Lesson 3

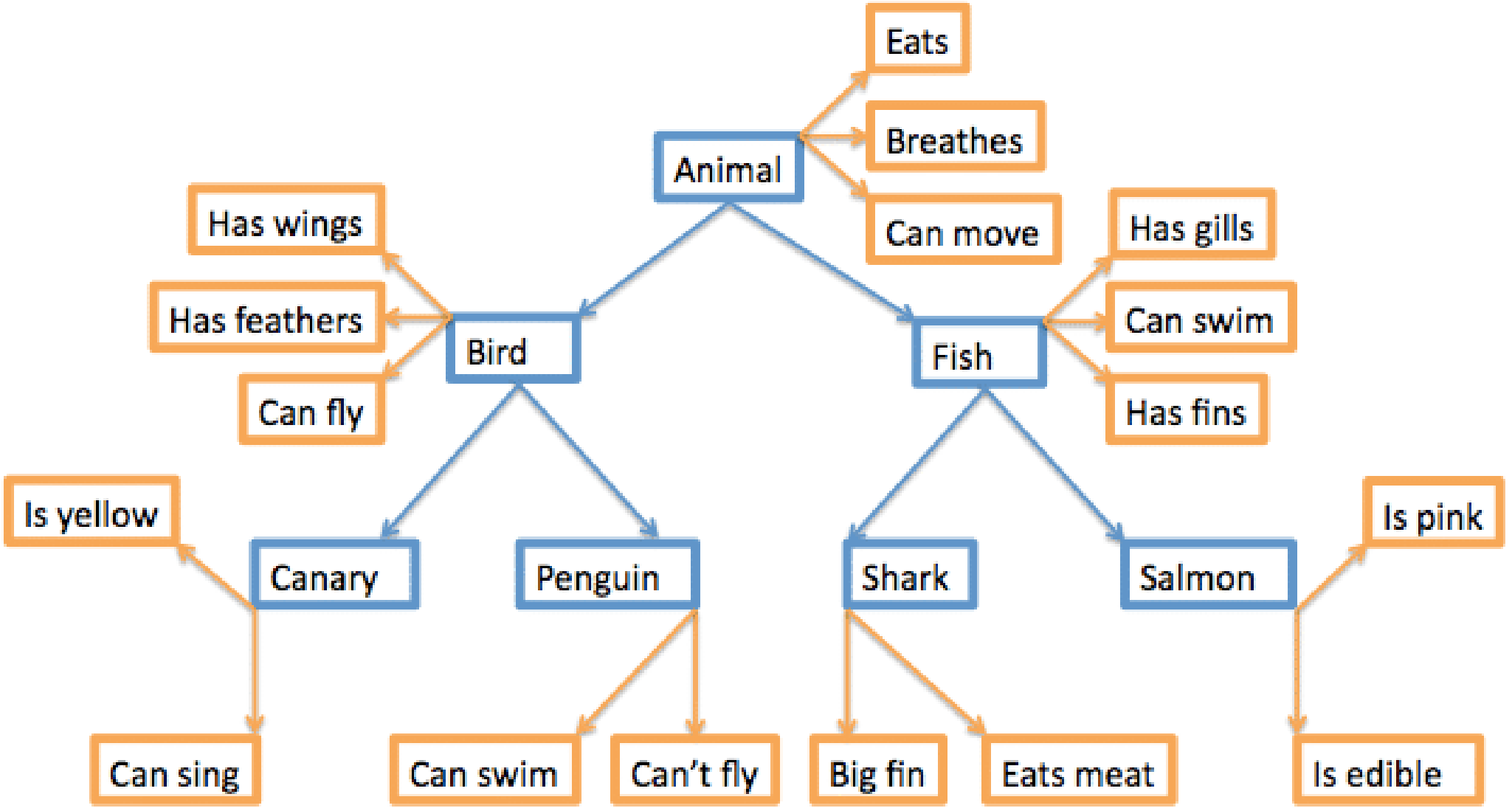
Interaction Design (CM3055)

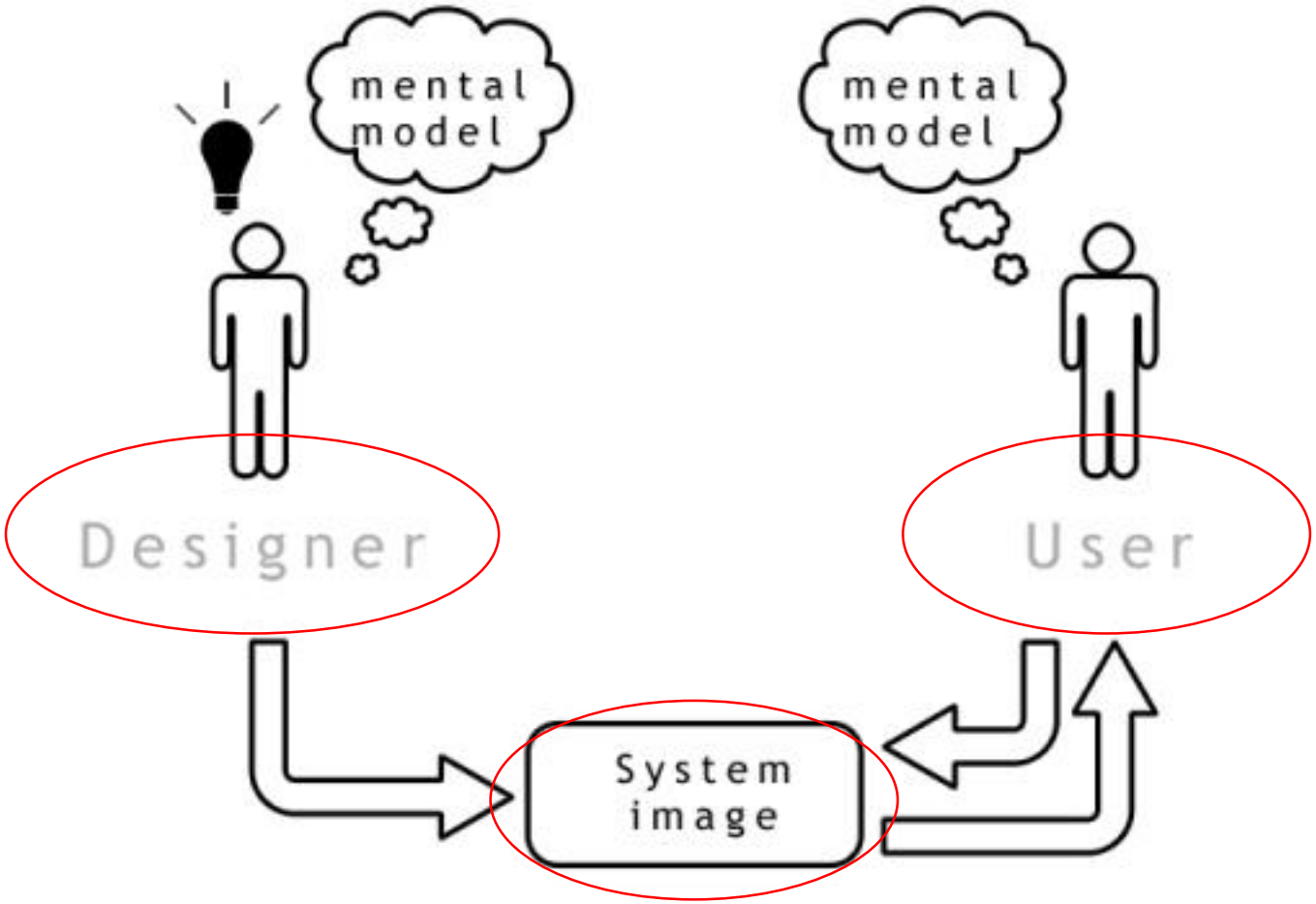
Modelling - how and why we model and the benefit it can provide in building systems that are fit for purpose.

- Apply IxD models to real world tasks
- Discuss differences between mental and system model

What Is a Mental Model?

A mental model is based on belief, not facts: that is, it's a model of what users know (or think they know) about a system such as your website. – *Nielsen Norman Group*





User-Centered System Design

For people to use a product successfully, they must have the **same mental model (the user's model) as that of the designer (the designer's model).**

But the designer only talks to the user via the product itself, so the entire communication must take place through the "system image": the information conveyed by the physical product itself.

(Originally published in Norman & Draper's *User Centered System Design* (1986), and reused frequently thereafter: *The Design of Everyday Things* (1988, 2003) and *Emotional Design*

Design as Communication: https://www.jnd.org/dn.mss/design_as_communication.html

Mental models play an important role in Human-Computer Interaction (HCI) and interaction design

Mental Models and designing an HCI

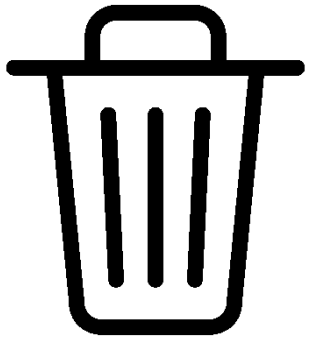
- Users bringing their own mental models to a system mental models
- Users will predict the behaviour of a system based on past experiences

HCI designers must consider user's mental models

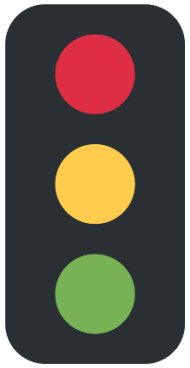
- If interface matches mental model = intuitive use
- need to design systems to match mental models - convergence between mental model & system model

What effect of Mental Model on user?

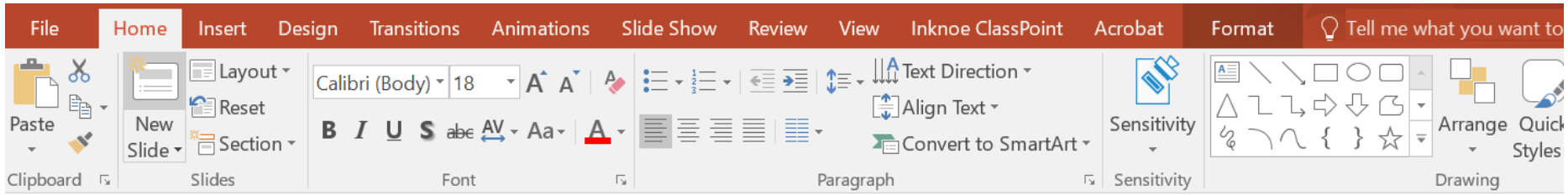
Error



Delete



Red - bad/stop
Green - good/go



icons on toolbars give a preconception of use require less training won't 'get lost' while using the system

How does this setting make use of a mental model?

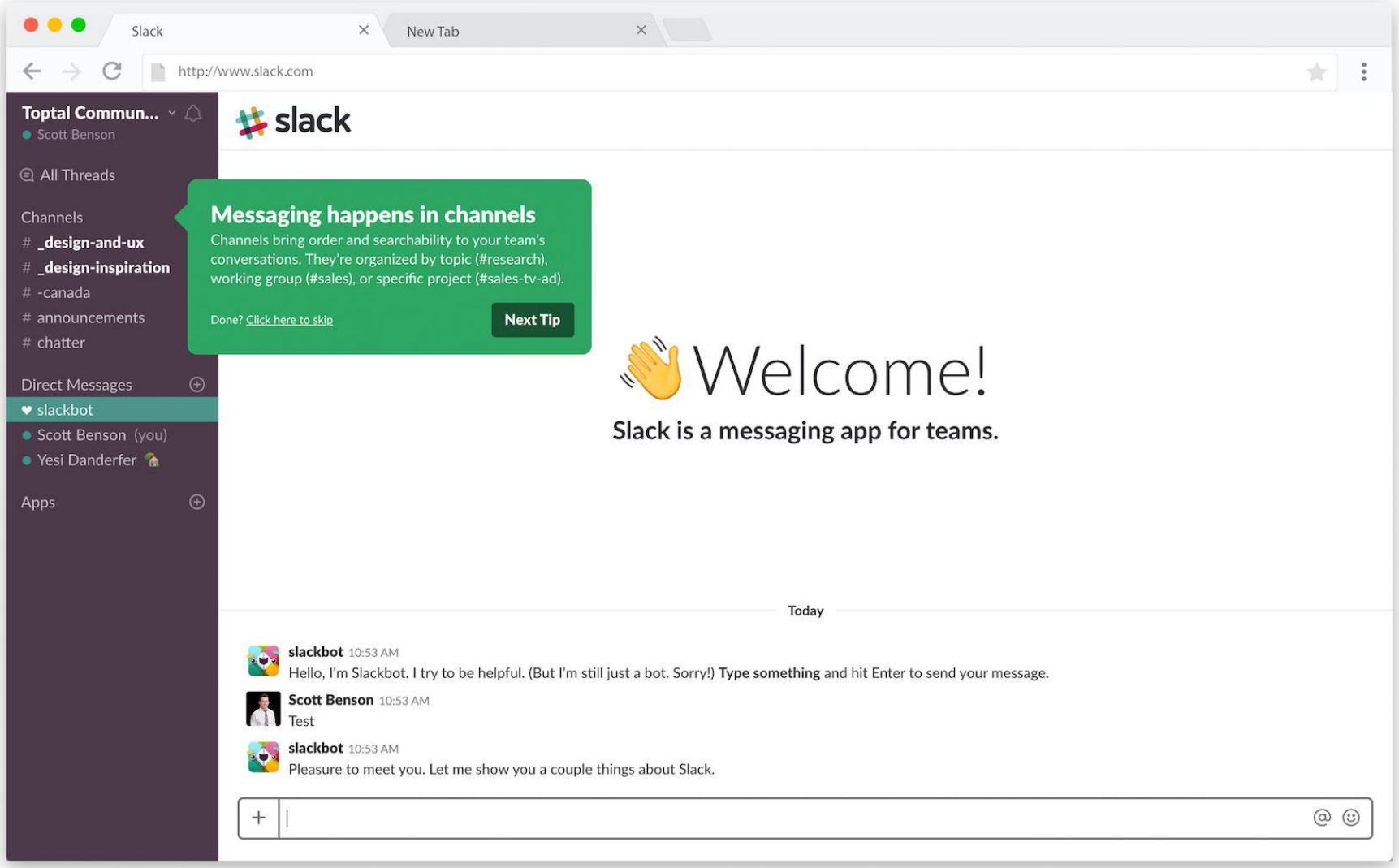
Misaligned User Mental Models

- occurs when there is a discrepancy between a user’s mental model and how a design actually works.

- kind of disconnect creates usability problems

Improving Misaligned Mental Models

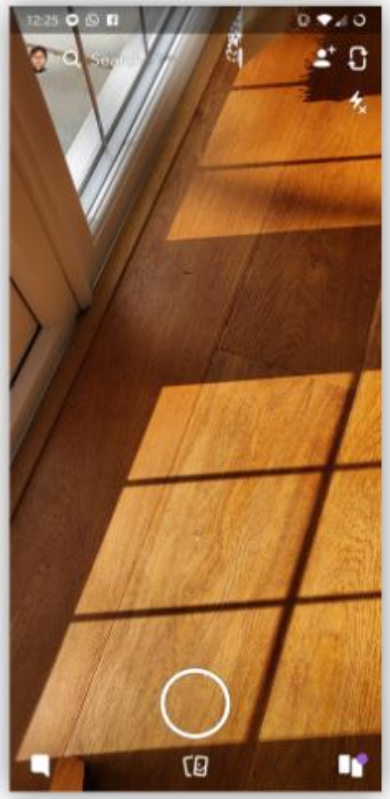
- Usability testing
- UX research methods
- Gaps between mental models can be improved with
  - interactive tours
  - careful onboarding
  - real-time feedback
  - and/or signifiers



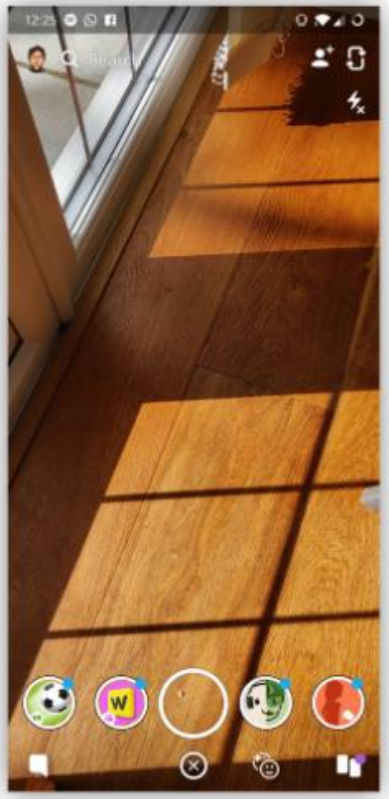
Slack uses interactive tours to help new users learn the interface and efficiently improves any contradictory mental models users may have.

When should we break away from a mental model?

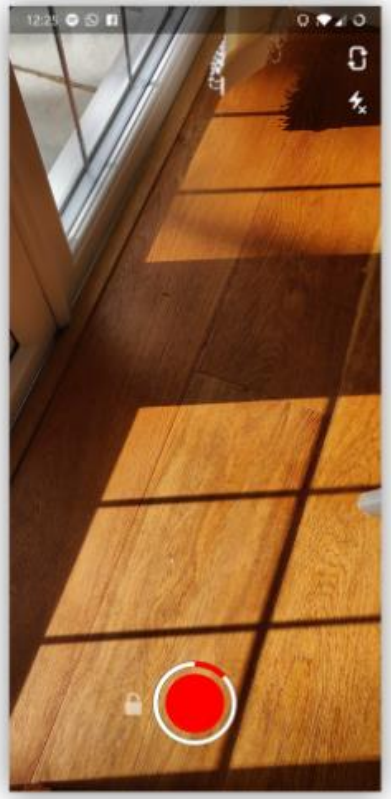
- Back to original problem when designing (innovation vs usability)
- Invite many people to share their ideas about a solution
- Test those ideas



Viewfinder

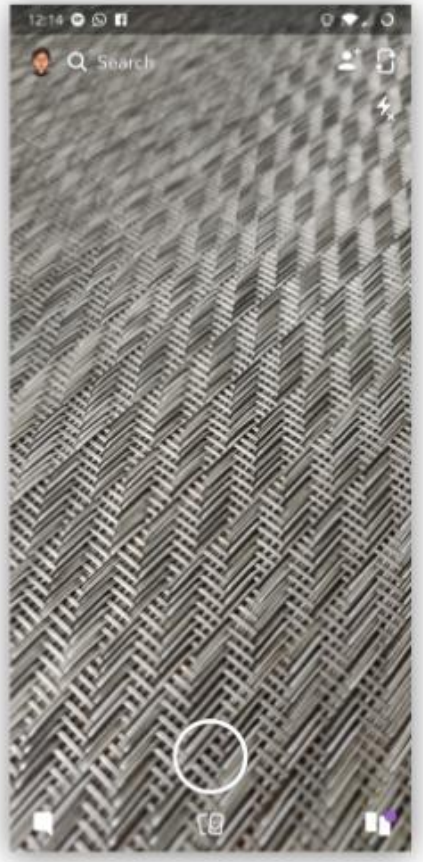


Filters

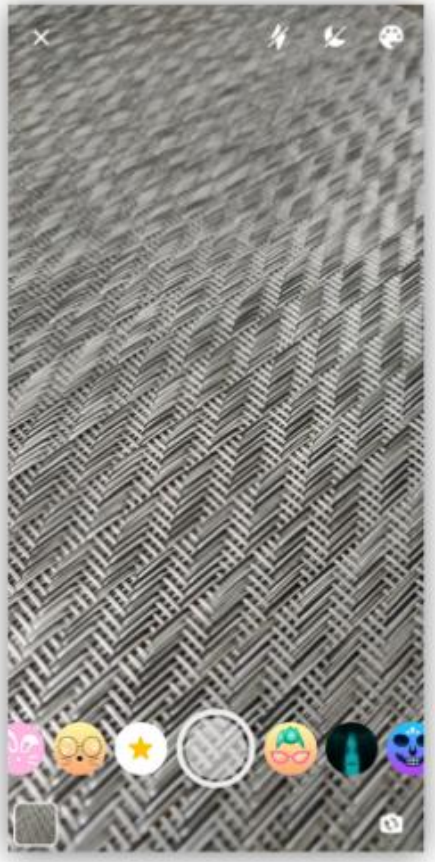


Recording

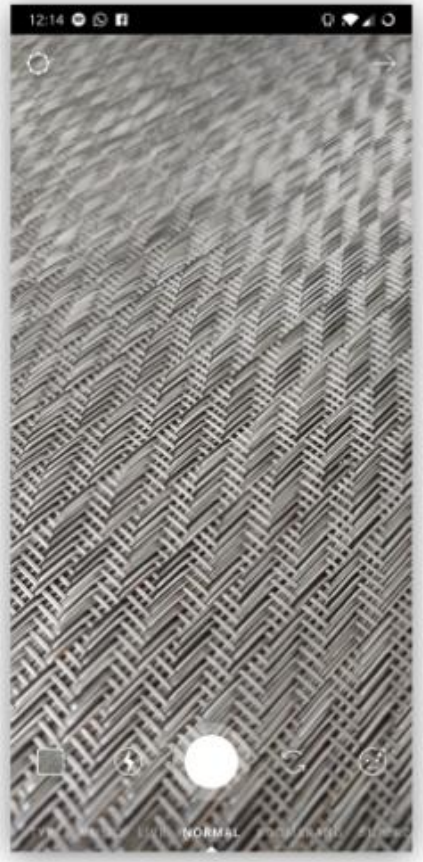
https://uxdesign.cc



Snapchat



Facebook Messenger



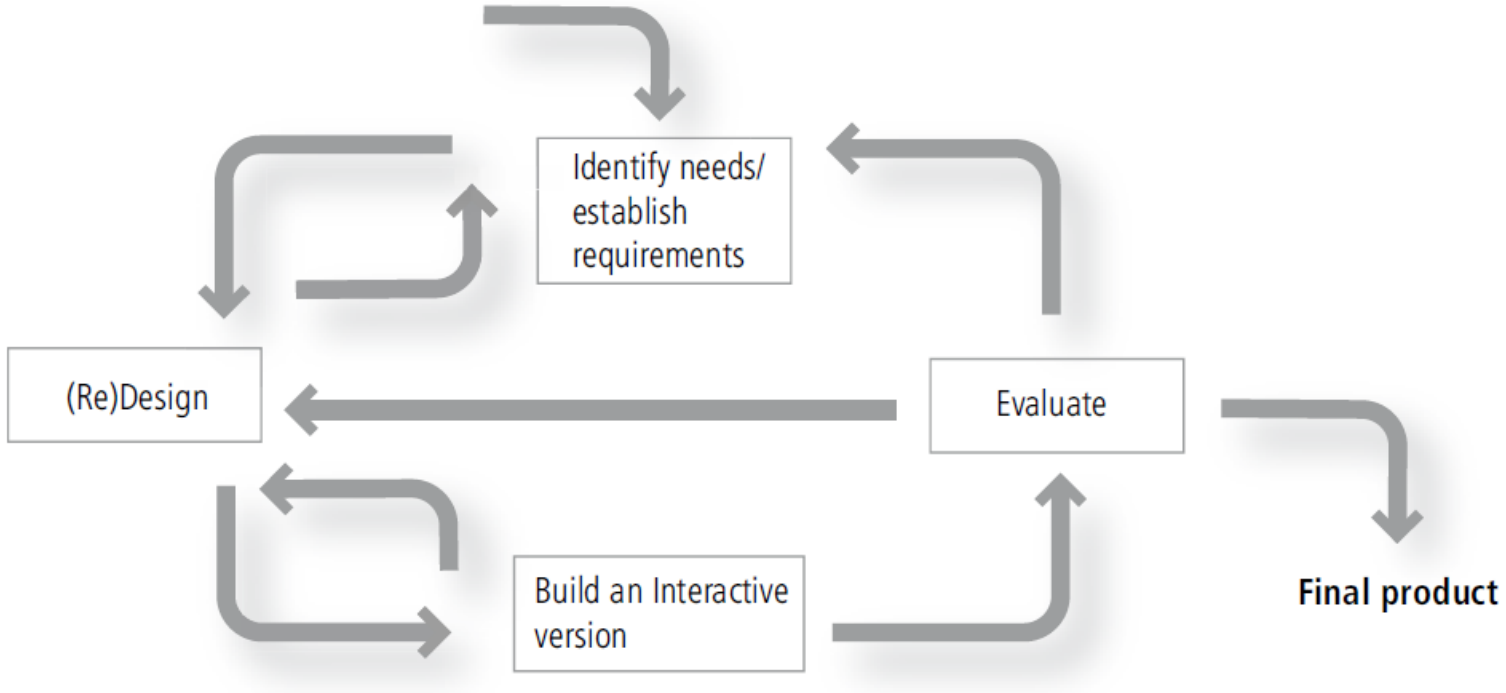
Instagram

https://uxdesign.cc

Facebook Messenger’s UI mirrors Snapchat, capitalizing on existing mental models.
Users of one popular app will have no trouble using and enjoying the other.

Iterative design

a design methodology based on a cyclic process of prototyping, testing, analyzing, and refining a product or process.



Paradigm change occurred with the move towards concepts of experience-centred design.

The inclusion of techniques such as ethnography – from sociological and anthropological disciplines – and technological developments led to a more co-operative design focus

Extra reading: https://airbrake.io/blog/sdlc/iterative-model

This is an interesting game as it models the **iterative design** process well.

- The 'user' (person setting the code) has an idea.
- We, as designers, keep designing products to meet the user need.
- They give us feedback.
- The design gets better each time.

https://www.archimedes-lab.org/mastermind.html

The UI design process

McInerney, P. and R. Sobiesiak 'The UI design process',
ACM SIGCHI Bulletin 32(1) 2000, pp.17–21.

Consider these when design UIs

- **Users judge designs quickly and care about usability and likeability.**
  - getting their tasks done easily and with minimum effort
  - design should therefore be “invisible
  - understand your users’ contexts and task flows (e.g. customer journey maps)

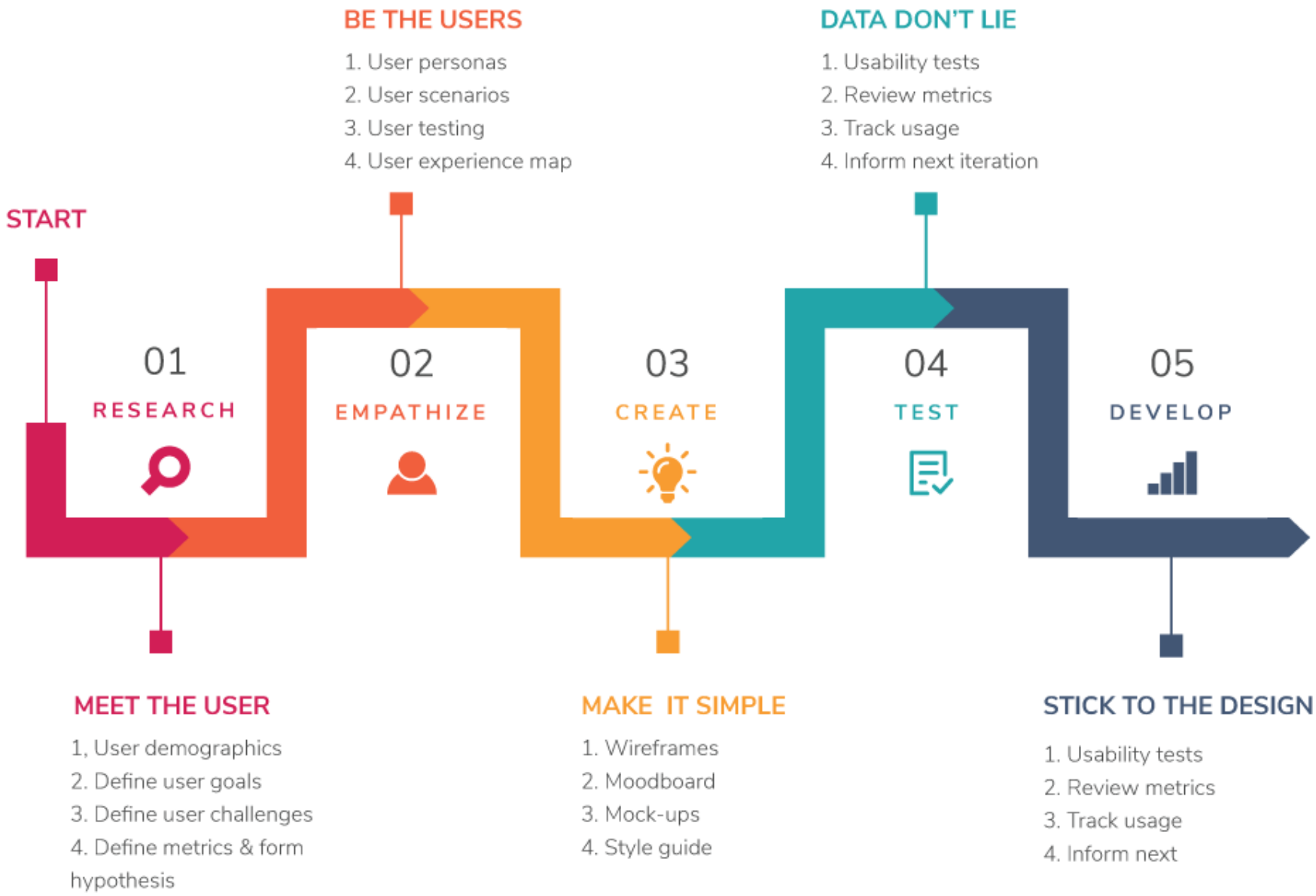
- **UIs should also be enjoyable (or at least satisfying and frustration-free).**
  - design predicts users’ needs – personalized, immersive experiences
  - elements of gamification can make your design more fun

- **UIs should communicate brand values and reinforce users’ trust.**
  - emotional design

UI Design Process

1. Context and user recognition
2. Navigational and systemic interface design
3. Distributional design of interface
4. Visual interface design
5. Products prototype design
6. Testing usability of the prototype
7. Specification of UI

https://www.cronj.com/



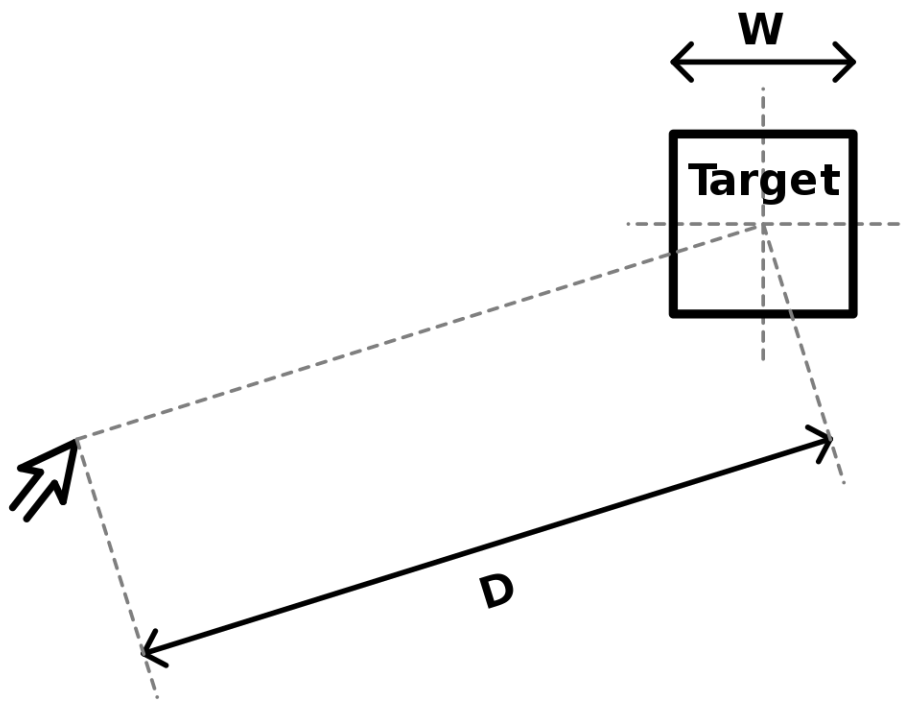
User Experience Design Process

https://medium.com/

Fitts' Law (Fitts, 1954)

- Fitts' Law predicts that the time to point at an object using a device is a function of the distance from the target object and the object's size.
- **The larger an item is, and the closer it is to your cursor, the easier it is to click on**
- The further away and the smaller the object, the longer the time to locate it and point to it.
- Fitts' Law is useful for evaluating systems for which the time to locate an object is important.

"...the time to acquire a target is a function of the distance to and size of the target"



$$ID = \log_2\left(\frac{2D}{W}\right)$$

ID - index of difficulty

D - the distance to the center of the target

W - the tolerance or width of the target

Fitts' Law (Fitts, 1954)

- http://bit.do/FittssTest
- Do at least 10 for each trial

Takeways of Fitts' Law

1. Touch targets should be large enough for users to accurately select them.
2. Touch targets should have ample spacing between them.
3. Touch targets should be placed in areas of an interface that allow them to be easily acquired.

Download

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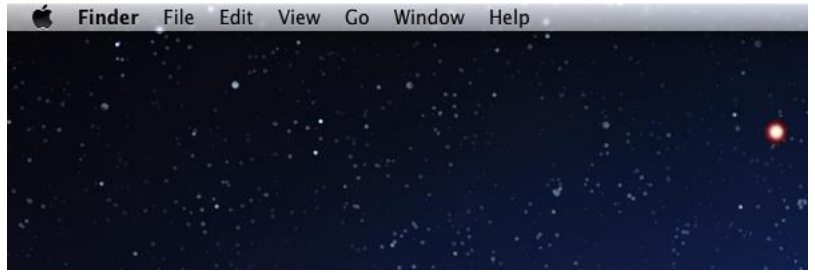
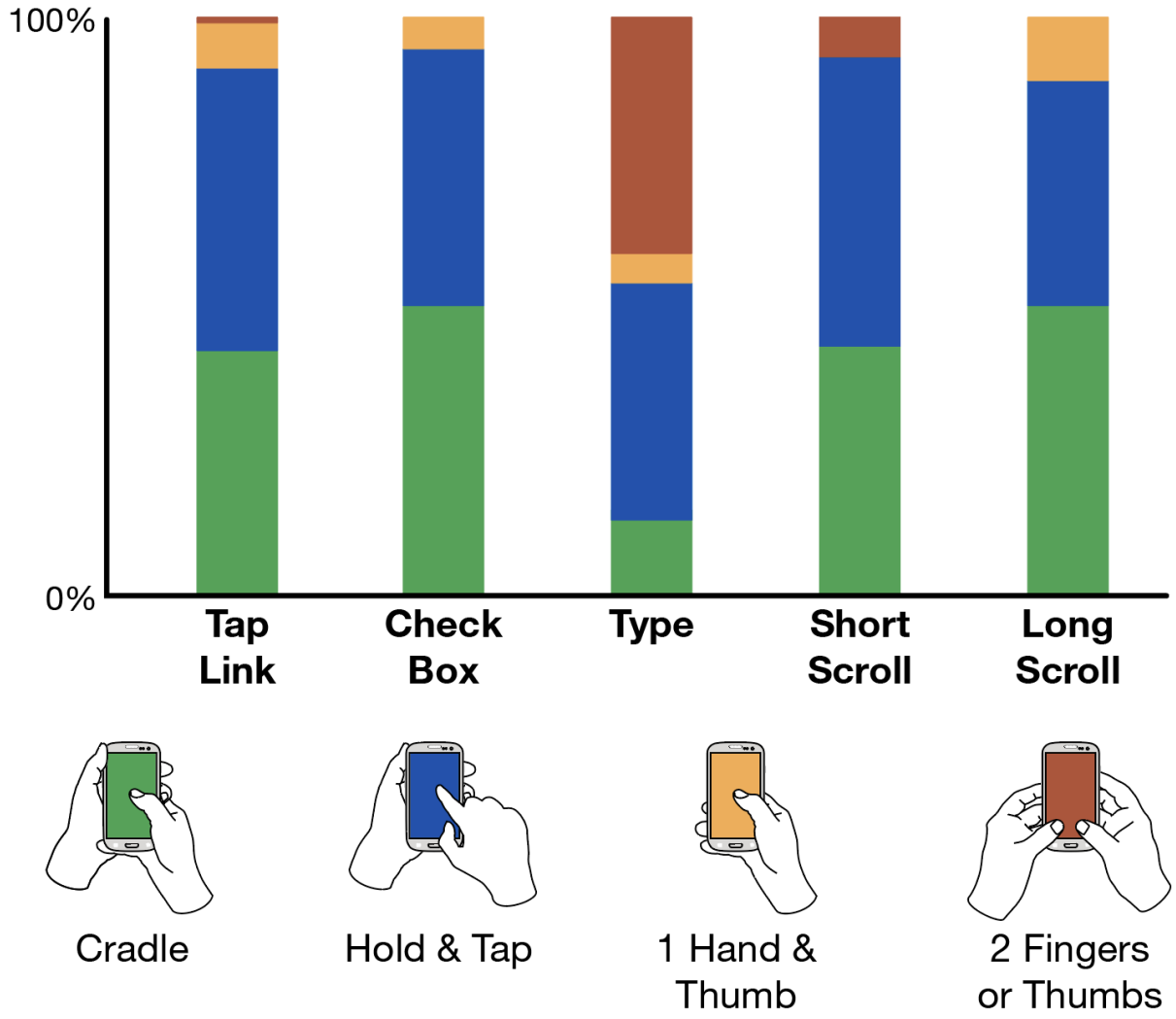
Login

Login



Holding the phone



Chapter 5 of “Touch Design for Mobile Interfaces”

Fitts' Law In The Touch Era
https://www.smashingmagazine.com/2022/02/fitts-law-touch-era/

Fitts' Law: The Importance of Size and Distance in UI Design
https://www.interaction-design.org/literature/article/fitts-s-law-the-importance-of-size-and-distance-in-ui-design

Design for Fingers, Touch, and People, Part 1
https://www.uxmatters.com/mt/archives/2017/03/design-for-fingers-touch-and-people-part-1.php

The information capacity of the human motor system in controlling the amplitude of movement
http://www2.psychology.uiowa.edu/faculty/mordkoff/InfoProc/pdfs/Fitts%201954.pdf