SWINBURNE UNIVERSITY OF TECHNOLOGY

COS20031

Computing Technology Design Project

Week 04:

Design Thinking, Requirements and Modelling Entities and Relationship

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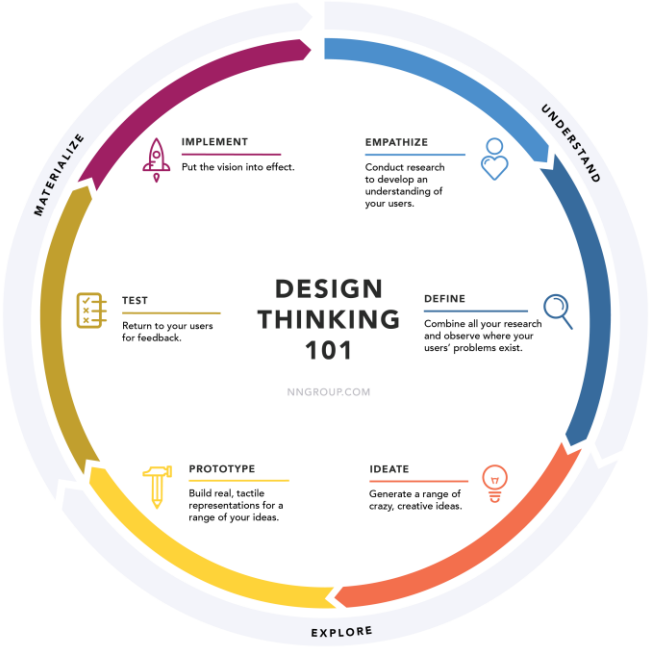
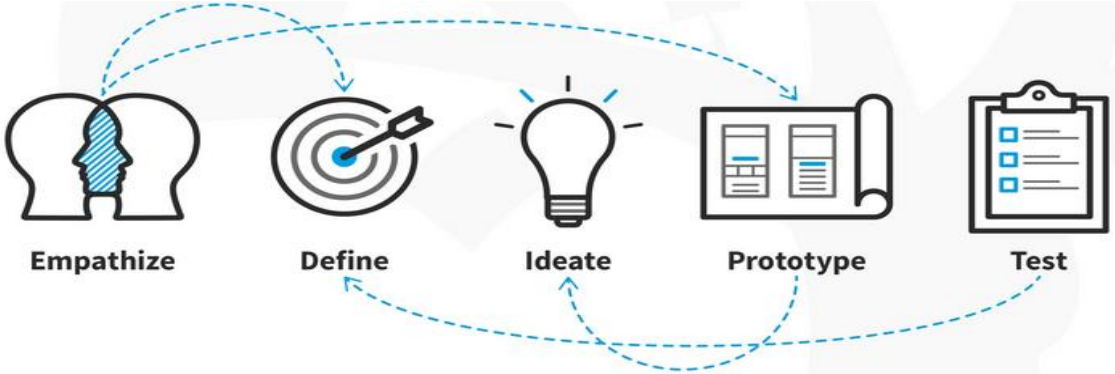
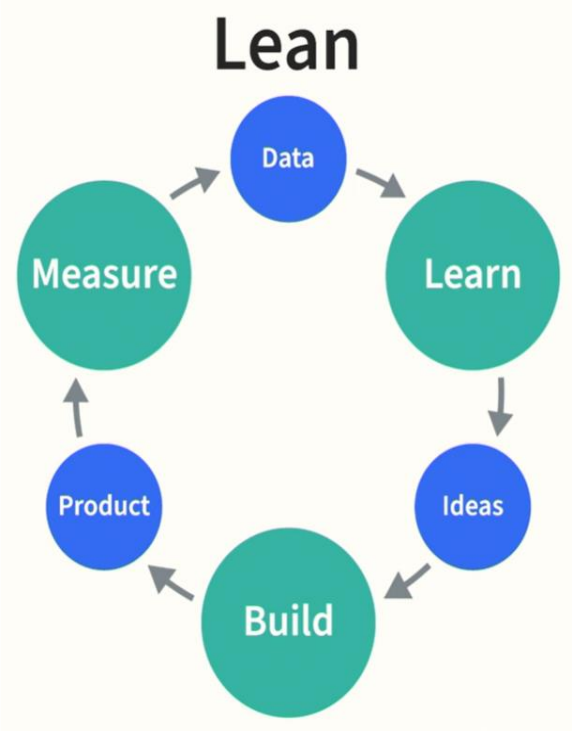
(A) Design Thinking

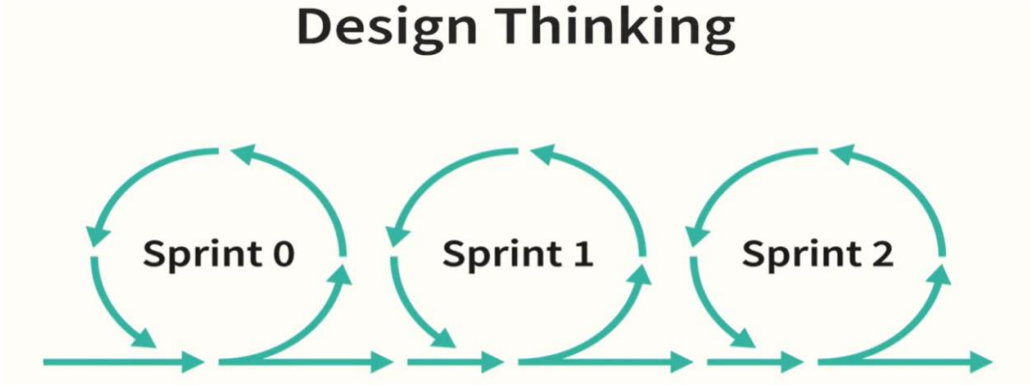


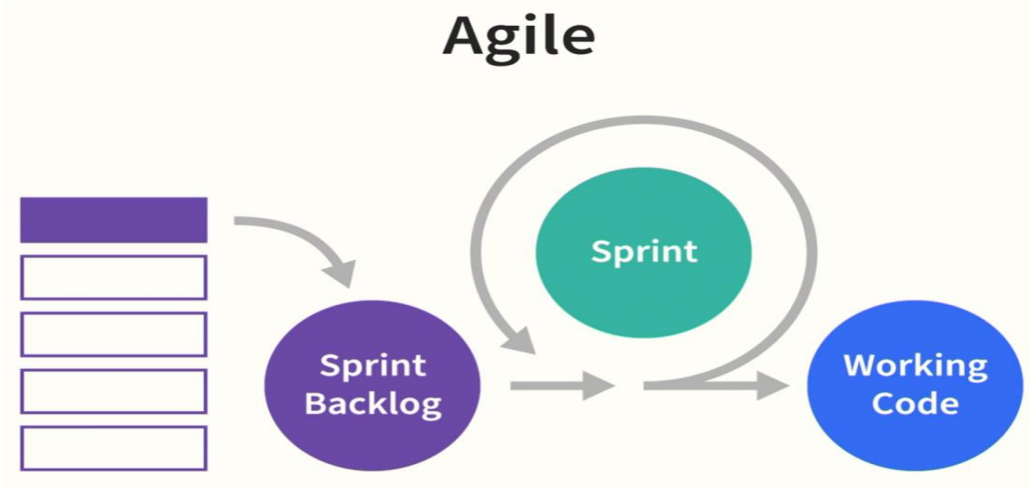
What is Design Thinking?



Agile, lean and design thinking







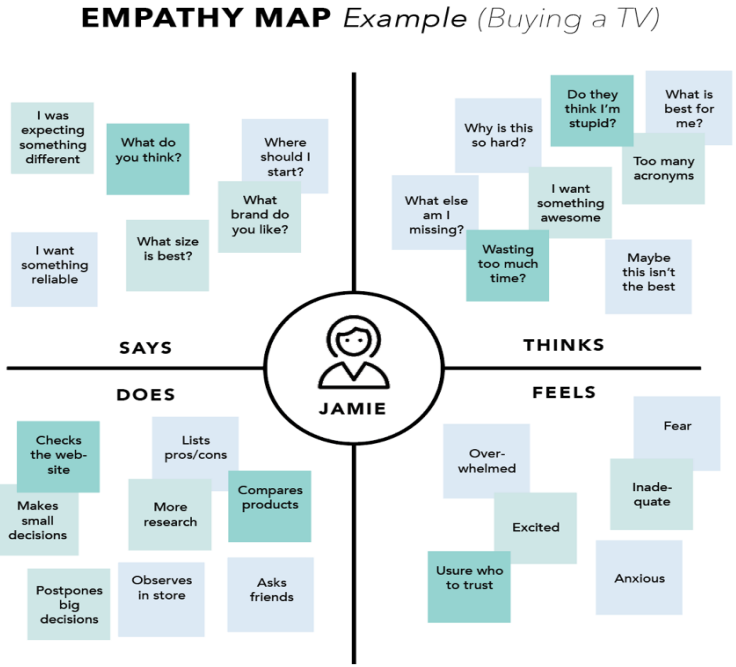
Empathy map usage

- **Empathy Mapping: The First Step in Design Thinking**

Visualizing user attitudes and behaviors in an empathy map helps UX teams align on a deep understanding of end users. The mapping process also reveals any holes in existing user data.

- **Format**

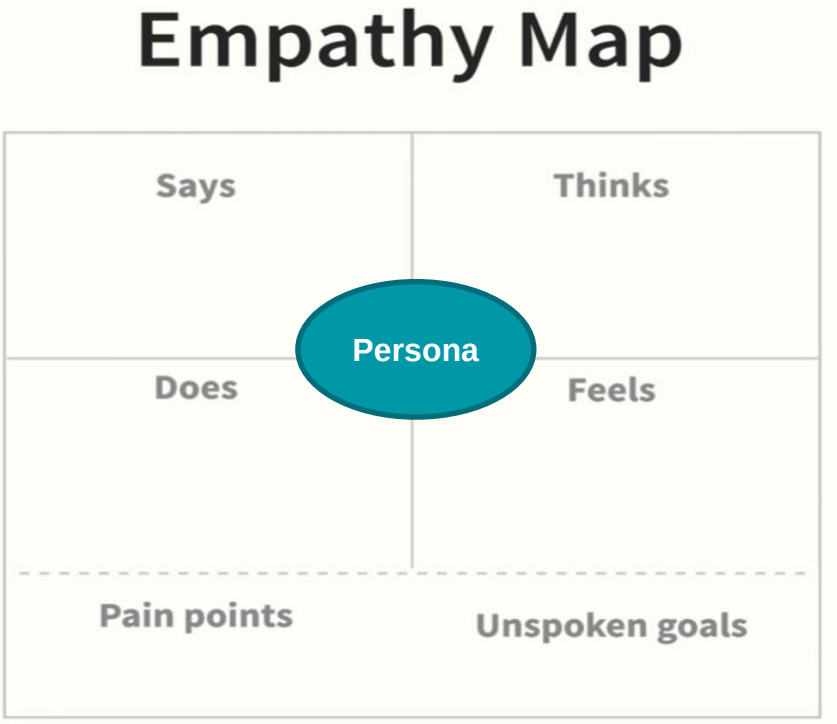
Traditional empathy maps are split into 4 quadrants (*Says*, *Thinks*, *Does*, and *Feels*), with the user or persona in the middle. Empathy maps provide a glance into who a user is as a whole and are **not** chronological or sequential.



Building an empathy map

How to Build an Empathy Map

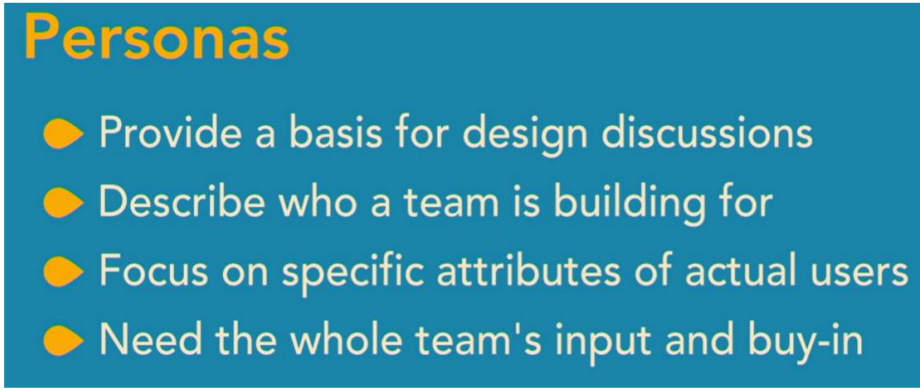
- **1.** Define scope and goals
- 2. Gather materials
- 3. Collect research
- 4. Individually generate sticky notes for each quadrant
- 5. Converge to cluster and synthesize
- 6. Polish and plan



https://www.nngroup.com/articles/empathy-mapping/

Create a persona

- 1. Cover the nuts and bolts
- 2. Outline each persona's demographics
- 3. Align your personas to reality
- 4. Describe what makes them tick



Personas are a valuable tool to help you get to know your customers, as well as how you can meet their needs or solve their problems. With detailed personas in place, everybody has a more consistent overview of your target audience. Plus, you're better equipped to provide empathy and insight when discussing features and product changes. Use this template to outline need-to-know information about your customers and take your marketing to the next level.

https://www.atlassian.com/software/confluence/templates/persona

Creating user stories

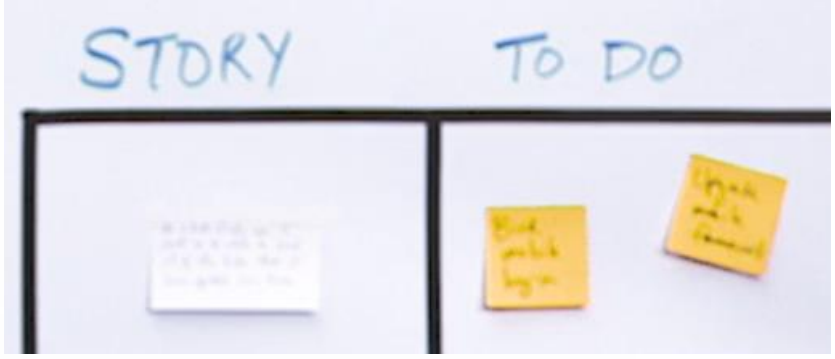
User Story

Brief statement of a functional product need from the perspective of a specific type of user

"As a standard customer, I want to see a list of benefits of upgrading so that I can see if it's worth the cost."

User Story Format

As a [user role], I [want/need/can] [goal] so that [reason].



Three Cs

Card

Conversation

Confirmation

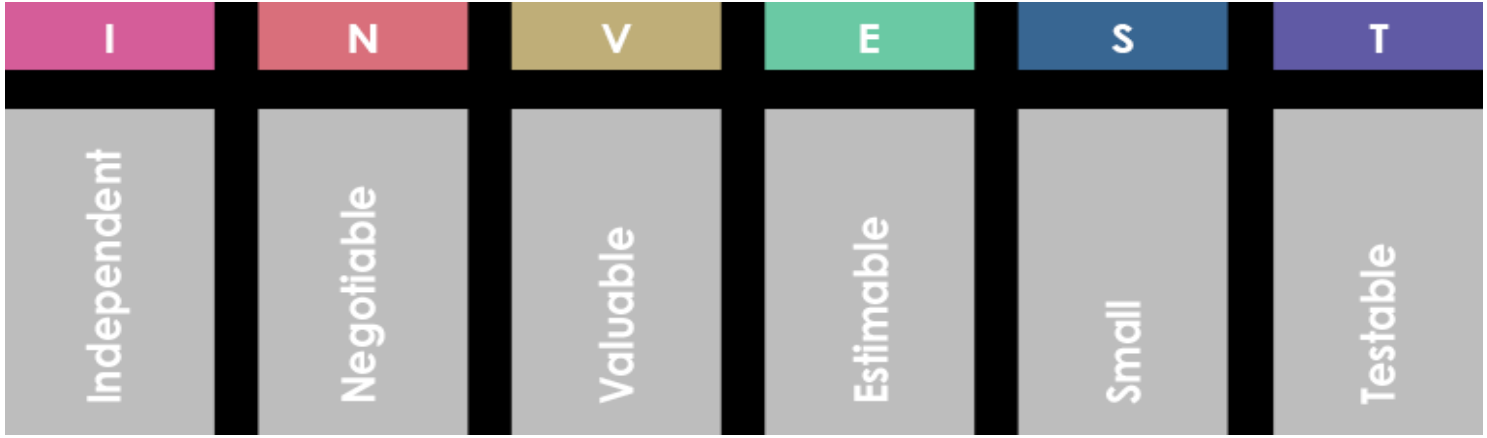
Writing effective user stories

In addition to a standardized format and complete elements, a good user story should also follow the **INVEST** principles:

1. **I**dependent;
2. **N**egotiable;
3. **V**aluable;
4. **E**stimatable;
5. **S**mall;
6. **T**estable.

Example User Stories

- Return list of birds
- Sort by match likelihood



https://www.cybermedian.com/how-to-write-effective-user-story-with-invest-principles/

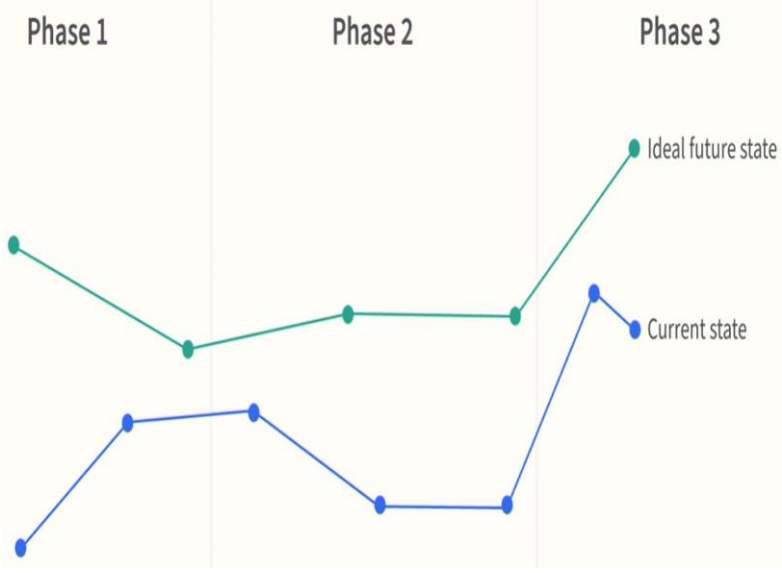
Grouping with themes or epics

- **What is an agile epic?**

An epic is a large body of work that can be broken down into a number of smaller stories, or sometimes called “Issues” in Jira. Epics often encompass multiple teams, on multiple projects, and can even be tracked on multiple boards.

- **Epic Splitting Method: F.E.E.D.B.A.C.K**
  - **F**: Flow - Influenced Story
  - **E**: Effort - Influenced Story
  - **E**: Entry - Influenced Story
  - **D**: Data Operations - Influenced Story
  - **B**: Business Rules - Influenced Story
  - **A**: Alternatives- Influenced Story
  - **C**: Complexity- Influenced Story
  - **K**: Knowledge- Influenced Story

What is a journey map



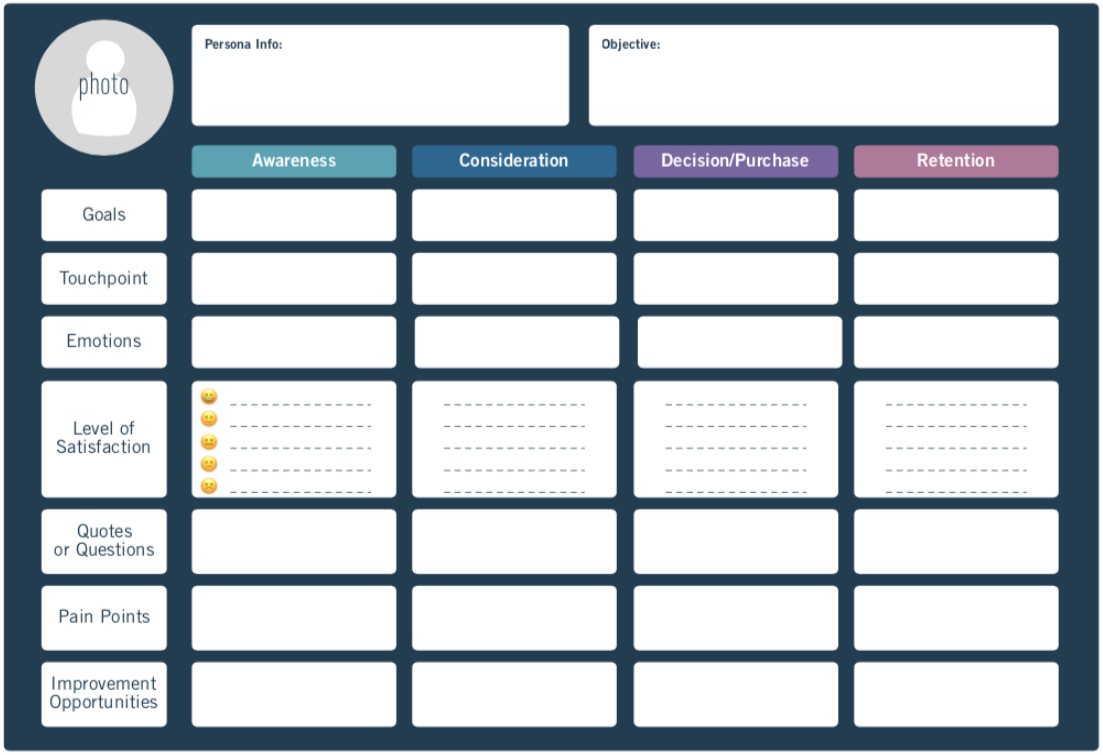
Journey map preparation

Defining Goals, Team, and Scope

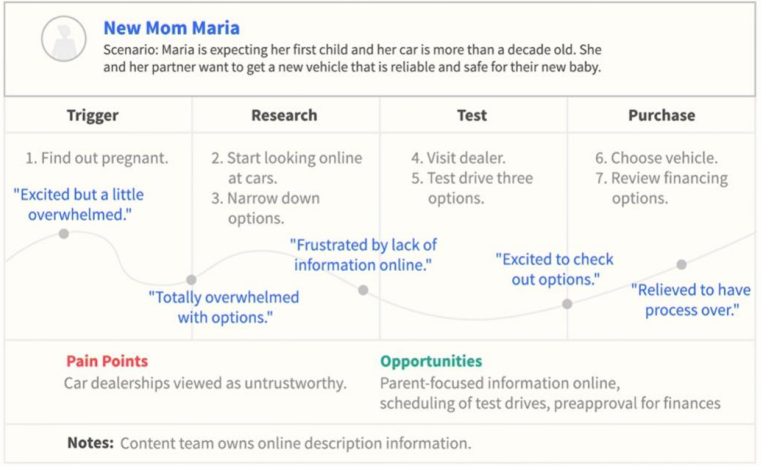
1. Set expectations for how the map will be used before starting
2. Spend time defining the objectives
3. Start with a small, focused scope
4. Accept that you can’t (and shouldn’t) map everything
5. Involve a cross functional team
6. Build a team of influencers and knowledge holders
7. Keep your stakeholders engaged
8. Iterate and don't let perfectionism drag you down
9. Focus on action and outcomes

https://www.nngroup.com/articles/journey-mapping-tips/

Building a journey map



Example of a Journey map



https://careerfoundry.com/en/blog/ux-design/how-to-make-customer-journey-map-with-template/

Alternative: Reading material about Design Thinking

- Empathy Mapping: The First Step in Design ThinkingLinks to an external site.
- How to build a personaLinks to an external site.
- How to write user storiesLinks to an external site.
- Journey maps 101Links to an external site.,
- Tips for getting started with journey mappingLinks to an external site.

(B) Gathering Requirements

Understand the goal

Creating a Mission Statement

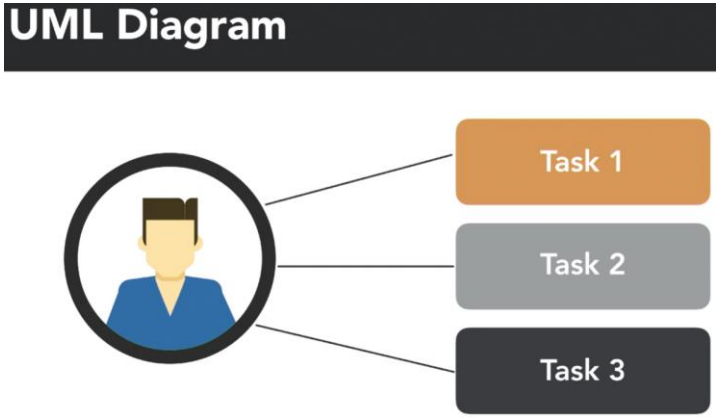
- Guides the database development process
- Will guard against "scope creep"
- Developed with project initiator
- Focused on the goal, not the tasks

Review the current system

- **1. Locating Current Records**
  - Outdated Computer Database
  - Spreadsheet Files
  - Paper records in file folders or cabinets
  - Always keep the mission statement in mind
- **2. Locating Current Data Export**
  - Summary reports
  - Transaction logs
  - Directories
  - Invoices and Receipts
- **3. Missing Requirements**
  - What does the system NOT do?
  - Look for bottlenecks in the process
  - Is requested summary data difficult to obtain?
  - Use the current system as a guide, no a model
- **4. Areas for Growth**
  - Are there any known future requirements?
  - What reports would be helpful if is available?

Discover actors and tasks

- **1. Locating Stakeholders**
  - Identify group of people that interact with the system
  - User groups are called “Actors”
  - Actors represent the same position or role
- **2. Possible Actors for Two Trees**
  - Account Executive
  - Salesperson
  - Warehouse manager
  - May all be the same person
  - External Actors include customer and vendor
- **3. Identifying Actors**
  - Review mission objectives for assistance
  - Ask “Who would take on this responsibility?”
  - Only include actors with mission objectives



Interview the client

- **1. Identify Interview Subjects**
  - Locate specific people in each actor group
  - Seek out the one with the most knowledge or experience
  - Sometimes known as “subject matter expert”
  - May also be a single point of contact
- **2. Conduct an Interview**
  - Come prepared with questions
  - Keep the interview on topic
  - Ask open-ended questions for general overviews
  - Ask closed questions for specific details
- **3. Business Rules**
  - Formal or informal constraints placed on data
  - May be written in a company manual
  - Or “Just known” by everyone in the organization

Interview Goal

Identify all of the data items the database will store.

Work with historical values

Storing Pricing Information

Products

Product Name	Price Each	...
Basil Infused	$19.00	...
Extra Virgin	$14.00	...
First Cold Press	$12.00	...
Mission	$12.50	...

Line Items

Line Number	Invoice Number	Product Name	Purchase Price	Quantity	...
1	121	First Cold Press	$12.00	2	...
2	121	Extra Virgin	$14.00	3	...
3	121	Mission	$12.50	1	...
1	122	Basil Infused	$19.00	1	...

Storing Status Information

Products

Product Name	Manufacturer	Price Each	Status	...
Basil Infused	1	$19.00	Discontinued	...
Extra Virgin	1	$14.00	Active	...
First Cold Press	1	$12.00	Active	...
Mission	1	$12.50	Active	...

Case study

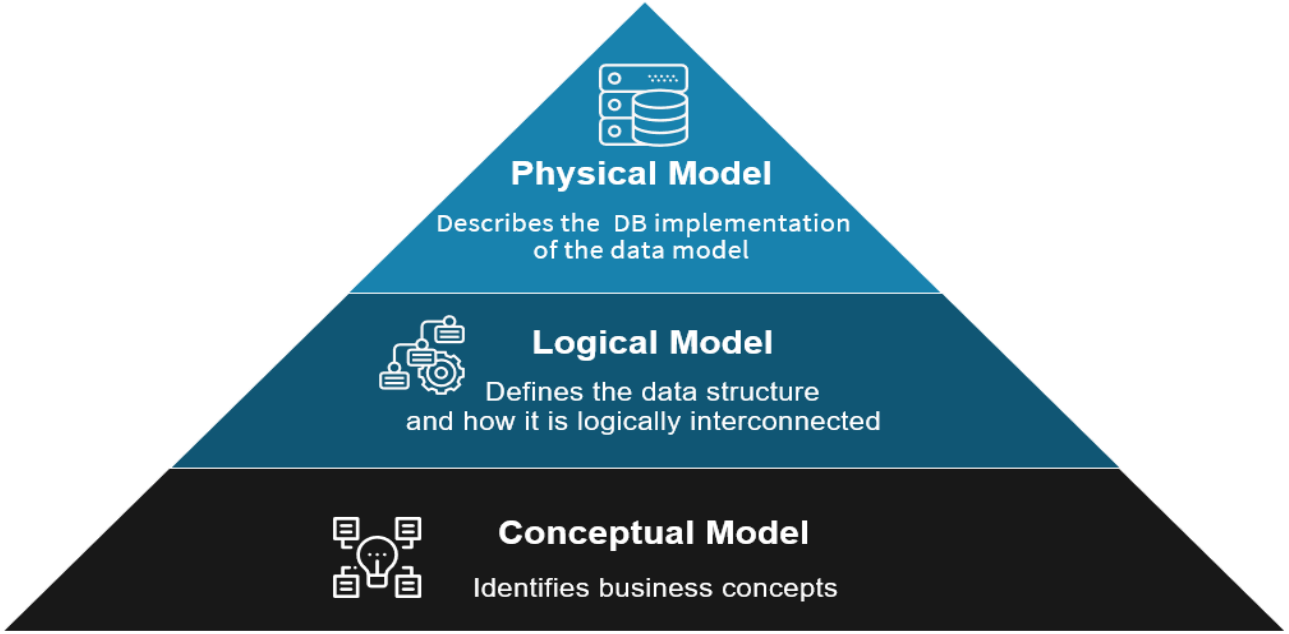
Identify exceptions and irregularities

Case study

- Customer name
- Business name
- Credit card
- Purchase order number
- Method of payment or customer type

"We need to collect the customer's first and last name and credit card number. Oh, unless it's a wholesale customer. Then we need the business name and a purchase order number."

(C) Developing the Conceptual Data Model



Understand entities and tables

- **1. Building a Data Model**
  - Graphical representation of the database
  - Your construction blueprint
  - Visualizes tables and field
  - Clarifies relationships between tables
- **2. Understanding Tables**
  - Tables represent collections of entities
  - They’re made up of records and rows of identical structure
  - Records store data on places, people, things, or events
- **3. Identifying Tables**
  - Organize field list into logical groupings
  - Field will characterize common subjects
  - Document review and interviews will guide the process
- **4. Tables Diagram**
  - Each table is represented by a rectangle
  - Field are listed below the entity name
  - Entities are connected by lines to represent relationships
  - Symbols are added to denote the type of relationships

Understand entities and tables (Example)

Diagramming a Data Model

Employees
Employee ID
Name
Home Address
Office Phone
Cubicle Number
Salary
Department
Title
Supervisor
…

Customers
Customer ID
Name
Billing Address
Shipping Address
Credit Card
…

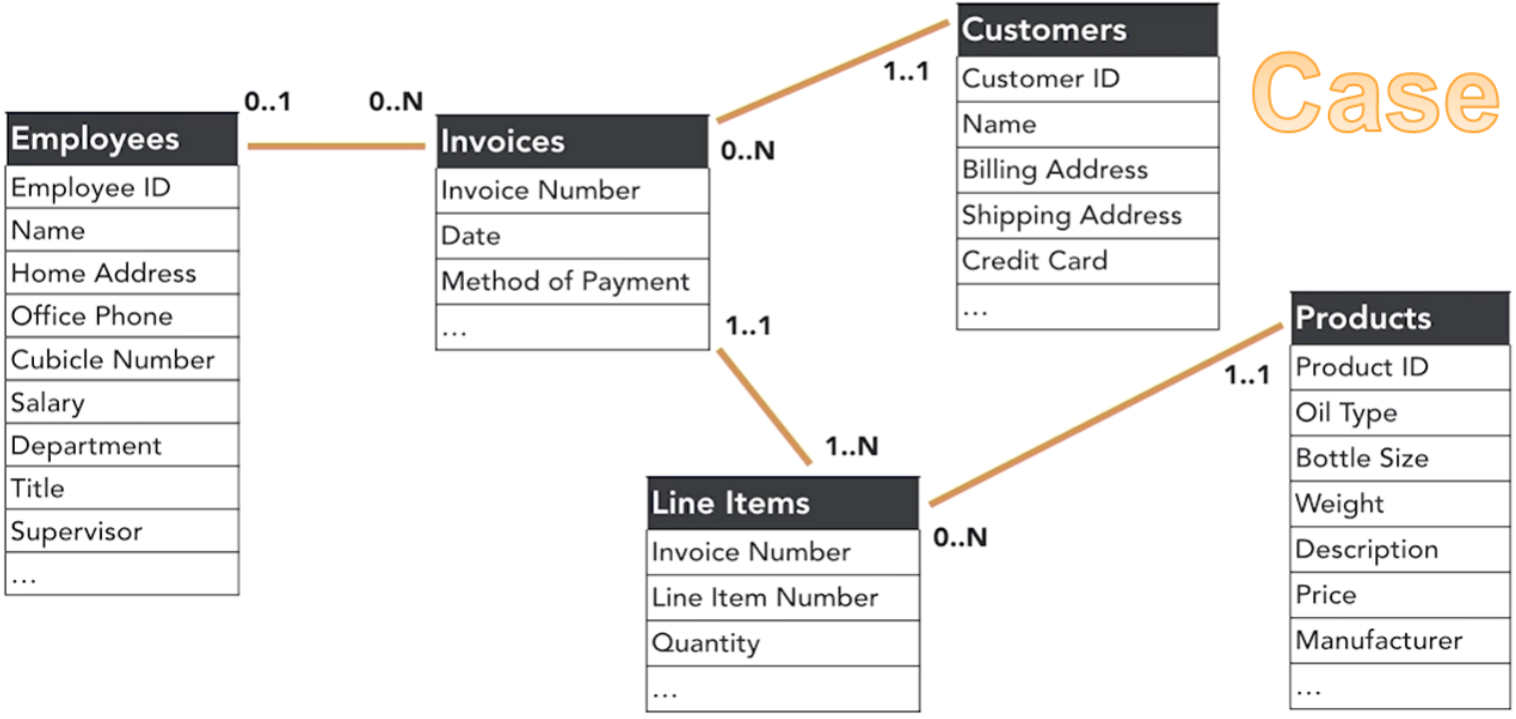
Invoices
Invoice Number
Date
Method of Payment
…

Products
Product ID
Oil Type
Bottle Size
Weight
Description
Price
Manufacturer
…

Case study

Develop relationships

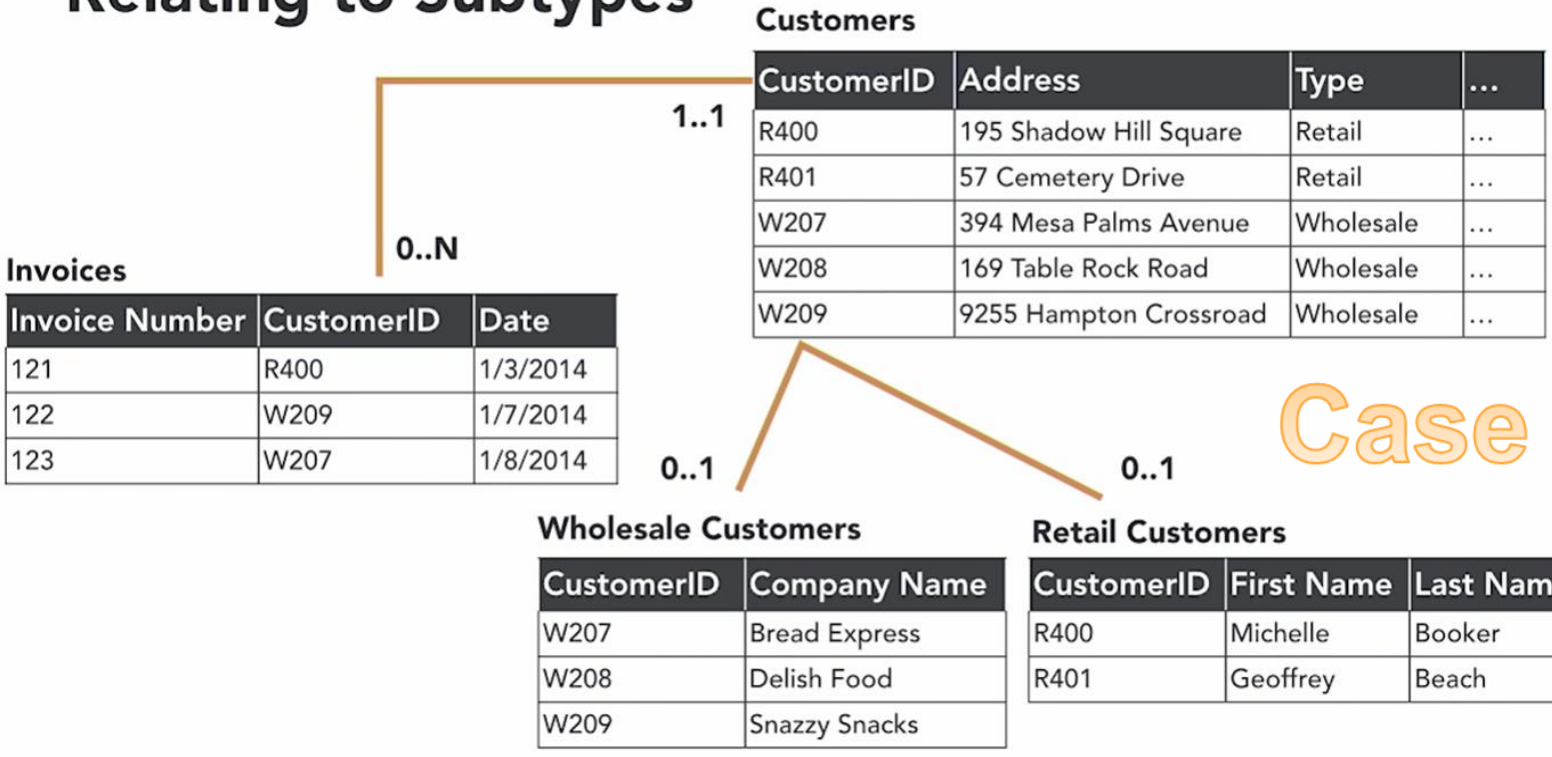
Establishing Relationships



Case study

Develop subtypes and supertypes

Relating to Subtypes

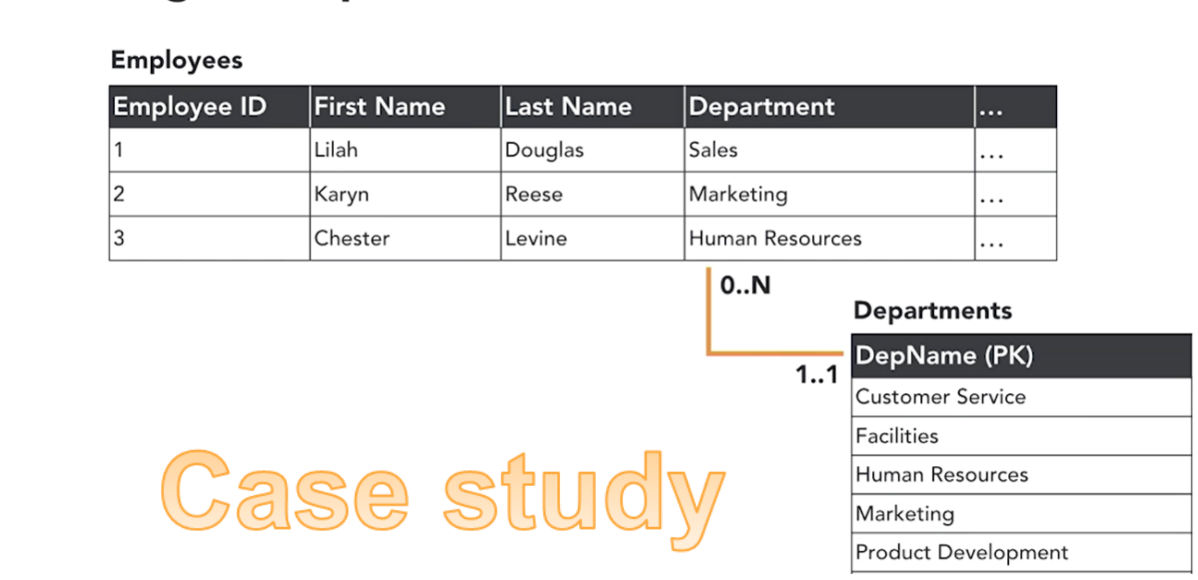


Case study

Utilise lookup tables

What are lookup table?

- Determined by business rules
- Help support data consistency
- Create a finite list of acceptance values
- Implemented as a drop-down list or combo box



Draft the initial data model

Draft the Data Model

- Organize tables into a model of your system
- Create relationships between entities
- Get the draft down on paper so you can see the bigger picture

Tutorial & Workshop

See Canvas.