INTRODUCTION TO HUMAN COMPUTER INTERACTION
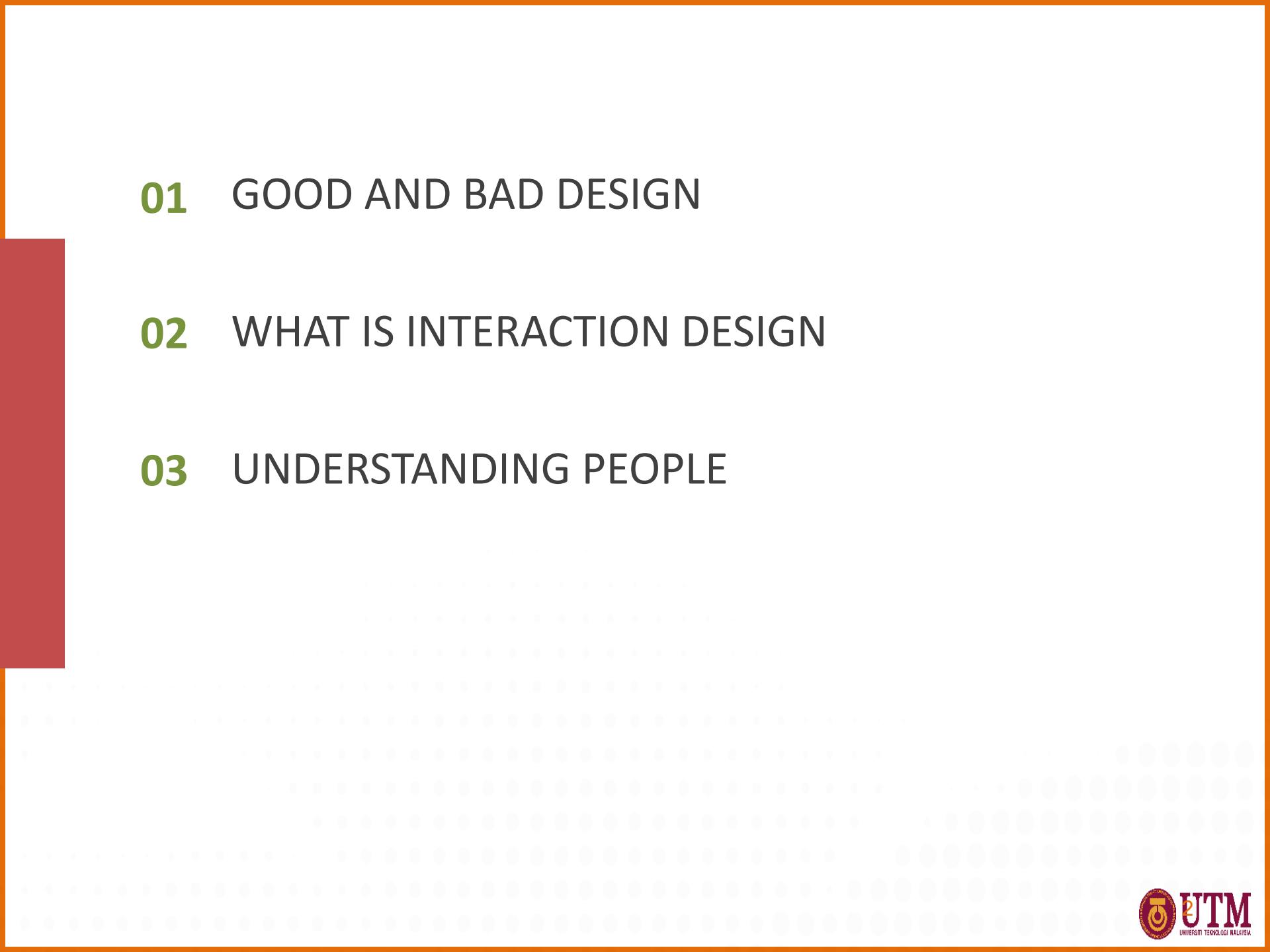
Chapter 01 (Part 2)

UTM
UNIVERSITI TEKNOLOGI MALAYSIA

GOOD & BAD
DESIGN

• • • •
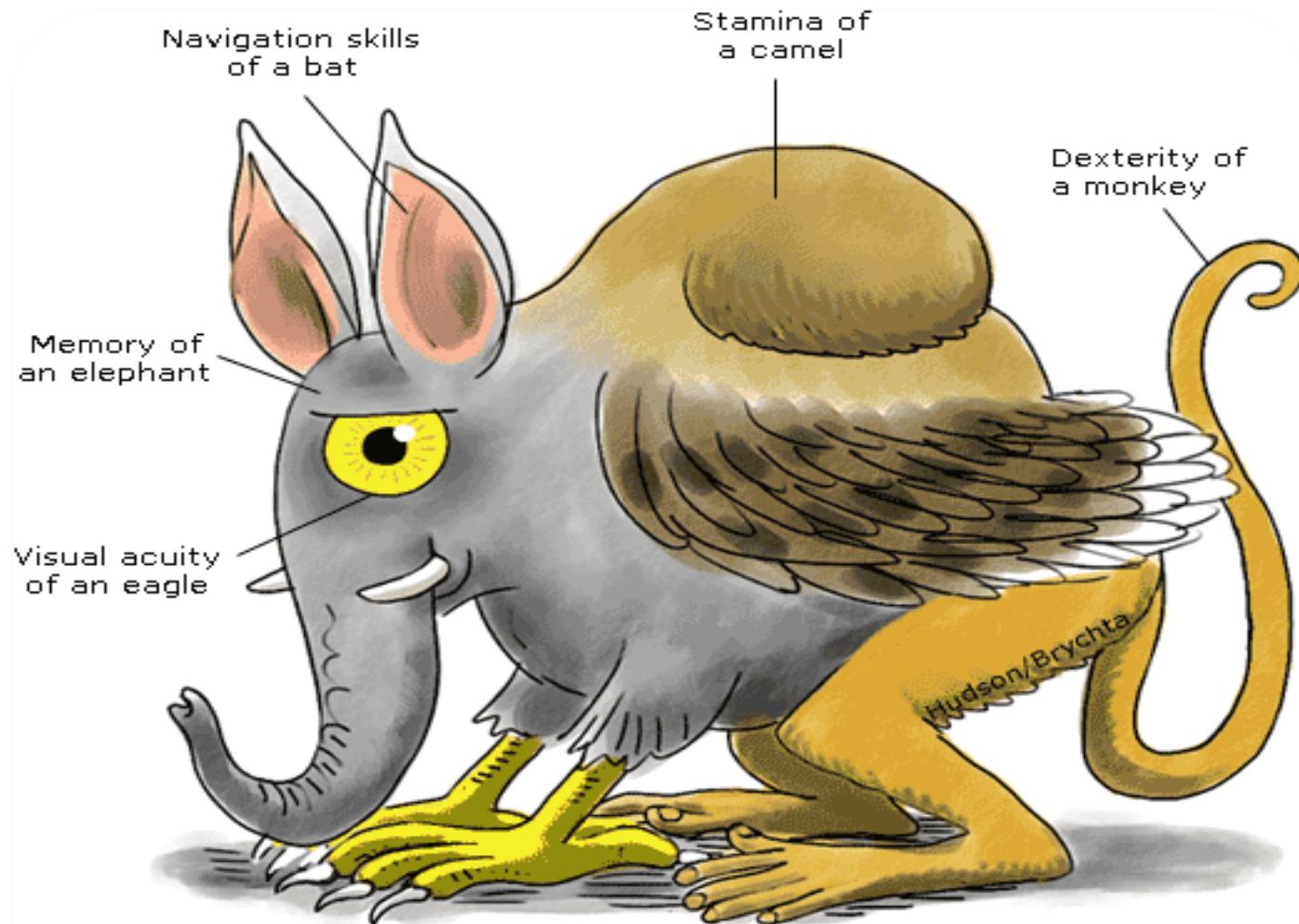
What is interaction design?

The Perfect User
(every designer 's wish)
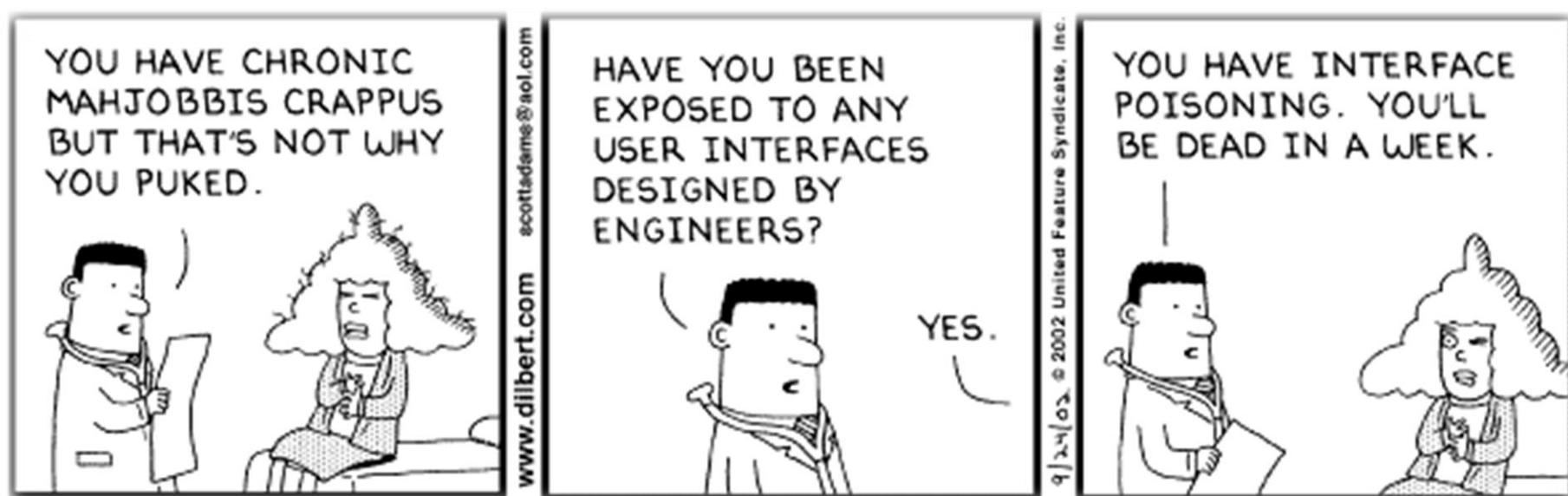
"The Perfect User"
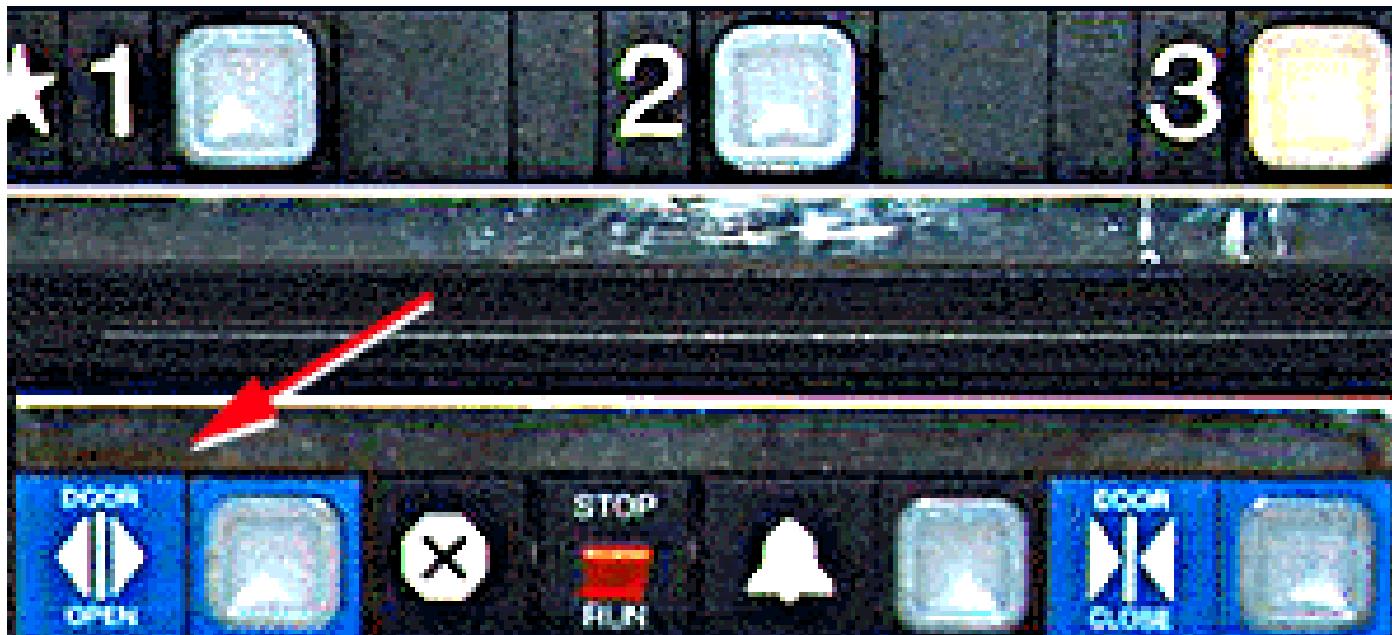
Interaction design

Concept/understanding how one/ individual **interact** with an entity and to **design the process** of interaction of that individual with the entity, that entity can be anything you pick it to be, for example your car, or your toaster, web browser and website that you view in a browser.

Bad Designs: Elevator Control

- How do I get out of the lift?

[www.baddesigns.com]

Bad Designs: Elevator Control

Elevator controls and labels on the bottom row all look the same, so it is easy to push a label by mistake instead of a control button

www.baddesigns.com

People do not make same mistake for the labels and buttons on the top row. Why not?

Bad Designs: Why is this vending machine so bad?

www.baddesigns.com

- Need to push button first to activate reader

- Normally insert bill first before making selection

- Contravenes well known convention

Good design
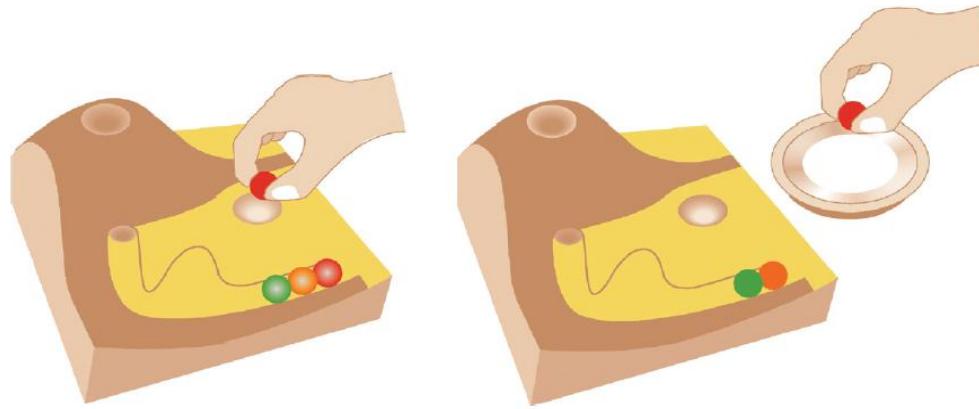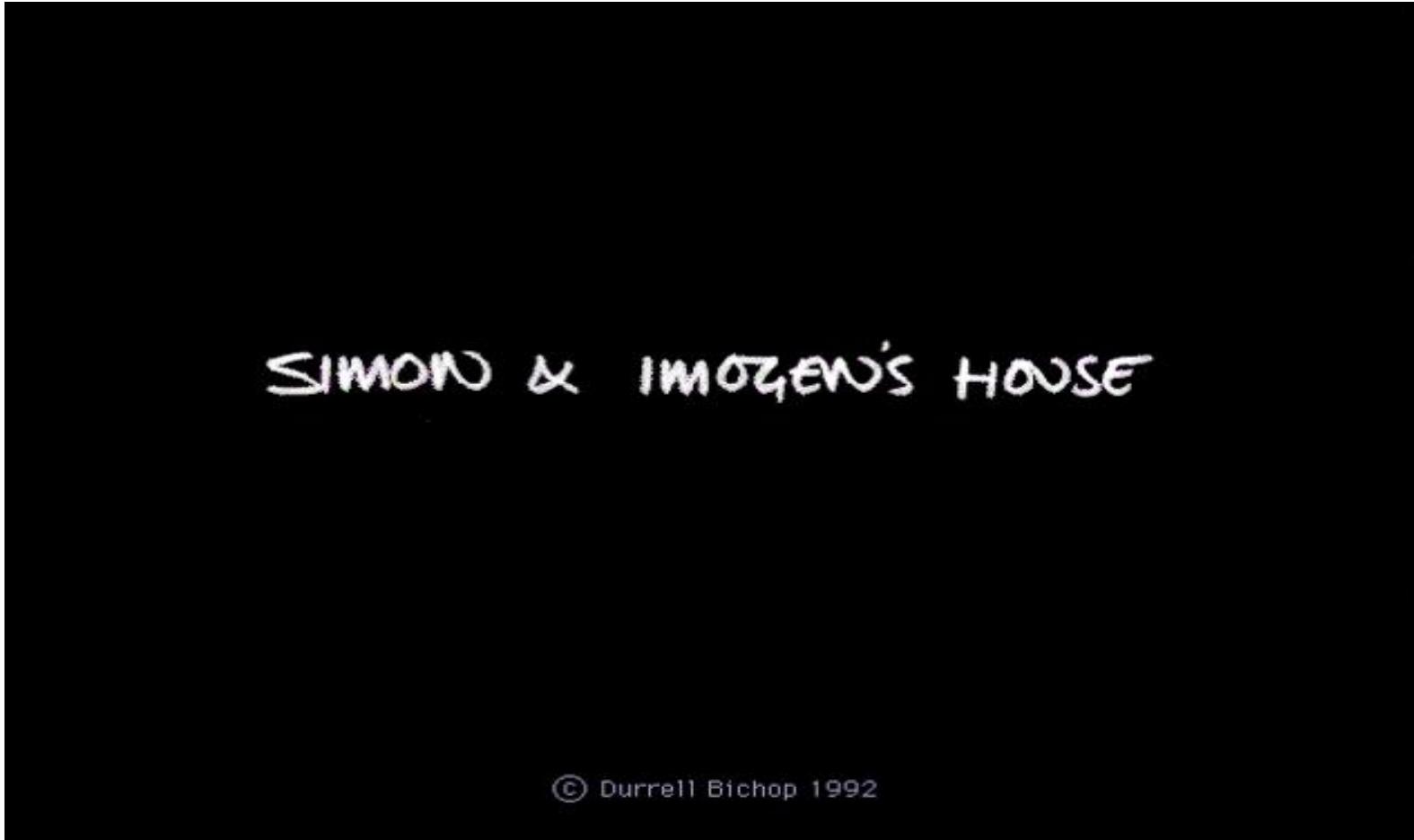
Figure 1.1 The marble answering machine

Source: Adapted from Gillian Crampton Smith: "The Hand that Rocks the Cradle" *ID Magazine*, May/June 1995, pp. 60–65.

- **Marble answering machine (Bishop, 1995)**

- Based on how everyday objects behave

- Easy, intuitive and a pleasure to use

- Only requires one-step actions to perform core tasks

Good design

SIMON & IMOGEN'S HOUSE

© Durrell Bichop 1992

How does the "marble" answering machine differ from the voice mail system?

Good design

Activity

How does the "marble" answering machine differ from the voice mail system?

Good design

Activity

- Use familiar physical object "marble pinball" that visually represent how many incoming message been left.
- Play recorder message
  - dropping the marble into a slot in the machine
- Dial the caller who left the message
  - Dropping the same marble pinball into another slot on phone
- It is aesthetically pleasing and enjoyable to use
- It only required one-step actions to perform core tasks
- It is a simple but elegant design
- It offers less functionality and allow anyone to listen to any the message

www.id-book.com

Good and bad design

The TiVo Remote

APEX
A standard Remote

Two contrasting remote control devices. How do they differ in their design and use?

Good and bad design

Activity
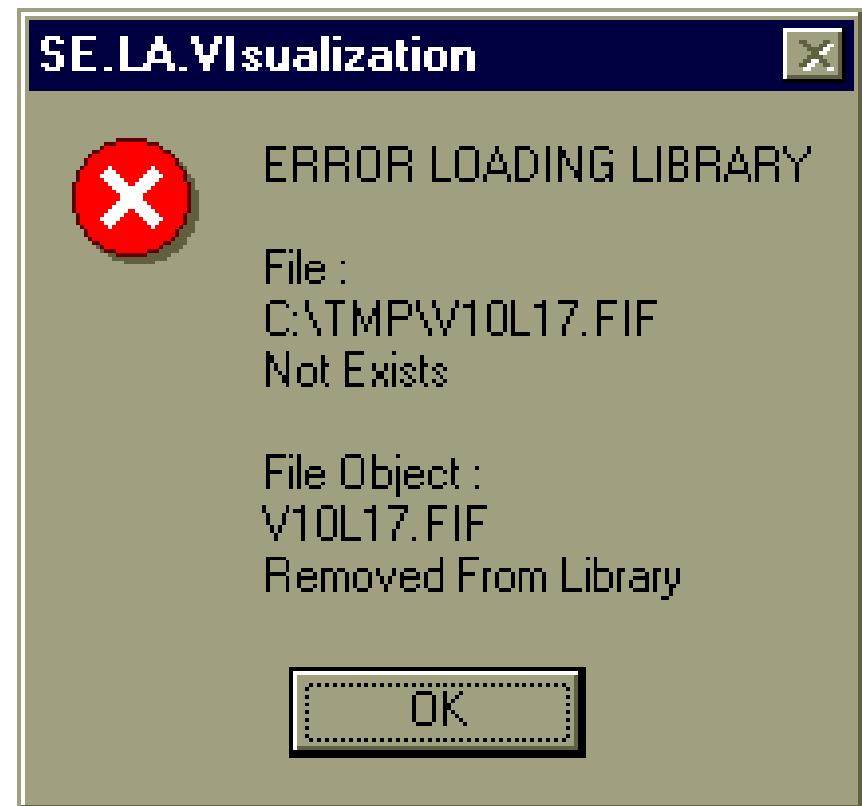
Why is the TiVo remote so much better designed than standard remote controls?

Good and bad design

- Why is the TiVo remote so much better designed than standard remote controls?
  - Peanut shaped to fit in hand
  - Logical layout and color-coded, distinctive buttons
  - Easy to locate buttons

Good & Bad Design
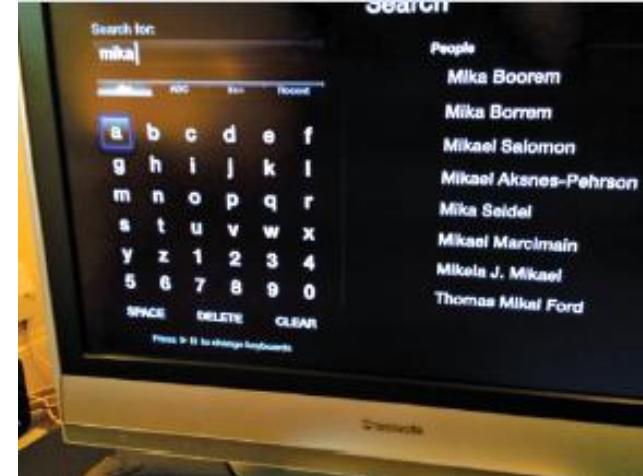
- We see this all the time.
  - What's good about the design of this error box?
    - The user knows there is an error
  - What's poor about the design of this error box?
    - Discouraging
    - Not enough information
    - No way to *resolve* the problem (instructions or contact info)

SE.LA.VIsualization

ERROR LOADING LIBRARY

File :
C:\TMP\V10L17.FIF
Not Exists

File Object :
V10L17.FIF
Removed From Library

OK

Dilemma

Which is the best way to interact with a smart TV?

- Standard remote device?
- Apple slimline remote control?
- Minnum's new keyboard?

http://minuum.com

Switching to Digital

- Many activities that used to be done with a physical artifact have gone digital

  - e.g. ticket machines, parking meters

- Benefit

  - Makes many tasks easier, quicker and more convenient

  - Our details can also be stored ready for next time

  - Don't have to wait in line before when buying a physical ticket

  - Easy to swipe QR code to gain entrance through a ticket barrier

- Disadvantages

  - Not everyone has a modern smartphone

  - Some people still prefer to use older phones which the apps won't work on

  - Some people prefer not to divulge personal information online

  - Some people prefer to talk to real people when making a purchase

20

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

. . . .

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)**
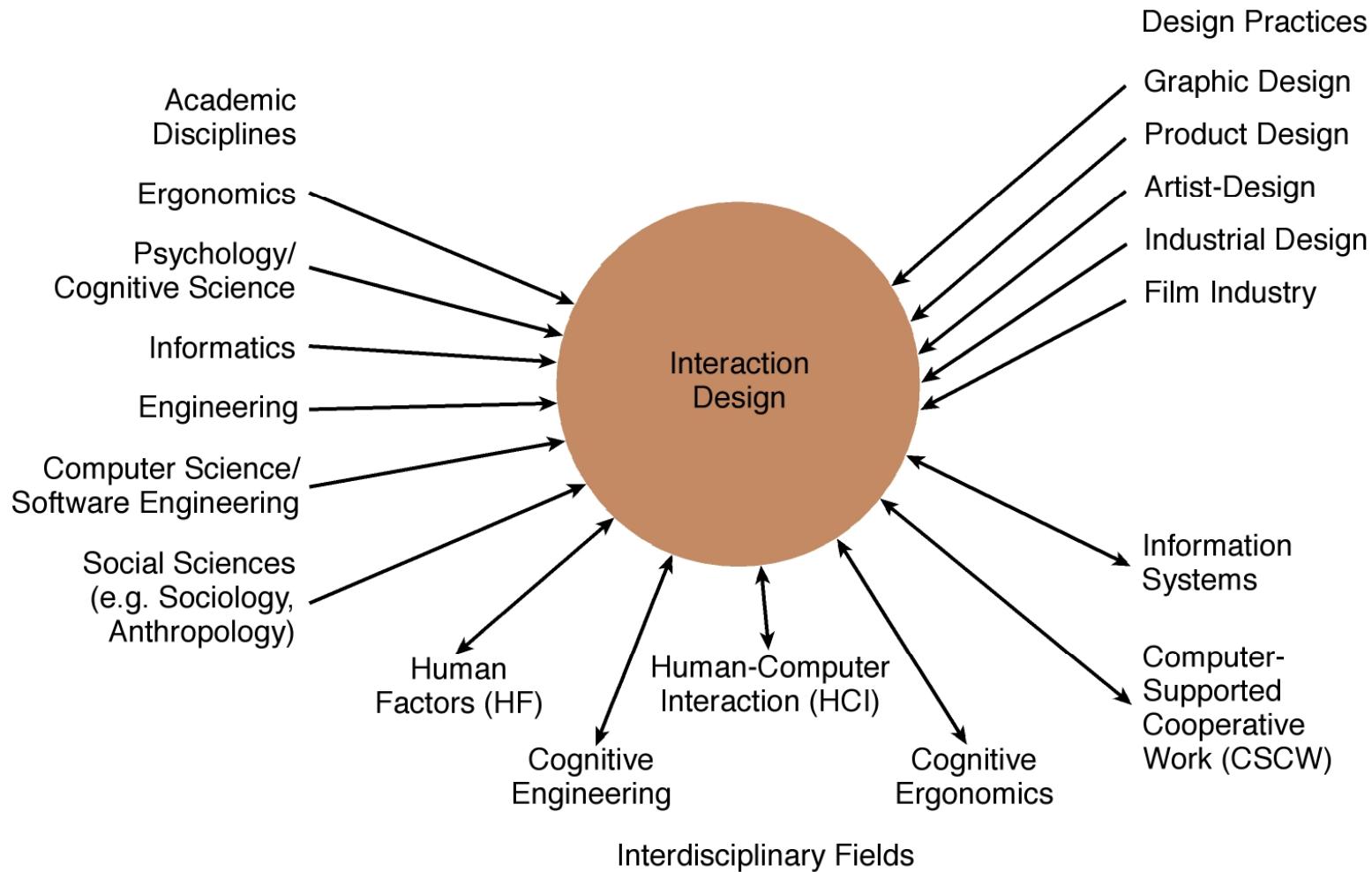
Goals of interaction design

- 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

HCI and interaction design

Design Practices

Graphic Design

Product Design

Artist-Design

Industrial Design

Film Industry

Academic Disciplines

Ergonomics

Psychology/ Cognitive Science

Informatics

Engineering

Computer Science/ Software Engineering

Social Sciences (e.g. Sociology, Anthropology)

Interaction Design

Information Systems

Computer-Supported Cooperative Work (CSCW)

Human Factors (HF)

Human-Computer Interaction (HCI)

Cognitive Engineering

Cognitive Ergonomics

Interdisciplinary Fields

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

Working in multidisciplinary teams

- 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 in business

- 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"

UNDERSTANDING
PEOPLE

• • • •

People-centered Design

- Involves **understanding how people feel** about a product and their pleasure and satisfaction when using it, looking at it, holding it, and opening or closing it.

- Their overall **impression** of **how good** it is to use

- The quality of the experience

  - "It is **not enough** that we build products that function, that are understandable and usable, we also need to build **joy and excitement, pleasure and fun, and yes, beauty** to people's lives."
  Don Norman (2004)

36

The User Experience

- How a product **behave**s 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

Defining user experience (UX)

How users **perceive** a product, such as whether a smartwatch is seen as sleek or chunky, and their **emotional reaction** to it, such as whether people have a **positive experience** when using it.

(Hornbæk and Hertzum, 2017)

Hassenzahl's (2010) model of the user experience
- Pragmatic: **how simple**, practical, and obvious it is for the user to achieve their goals
- Hedonic: how evocative and stimulating the interaction is to users

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.

And today…

iPhone 15

Nintendo switch

Tesla
model 3

Core characteristics of interaction design

- **Users** should be involved through the development of the project

- Specific **usability and user experience goals** need to be **identified**, clearly documented and agreed at the beginning of the project

- **Iteration** is needed through the core activities

Why?

- 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

Anna, IKEA online sales agent

- Designed to be **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?
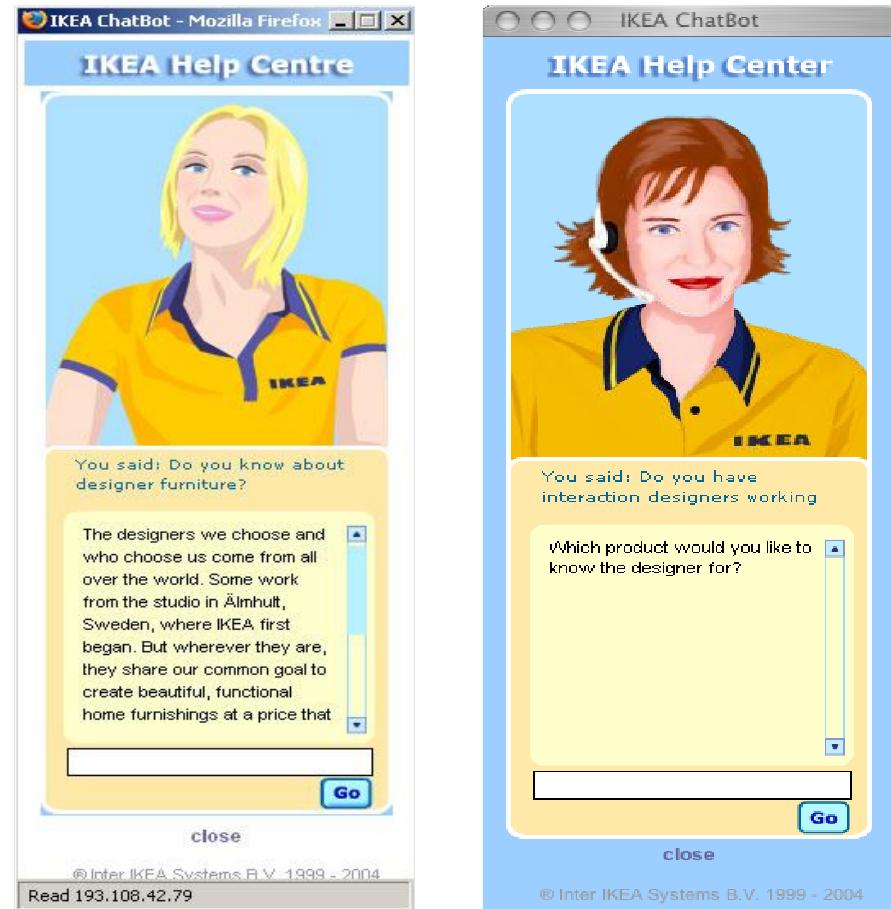

Figure 1.7 Anna the online sales agent, designed to be subtly different for UK and US customers. What are the differences and which is which? What should Anna's appearance be like for other countries, like India, South Africa, or China?

Source: Reproduced with permission from IKEA Ltd.

Accessibility

- Degree to which a **product is usable and accessible by as many people as possible**
- Try to **design, simple, accessible and usable**.

- Focus on disability:

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

Accessibility and inclusiveness

Accessibility*:* the extent to which an interactive product is accessible by as many people as possible

- – Focus is on people with disabilities; for instance, those using android OS or apple voiceover

Inclusiveness: making products and services that accommodate the widest possible number of people

- – For example, smartphones designed for all and made available to everyone regardless of their disability, education, age, or income

Disabilities

- Whether someone is disabled changes over time with age, or recovery from an accident

- The severity and impact of an impairment can vary over the course of a day or in different environmental conditions

- Disabilities can result because technologies are designed to necessitate a certain type of interaction that is impossible for someone with an impairment

Understanding disability

Disabilities can be classified as:
– Sensory impairment (such as loss of vision or hearing)
– Physical impairment (having loss of functions to one or more parts of the body after a stroke or spinal cord injury)
– Cognitive (including learning impairment or loss of memory/cognitive function due to old age)

Each type can be further defined in terms of capability:
– For example, someone might have only peripheral vision, be color blind, or have no light perception

Impairment can be categorized:

– Permanent (for instance, long-term wheelchair user)
– Temporary (that is, after an accident or illness)
– Situational (for example, a noisy environment means that a person can't hear)

Being cool about disability

- **Prosthetics** can be designed to move beyond being functional (and often ugly) to being desirable and fashionable

- People now refer to "**wearing** their wheels," rather than "**using** a wheelchair"

Fashionable leg cover designed by Alleles Design Studio

Any Questions