What is interaction design?

Outline

1.1 Introduction
1.2 Good and Poor Design
1.3 What Is Interaction Design?
1.4 The User Experience
1.5 The Process of Interaction Design
1.6 Interaction Design and the User Experience

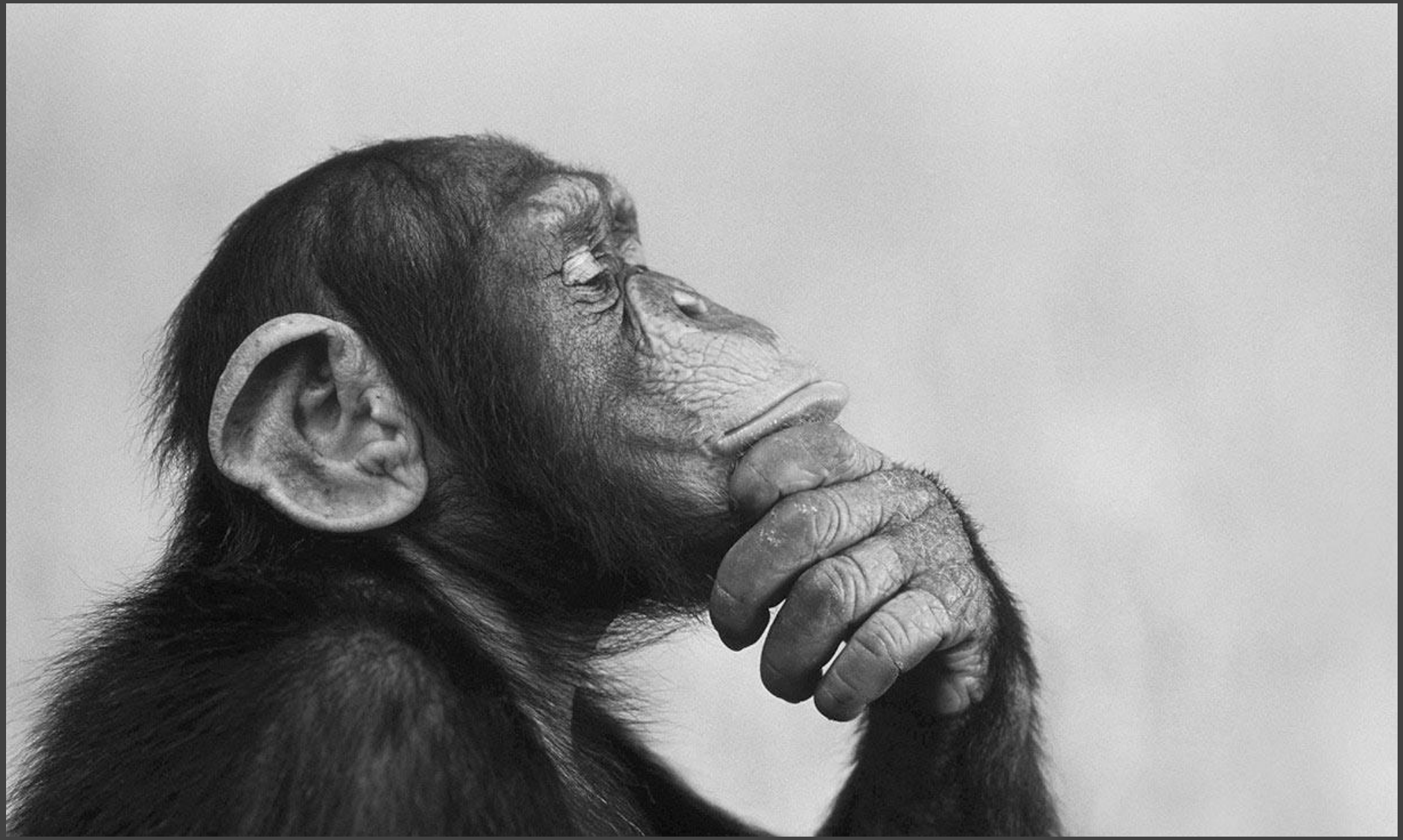
Learning outcomes

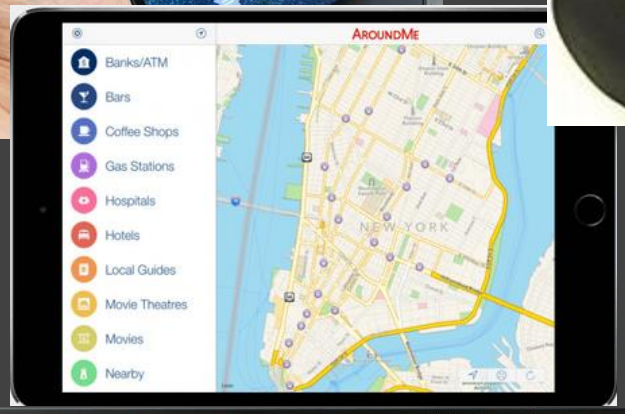
- Explain the difference between good and poor interaction design.
- Describe what interaction design is and how it relates to human–computer interaction and other fields.
- Explain the relationship between the user experience and usability.
- Describe what and who is involved in the process of interaction design.
- Outline the different forms of guidance used in interaction design.
- Enable you to evaluate an interactive product and explain what is good and bad about it in terms of the goals and core principles of interaction design.

Introduction

Think for a minute about…

What interactive products do you use in a typical day?




AROUNDME
Banks/ATM
Bars
Coffee Shops
Gas Stations
Hospitals
Hotels
Local Guides
Movie Theatres
Movies
Nearby
NEW YORK


12:38
CLOCK RADIO AJ3123


mobile


ATM
RECEIPT
CARD
CASH
CANCEL
ENTER

Think about..

..how usable they are.

..How many are actually easy, effortless, and enjoyable to use?

Others, like a ticket machine, can be very frustrating. Why is there a difference?

They are generally easy and enjoyable to use

Smartphones and social networking sites have been designed primarily with the user in mind.

Others, such as setting the alarm on a digital clock, have not necessarily been designed with the users in mind, but have been engineered primarily as systems to perform set functions

One main aim of interaction design is to reduce the negative aspects (e.g. frustration, annoyance) of the user experience while enhancing the positive ones (e.g. enjoyment, engagement).

it is about developing interactive products1 that are easy, effective, and pleasurable to use – from the users' perspective.

In this chapter..

- We begin by examining what interaction design is
- We look at the difference between good and poor design, highlighting how products can differ radically in how usable and enjoyable they are.
- We then describe what and who is involved in the process of interaction design.
- The user experience, which is a central concern of interaction design, is then introduced.
- Finally, we outline how to characterize the user experience in terms of usability goals, user experience goals, and design principles.

Good and Bad Designs

- What are the characteristics?

Good and Poor Design

- A central concern of interaction design is to develop interactive products that are usable.
- By this is generally meant easy to learn, effective to use, and providing an enjoyable user experience.

What to design

- Need to take into account:
  - Who the users are
  - What activities are being carried out
  - Where the interaction is taking place

- Need to optimize the interactions users have with a product:
  - So that they match the users' activities and needs

Understanding users' needs

- Need to take into account what people are good and bad at
- Consider what might help people in the way they currently do things
- Think through what might provide quality user experiences
- Listen to what people want and get them involved
- Use tried and tested user-centered methods

What is interaction design?

"Designing interactive products to support the way people communicate and interact in their everyday and working lives."

Preece, Sharp and Rogers (2015)

"The design of spaces for human communication and interaction."

Winograd (1997)

Goals of interaction design

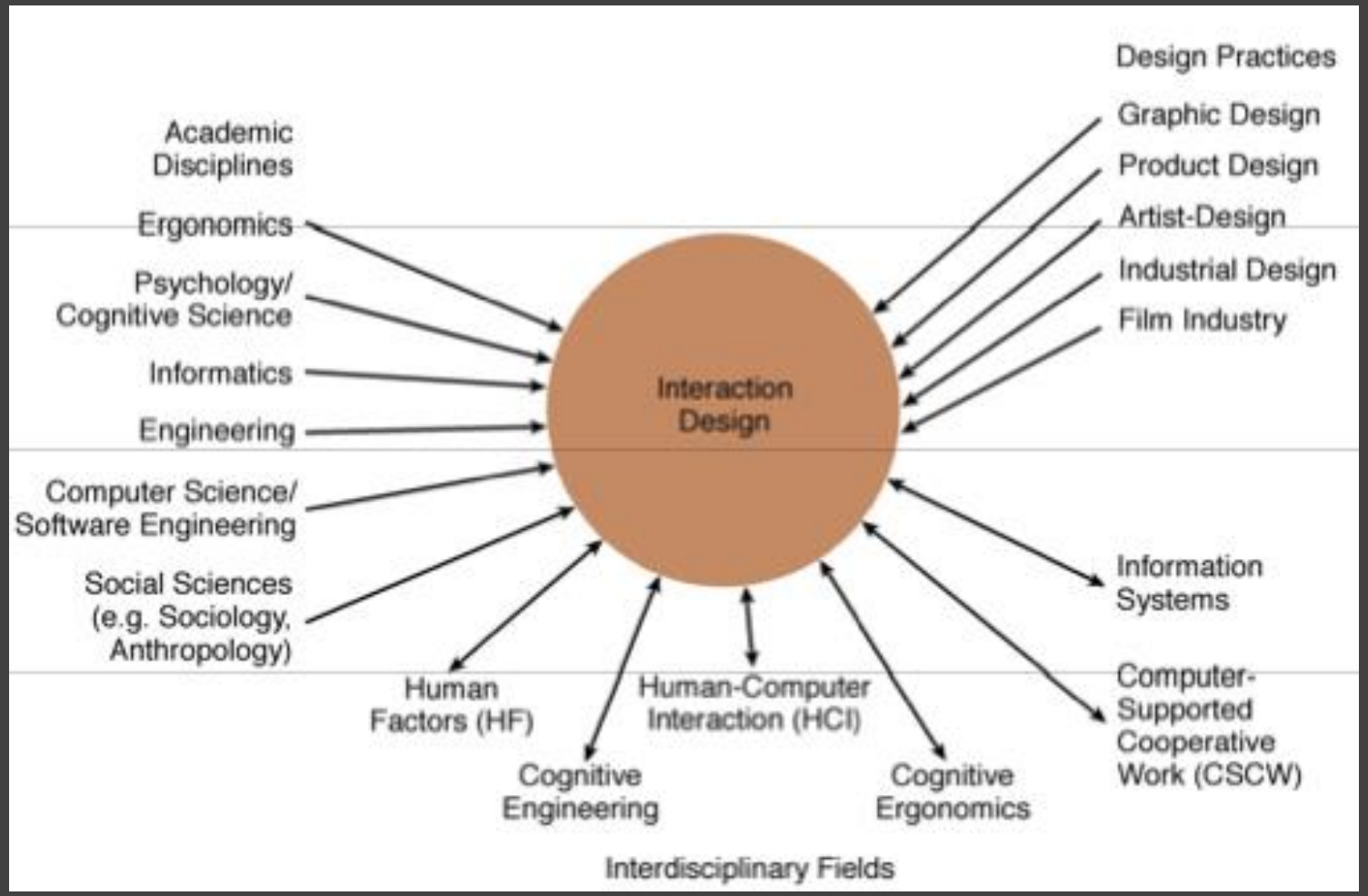
- Develop usable products
  - Usability means easy to learn, effective to use and provide an enjoyable experience
- Involve users in the design process

Which kind of design?

- Number of other terms used emphasizing what is being designed, e.g.
  - user interface design, software design, user-centered design, product design, web design, experience design (UX)

- Interaction design is the umbrella term covering all of these aspects
  - fundamental to all disciplines, fields, and approaches concerned with researching and designing computer-based systems for people

The Components of Interaction Design



Relationship among contributing academic disciplines, design practices, and interdisciplinary fields concerned with interaction design (double-headed arrows mean overlapping)

Relationship between ID, HCI and other fields

- Academic disciplines contributing to ID:
  - Psychology
  - Social Sciences
  - Computing Sciences
  - Engineering
  - Ergonomics
  - Informatics

Relationship between ID, HCI and other fields

- Design practices contributing to ID:
    - Graphic design
    - Product design
    - Artist-design
    - Industrial design
    - Film industry

Relationship between ID, HCI and other fields

- Interdisciplinary fields that ‘do’ interaction design:
    - HCI
    - Ubiquitous Computing
    - Human Factors
    - Cognitive Engineering
    - Cognitive Ergonomics
    - Computer Supported Co-operative Work
    - Information Systems

Who Is Involved in Interaction Design?

- Many people from different backgrounds involved
- Different perspectives and ways of seeing and talking about things
- Benefits
  - more ideas and designs generated
- Disadvantages
  - difficult to communicate and progress forward the designs being create

Interaction Design Consultants

- Increasing number of ID consultancies, examples of well known ones include:

  - Nielsen Norman Group: “help companies enter the age of the consumer, designing human-centered products and services”
  - Cooper: “From research and product to goal-related design”
  - Swim: “provides a wide range of design services, in each case targeted to address the product development needs at hand”
  - IDEO: “creates products, services and environments for companies pioneering new ways to provide value to their customers”

What do professionals do in the ID business?

- interaction designers - people involved in the design of all the interactive aspects of a product
- usability engineers - people who focus on evaluating products, using usability methods and principles
- web designers - people who develop and create the visual design of websites, such as layouts
- information architects - people who come up with ideas of how to plan and structure interactive products
- user experience designers (UX) - people who do all the above but who may also carry out field studies to inform the design of products

User Experience

The User Experience

- How a product behaves and is used by people in the real world
  - the way people feel about it and their pleasure and satisfaction when using it, looking at it, holding it, and opening or closing it
  - "every product that is used by someone has a user experience: newspapers, ketchup bottles, reclining armchairs, cardigan sweaters." (Garrett, 2010)
  - "all aspects of the end-user's interaction with the company, its services, and its products. (Nielsen and Norman, 2014)

- Cannot design a user experience, only design for a user experience

Why was the iPod user experience such a success?

Figure 1.6 The iPod Nano Touch

Source: ©Press Association, reproduced with permission.

- Quality user experience from the start
- Simple, elegant, distinct brand, pleasurable, must have fashion item, catchy names, cool, etc.

What is involved in the process of interaction design

Interaction Design involves four basic activities:

1. Identifying **needs** and establishing **requirements'**
2. Developing alternative **designs** that meet those requirements
3. **Building** interactive versions of the designs so that they can be communicated and assessed
4. **Evaluating what is being built throughout the process**

Core characteristics of interaction design

1. Users should be involved through the development of the project
2. Specific usability and user experience goals need to be identified, clearly documented and agreed at the beginning of the project

Usability Goals: concerned with meeting a usability criteria (e.g. efficiency)

- **Effectiveness** - how good a system is at doing what it is supposed to
- **Efficiency** - the way a system supports users in carrying out their tasks
- **Safety** - protecting the users from dangerous conditions / undesirable situations
- **Utility** - extent to which the system provides the **right kind of functionality** so that users can do what they need or want to do
- **Learnability** - how easy a system is to learn to use
- **Memorability** - how easy a system is to remember how to use, once learned

4. Iteration is needed through the core activities

Why go to this length?

- Help designers:
  - understand how to design interactive products that fit with what people want, need and may desire
  - appreciate that one size does not fit all
    - e.g., teenagers are very different to grown-ups
  - identify any incorrect assumptions they may have about particular user groups
    - e.g., not all old people want or need big fonts
  - be aware of both people's sensitivities and their capabilities

Accessibility

- Degree to which a product is usable and accessible by as many people as possible

- Focus on disability:
  - Have a mental or physical impairment
  - This has an adverse affect on their everyday lives
  - It is long term

Anna, IKEA online sales agent

- Designed to be different or UK and US customers
- What are the differences and which is which?
- What should Anna's appearance be like for other countries, like India, South Africa, or China?

Figure 1.7 Anna the online sales agent, designed to be subtly different for UK and US customers. What are the differences and which is which? What should Anna's appearance be like for other countries, like India, South Africa, or China?

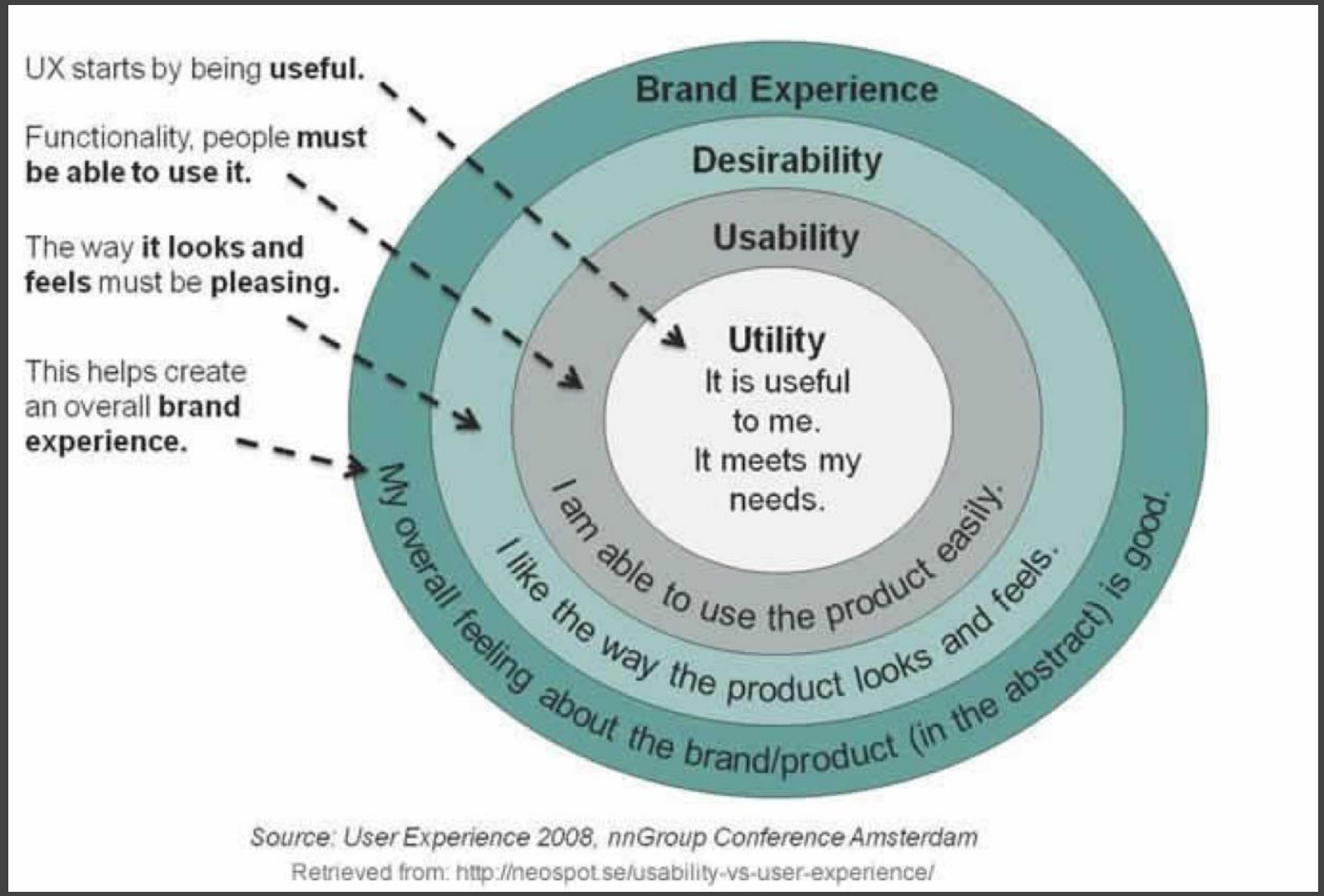
Source: Reproduced with permission from IKEA Ltd.

Usability goals

User experience goals

Desirable and undesirable aspects of the user experience		
Desirable aspects		
Satisfying	Helpful	Fun
Enjoyable	Motivating	Provocative
Engaging	Challenging	Surprising
Pleasurable	Enhancing sociability	Rewarding
Exciting	Supporting creativity	Emotionally fulfilling
Entertaining	Cognitively stimulating	
Undesirable aspects		
Boring	Unpleasant	
Frustrating	Patronizing	
Making one feel guilty	Making one feel stupid	
Annoying	Cutesy	
Childish	Gimmicky	

User experience is a “consequence of the presentation, functionality, system performance, interactive behaviour, and assistive capabilities of the interactive system”



Source: User Experience 2008, nnGroup Conference Amsterdam
Retrieved from: http://neospot.se/usability-vs-user-experience/

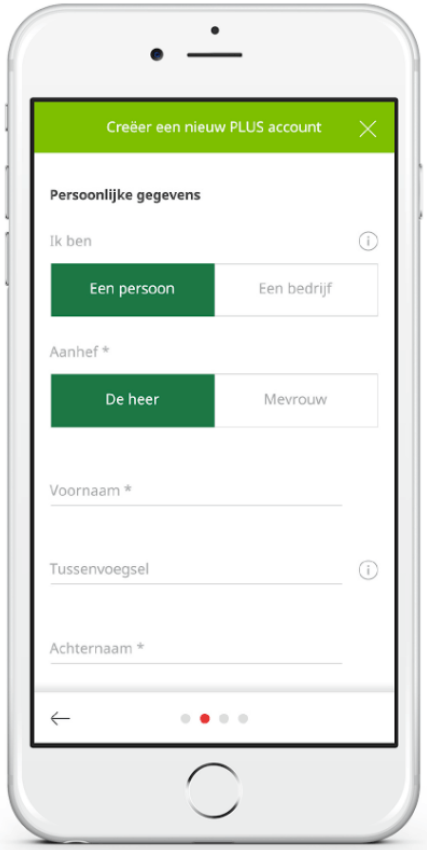
Usability and user experience goals

- Selecting terms to convey a person's feelings, emotions, etc., can help designers understand the multifaceted nature of the user experience
- How do usability goals differ from user experience goals?
- Are there trade-offs between the two kinds of goals?
  - e.g. can a product be both fun and safe?
- How easy is it to measure usability versus user experience goals?

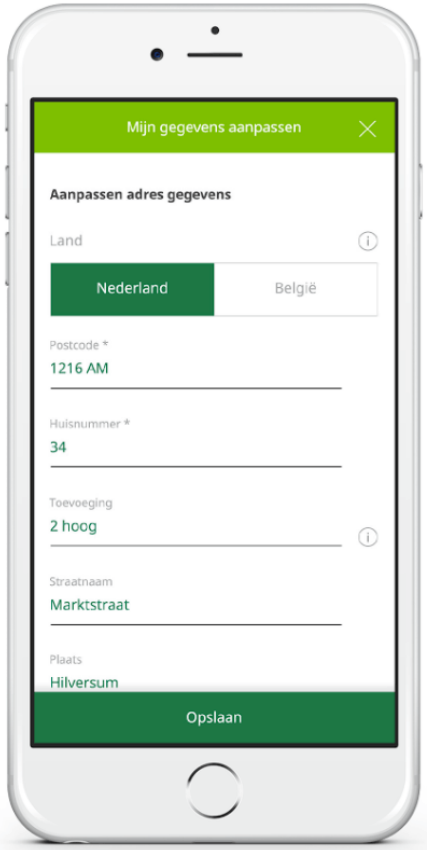
Design principles

- Generalizable abstractions for thinking about different aspects of design
- The do’s and don'ts of interaction design
- What to provide and what not to provide at the interface
- Derived from a mix of theory-based knowledge, experience and common-sense

Visibility - can I see it?



Labels play placeholder's role when the field is empty



Placeholder text transform into a label when the field is filled

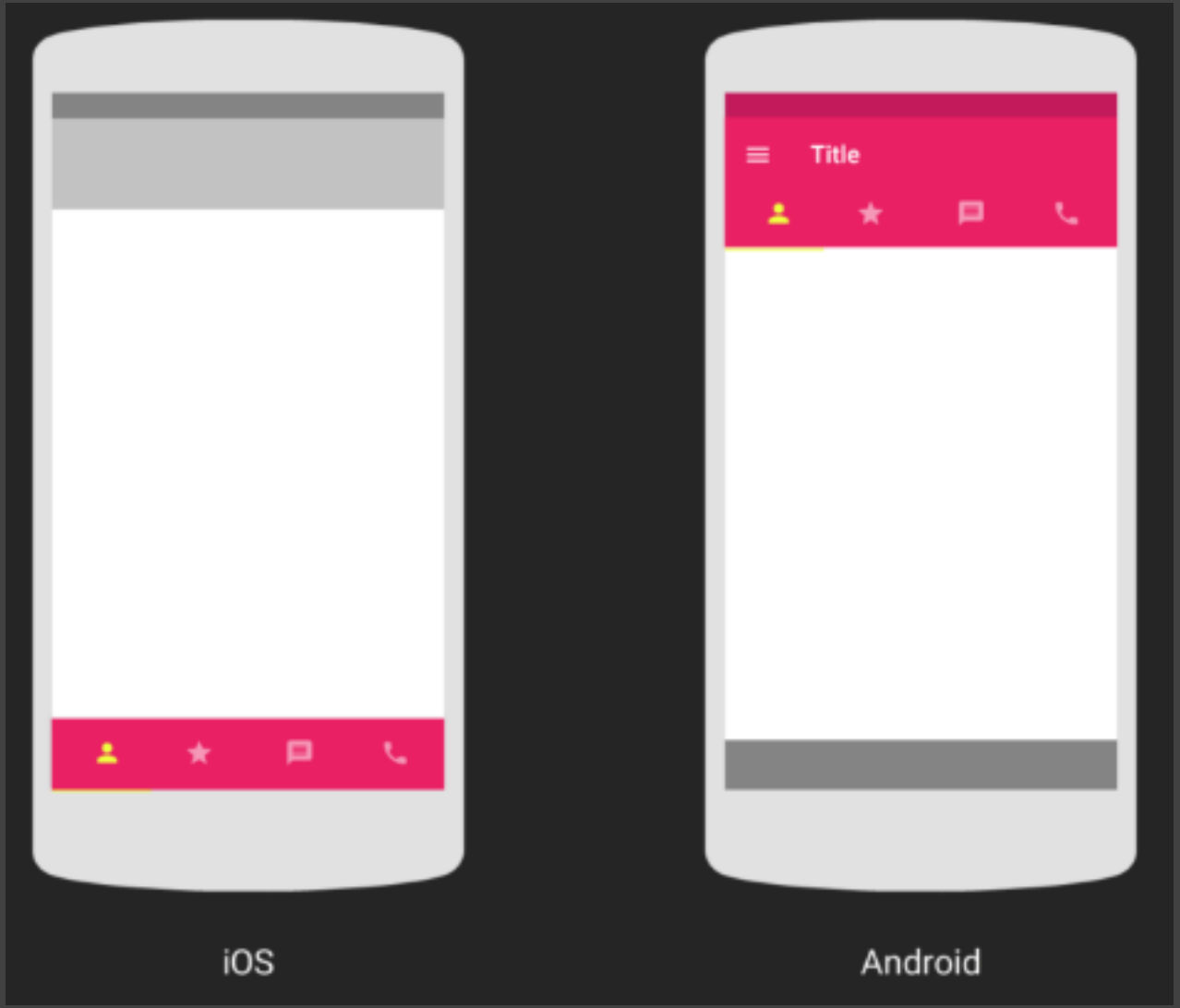
Visibility

Don’t hide it. Avoid hidden navigation such as gesture-

driven because most users will have a hard time

finding it.

Communicate the current location. - “Where am I?”



Visibility

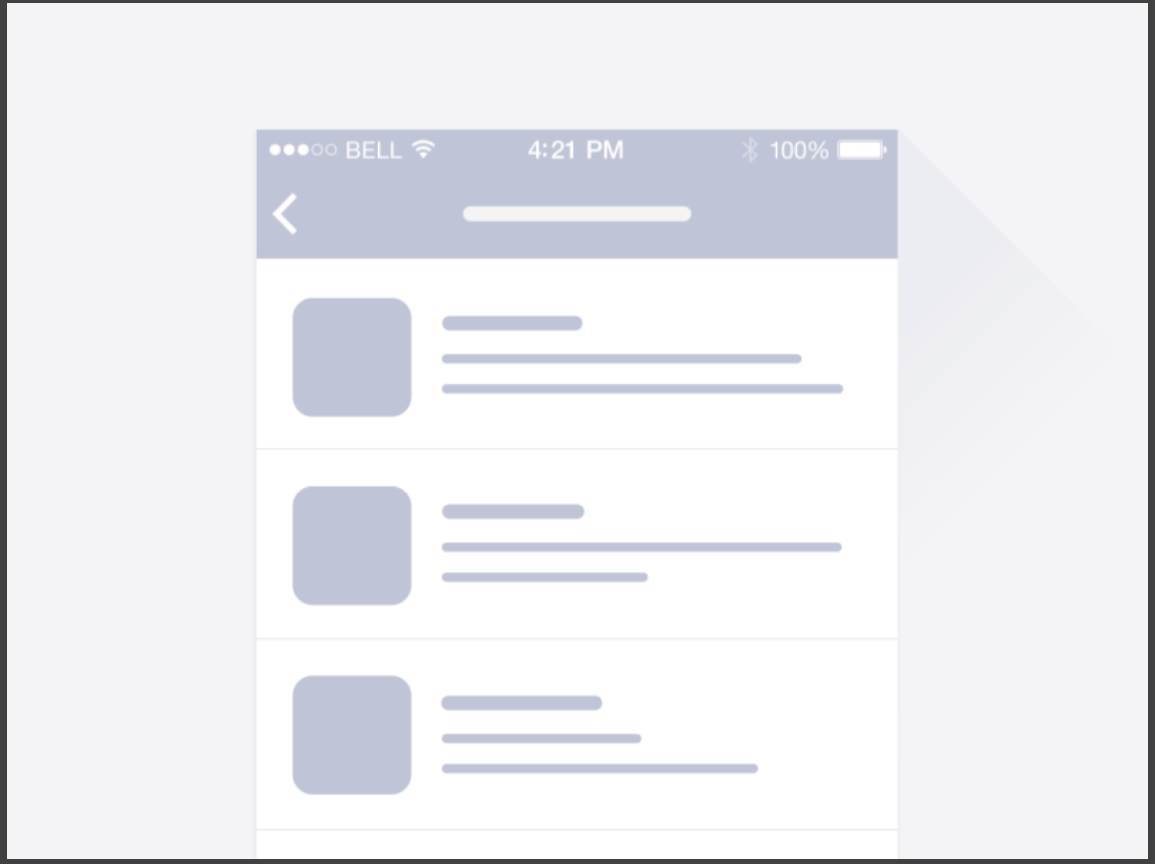
Only use gestures that are most natural for the app from your category.

Why? Because gestures are *hidden controls*.

Every time a visible control is replaced with a gesture, the app's learning

curve goes up.

-gestures have a lower discoverability



Visibility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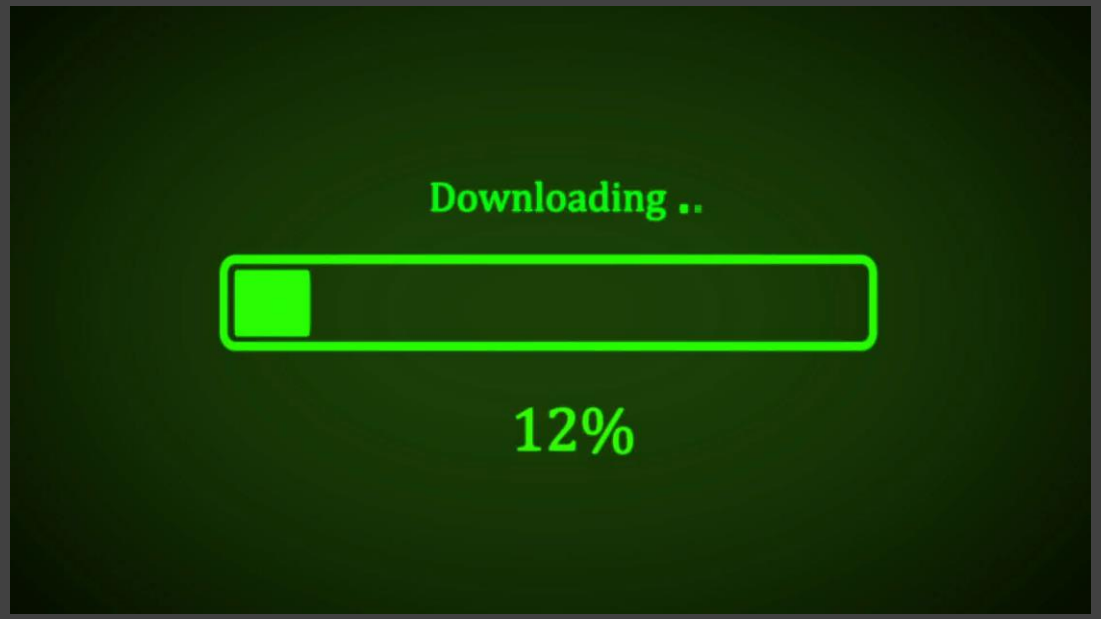
Downloading ..
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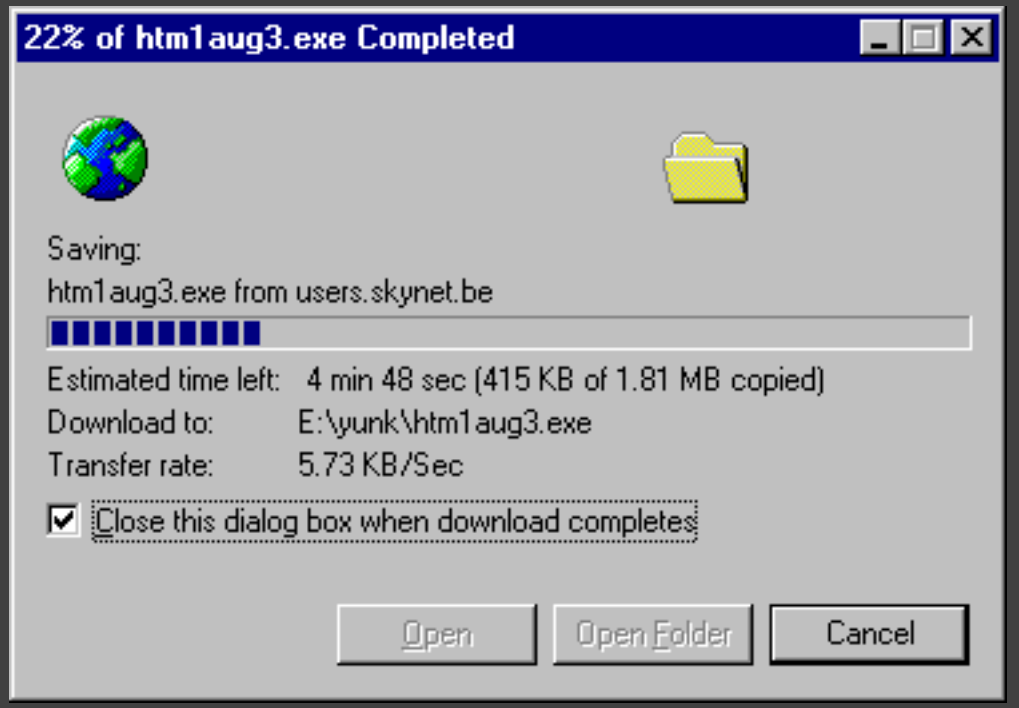
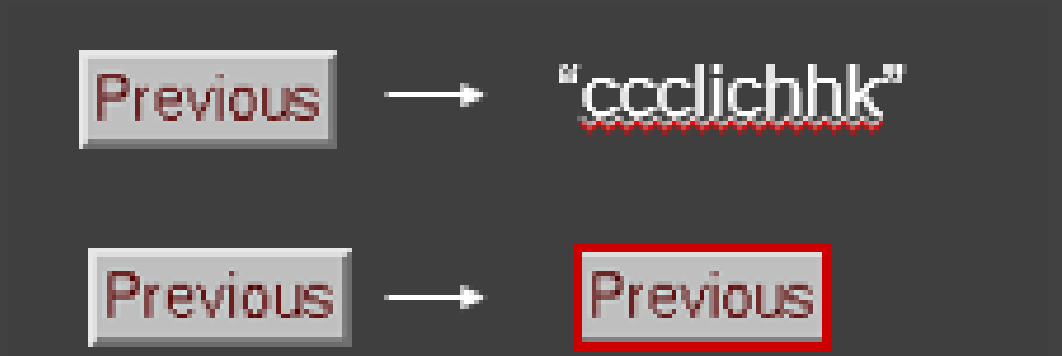
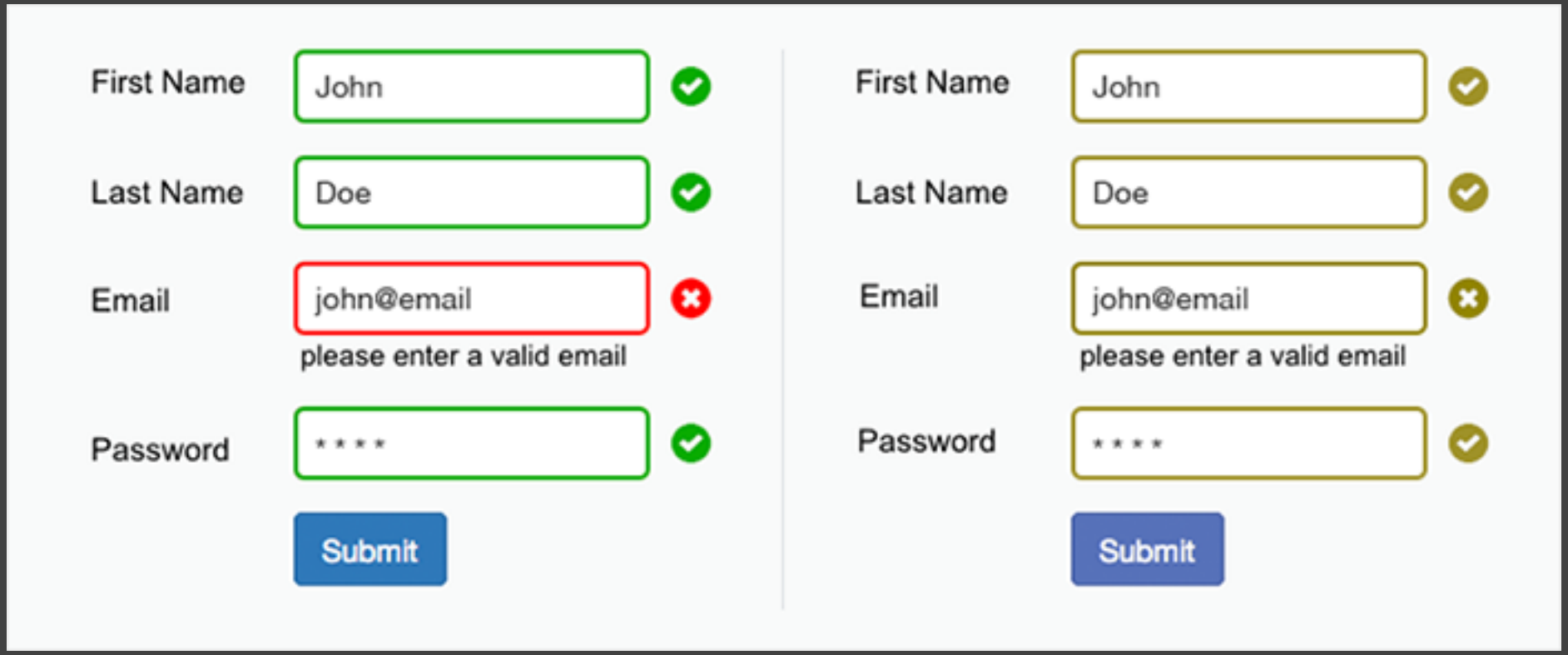

22% of htm1aug3.exe Completed
Saving:
htm1aug3.exe from users.skynet.be
Estimated time left: 4 min 48 sec (415 KB of 1.81 MB copied)
Download to: E:\yunk\htm1aug3.exe
Transfer rate: 5.73 KB/Sec
Close this dialog box when download completes
Open
Open Folder
Cancel

Feedback

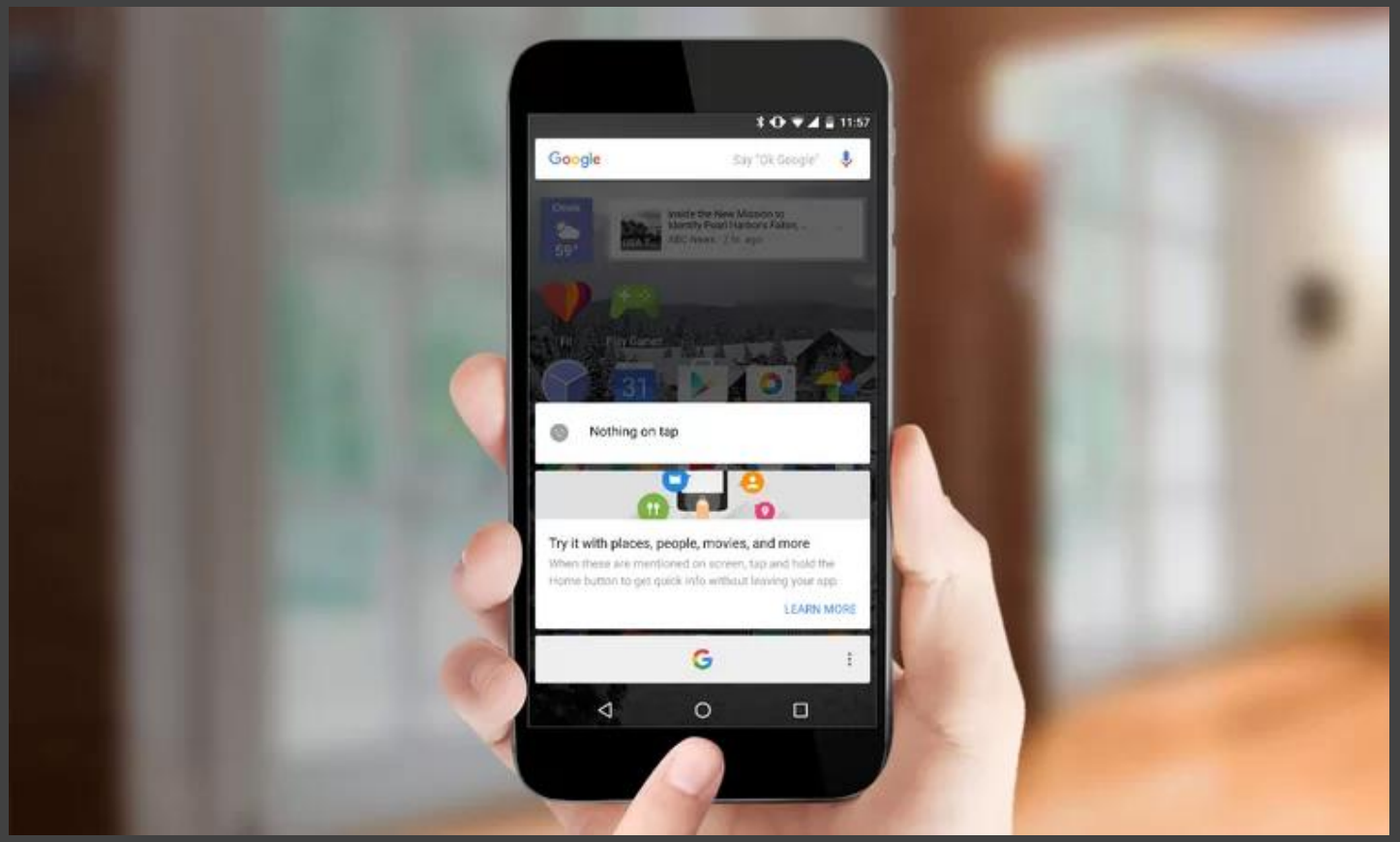
- Sending information back to the user about what has been done
- Includes sound, highlighting, animation and combinations of these
  - e.g. when screen button clicked on provides sound or red highlight feedback:



Feedback


First Name
John
Last Name
Doe
Email
john@email
please enter a valid email
Password
****
Submit
First Name
John
Last Name
Doe
Email
john@email
please enter a valid email
Password
****
Submit

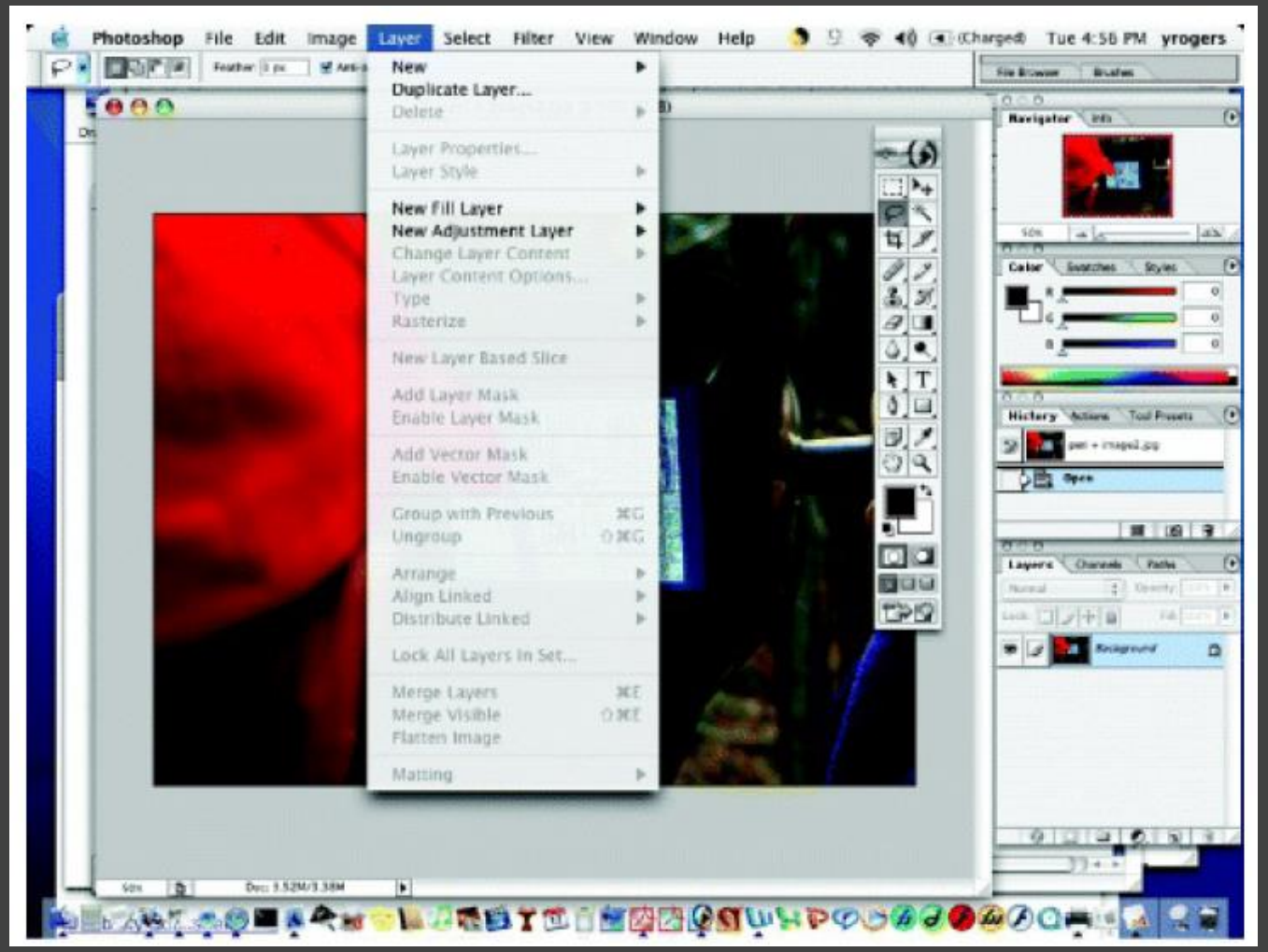
Feedback


11:57
Google
Say "Ok Google"
Nothing on tap
Try it with places, people, movies, and more
When these are mentioned on screen, tap and hold the home button to get quick info without leaving your app
LEARN MORE

Constraints

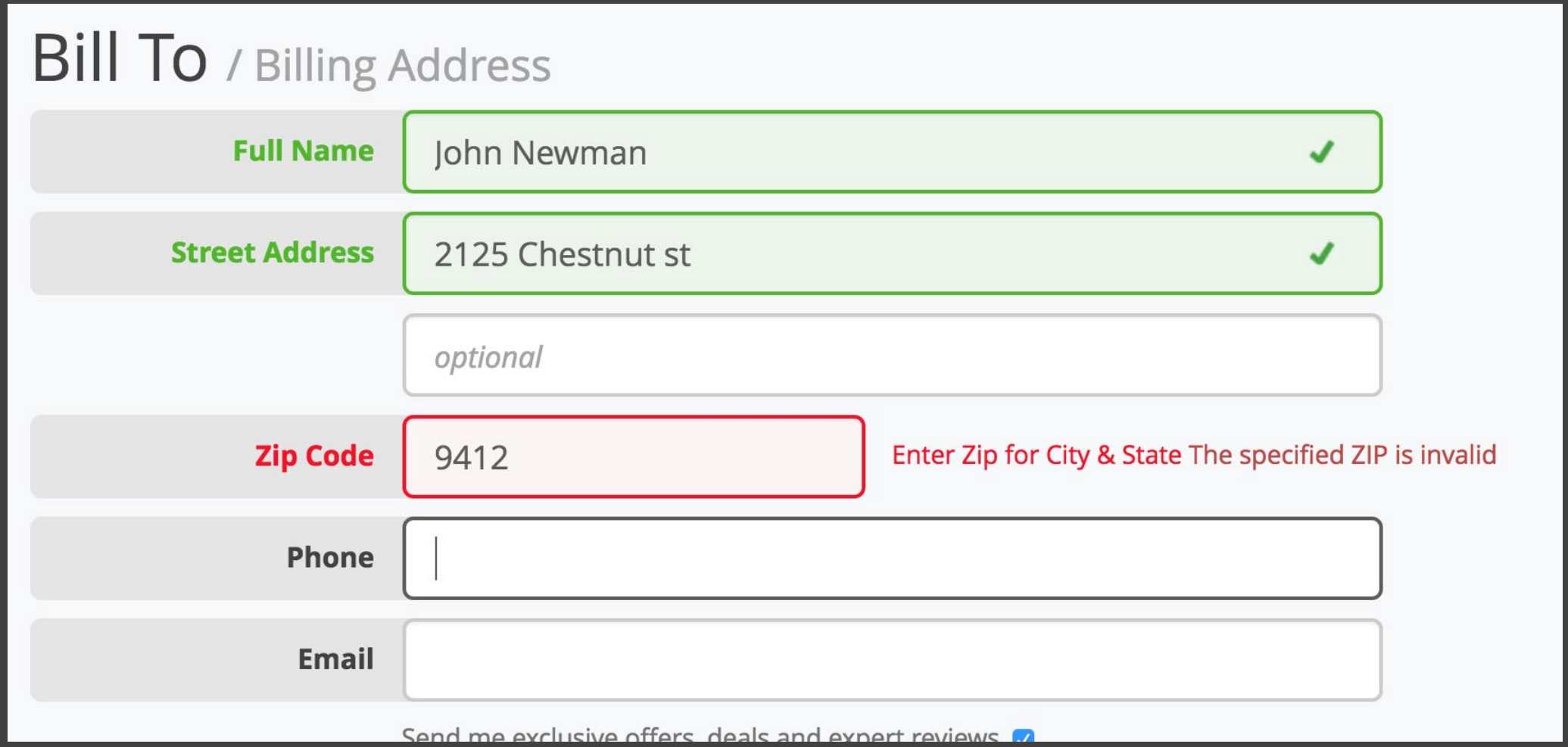
- Restricting the possible actions that can be performed
- Helps prevent user from selecting incorrect options
- Physical objects can be designed to constrain things
    - e.g. only one way you can insert a key into a lock

Constraints ex.



A menu showing restricted availability of options as an example of logical constraining. Shaded areas indicate deactivated options

Constraints



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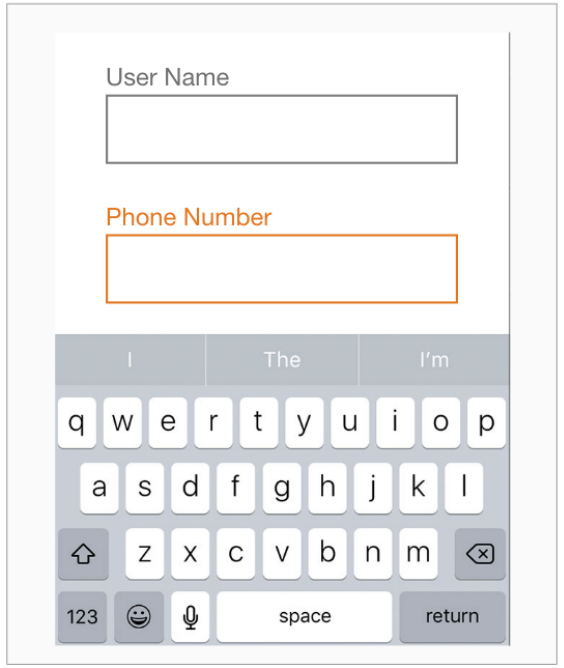
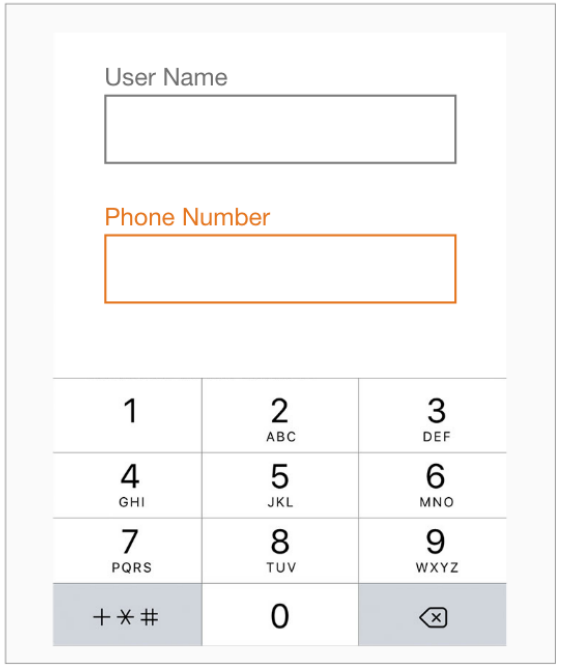


Don't



Do

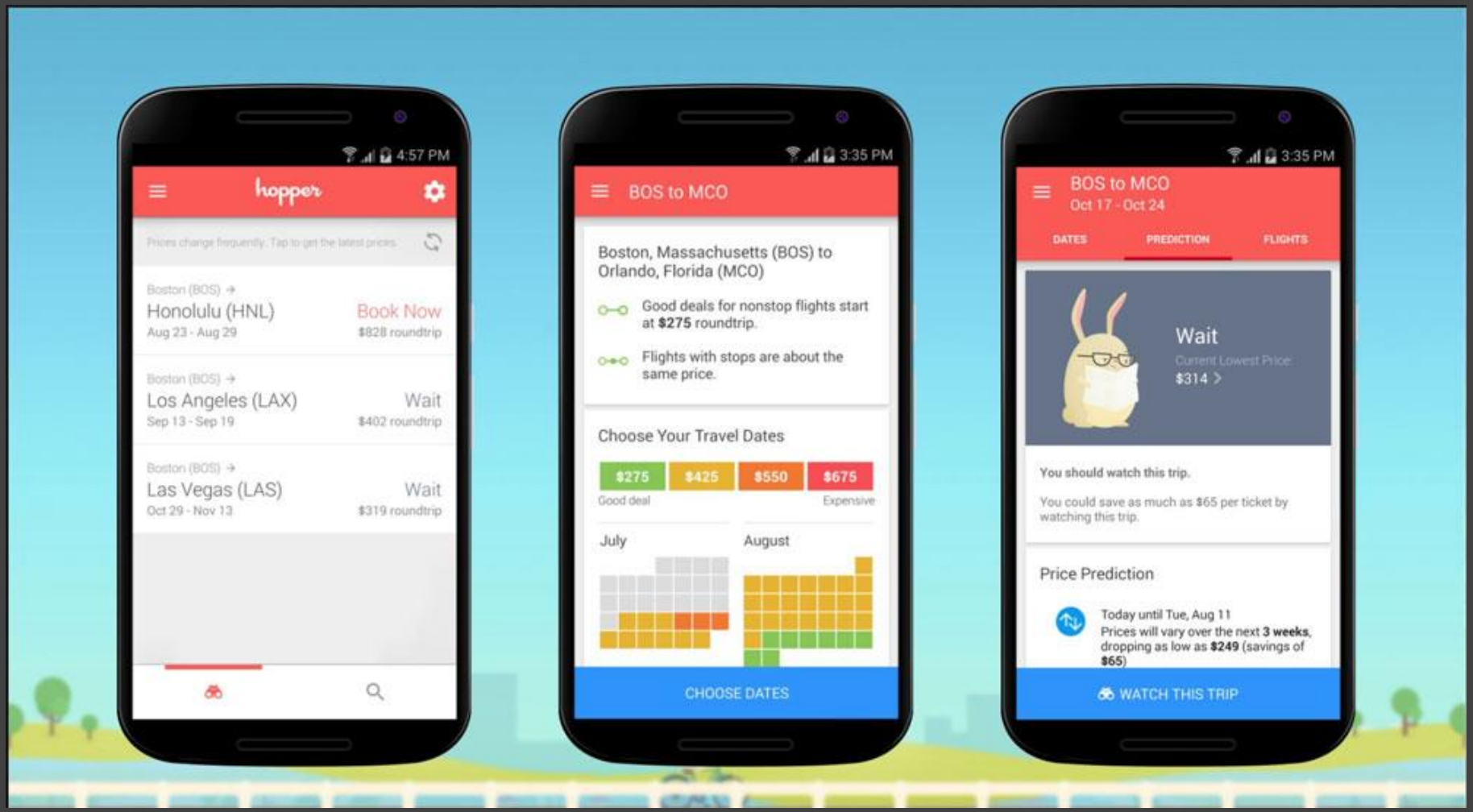
Consistency

- Design interfaces to have similar operations and use similar elements for similar tasks

- For example:
  - always use ctrl key plus first initial of the command for an operation – ctrl+C, ctrl+S, ctrl+O

- Main benefit is consistent interfaces are easier to learn and use

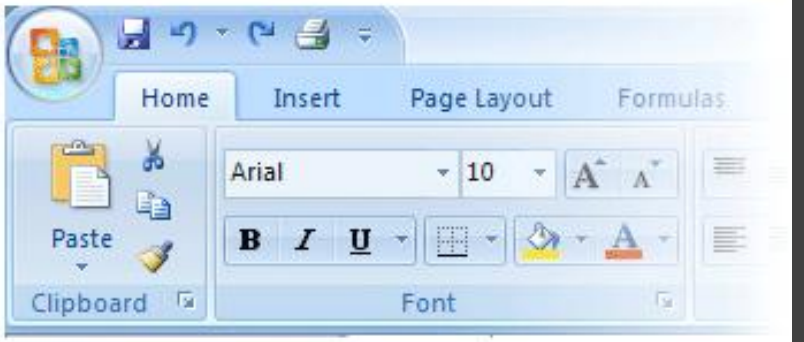
Consistency



Consistency

Microsoft Word

Microsoft Excel

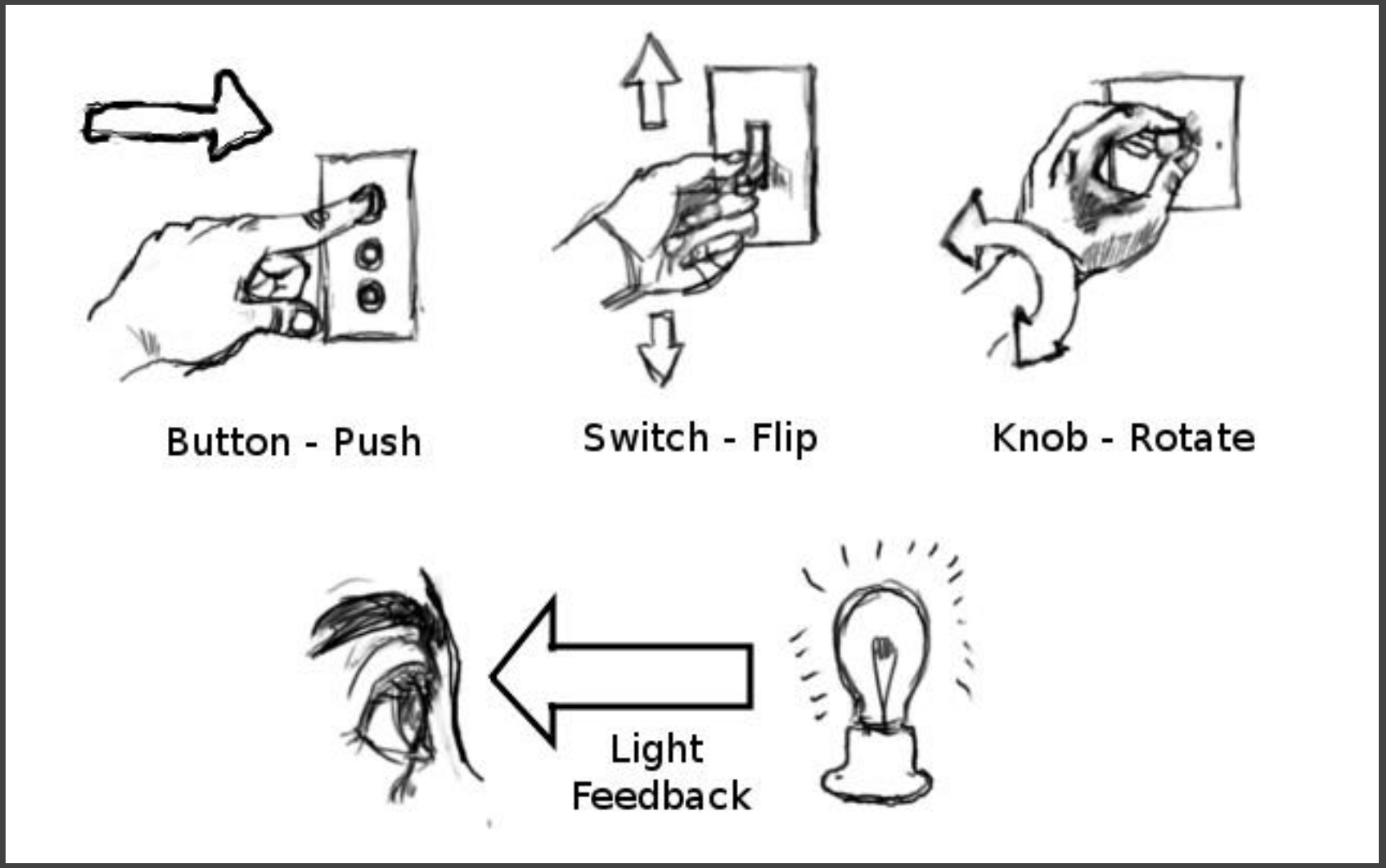


Microsoft Powerpoint

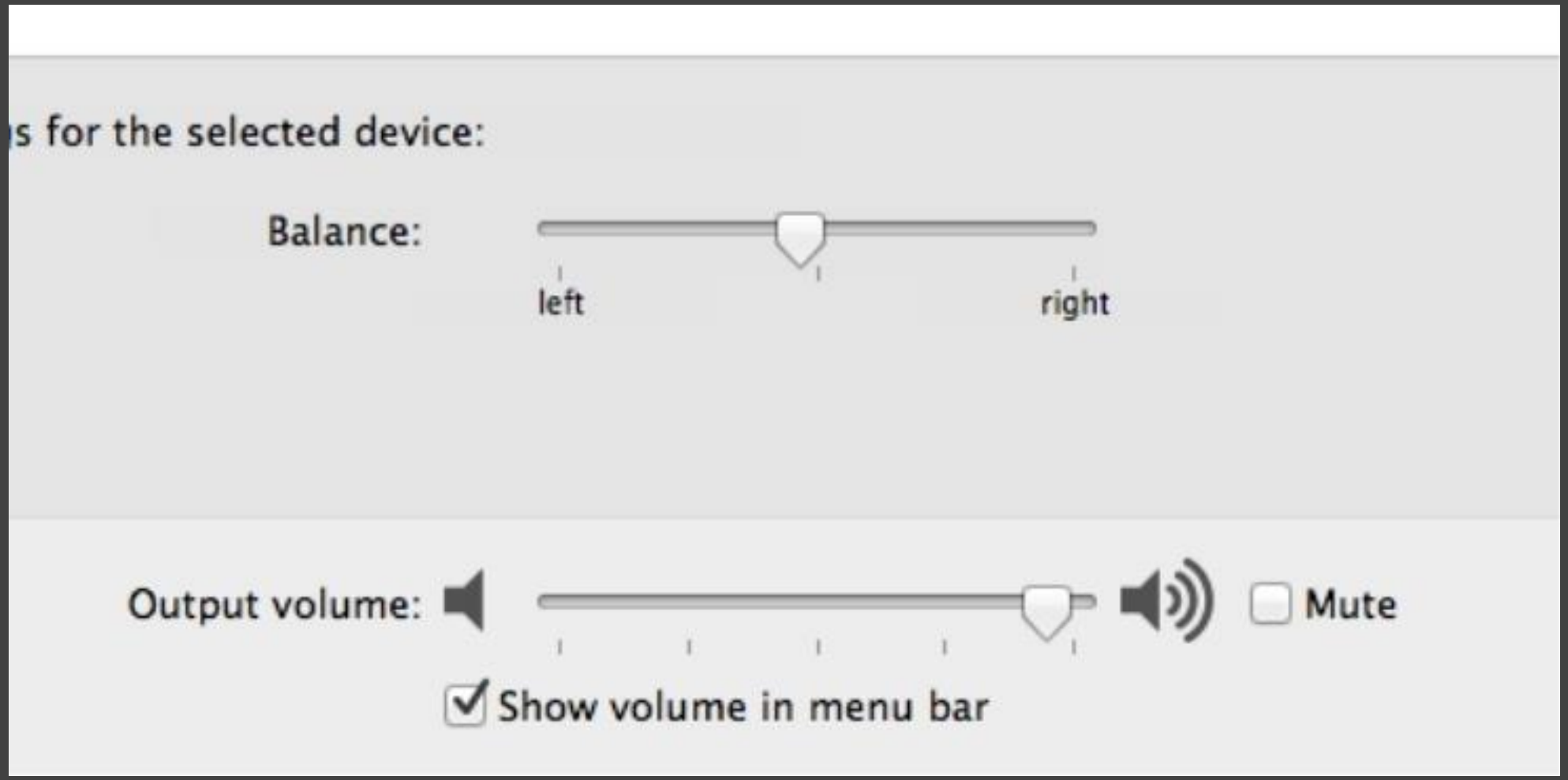
Affordances: to give a clue

- Refers to an attribute of an object that allows people to know how to use it
  - e.g. a mouse button invites pushing, a door handle affords pulling
- Help users to perform tasks or to do something
- Since has been much popularised in interaction design to discuss how to design interface objects
  - e.g. scrollbars to afford moving up and down, icons to afford clicking on

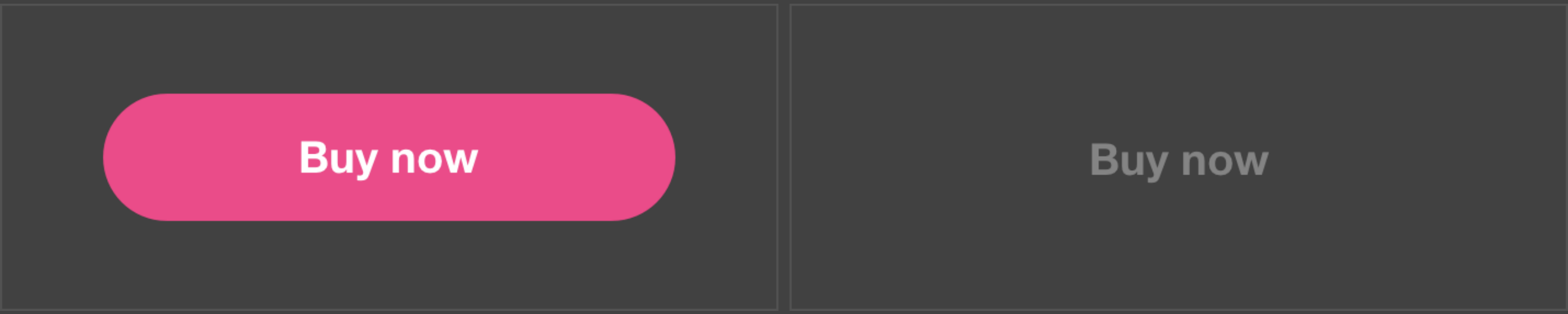
Affordance



Affordance


s for the selected device:
Balance:
left
right
Output volume:
Mute
Show volume in menu bar

Affordance



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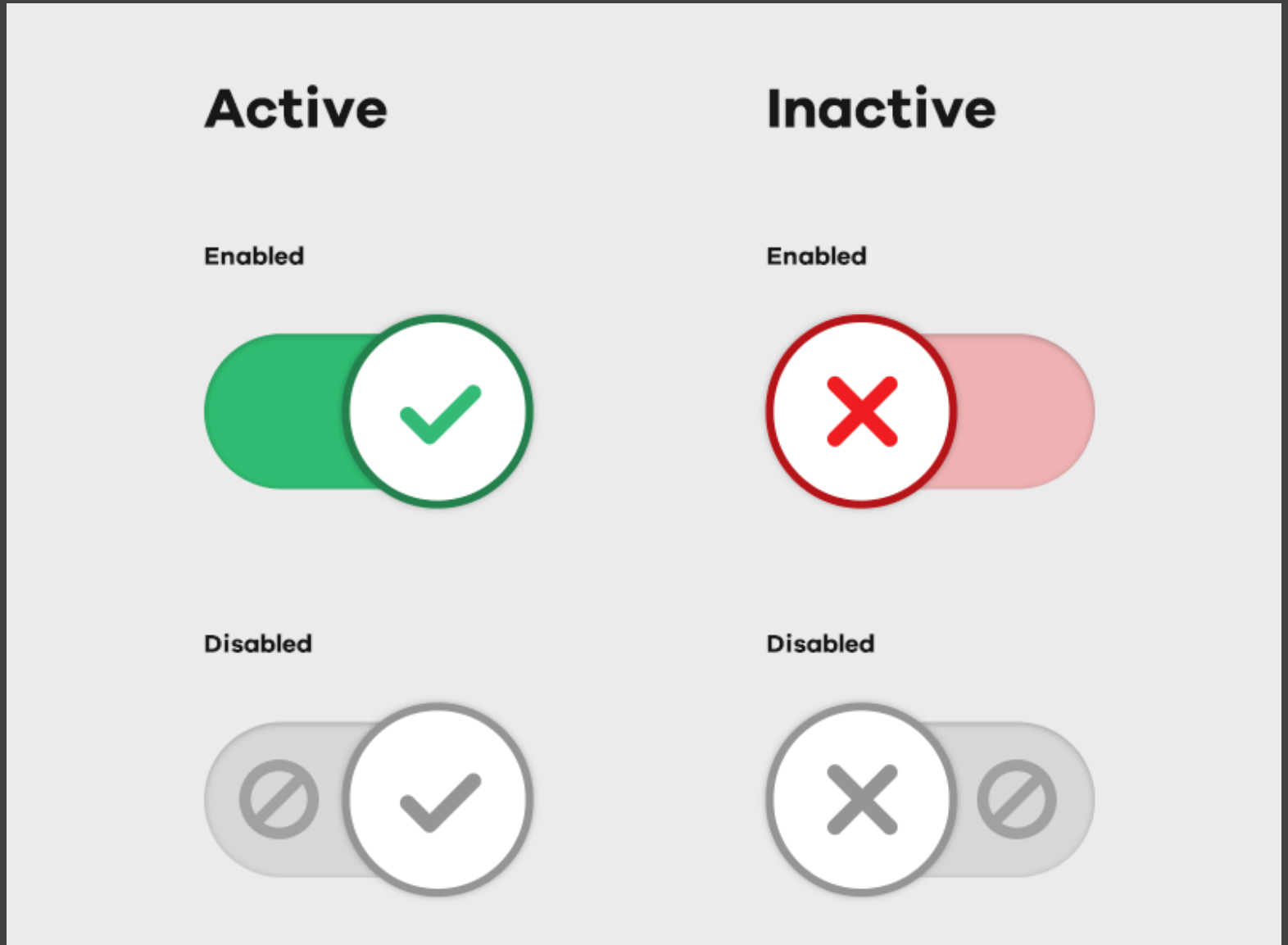


Affordance

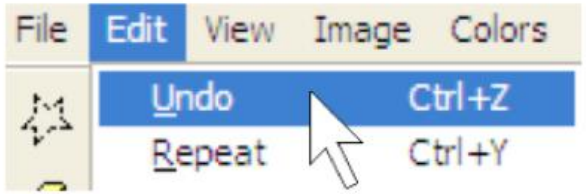
- Buttons & links

- Drop-down arrows

- Texture

- Mouse cursor

- Highlight on mouseover



What does ‘affordance’ have to offer interaction design?

- Interfaces are virtual and do not have affordances like physical objects
- Norman argues it does not make sense to talk about interfaces in terms of ‘real’ affordances
- Instead interfaces are better conceptualized as ‘perceived’ affordances
  - Learned conventions of arbitrary mappings between action and effect at the interface
  - Some mappings are better than others

Summary

- In this chapter we have looked at what interaction design is and its importance when developing apps, products, services, and systems.
- To begin, a number of good and bad designs were presented to illustrate how interaction design can make a difference.
- We described who and what is involved in interaction design, and the core set of design processes that need to be followed.
- We explained in detail what usability and user experience are and how they have been characterized, and how to operationalize them in order to assess the quality of a user experience resulting from interacting with an interactive product.
- The increasing emphasis on designing for the user experience and not just products that are usable was stressed.
- A number of core design principles were also introduced that provide guidance for helping to inform the interaction design process.

Key points

- Interaction design is concerned with designing interactive products to support the way people communicate and interact in their everyday and working lives.
- Interaction design is multidisciplinary, involving many inputs from wide-ranging disciplines and fields.
- The notion of the user experience is central to interaction design.
- Optimizing the interaction between users and interactive products requires taking into account a number of interdependent factors, including context of use, types of activity, accessibility, cultural differences, and user groups.
- Identifying and specifying relevant usability and user experience goals can help lead to the design of good interactive products.
- Design principles, such as feedback and simplicity, are useful heuristics for analyzing and evaluating aspects of an interactive product.

Assessment Task

1. Evaluate an interactive product and explain what is good and bad about it in terms of the goals and core principles of interaction design.