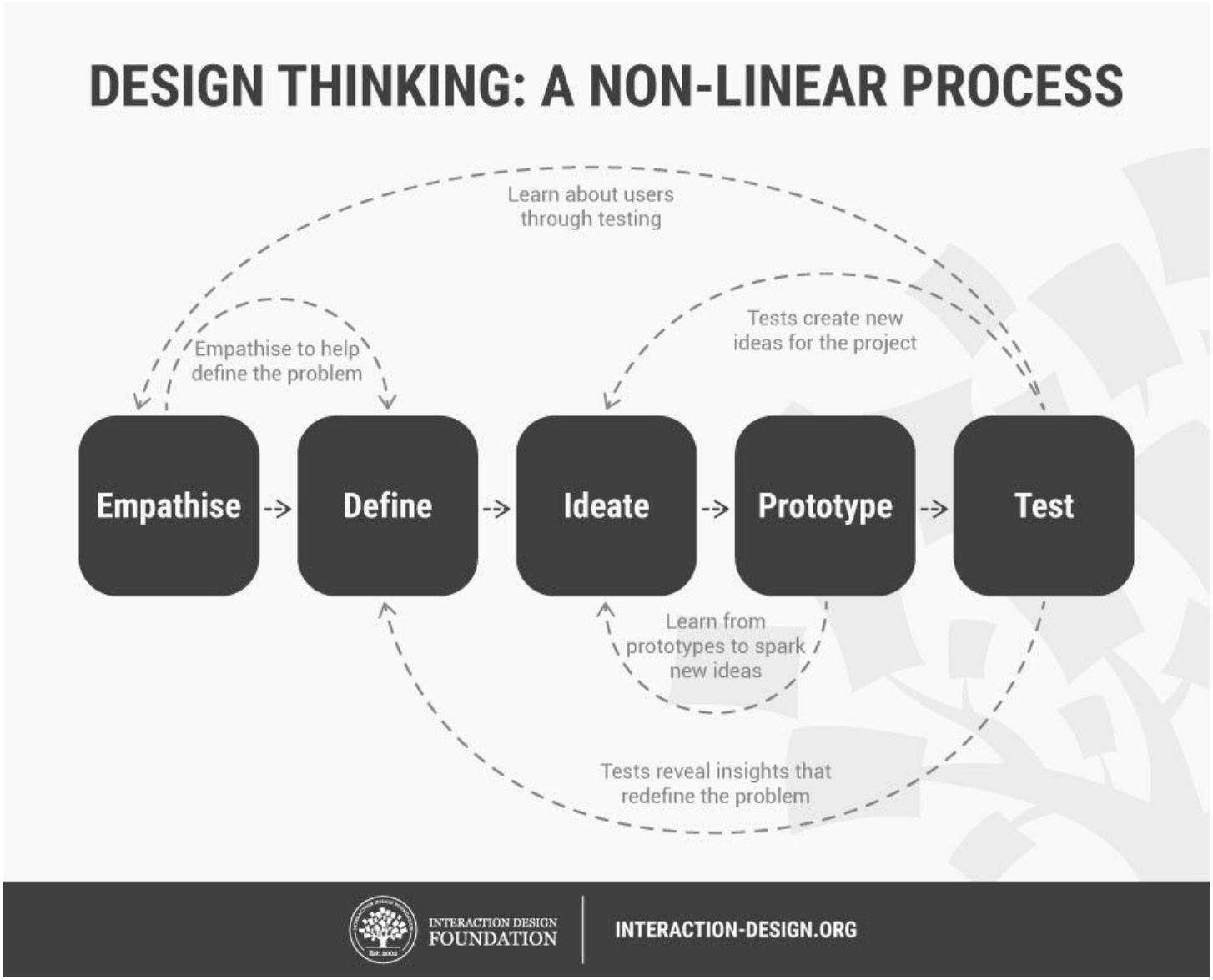
CT318 LECTURE 5

Design Thinking 2:

- Design Projects: Challenges
- Design Thinking Step 2: Define
- Problem Statements
- Represent Requirements: Task & User Needs
- PACT (Preece et al)

DESIGN PROJECTS

- Design Projects
  - Design Challenges to be explored: empathizing, defining will follow
  - What is the problem?
  - Who has the problem? (user centred not technology / product)
  - Problem statements: feedback


DESIGN THINKING: A NON-LINEAR PROCESS
Learn about users through testing
Empathise to help define the problem
Tests create new ideas for the project
Empathise
Define
Ideate
Prototype
Test
Learn from prototypes to spark new ideas
Tests reveal insights that redefine the problem
INTERACTION DESIGN FOUNDATION
INTERACTION-DESIGN.ORG

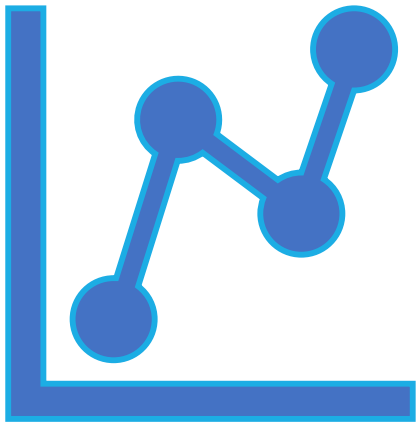
DEFINE

DEFINE: SYNTHESIS

"An integral part of the Design Thinking process is the definition of a meaningful and actionable problem statement, which the design thinker will focus on solving. This is perhaps the most challenging part of the Design Thinking process, as the definition of a problem (also called a design challenge) will require you to synthesise your observations about your users from the first stage in the Design Thinking process, which is called the Empathise stage"

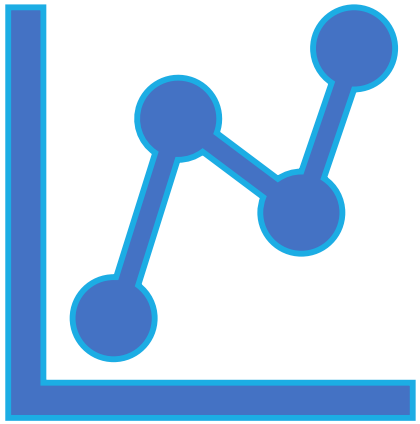
Dam & Siang, IDF 2020

DEFINE: ANALYSIS TO SYNTHESIS?



- Empathise to collect and analyse user needs
- Synthesise output from Empathising stage
- Analyse collected data (qualitative and quantitative)
- Produce problem statements: representations of User Needs

DEFINE: PROBLEM STATEMENTS



- Good problem statements:
  - Human centred: focused on people's needs not technology or product
  - Broad enough for creative freedom: not technical requirements
  - Defined enough to be manageable
  - Begin with an action oriented verb: "create", "define", "adapt"

DEFINE: HOW TO?

- How to synthesise output from empathizing stage?
- Create a wall of information: collate findings into one place: space, saturate and group into:
  - Empathy Maps
  - Personas
  - Points of View
  - User Needs Statements

USER NEEDS: REPRESENTATIONS

Users:

- Personas
- Empathy Maps

Tasks:

- Activity / Task Analysis

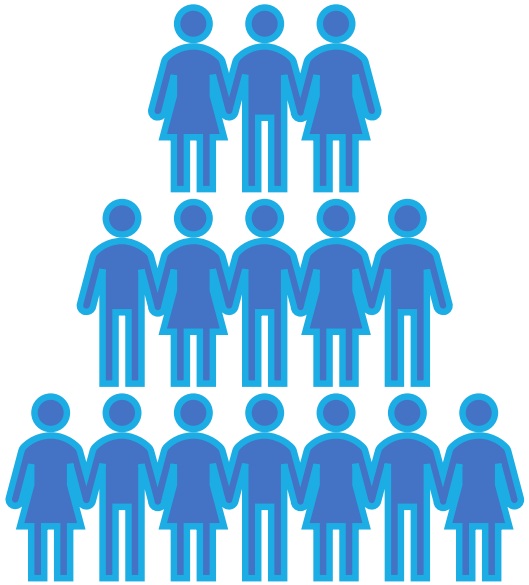
Users & Tasks:

- User Needs Statements
- User Stories
- Use Cases, Scenarios
- Storyboards
- Prototypes

USERS: PERSONAS

- Diversity of humans - abilities, backgrounds, motivations & personalities - design challenge
- "*Average*" or "*typical*" user?
- How to design to accommodate this diversity?

- **Personas:**
  - Concrete example of a user and their motivation, behaviours, abilities
  - Helps keep designers consistent over time
  - Increases empathy
  - Helps innovation



PERSONAS

openmoko

The Greenhorn

JOHN

Profile

- Probably the single biggest segment of mobile users.
- Want simple: turn on their mobile, dial a number and talk to their intended party.
- Don't care about anything other than the mobile being able to be used as a phone, and possibly contacts.

Scenario

I didn't get my first phone until 2001. My daughter bought it for me. I didn't feel it was necessary but since then, I have it with my all the time and use it more than my home phone.

The Casual User

EMILY

Profile

- Take advantage of most phones features, but not all.
- Use the phone to make calls, use the contacts, send text messages, and take pictures.
- Their mobile is always with them.

Scenario

My phone has to look cool. I personalize it with decals, charms, and ring tones. I talk on it everywhere, so my phone style is everything. Of course, it has to work too. I usually talk on the phone, but recently started taking pictures and recording video. My phone is my favorite accessory.

The Texter

AKIKO

Profile

- Texting is far more popular than calling.
- Will send and receive thousands of text messages per month.
- Rarely use their phones for calling.
- Want a clean texting interface with the fastest possible input.

Scenario

I prefer texting than calling because it's more fun and creative. My friends and I probably text each other around 40 times a day. We'll even text to order food. It's far more interesting and less intrusive. I don't have to worry about disturbing people on the train with my talking. I love it.

The Business User

STEPHAN

Profile

- Wants a phone that is simple, but functions as an integrated smart device.
- Want to read email and call back the sender with the least amount of effort.
- Needs "Popular" mail server integration, including Blackberry and Exchange.

Scenario

My mobi is my life. Without it my business would suffer. I take conference calls while driving down the M25. If someone text me, I need to ring them without taking my eyes off the road. And since I use my mobi everywhere, it needs to be durable. The last thing I need is for it to break after one drop.

The Power User

ROBERTO

Profile

- Will use almost all of the built-in functionality.
- Will also extend their phones functionality with additional software.
- Will flip through every menu options and changing settings.

Scenario

I'm addicted to new toys. I get the latest gadgets as soon as they arrive on the market. I upgrade my phone every 6 months. I guess you can say this is almost a sport for me. Or an addiction? I just love to explore the latest and how it can make life fun.

The Hacker

RICKY

Profile

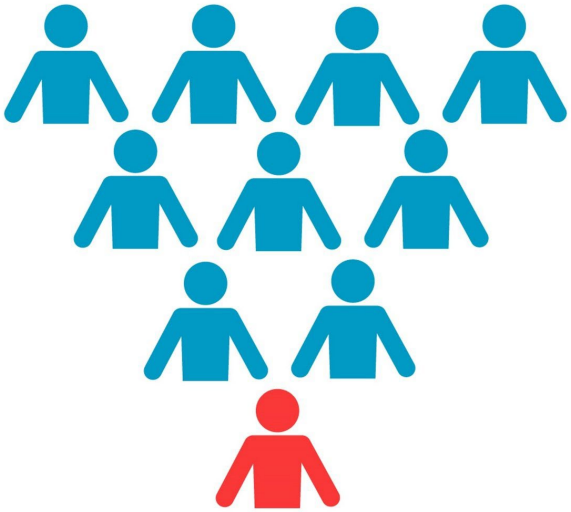
- Care more about customization.
- Want to make changes to every aspect of the phone.
- Belong to mailing lists and forums about hacking the phone.
- Contribute to the open source community.

Scenario

As soon as I found out about an open source phone, I jumped on it. I created two apps for the phone and am working on the texting solution. I probably should spend more time at my day job, but this is far more fun. Of course, I use my phone for calls and texting too.

EXTREME PERSONA

- To avoid "cliches" and bias in user populations
- Focus on specific characteristics of rare or specialist groups
  - Multi minority: physical
  - Hard lifer: emotional
  - Toxic behaviours: behavioural
- Include an extreme persona as part of target user group



EMPATHY MAP

- Aggregated empathy maps summarize qualitative data
- An empathy map can be used to communicate a persona, instead of the traditional 'business card' approach

TASKS & ACTIVITIES

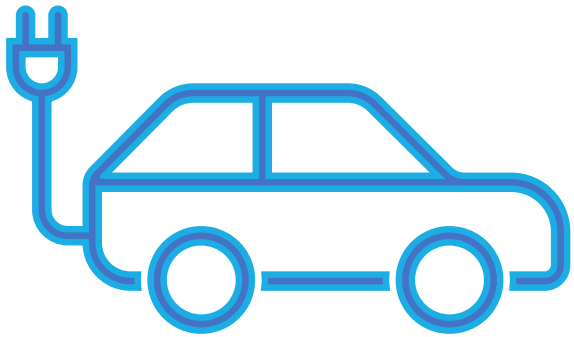
- Activity Analysis
- Hierarchical Task Analysis
- Card Sorting
- Affinity Diagrams

ACTIVITY ANALYSIS

- Activity: narrow / broad (e.g. starting a car, making coffee)
- Often done implicitly in design: explicit
- Activity Analysis Outcomes (not a design):
  - What are steps involved?
  - What artifacts are used?
  - What are goals? How to measure success?
  - What are pain points? Workarounds, breakdowns

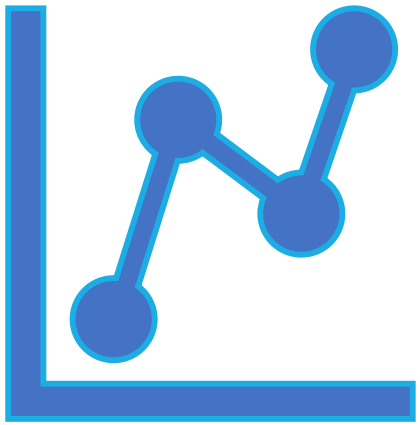
ACTIVITY ANALYSIS EXAMPLE

- Activity: Starting a car
- Narrow / Broad?
  - Unlock driver's door
  - Take a seat behind the wheel
  - Insert key in ignition switch
  - Turn key fully clockwise
  - When engine starts, release the key



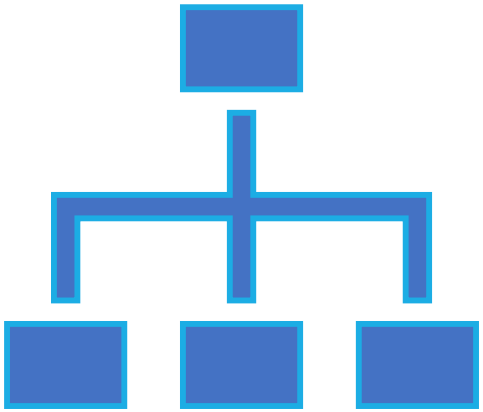
- Opportunity for redesign?
  - Artifacts?
  - Goals: important to point of view as designer: narrow / broad pain points?
  - Creating new things - metaphors

TASK REQUIREMENTS: ANALYSIS



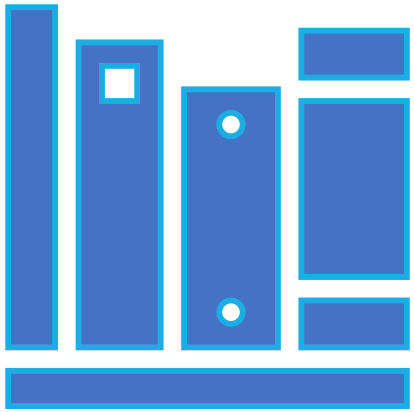
- Analyse how users perform tasks
- The things they do, they act on and they need to know
- Task analysis techniques such as HTA help to investigate existing systems and practices
- Three different approaches to task analysis, each with a different emphasis:
  - **Task decomposition**: task is split into subtasks
  - **Object** / **ER** based analysis: the actors, objects & relationships
  - **Knowledge-based techniques**: what users need to know, ontologies

TASK ANALYSIS METHODS

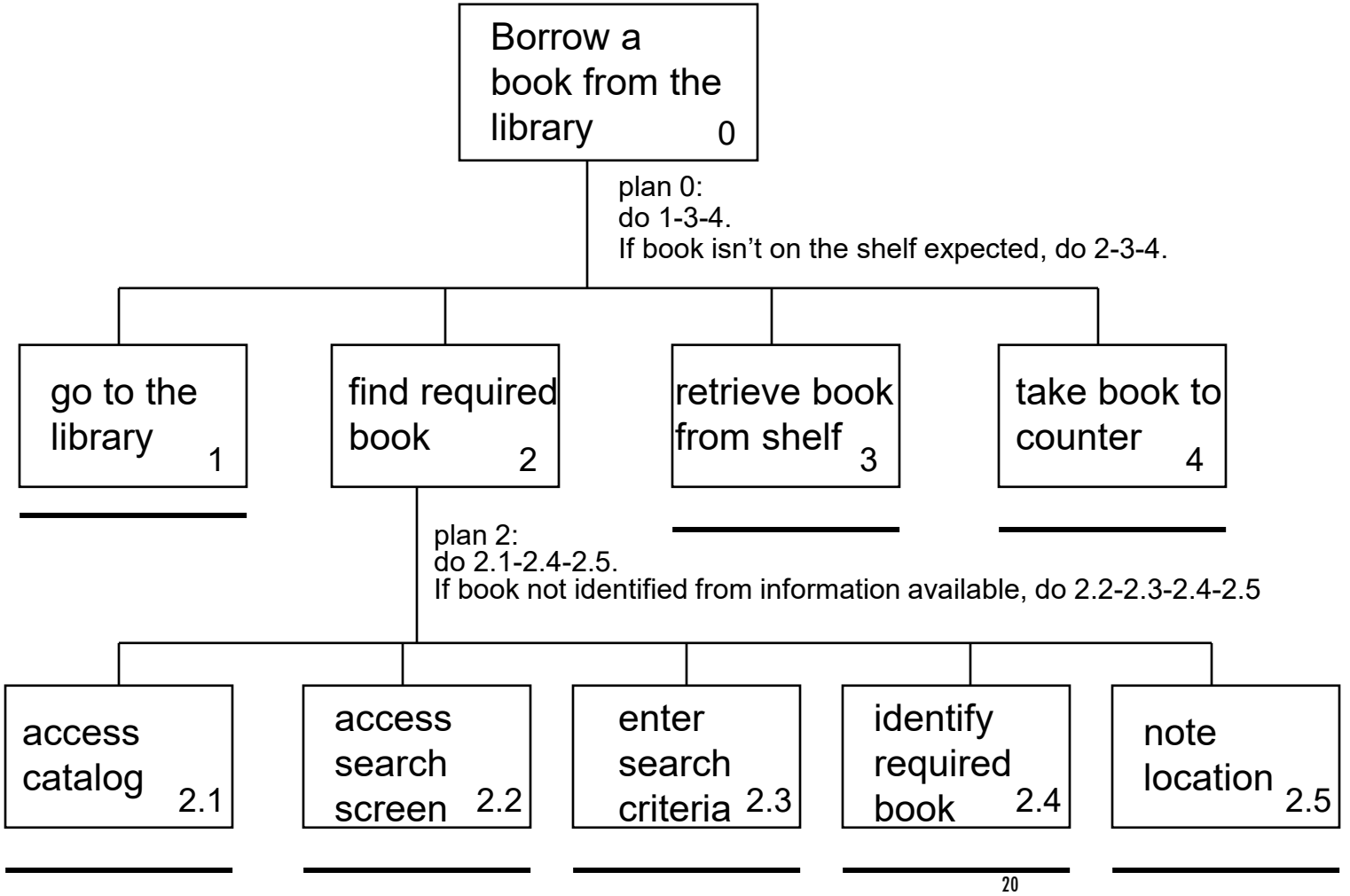


- **Task Decomposition:**
- *Hierarchical Task Analysis* (*HTA*) outputs a hierarchy of tasks and subtasks in the order they are performed
- Iteration & when to stop: P * C rule
- Represented diagrammatically and textually
- Example: Task of vacuum cleaning; making coffee
- **Example:** Borrow a book from library?

HIERARCHICAL TASK ANALYSIS (HTA)

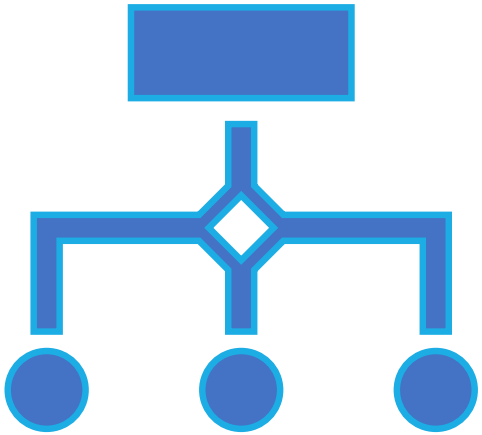


- 0: Borrow a book from the library:
  - 1. go to the library
  - 2. find the required book
    - 2.1 access library catalogue
    - 2.2 access the search screen
    - 2.3 enter search criteria
    - 2.4 identify required book
    - 2.5 note location
  - 3. go to correct shelf and retrieve book
  - 4. Take book to checkout
- Or 2 first? Then 1,3,4?


Borrow a book from the library 0
plan 0:
do 1-3-4.
If book isn't on the shelf expected, do 2-3-4.
go to the library 1
find required book 2
retrieve book from shelf 3
take book to counter 4
plan 2:
do 2.1-2.4-2.5.
If book not identified from information available, do 2.2-2.3-2.4-2.5
access catalog 2.1
access search screen 2.2
enter search criteria 2.3
identify required book 2.4
note location 2.5

TASK ANALYSIS USES

- Output is some breakdown of tasks people perform and the objects, plans, sequences of actions etc.
- This material can be used for many purposes:
  - Production of tutorials and support material
  - Requirements capture and high-level systems design
  - Assignment of tasks to human or computer: who provides data, who does task? (e.g. currency converter)
  - Detailed interface design
- TA does not scale very well, given complexity of real tasks (size, overlapping, parallel, interruptions)



DATA GATHERING: CARD SORTING

- Card sorting: web search akin to looking for a scissors in someone else's kitchen! (Benyon)
- Understanding how people classify and categorise things: information architecture / ontology

AFFINITY DIAGRAMS

- Group information & find relations between groups
- Post-Its on large surfaces
  - haptic UI
  - immersive
  - persistent
  - brainstorming

USERS & TASKS

Describing sequence of actions undertaken by users:

- **User Needs Statements (PoV)**
- **User Stories**: specific, and communicate the value of the experience to its users
- **Storyboards**: generic / specific; visual
- **Scenarios:** specific; visual / textual

USER NEEDS STATEMENTS

- Actionable problem statements
- Summarise:
  - Who a particular user is
  - The user's need
  - Why the need is important to the user
- Define what you want to solve, before solving it
- Advance presumptive solutions towards deeper problem insights

USER NEEDS STATEMENTS

- Align different points of view before progressing to **ideate** stage
- Captures **what** (from empathic insights) rather than **how** (predetermined solutions): what is important to user not UI buttons
- **Verbs** (user goals) rather than **nouns** (UI solutions): *choices* not *dropdown*; *digest varied information* not *dashboard*
- User needs: goals (service provided) not preferences (what they like stylistically)
- **Format: user – need – goal**
- (User) needs a way to (address this need) so that they (accomplish their goal)

USER NEEDS STATEMENTS: EXAMPLES

"Users don't need another food delivery platform; they just need a way to look for food in their area and have it delivered whenever they want

Your users do not require a shopping cart; instead, they require an overview of the products and the total cost in order to finalize their purchase

The goal of your designs is not to build a checkout page, button, or pricing table; instead, it should be to understand the user's demands and provide a solution"

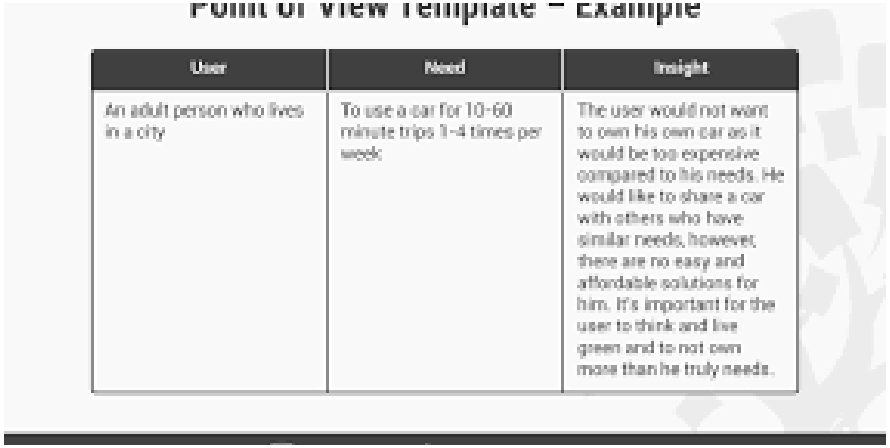
Kaushik, 2021, UXPlanet

- Users do not need to login!

USER NEEDS STATEMENTS: EXAMPLES

- As a renter, I need to know how much my utility bills will be so I can budget appropriately
- As a homeowner, I need to know how much property / council tax I have to pay so I am tax compliant
- As a car owner, I need to know where I can find the cheapest fuel so I save money
- As a student, I need to know where I can study so I don't waste valuable study time searching for a free space
- *"As a householder living near a proposed fracking site I want to know what effect fracking has on nearby households So that I can make a decision about moving home"* (UKGov)

USER NEEDS STATEMENTS



Point of View Template – Example

User	Need	Insight
An adult person who lives in a city	To use a car for 10-60 minute trips 1-4 times per week	The user would not want to own his own car as it would be too expensive compared to his needs. He would like to share a car with others who have similar needs, however, there are no easy and affordable solutions for him. It's important for the user to think and live green and to not own more than he truly needs.

User Need

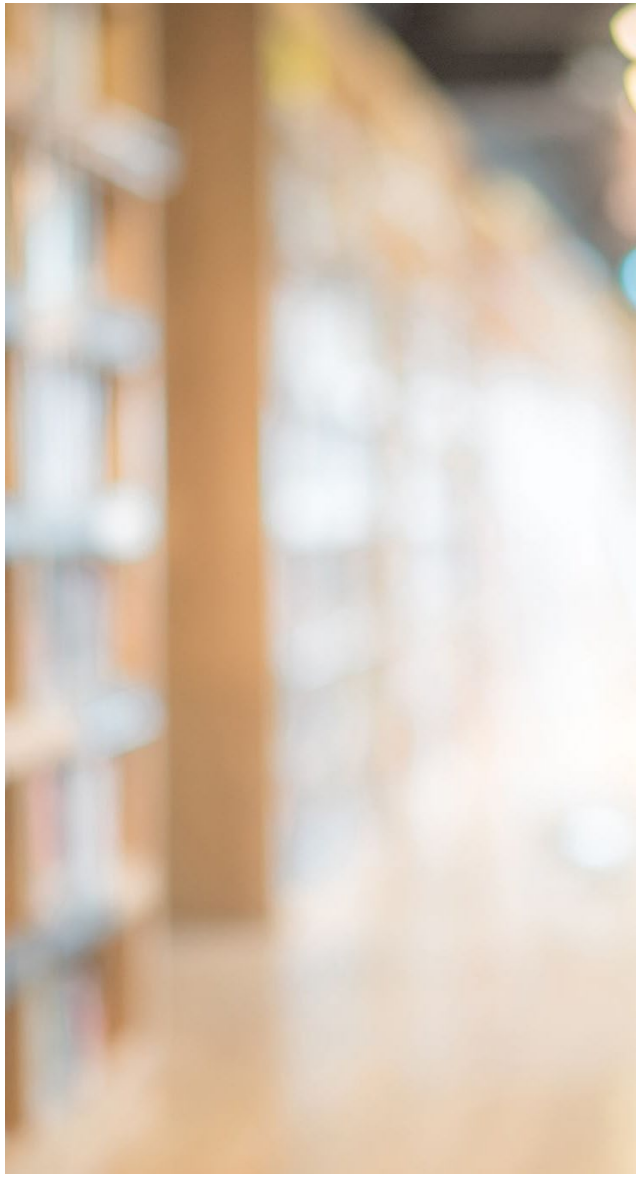
As a [User Type] **I need/ want** [User Need] **so that** [User Goal] .

User Problem

[Situation] **is challenging for** [User Type] **because** [Cause/ Problem] .

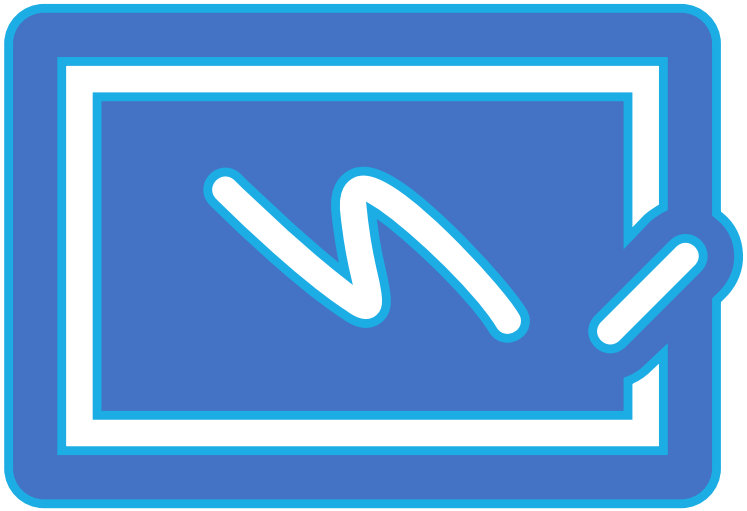
USER STORIES

- Using storytelling in UX design: Account of events from user's perspective: well crafted from user insights, empathic
- Shared vocabulary, focus on common goal, ignite imagination and persuade stakeholders: compelling
- Current (as-is) or Future
- User & user goals are building blocks upon which empathy, context, plot and insight are built
- User, User's goal & motivation, Context, Plot, Insight, Spectacle



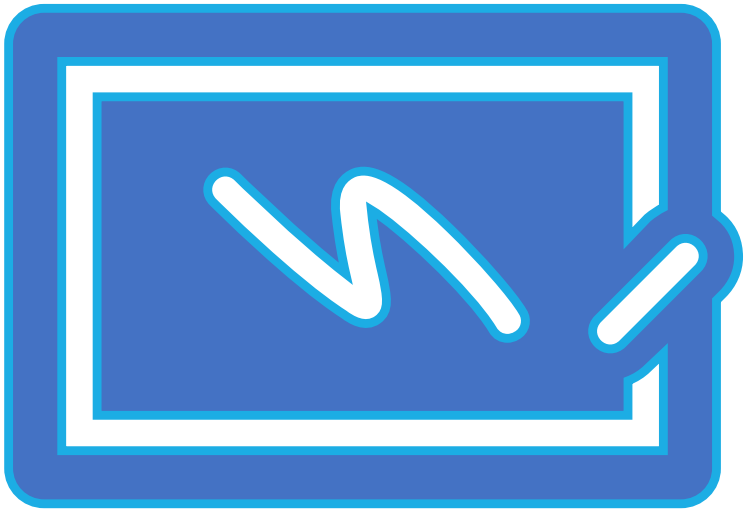
STORYBOARDS

- Storyboard: visual communication of ideas
- "Communicates a story through images displayed in a sequence of panels that chronologically map the story's main events." NNG
- Provide additional context
- Images make the story quick to understand at first glance and easy to remember: informal
- Storyboards consist of:
  - A specific scenario
  - Visuals: define fidelity
  - Corresponding captions

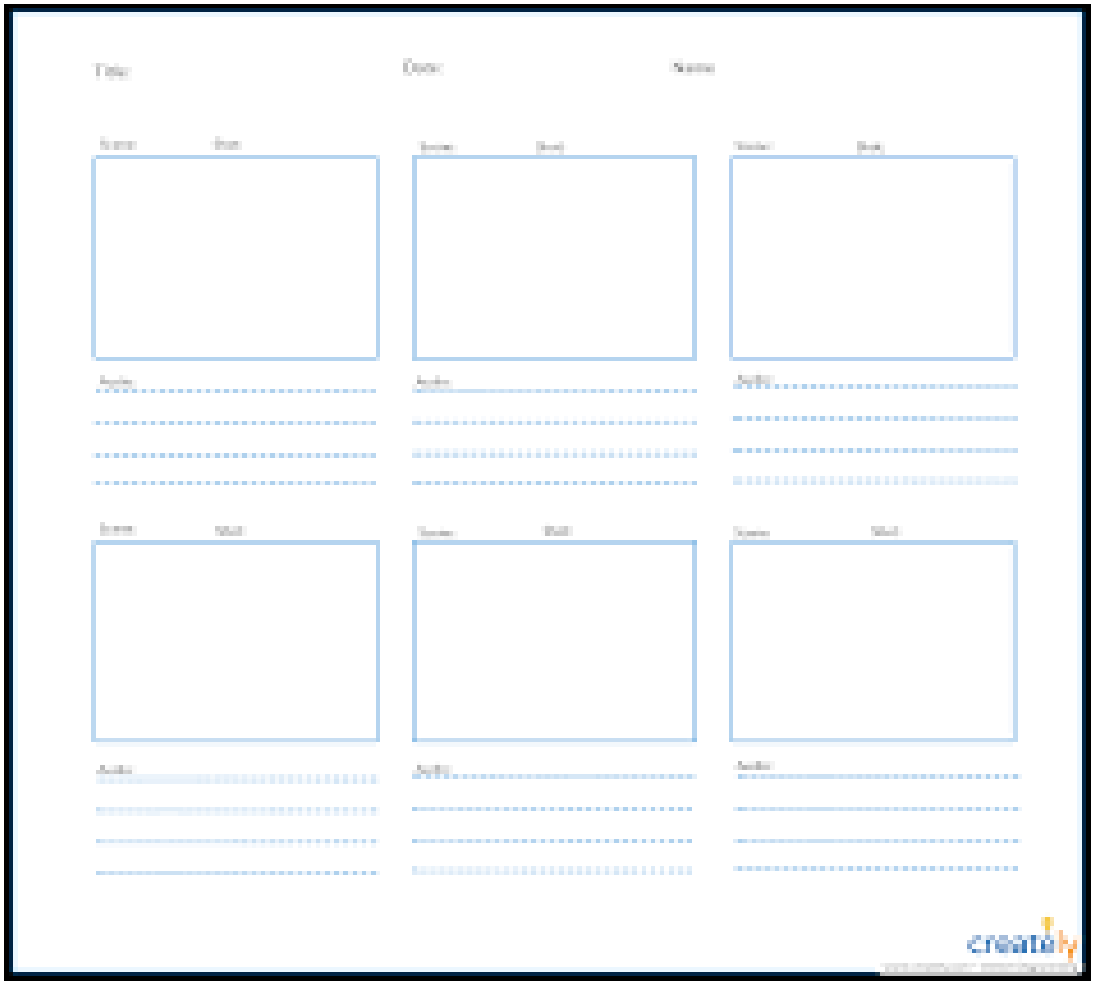


STORYBOARDS

- **Tasks** & **activities** you want to support (not UI)
- Holistic focus: no commitment to particular UI
- In a few panels capture what user will accomplish
- Will have person in it
- Communicate flow & ideas: key points in time
- Extremely harsh time limits: 10 minutes
- Three key components:
  - Setting: people, environment, task
  - Sequence: steps
  - Satisfaction: user motivation



STORYBOARD TEMPLATE

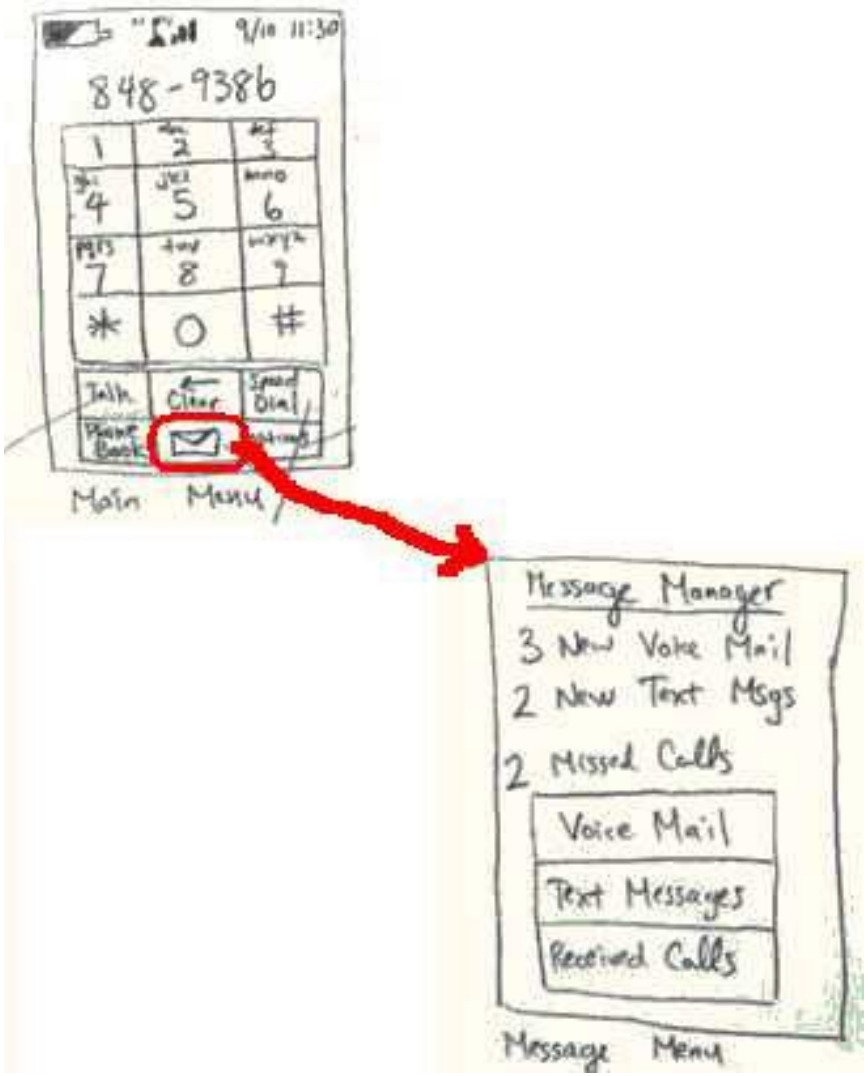


SCENARIOS

- An informal narrative story, simple, ‘natural’, personal, - not generalisable
- Illustrate using storyboards: sequences of sketches showing screens & transitions
- Good to demonstrate to management, marketing and customers
- Can replace much textual specification

SCENARIOS

- Scenarios are *design specific*, tasks aren't
- Scenarios force us to
  - show how various features will work together
  - settle design arguments by seeing examples
    - only examples -> need to look beyond
- Show users storyboards
  - sequences of sketches showing screens
  - actions users can take
  - get feedback

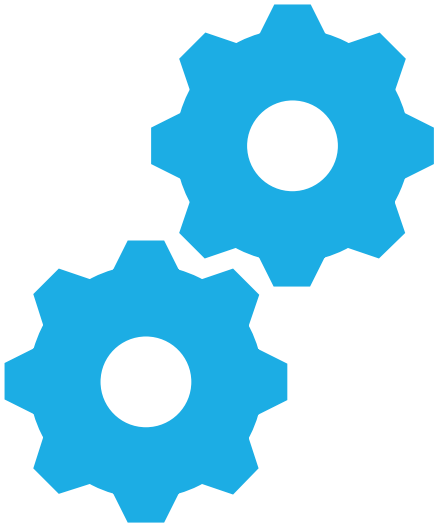


PACT FRAMEWORK

- **PACT:** People, Activities, Contexts and Technologies *(Preece et al, Interaction Design* book)
- ***People*** use ***technologies*** to undertake ***activities*** in ***contexts***
- Variety of these elements that makes designing interactive systems such a challenge
- Aim: best possible mix of technologies to support the activities being undertaken by people in different contexts
- PACT analysis useful for analysis and design
- Good Project Framework

REQUIREMENTS TO DESIGN

- Design begins after set of requirements established: Ideation & Design
- Define **what** product will do before you design **how** the product will do it!
- Brainstorm different design solutions
- Two stages of design:
  - **Conceptual**: what the product will do & how it will behave: ***knowledge*** about system
  - **Physical**: details such as screen structure, icons, graphics: system ***actions***



CT318 LECTURE 5 REVIEW

Design Thinking 2:

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- Represent Requirements: Task & User Needs
- PACT (Preece et al)