Lesson 2

Interaction Design (CM3055)

Recap of last lesson

Interaction design was put forward by the founder of **IDEO, Bill Mogridi, in 1984**.

Beginning…. Softface, renamed as **interaction design**

https://www.ideo.com/

Work of ID

- try to understand and shape human behaviour to achieve this goal
- manage the complexity of interaction in an engineering-centric world; a way of connecting and thinking about people and their activities, emotions and experiences
- About computing, language, communication and technology and the aesthetics of human interaction.
- the need to not lose sight of the elements of craft, execution, and appropriateness

user experience

Introduction to User Centred Design

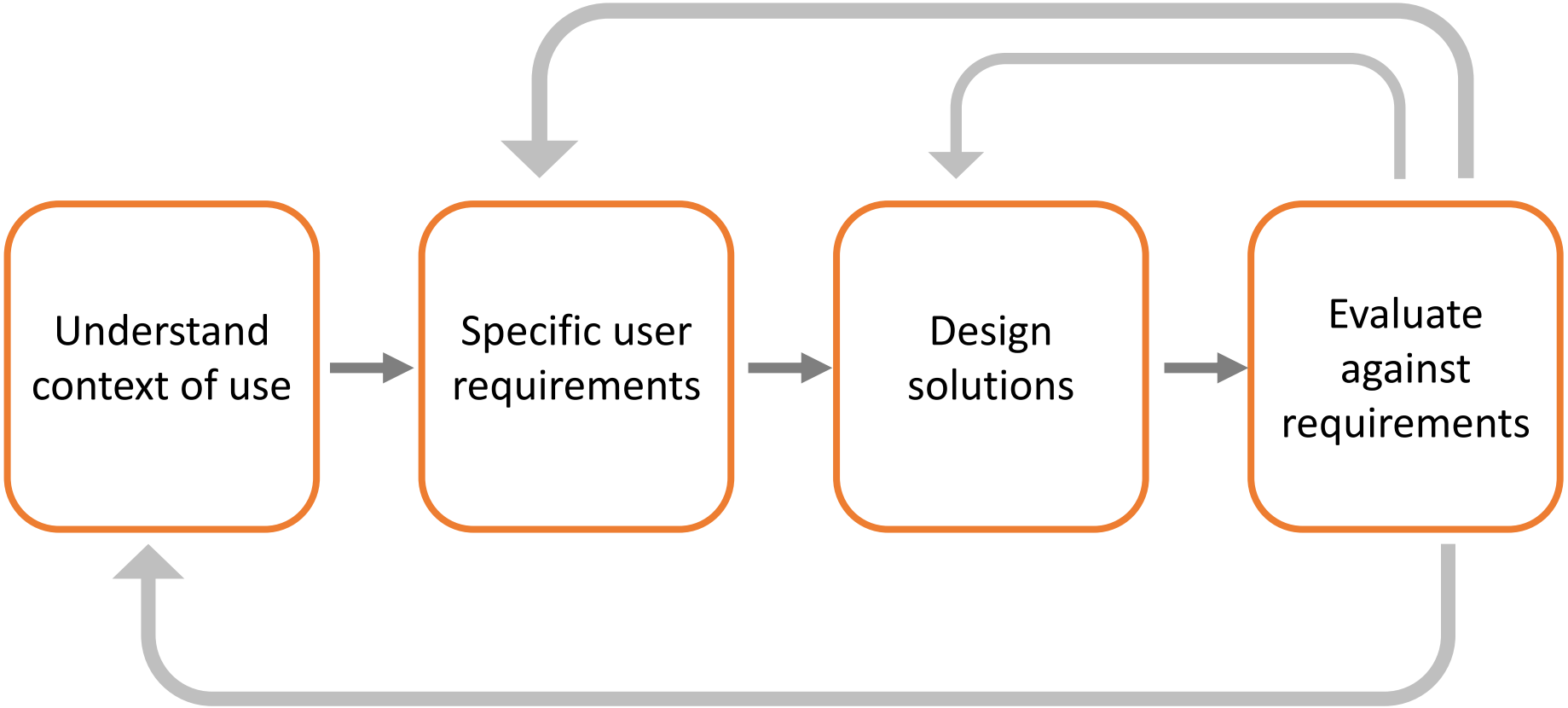
User-centered design (UCD) is an **iterative design process** in which designers focus on the users and their needs in each phase of the design process.

Design teams **involve users** throughout the design process via a **variety of research** and **design techniques**, to create highly **usable and accessible products** for them.

Key Features of User-Centred Design

1) Direct engagement with users
2) Do observation
3) Research
4) Evaluation

Image from drudesk.com



User-centered design is an iterative process that focuses on an understanding of the users and their context in all stages of design and development.

https://www.interaction-design.org/

What about today's design work?

Focuses on people's digital experiences and the role technology plays in their everyday lives.

Actively connect us with other people, information, and services through an array of digital technologies.

Design for your users and not for ourselves

Design Disciplines

Look at similar artefacts

Analyse users' needs and abilities

Sketch different designs, make prototypes

Show to users and test

Build as a physical artefact

Software Engineering & Interaction Design

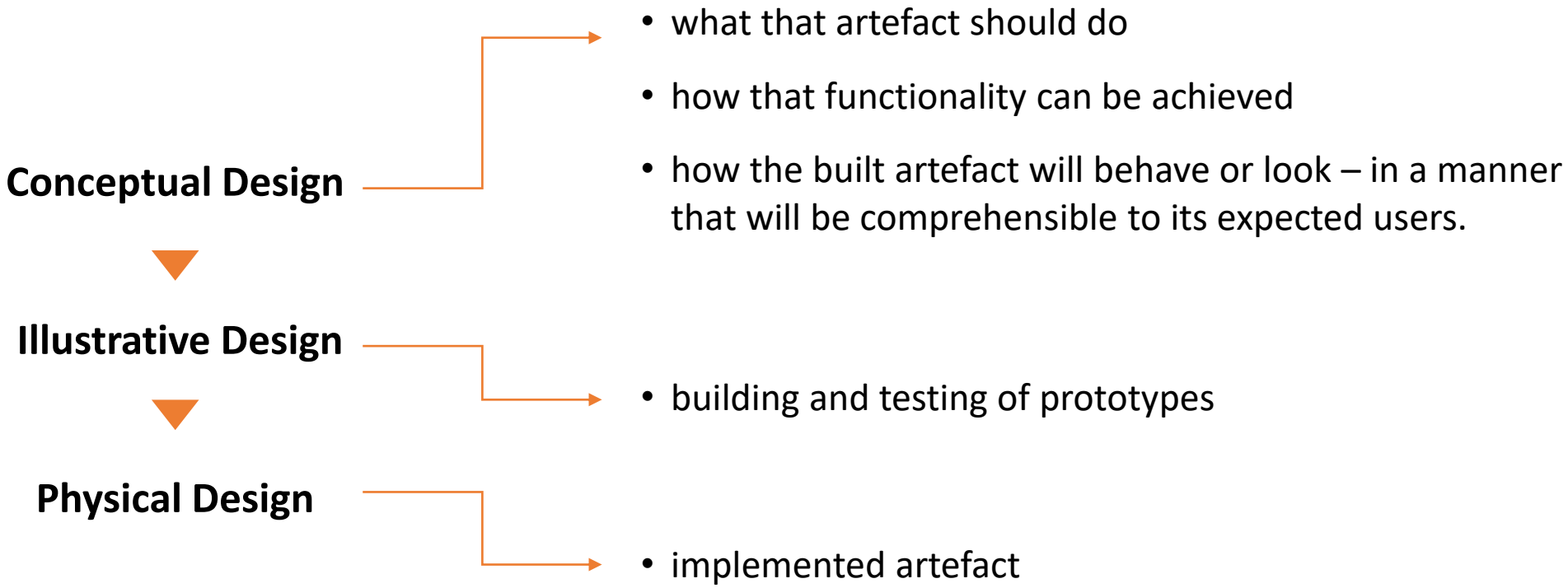
Feasibility study

Requirements definition

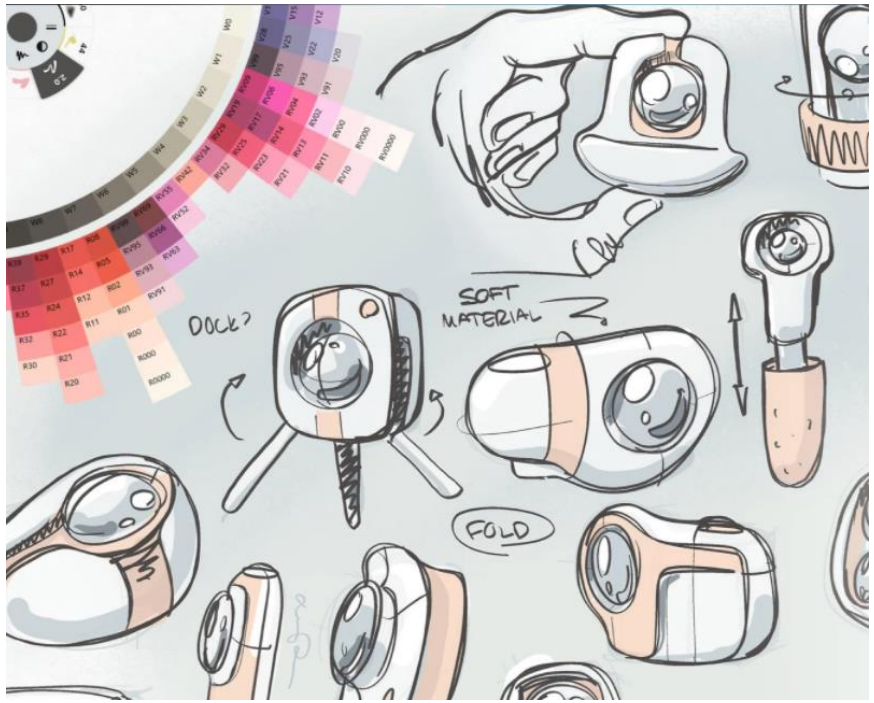
Design implementation

Test Implementation

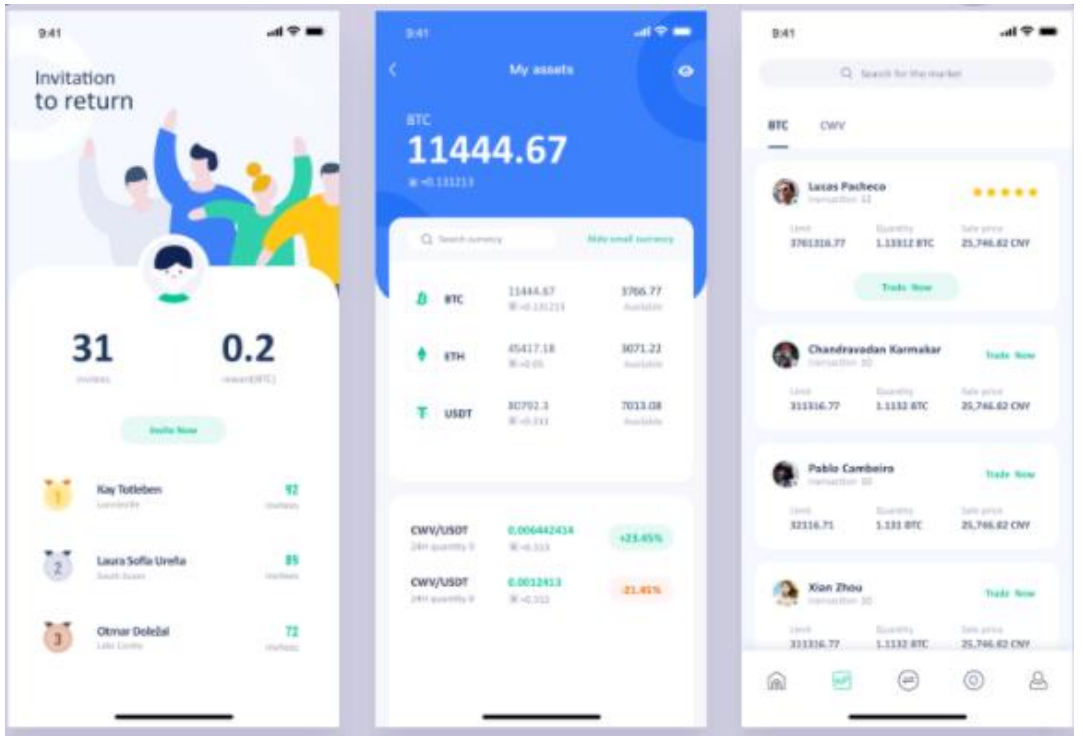
System update and maintenance


Conceptual Design
Illustrative Design
Physical Design
• what that artefact should do
• how that functionality can be achieved
• how the built artefact will behave or look – in a manner that will be comprehensible to its expected users.
• building and testing of prototypes
• implemented artefact

Examples of conceptual design



https://play.google.com/store/apps/details?id=com.tophatch.concepts&hl=en_AU



Concepts Design for an app

Understanding users and their tasks

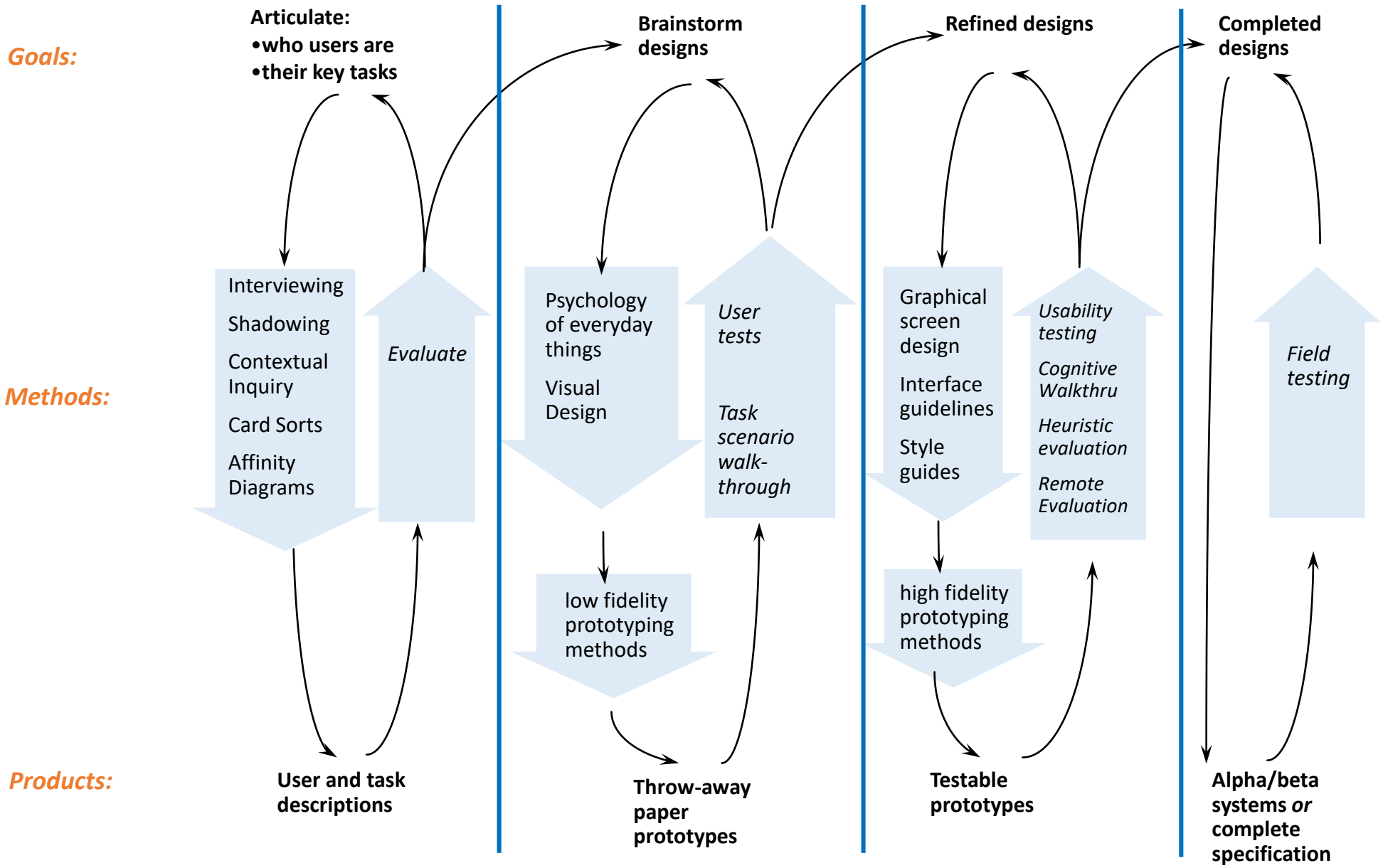
- **Task-centred system design process:**
  - developing task examples
  - task scenarios and walkthroughs

• Designing with the user

- **User-Centred Design and prototyping:**
  - User-Centred system design
  - low fidelity prototyping methods

- **Evaluating interfaces with users:**
  - observing people using systems via various methods
  - detecting inappropriate design and correcting by iterative design

An interface design process



https://www.ideo.com/

Design Thinking

IBM Design Thinking *+ Agile*

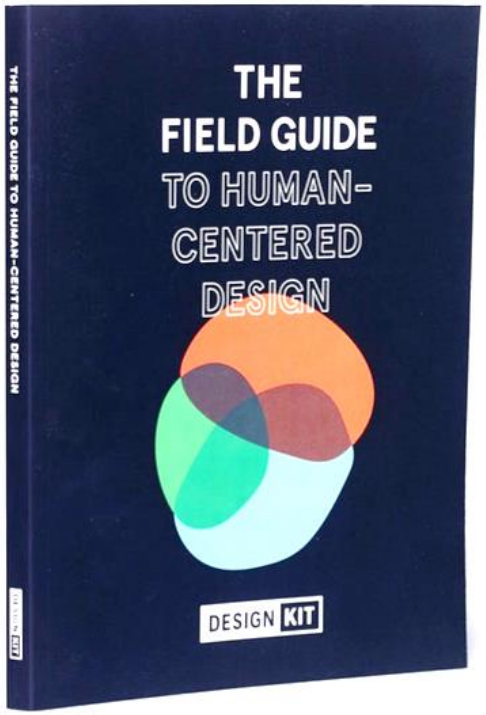
https://www.youtube.com/watch?v=M66ZU2PCIcM&feature=youtu.be

DESIGN KIT

brought to you by IDEO·ORG

MINDSETS METHODS CASE STUDIES RESOURCES HI SHARLIN

https://www.designkit.org/resources/1



Free PDF download

A full-color, 192-page book, the Field Guide comes with 57 design methods, the key mindsets that underpin how and why IDEO.org believes design can change lives, a full slate of worksheets, and case studies from projects that show human-centered design in action.

https://www.ted.com/talks/david_kelley_on_human_centered_design

What is Design Thinking?

"Design thinking is a human-centered approach to innovation that draws from the designer's toolkit to integrate the needs of people, the possibilities of technology, and the requirements for **business success**."

Tim Brown, president and CEO, IDEO

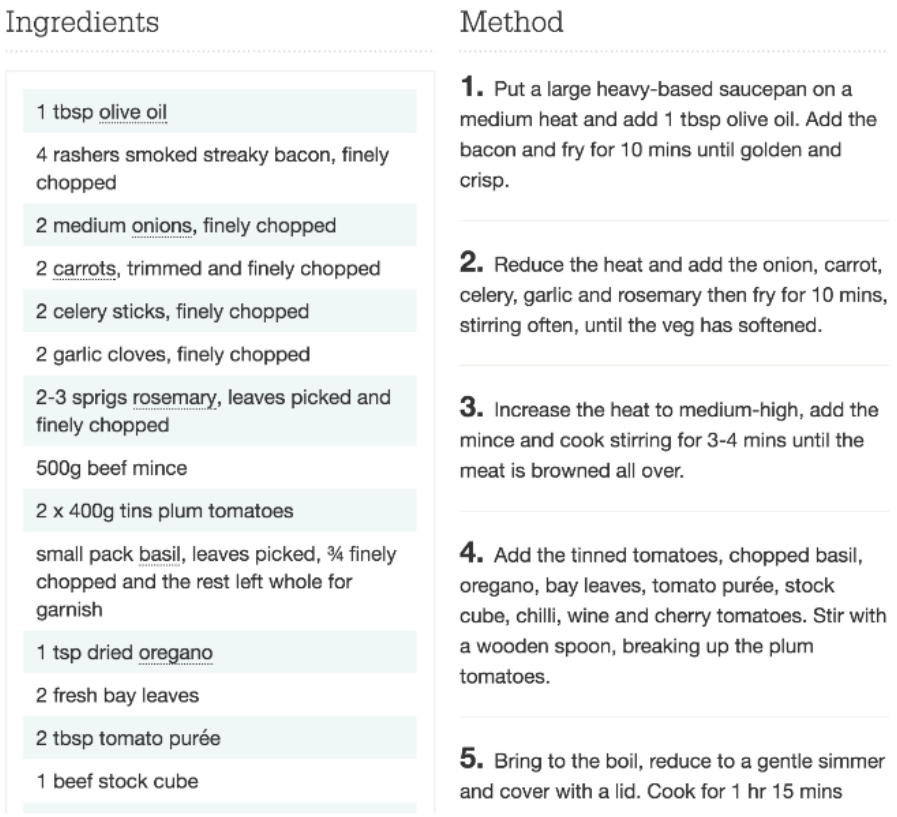
Design Thinking is a **cooking class**!

Cooking class > learn the general philosophies of cooking, how flavour works, which ingredients complement each other, how to prepare specific items (chopping onions, cooking meat, making a sauce)

What is a Design Sprint?

“The sprint is a five-day process for answering critical business questions through design, prototyping, and testing ideas with customers”

Jake Knapp, Author of SPRINT and one of the inventors of the Design Sprint



Ingredients

- 1 tbsp olive oil
- 4 rashers smoked streaky bacon, finely chopped
- 2 medium onions, finely chopped
- 2 carrots, trimmed and finely chopped
- 2 celery sticks, finely chopped
- 2 garlic cloves, finely chopped
- 2-3 sprigs rosemary, leaves picked and finely chopped
- 500g beef mince
- 2 x 400g tins plum tomatoes
- small pack basil, leaves picked, ¾ finely chopped and the rest left whole for garnish
- 1 tsp dried oregano
- 2 fresh bay leaves
- 2 tbsp tomato purée
- 1 beef stock cube

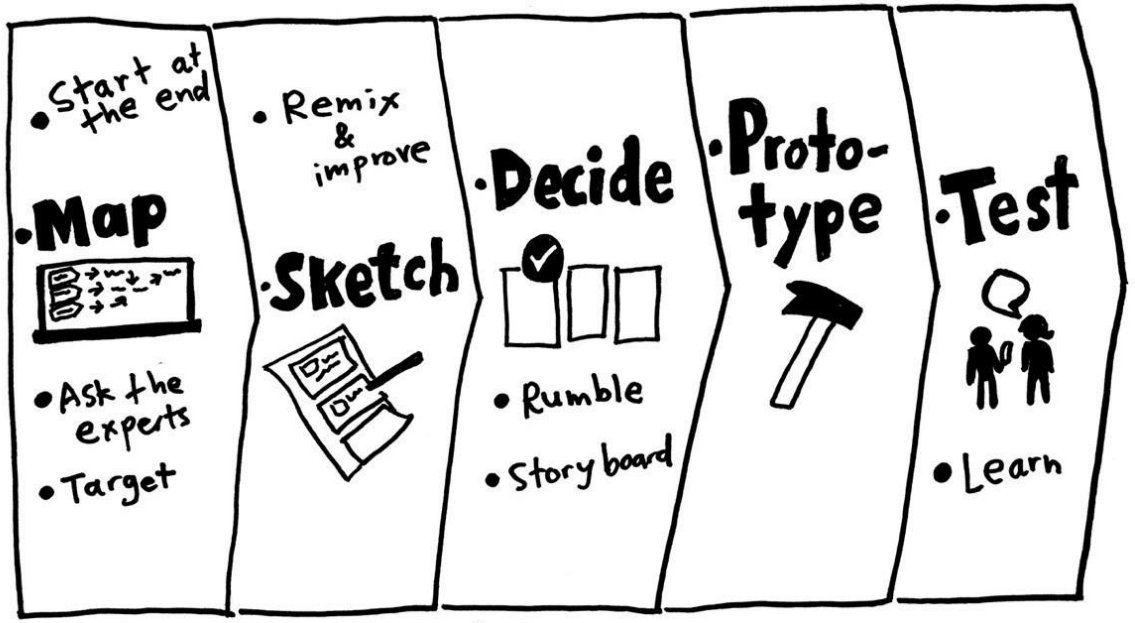
Method

1. Put a large heavy-based saucepan on a medium heat and add 1 tbsp olive oil. Add the bacon and fry for 10 mins until golden and crisp.
2. Reduce the heat and add the onion, carrot, celery, garlic and rosemary then fry for 10 mins, stirring often, until the veg has softened.
3. Increase the heat to medium-high, add the mince and cook stirring for 3-4 mins until the meat is browned all over.
4. Add the tinned tomatoes, chopped basil, oregano, bay leaves, tomato purée, stock cube, chilli, wine and cherry tomatoes. Stir with a wooden spoon, breaking up the plum tomatoes.
5. Bring to the boil, reduce to a gentle simmer and cover with a lid. Cook for 1 hr 15 mins

The Design Sprint is a specific step-by-step system for producing and testing ideas (often product/service/business ideas).

Design Sprint is a recipe. It shows you exactly what ingredients you’ll need, what to do, when to do it and in the case of a larger kitchen, who should do what.

GV's Sprint Process in 90 Seconds
https://youtu.be/K2vSQPh6MCE

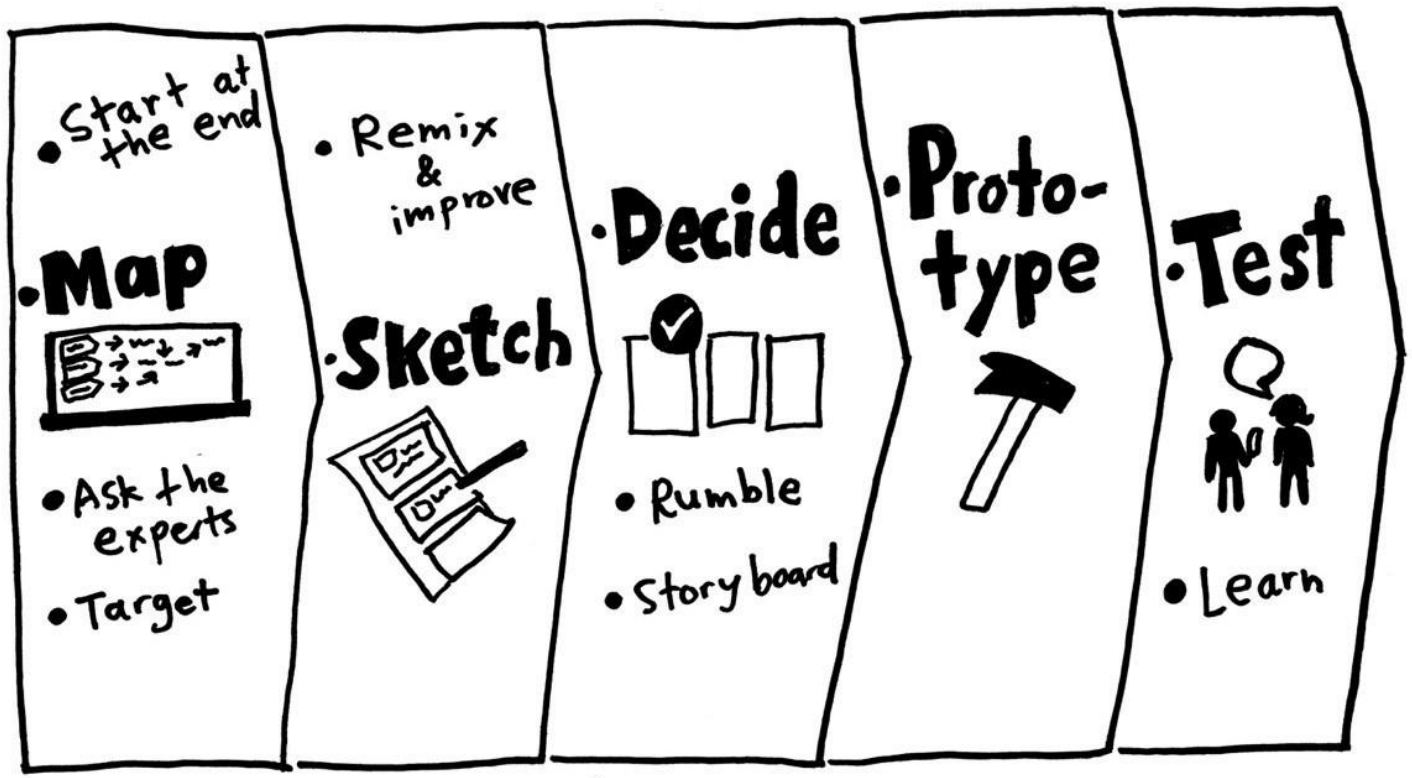


The Design Sprint
https://www.gv.com/sprint/

Sprint: Monday
https://youtu.be/7zOBMxRYJ7I

Sprint: Tuesday
https://youtu.be/_ITJ5lAXQhg

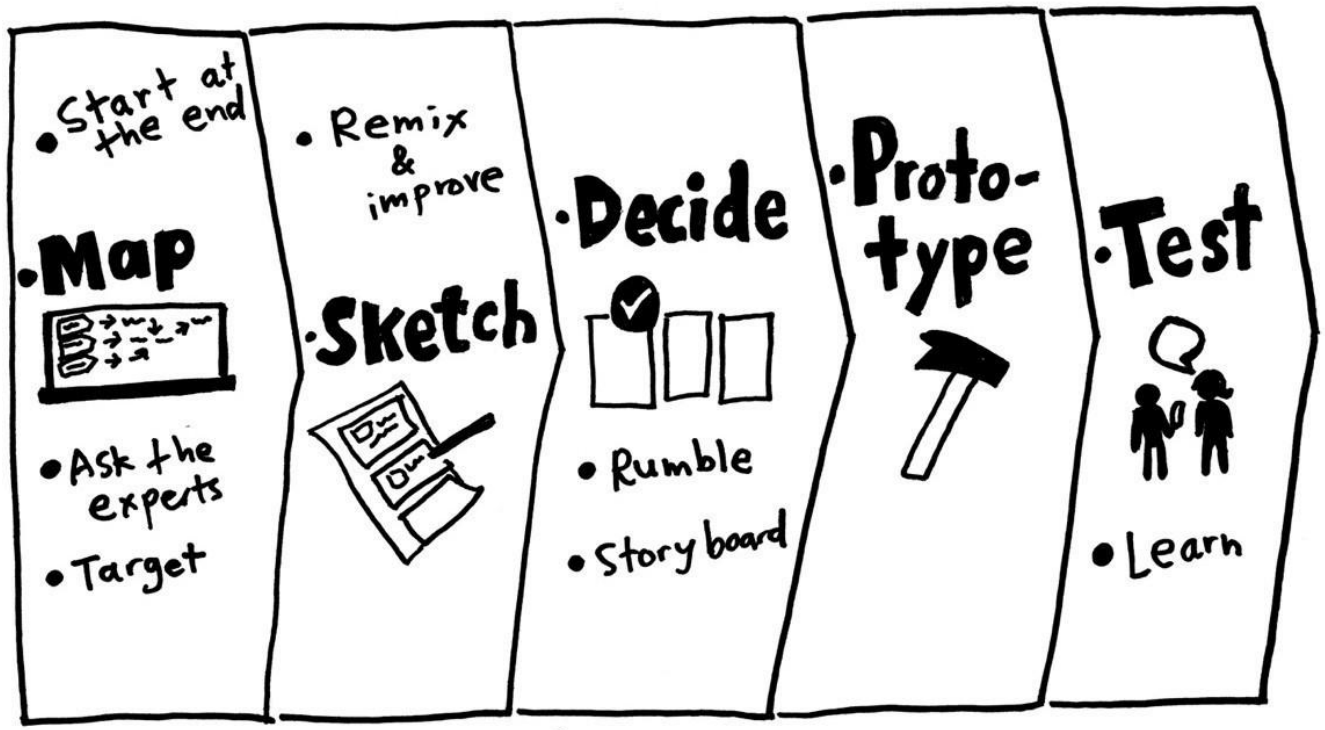
Sprint: Wednesday
https://youtu.be/7BKBFOOKbNo



Sprint: Thursday
https://youtu.be/lGcwFV76t7o

Sprint: Friday
https://youtu.be/jQmBuKN10VY

Sprint: 5-act interview
https://youtu.be/U9ZG19XTbd4



Uncomfortable Interactions

Videos

IDEO
How to solve problems like a designer
https://www.youtube.com/watch?v=wOrmr5kT-48

What Is Design Thinking?
https://www.youtube.com/watch?v=a7sEoEvT8l8

Iphone interaction design
https://www.youtube.com/watch?v=ab3RGM5oiwE

Connecting - Trends in UI, Interaction, & Experience Design
https://www.youtube.com/watch?v=lciYKwVLTuk

Donald Norman

https://www.jnd.org/

Don Norman’s Principles of Interaction Design

1. Visibility

Basic principle that the more visible an element is, the more likely users will know about them and how to use them.

Equally important is the opposite: when something is out of sight, it’s difficult to know about and use.

hamburger side-bar menus

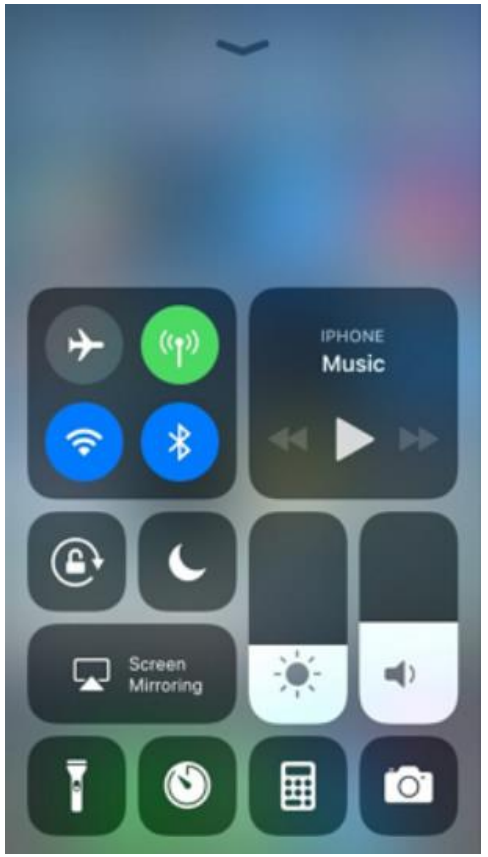
vs

tab-bar menus

2. Feedback

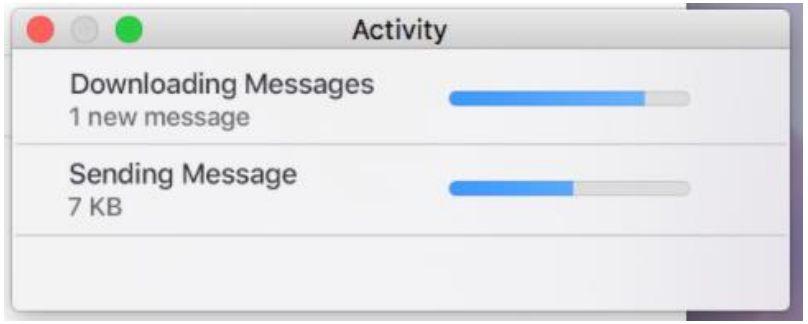
- sending back to the user information
- action has actually been done {and} what result has been accomplished

- displaying the details of the date and time when a file was updated
- percentage bar showing the rate and progress of a process that is being performed
- ‘Busy’ icons showing that the system is processing and temporarily unable to respond to other commands
- an effective sound tone which acts as a warning and attracts a user’s attention
- the clicks of simulated key presses on touch screens.
- Includes sound, highlighting, animation and combinations of these



When feedback is used in design, the system tells the user that it has done something in response to the user's input

Without feedback, the user would not have information about if they have completed the action.



What are some interfaces that may not work without feedback? Why?

3. Constraints

Constraints limit
the number of possibilities of what can be done with an object.

4 main types

Physical constraints
restrict the possible operations of an object

Semantic constraints
depend on the semantics (the ‘meaningfulness’) of the situations which users know about

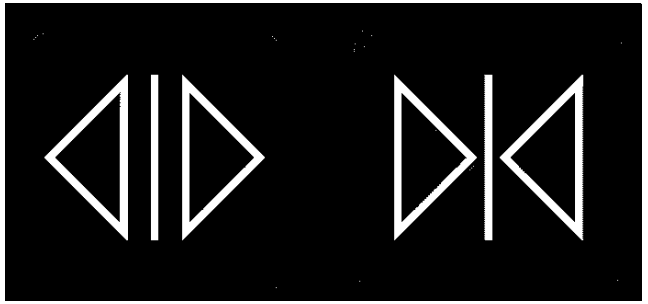
Cultural constraints
consist of information and rules that help us to know what to do in social settings

Logical constraints
work through constraining the order, position or location of objects.

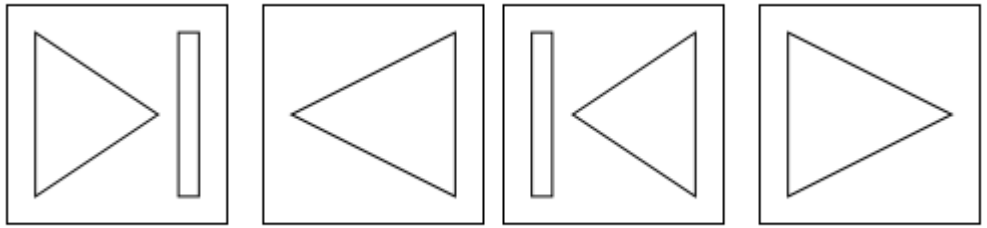
4. Mappings

- the spatial and conceptual relations between different parts of a system or between controls and their outcomes

- appear natural and intuitive to users ----- good

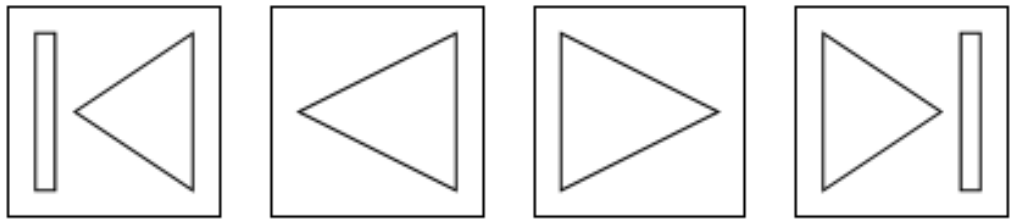


Why is this a poor mapping of control buttons for the sequence of actions of fast rewind, rewind, play and fast forward?



Suggest a better mapping!

Why is this a better mapping?



Btn 3 **Btn 2** **Btn 4** **Btn 1**

The control buttons are mapped better onto the sequence of actions of fast rewind, rewind, play and fast forward

Natural Mapping

- takes advantage of physical analogies and cultural standards to provide the user with an understanding of how something works.

A

B

Which controls go with which burner?

5. Consistency

- Consistency within the same or familiar functions and scenes, to use the consistent performance, operation, and feeling in a (or a category) product.

- Why consistency?
  - reduce the user's learning and cognitive costs
  - probability of misuse

https://www.mockplus.com/blog/post/interaction-design-principles

Consistency

- **Internal consistency** of a design with itself
- **External consistency** with other interface designs and other systems
- **External correspondence** of a design to features in the world beyond the computer domain

Consistent Structure and Interactions

1. Consider how to consistently place elements throughout your site or app
2. Think about what UI patterns
3. Plan out what input elements
4. Pick or design a good icon set

Consistent style

1. Color scheme
2. Style
3. Borders
4. Type and fonts
5. Size
6. Background images
7. Effects

1 DIFFERENCES
CAN DISTRACT

While differences can draw attention, they can just as easily cause **distraction**. When users start asking why something looks or works the way it does, that's a red flag: it means **they're focused on the UI**, on the visual design, instead of on the content, data or experience that's most important to them.

2 CONSISTENCY
IN UI DESIGN MEANS

Components with **similar behavior** should have a **similar appearance**

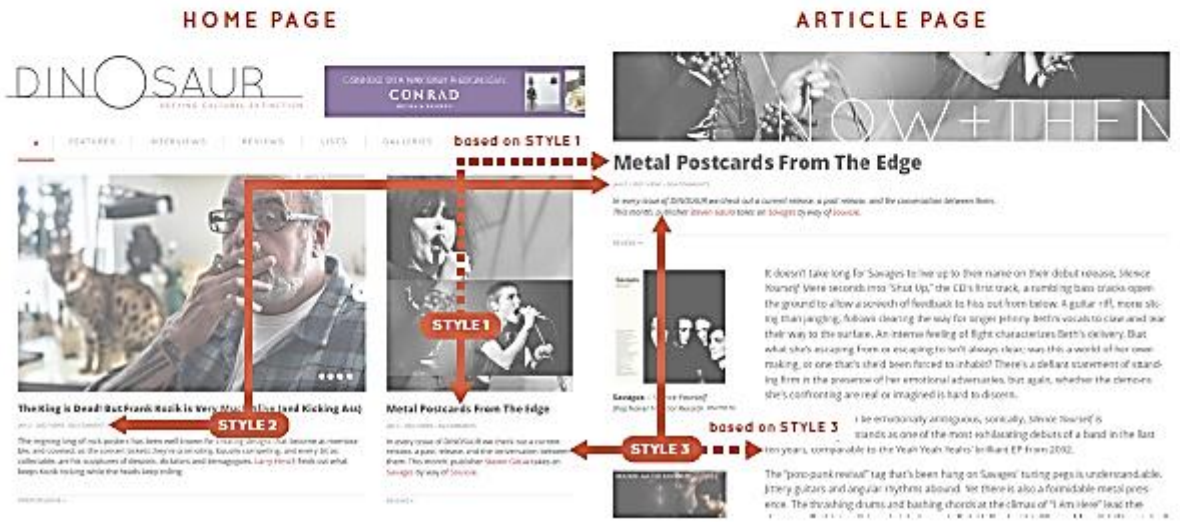
Components with **different behavior** should have a **different appearance**

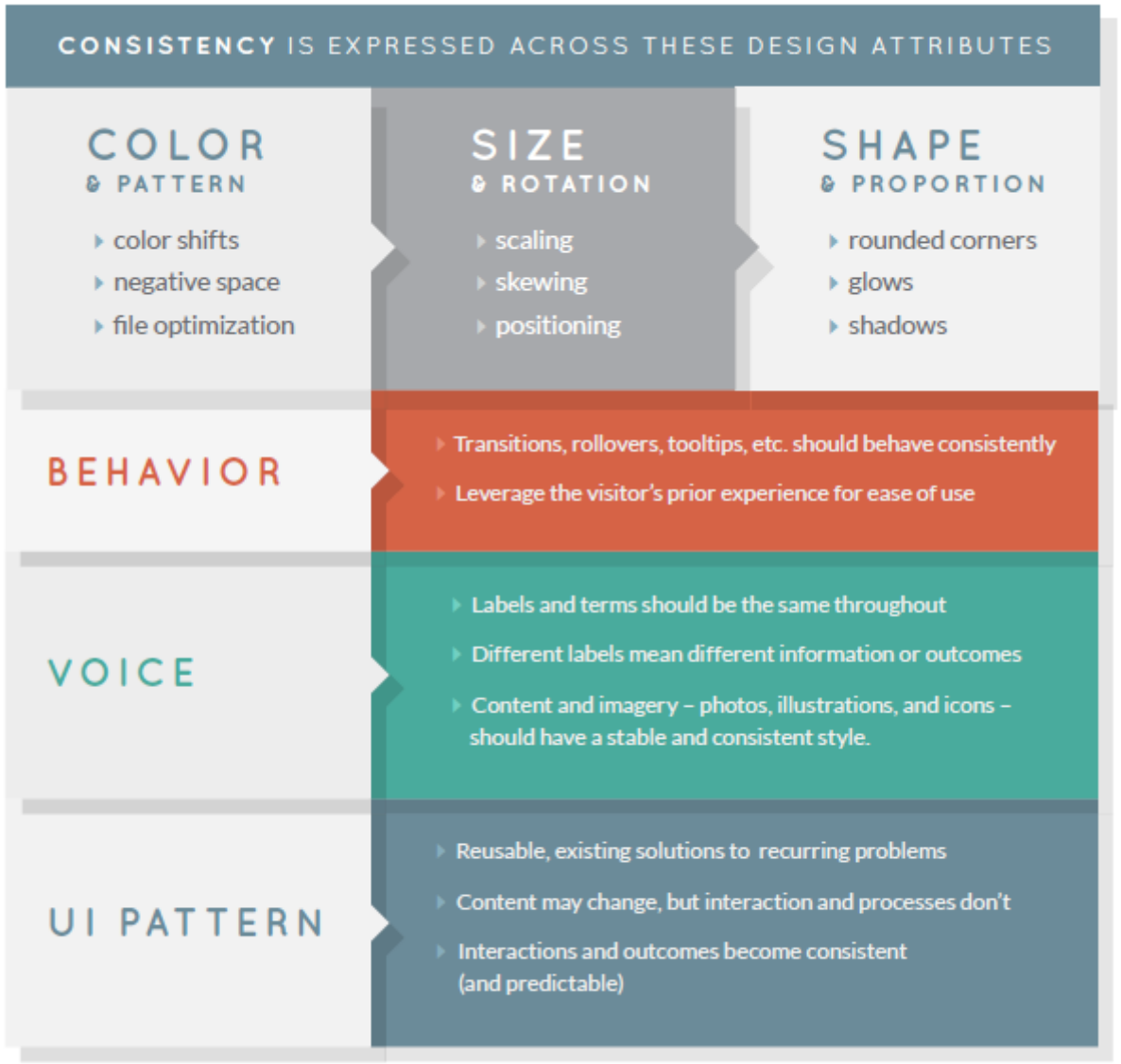
3 STYLING
ENABLES CONSISTENCY

Identify **different types** of content: headlines, body, bullets, charts, etc.

Create **specific styles** for each - font, weight, color

Apply **consistently** across all screens; base any **new styles** on those already existing




CONSISTENCY IS EXPRESSED ACROSS THESE DESIGN ATTRIBUTES
COLOR
& PATTERN
color shifts
negative space
file optimization
SIZE
& ROTATION
scaling
skewing
positioning
SHAPE
& PROPORTION
rounded corners
glows
shadows
BEHAVIOR
Transitions, rollovers, tooltips, etc. should behave consistently
Leverage the visitor's prior experience for ease of use
VOICE
Labels and terms should be the same throughout
Different labels mean different information or outcomes
Content and imagery – photos, illustrations, and icons – should have a stable and consistent style.
UI PATTERN
Reusable, existing solutions to recurring problems
Content may change, but interaction and processes don't
Interactions and outcomes become consistent (and predictable)

6. Affordance (push or pull?)

what you can do to an object

Term coined by one of the top cited American psychologist James J. Gibson from the Department of Psychology at Princeton University who did remarkable work on visual perception

Which one of the above do you perceive to be clickable?

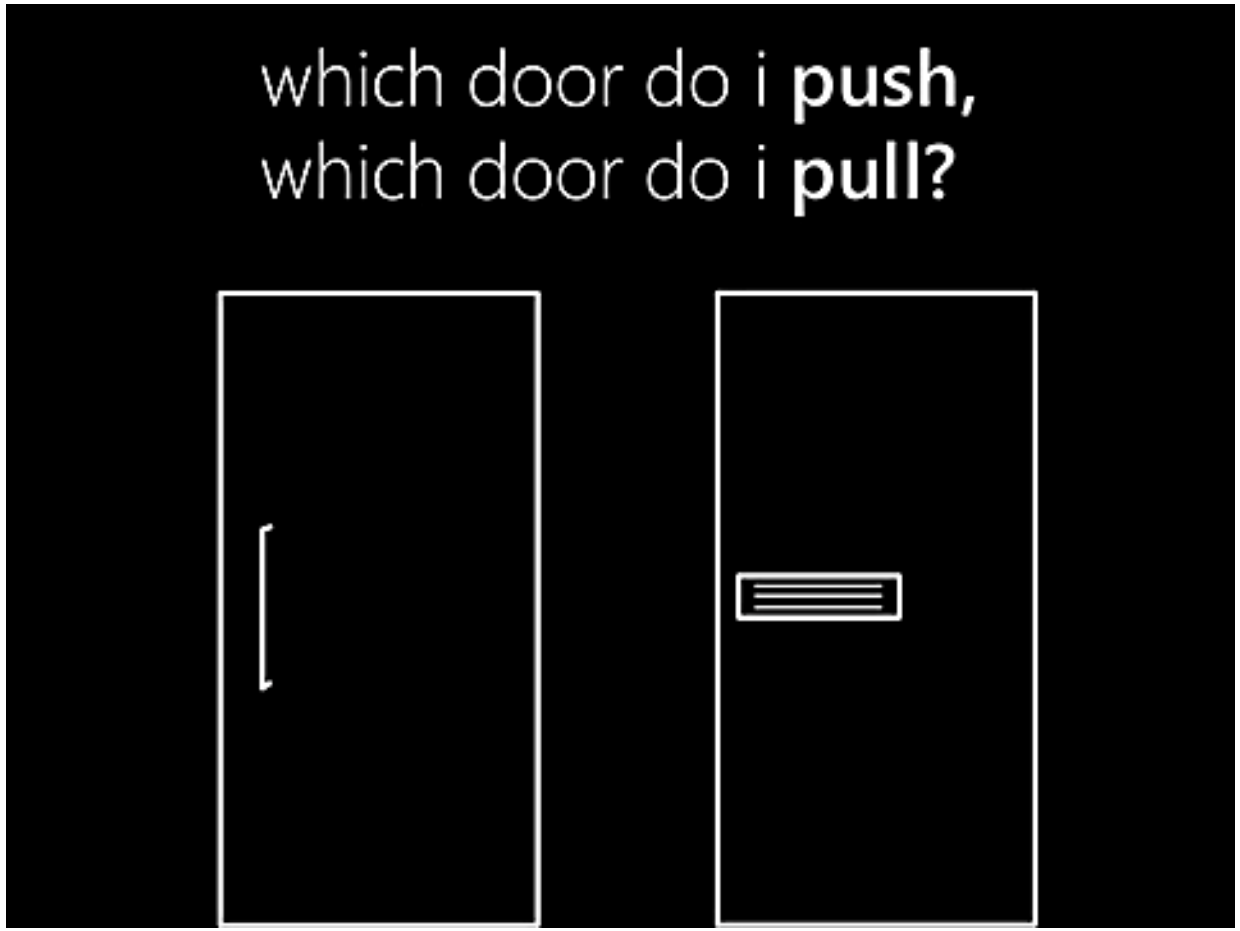
“Perceived affordances" are actions you understand just by looking at the object, before you start using it (or feeling it, if it's a physical device rather than an on-screen UI element).

Imagine a web form had no labels like the interior of this spacecraft relied on pure iconography.

By Dave Wilson

The Norman door

https://uxdesign.cc/intro-to-ux-the-norman-door-61f8120b6086



https://youtu.be/yY96hTb8WgI

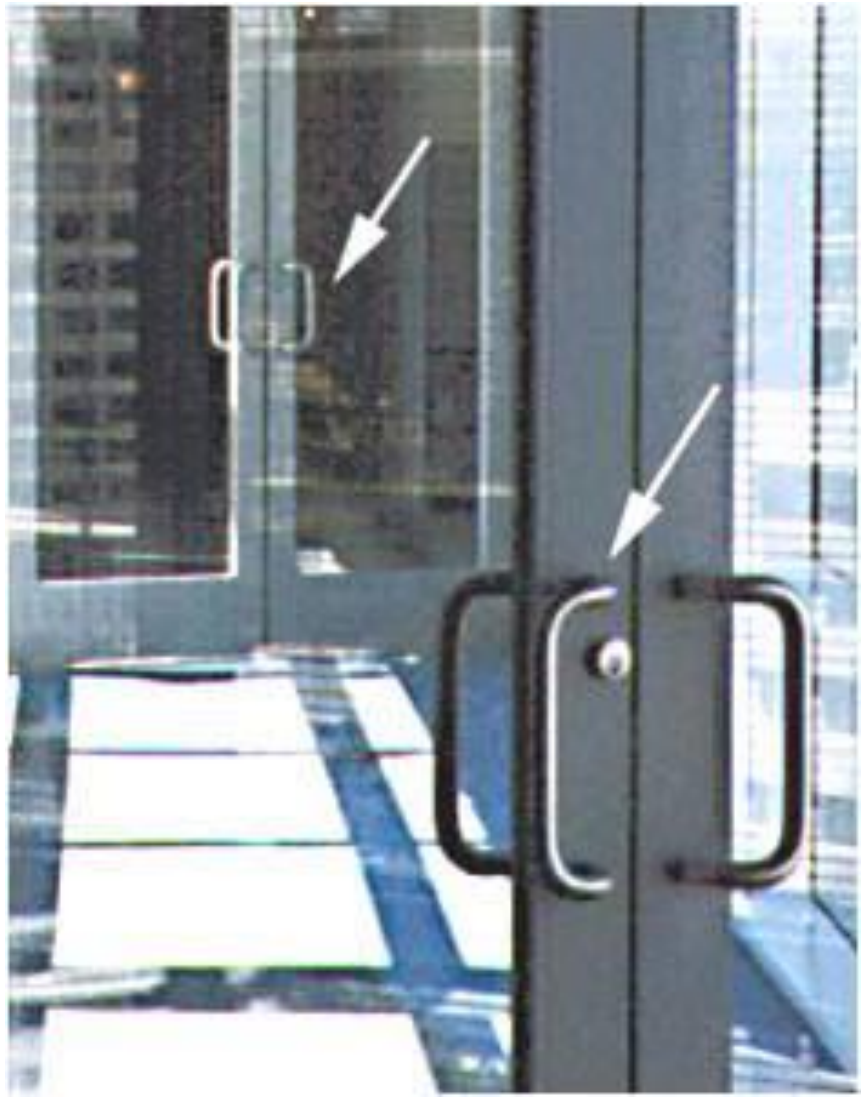
The “Norman Door” is a good example of affordance.

This set of doors connects a walkway between two buildings

Although both sides of both sets of doors have handles, only the outer handles are meant to be pulled

Using either set of doors once inside the walkway, to exit, one needs to push.

Feel trapped?

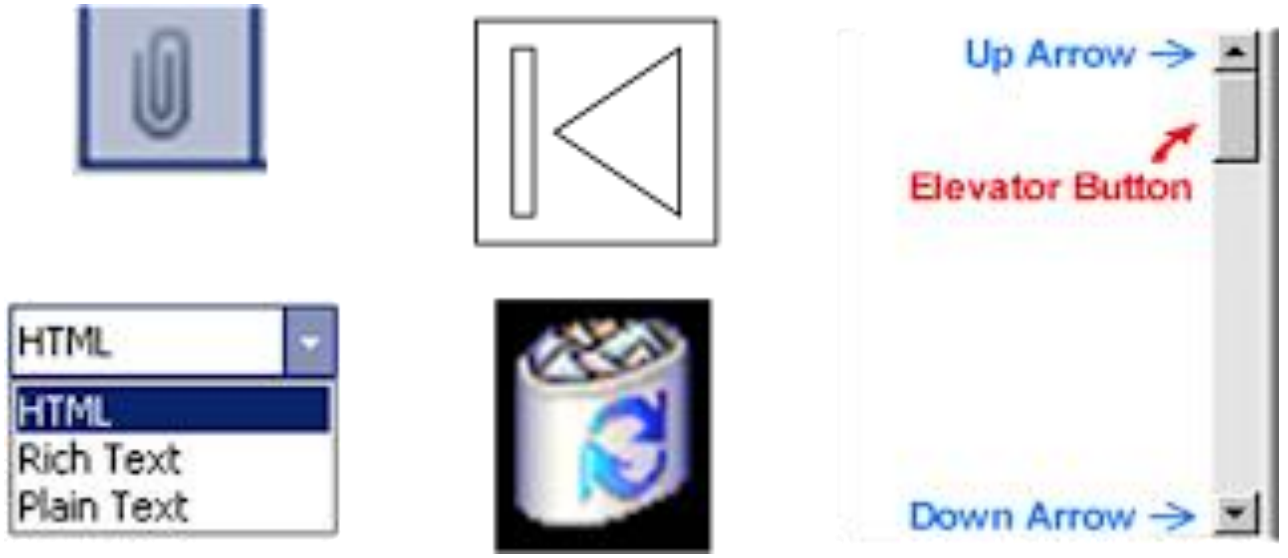


Physical affordances:

How do the following physical objects afford? Are they obvious?

Affordance (Logical)
Virtual affordances (logical)

- How do the following screen objects afford?
- What if you were a novice user?
- Would you know what to do with them?

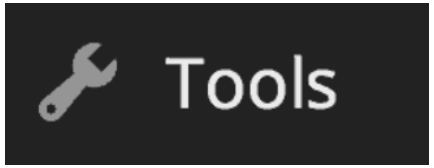


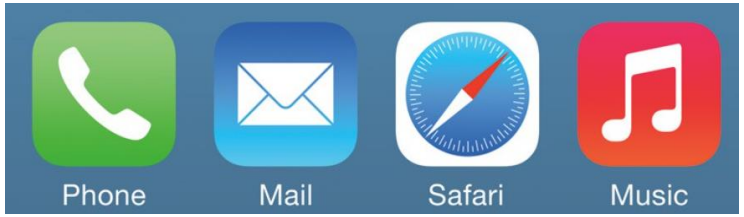
Metaphors

‘Interface metaphors’ and analogies are commonly used as part of a conceptual model to convey to users how to understand what a product is for and how to use it for an activity.

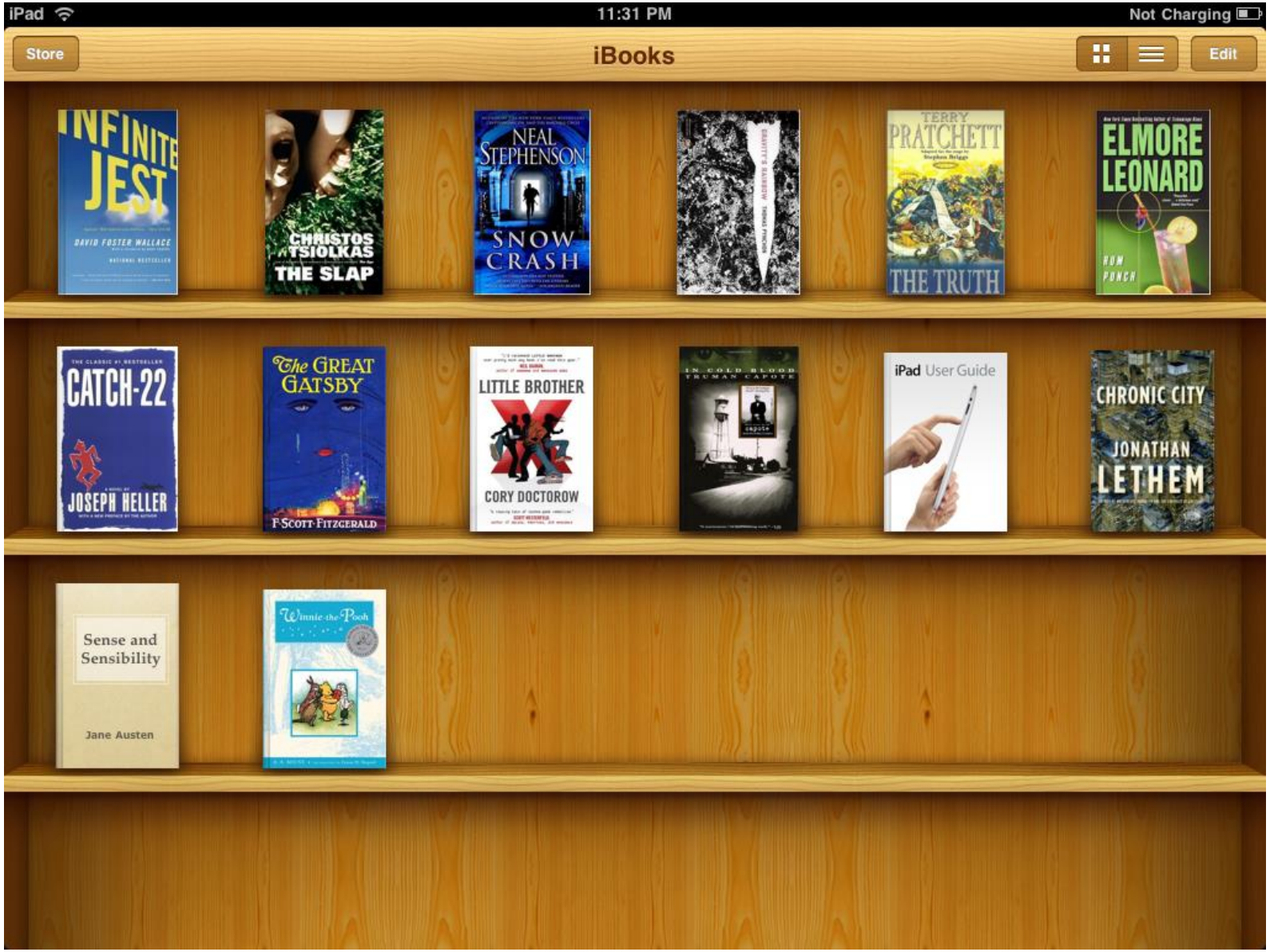
Purpose

- function as natural models
- leverage our knowledge of familiar, concrete objects/experiences to understand abstract computer and task concepts
- to give the user instantaneous knowledge about how to interact with the user interface





understand the underlying meaning of a metaphor in order for it to communicate



Metaphor and [skeuomorphism](#) used here

Interaction Design Shapes our everyday life

"... Shaping our everyday life through digital artifacts for work, play, and entertainment

Gillian Crampton Smith
1st Interaction Design programme
at RCA, 1989

User-Centred Design or User-Centred System Design

- belief that, in order to design truly usable systems, designers and developers needed to have a much clearer understanding of what the users of a proposed system or application actually wanted from it.

- making products usable by involving users to obtain feedback through the use of prototypes.

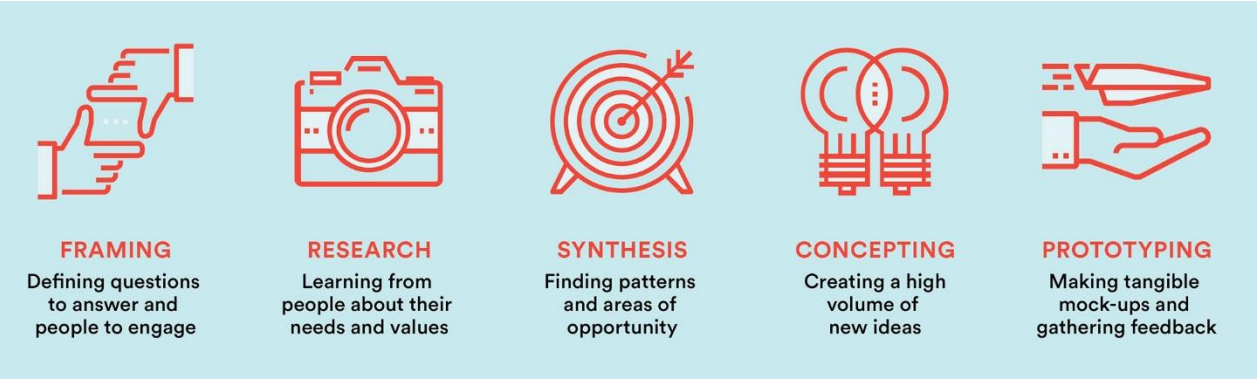
User-centered design (UCD) is an approach to design that grounds the process in information about the people who use the product

(Usability Professionals Association)

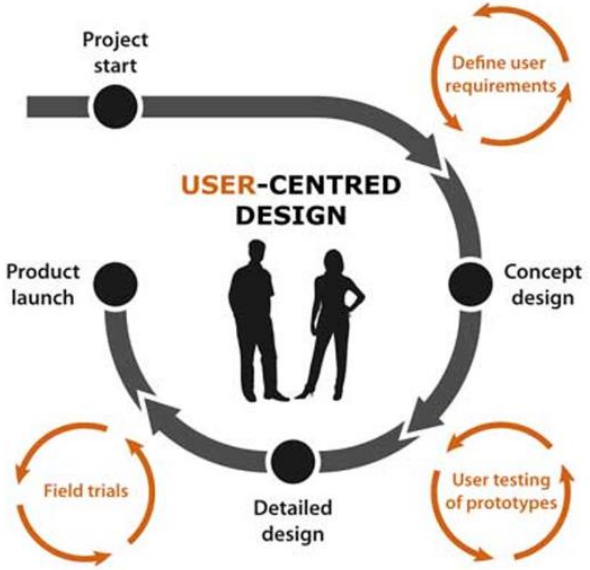
User-centered design
vs.
Human-centered design

HCD

- all users are humans, but not all humans will be your users.



Graphics from greatergoodstudio.com

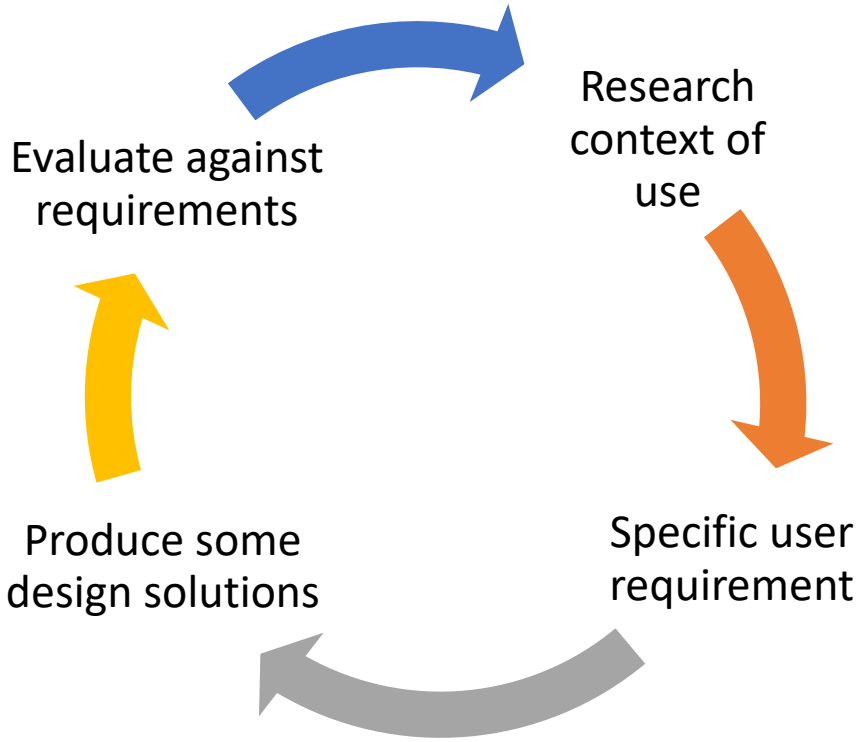


Graphics from theuserhub.com

UCD

- requires deeper analysis of users – your target audience only about general characteristics of a person;
- about particular habits and preferences of target users to come up with right solutions for specific problems.

User-Centred Design Process



Human Centered Design has ISO Standards:

ISO 9241-210:2010: Ergonomics of human-system interaction -- Part 210: Human-centred design for interactive systems

ISO 9241-210:2010 provides requirements and recommendations for human-centred design principles and activities throughout the lifecycle of computer-based interactive systems. It is intended to be used by those managing design processes, and is concerned with ways in which both hardware and software components of interactive systems can enhance human–system interaction.

Involve your users!

- Identify appropriate interface functionality to increase user satisfaction.
- Decide how best to utilise design decisions to produce systems which are acceptable to users.
- Establish usability criteria and responsibilities before irrevocable hardware and software decisions are made.
- Measure, record and analyse users' reactions and performance to scenarios, simulations and prototypes.
- Design iteratively

Extra reading: Iterative User Interface Design.pdf

Interaction Design → **focused on the person**

- User-centred design
- Iterative prototyping

Ideas!

- Brainstorm
- Create personas
- Conduct task analyses
- Write scenarios
- Uncover problems with cognitive walk-throughs

Define your problem

“If I had an hour to solve a problem I'd spend 55 minutes

_____ and 5 minutes

_____.”

~ Albert Einstein

3 Lessons from Albert Einstein on Problem Solving

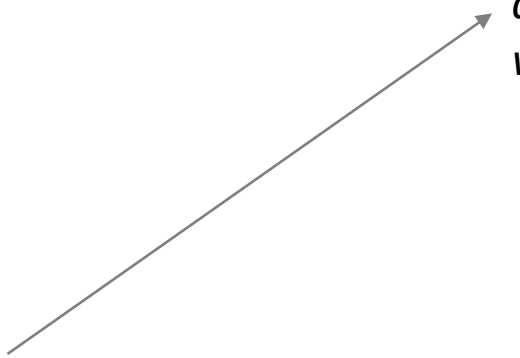
Solving problems can be more fun than frustrating.

https://medium.com/swlh/3-lessons-from-albert-einstein-on-problem-solving-c5438b2ac2b9

Ideate

Apple’s 10-3-1 process for finding design solutions

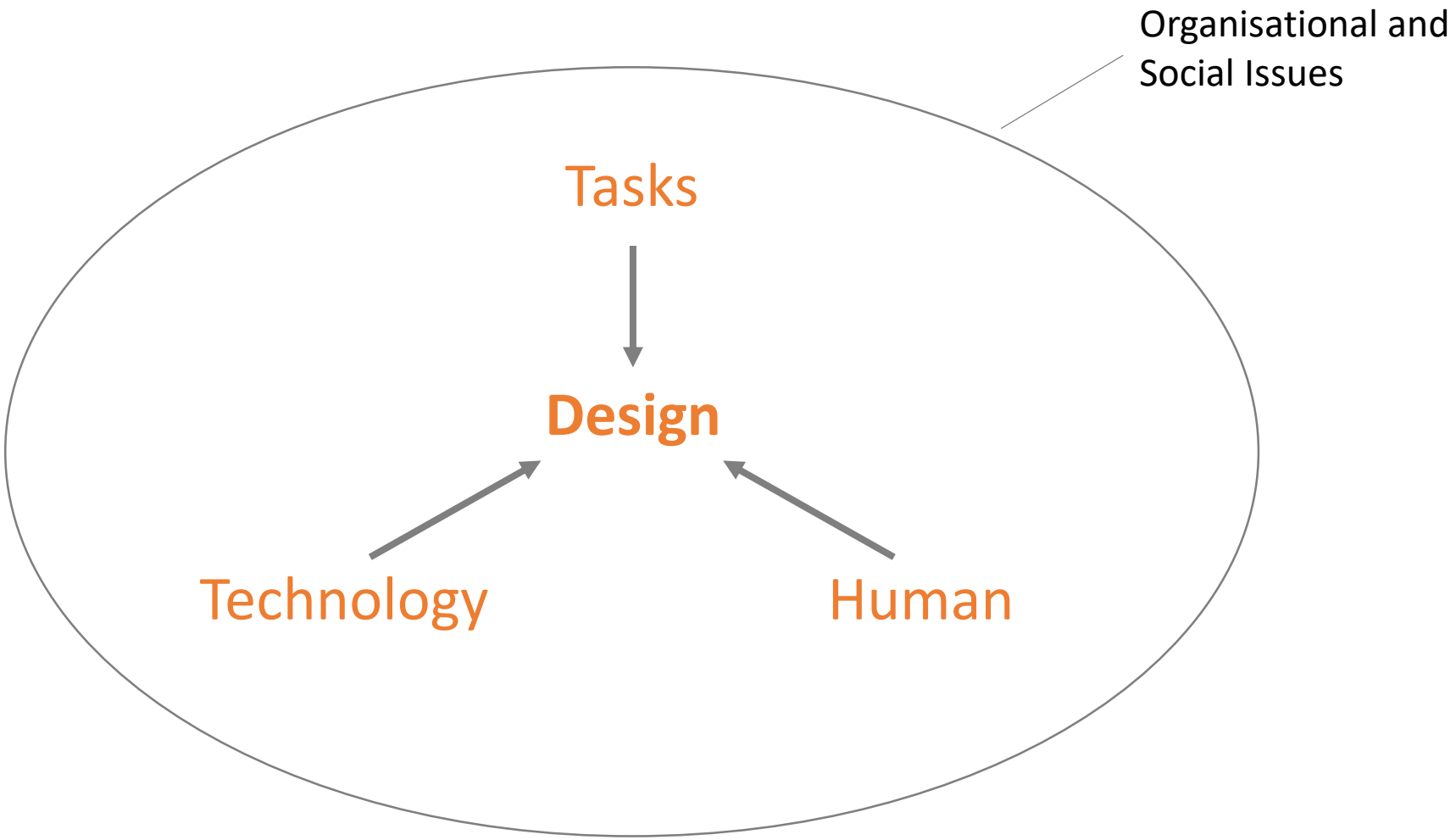
*'the view of the human in HCI becomes
richer and more open once this point of view is adopted,
and it thus offers greater surplus and a richer potential
with which to work as designers*



User Experience Design

involves both the observation of, and involvement in, users' everyday working life

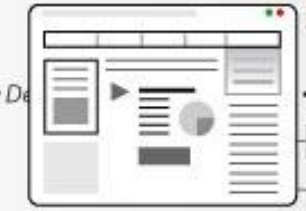
- Valuing the whole person behind 'the user'
- Focusing on how people make sense of their experiences
- Seeing the designer and user as co-producers of experience
- Seeing the person as part of a network of social (self-other)
- relationships through which experience is co-constructed
- Seeing the person as a concerned agent, imagining possibilities, making creative choices, and acting

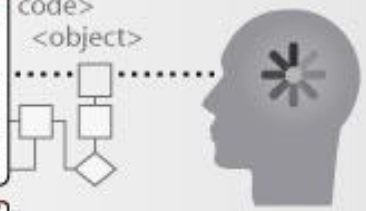


User-Centred Design

USER EXPERIENCE DESIGN DIAGRAM

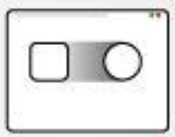
Language Interaction Motion Graphic Interface De

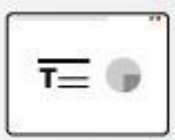


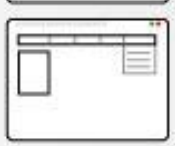


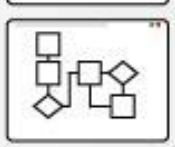
- Conscious Awareness +

Written Language	English, Spanish, Mandarin, etc.
Graphic Design	Shape, symbolism, line, color, spacial composition, texture, dimension, and other facets of visual rendering.
*Sound	Music or spoken word (a.k.a Voice Over / V.O.) audio.
Motion	Animation, change, motion, time, rhythm, calculus.
Information Design	Textual style, graphics, and compo-sition for information structure, meaning, relationship and user comprehension.
Interface Design	Graphical and information design elements utilized to indicate controls for data manipulation.
Interaction Design	Task flow, system flow/behavior, and human comprehensibility of controls provided by the user interface.
Programming	"Front-end" (client executed) or "back-end" (server executed) code for data input, processing, and retrieval.









The mind's eye does not naturally distinguish between individual elements that comprise an interactive system. Parts of the interactive communications / software vernacular are not experienced separately by the user, but as a complete synthetic language which is apprehended and used as a unified whole.

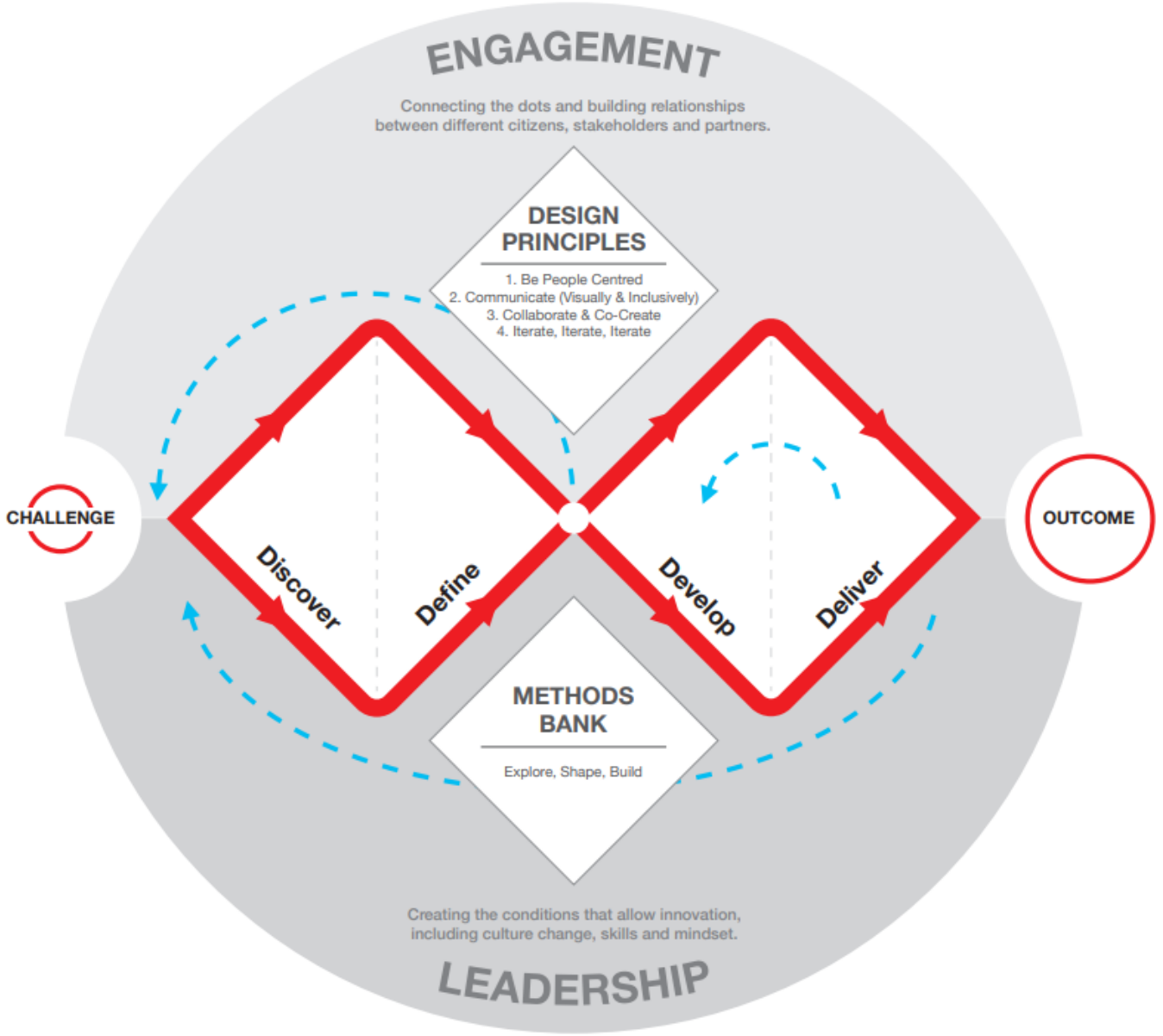
User Experience Design is the art and science of intgrating all of the various elements that comprise an interactive system so that

1) The user's needs, limitations, goals, desires, and expectations are served
2) The publishing organization's objectives are served as a result of serving the user's (#1)
3) The whole is greater than the sum of is parts

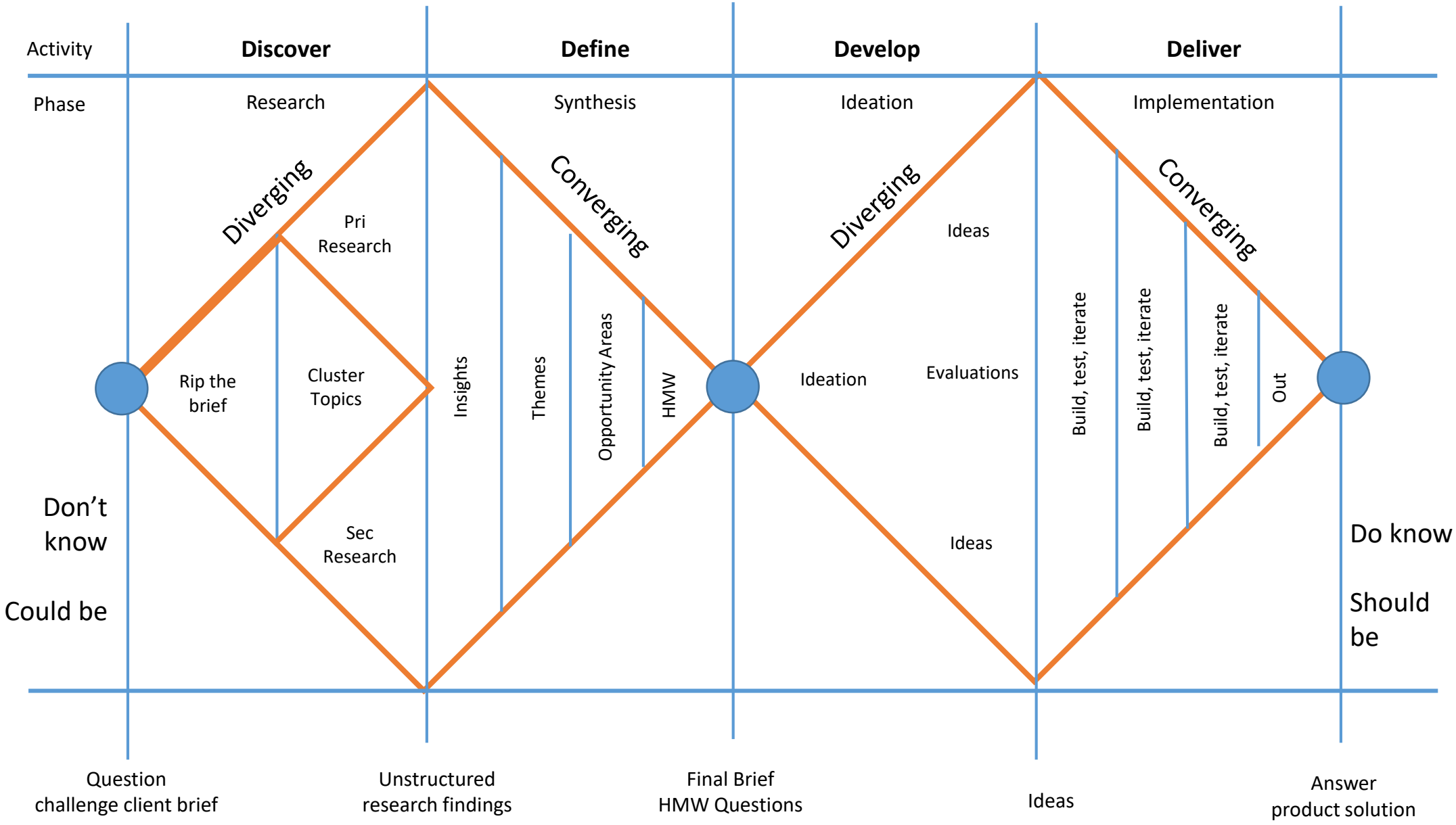
*Sound is seldom used in contemporary web app's but is a multimedia element common to other types of web-based software, thus important to UX.

http://uxdesign.com/ux-defined

The Double Diamond Approach to Design



Design Council's Double Diamond @ https://www.designcouncil.org.uk/n


Activity
Discover
Define
Develop
Deliver
Phase
Research
Synthesis
Ideation
Implementation
Diverging
Converging
Diverging
Converging
Pri Research
Rip the brief
Cluster Topics
Sec Research
Insights
Themes
Opportunity Areas
HMW
Ideas
Ideation
Evaluations
Ideas
Build, test, iterate
Build, test, iterate
Build, test, iterate
Out
Don't know
Could be
Do know
Should be
Question challenge client brief
Unstructured research findings
Final Brief HMW Questions
Ideas
Answer product solution

What is Jobs To Be Done (JTBD)?

Jobs To Be Done (JTBD) is a theory of customer demand that describes why and how people decide to adopt new products or services.

Product managers, marketers, and entrepreneurs use this theory to lower the risk of going to market with solutions people won’t buy.

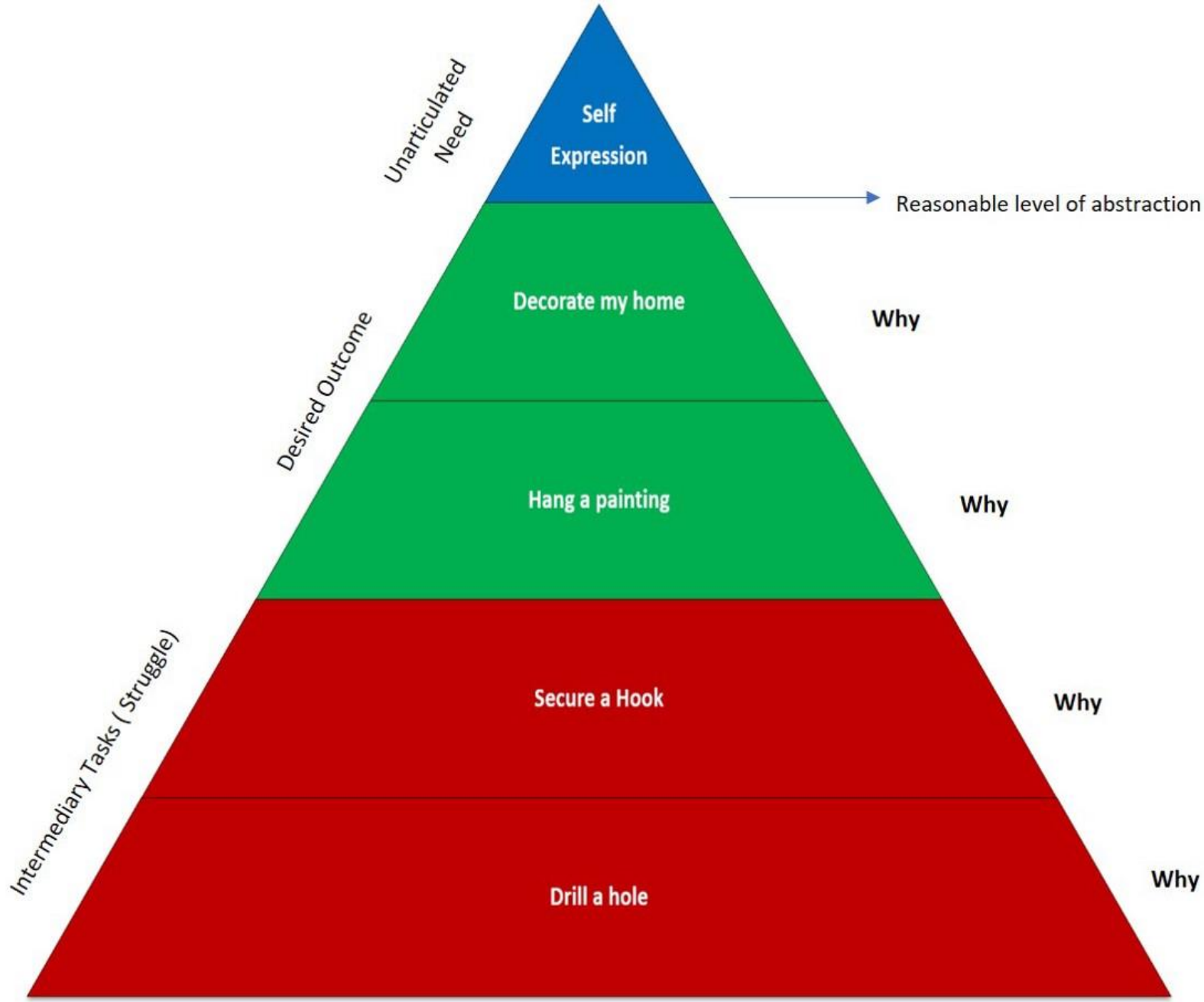
JTBD theory states that people shop and buy new products to transform their current situation and make progress on their **goals.**

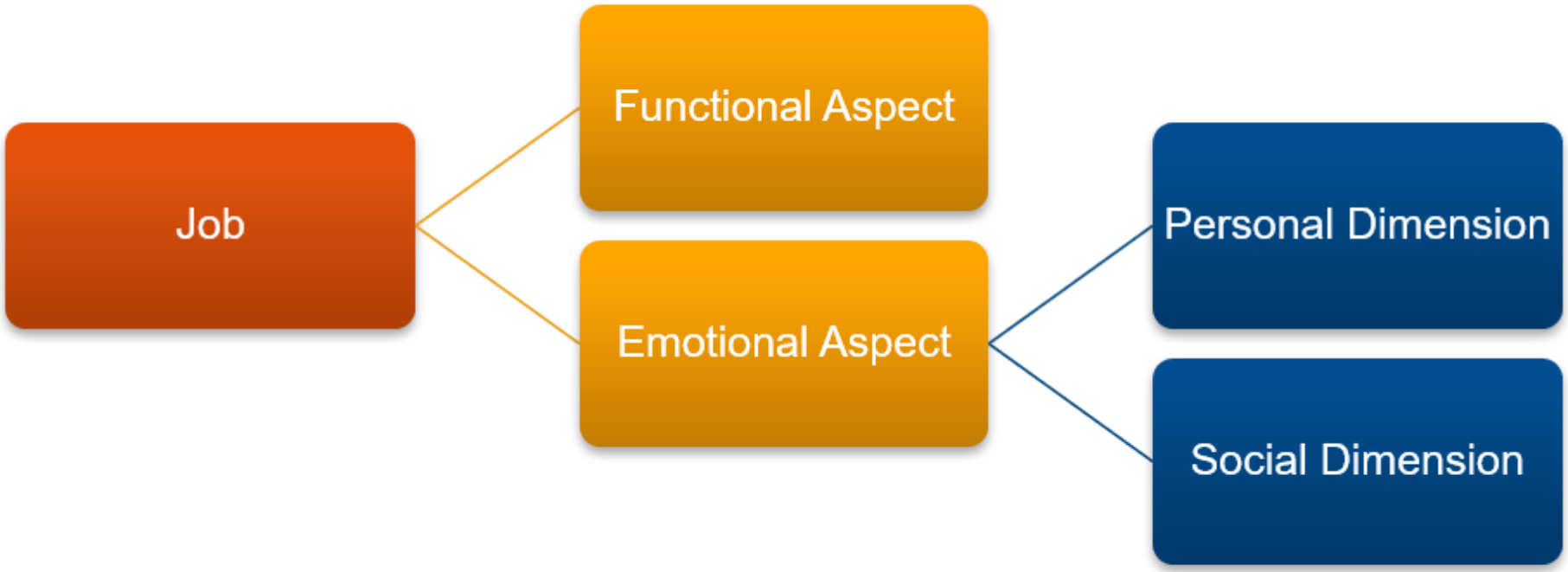
This is their *Job* to be done.

Jobs-to-be-Done Theory tenets as the building blocks for predictable growth:

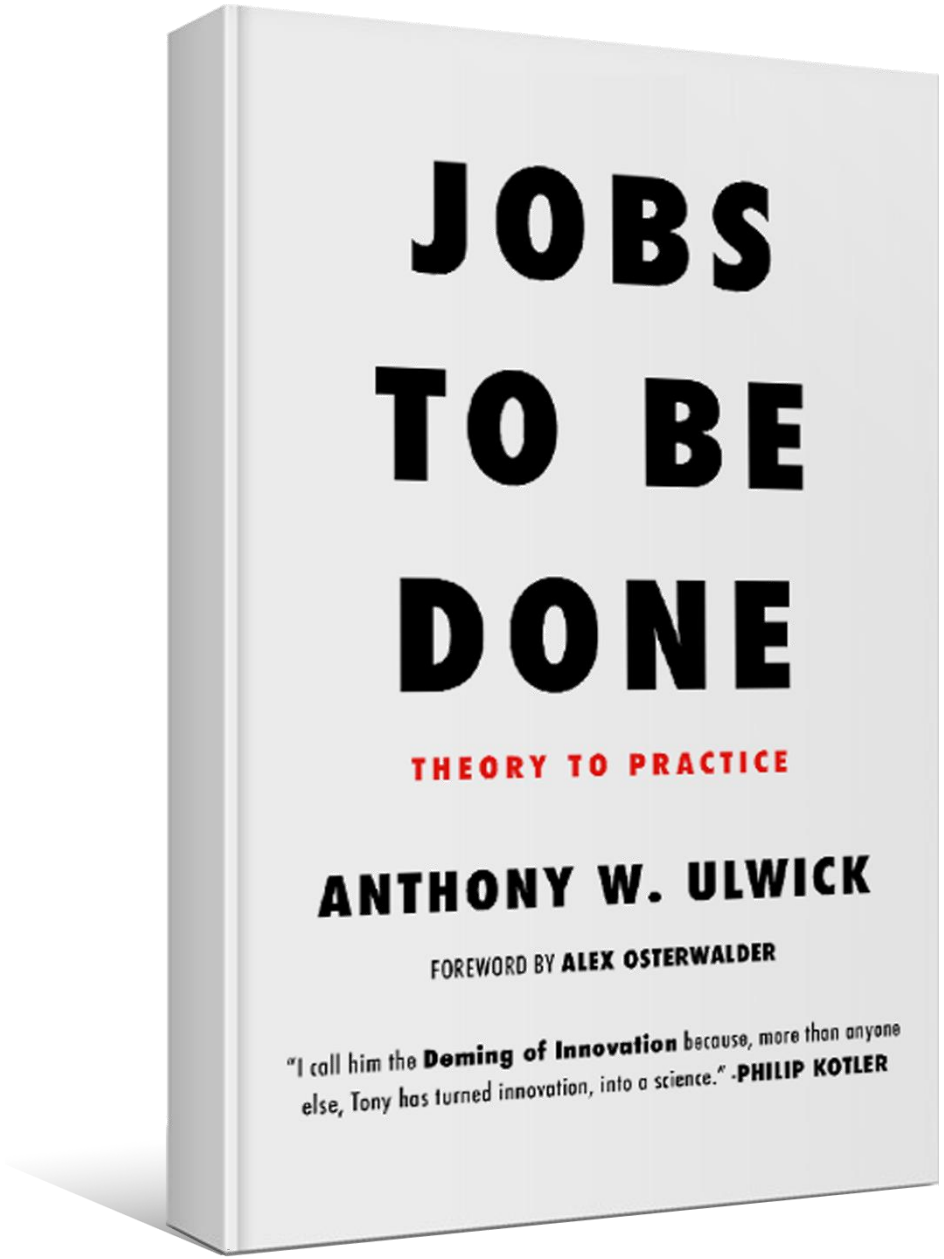
1. People buy products and services to get a “job” done.
2. Jobs are functional, with emotional and social components.
3. A Job-to-be-Done is stable over time.
4. A Job-to-be-Done is solution agnostic.
5. Success comes from making the “job”, rather than the product or the customer, the unit of analysis.
6. A deep understanding of the customer’s “job” makes marketing more effective and innovation far more predictable.
6. People want products and services that will help them get a job done better and/or more cheaply
7. People seek out products and services that enable them to get the entire job done on a single platform
8. Innovation becomes predictable when “needs” are defined as the metrics customers use to measure success when getting the job done

https://jobs-to-be-done.com/the-5-tenets-of-jobs-to-be-done-theory-ba58c3a093c1


Unarticulated Need
Self Expression
Reasonable level of abstraction
Desired Outcome
Decorate my home
Why
Hang a painting
Why
Intermediary Tasks (Struggle)
Secure a Hook
Why
Drill a hole
Why



Jobs to be done in where advertising and brand positioning



https://jobs-to-be-done-book.com/

Why is Interaction Design important?

Activity

"Don't design a product, design an intervention"