Designing interactive systems

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PART I

ESSENTIAL INTERACTIVE SYSTEM DESIGN

PART I

- Goal: design an interactive systems
  - Are enjoyable to use
  - Do useful things
  - Enhance the lives of the people using them
- This design should be human-centred
- Designers should put people than technology at the centre of the design process

PART I (2)

- In the days of the Web:
  - E-commerce: immediacy
  - Issues of usability: critical to e-commerce
- This part provide a guide to the essence of the human-centred of interactive system

PART I (3)

- Chapter 1. Designing interactive systems: A fusion of skills
- Chapter 2. People, activities, context and technologies: A framework for designing interactive systems
- Chapter 3. Principles and practice of interactive systems design
- Chapter 4. Case study: The Home Information Centre (HIC) 1

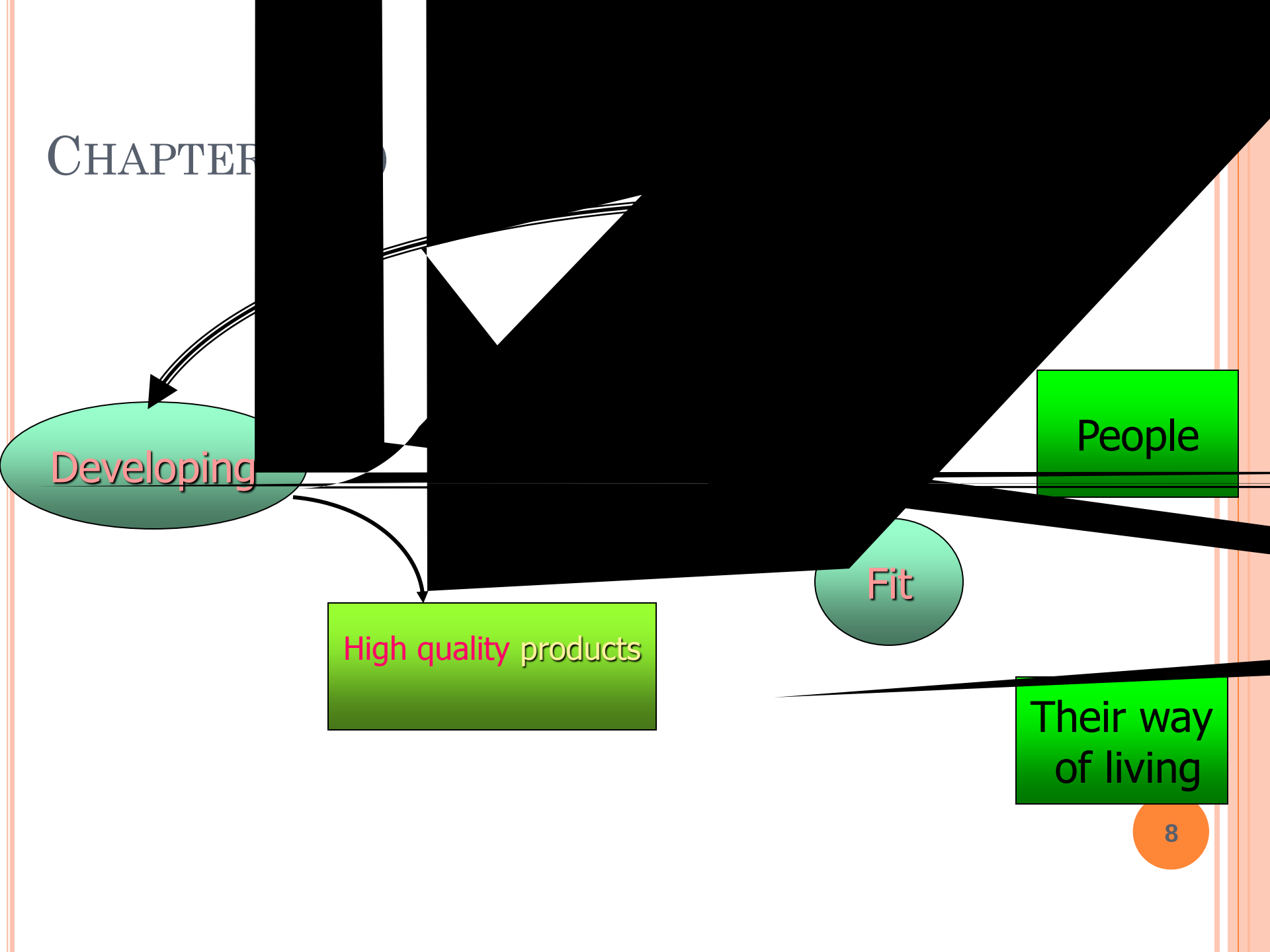
Chapter 1:

Designing interactive systems: A fusion of skills

Chapter 1

- 1.1 The variety of interactive systems
- 1.2 The concerns of interactive systems design
- 1.3 Being digital
- 1.4 The skills of the interactive systems designer
- 1.5 Why being human-centred is important

CHAPTER


Developing
People
Fit
High quality products
Their way of living

Chapter 1 (3): Knowledges received

- Understanding the basic concepts of interactive systems design
- Understanding the importance of being human-centred in the design
- Understanding the historical background to the subject
- Understanding the skills and knowledge needed for a interactive systems designer

1.1 The variety of interactive systems

Designing interactive systems is concerned with many types of product

Designing interactive systems

Environment of communication and interaction for devices and people

Software systems

Designing

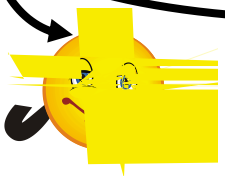
Web sites

Interactive products

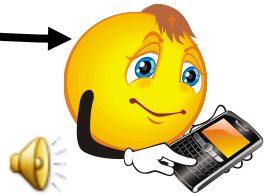
Interactive systems and products for

Games

MP3 players



Digital cameras



Application for telephones

The home

Work

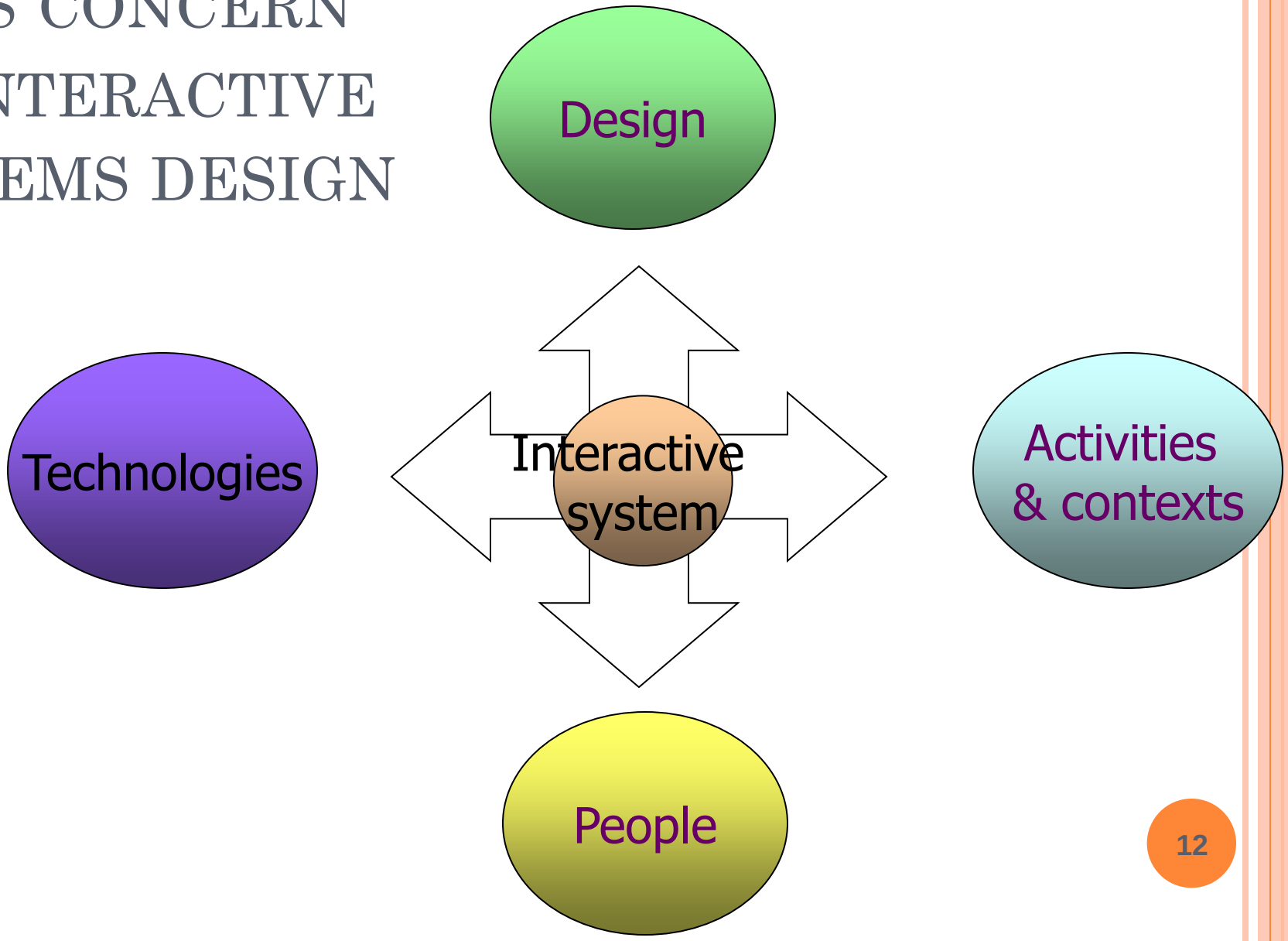
Communities

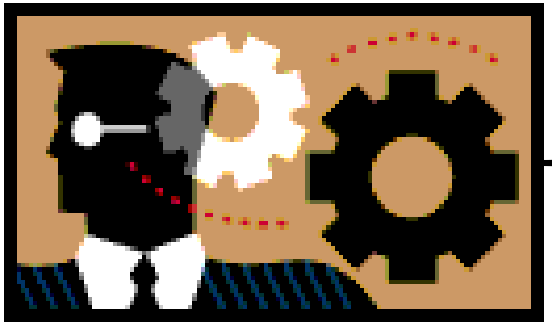
1.2 The concerns of interactive systems design

- The interactive systems design covers a very wide of activities:
  - Designers work on both hardware and software ⇒ product design
  - Designers produce a piece of software running:
    - On a computer
    - On a programmable device
    - Over the Internet

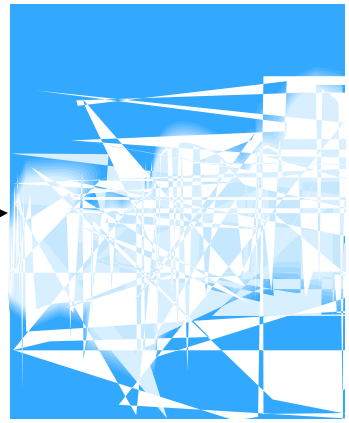
  ⇒ system design/ service design

Keys concern of interactive systems design





Design



Creation

Artistic design

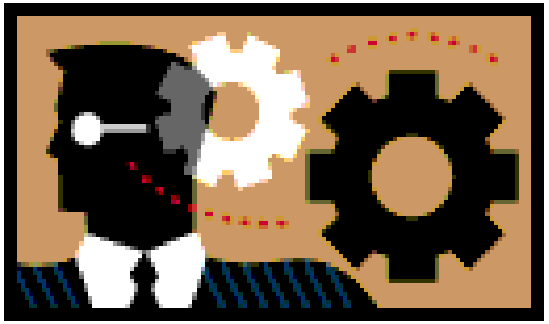
Design as craft

Representation

Engineering design

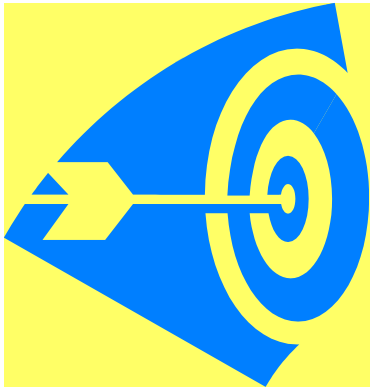
Design

- Creative process:
  - Produce sketches and outlines
  - Discuss with clients before formalizing a blueprint
- Representation:
  - Produce and evaluate various designs of:
    - Page layout
    - Colour scheme
    - Graphics
    - Overall structure



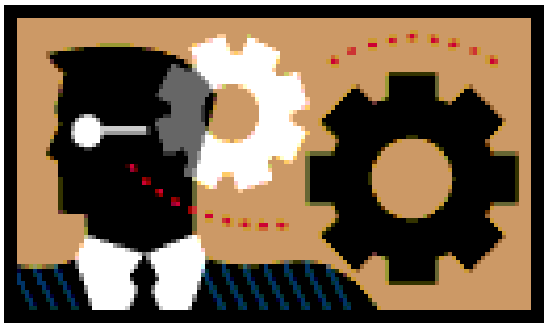
Design

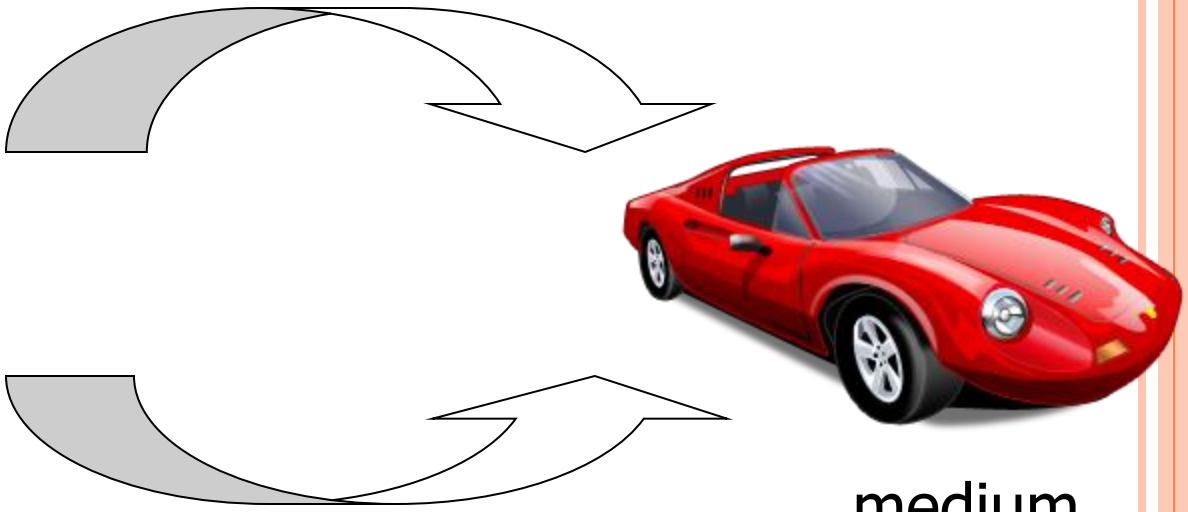
requirements



Solutions

work with

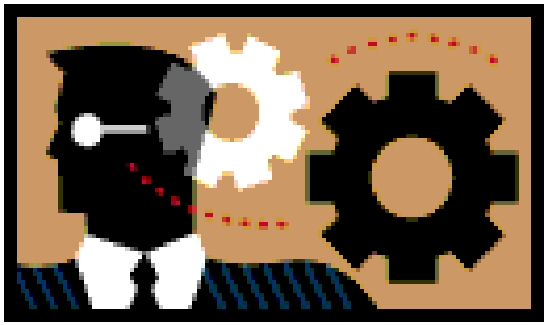




Design

medium

shape

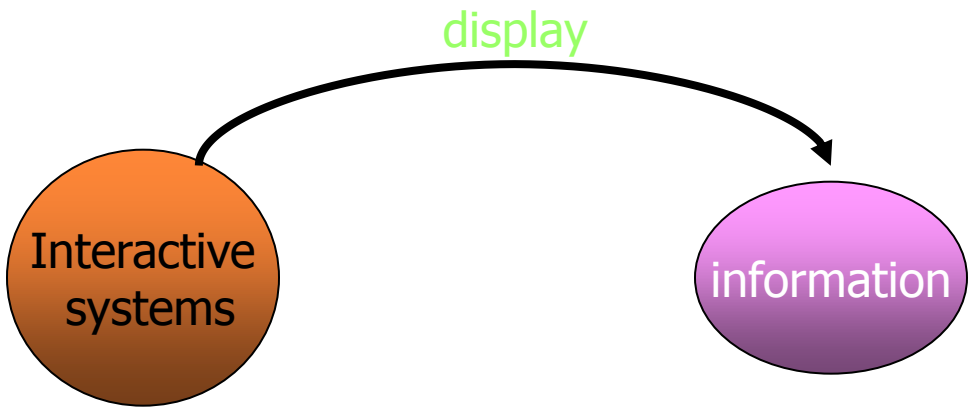


Design

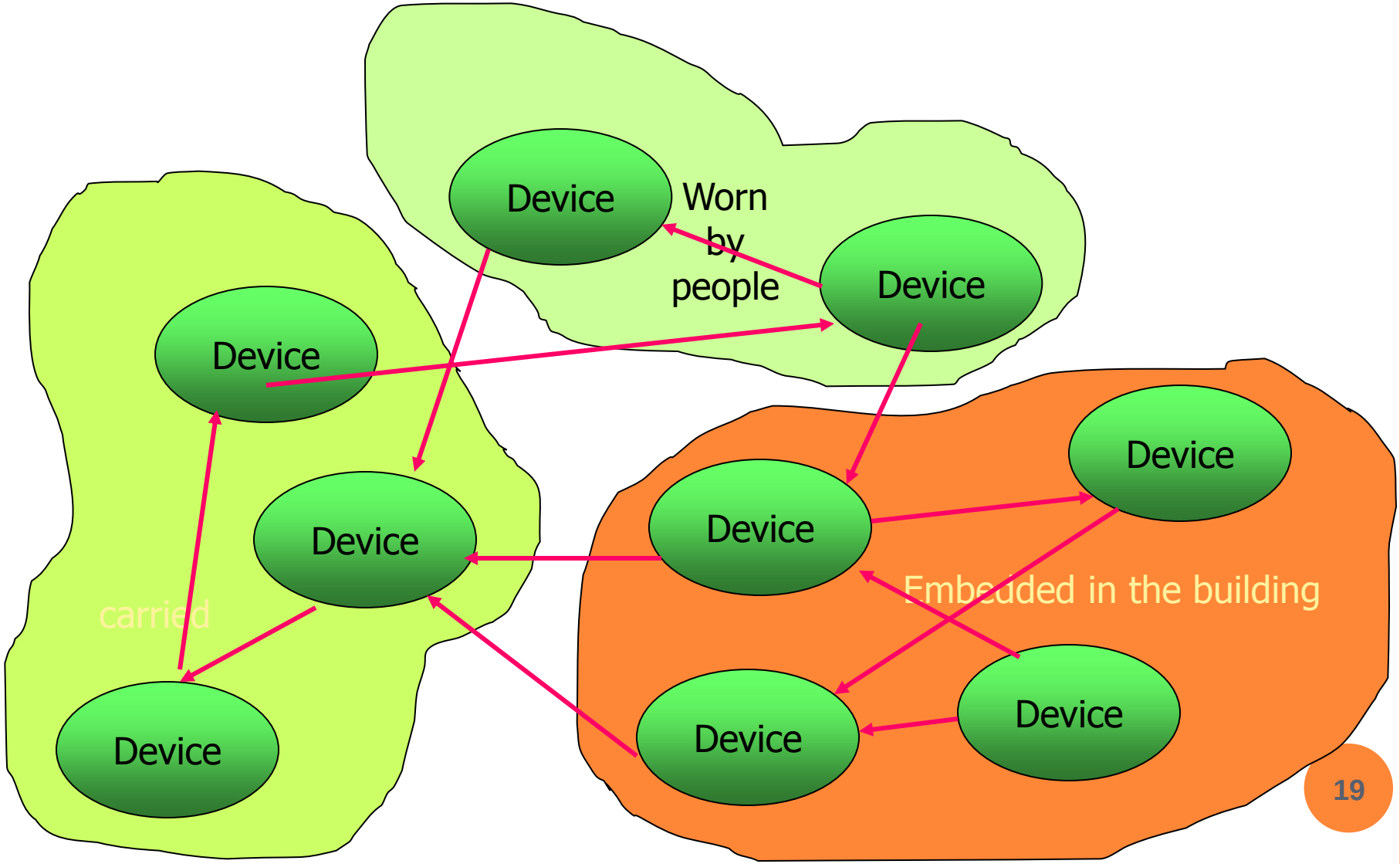
Social activity

Conscious activity

People and technologies



People and technologies



People and technologies

things which do not process info





Exclude

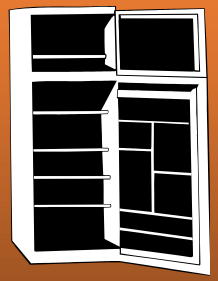
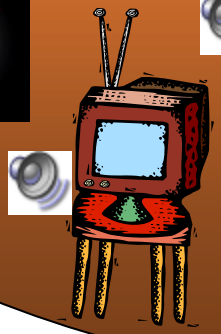
Interactive systems

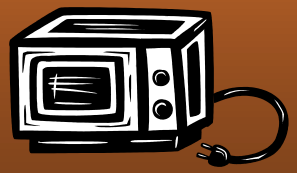








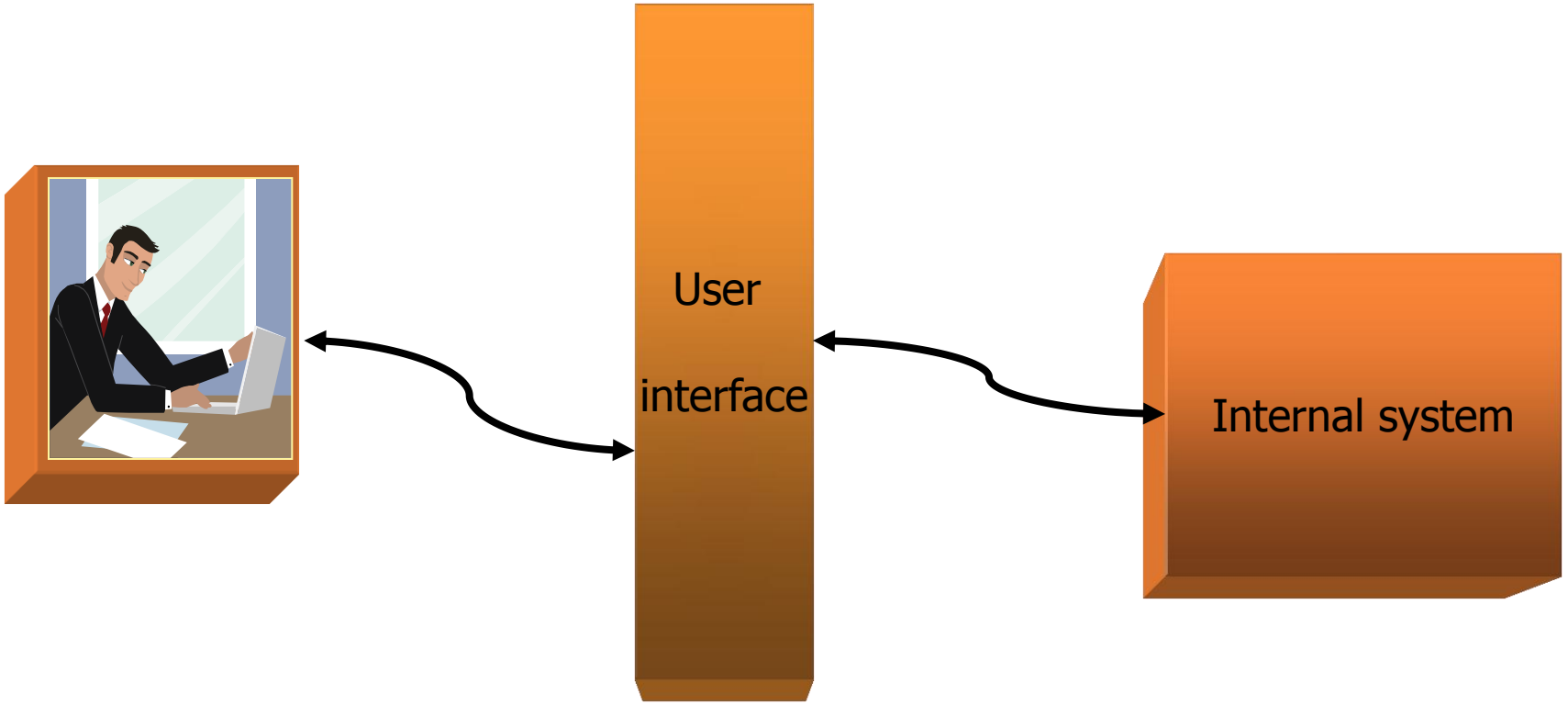



People and technologies

View	People characters	Machine characters
Machine centred	- Vague - Disorganized - Distractible - Emotional - Illogical	-Precise - Orderly - Undistractible - Unemotional - Logical
People-centred	- Creative - Compliant - Attentive to change -Resourceful -Able to make flexible decisions based on context	- Dumb -Rigid -Insensitive to change -Unimaginative -Constrained to make consistent decisions

Adapted from Norman (1993), p.224

User interface

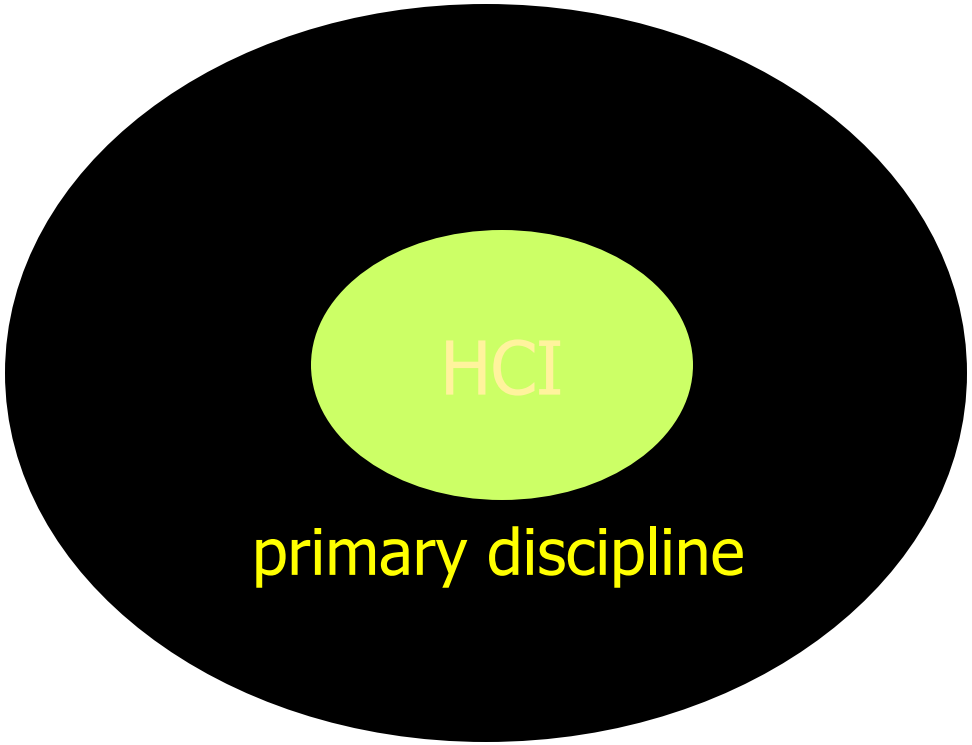


- Design an interactive system ⊇ design user interface

Being human-centred

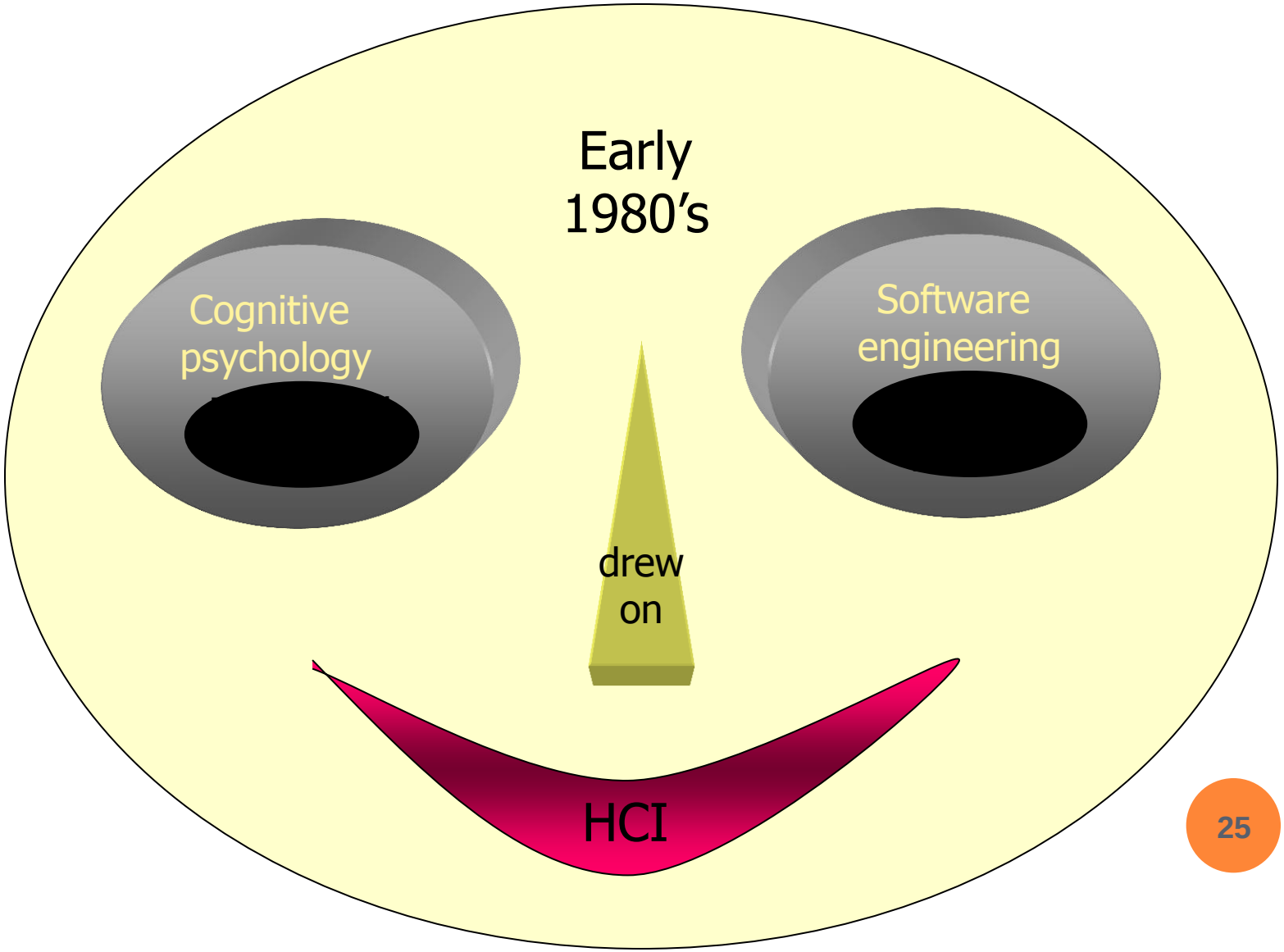
- Putting people first to support people and for people to enjoy
  - Thinking about what people want to do rather than the technology can do
  - Designing new ways to connect people to people
  - Involving people in the design process
  - Designing for diversity

Human-Computer Interaction (HCI)



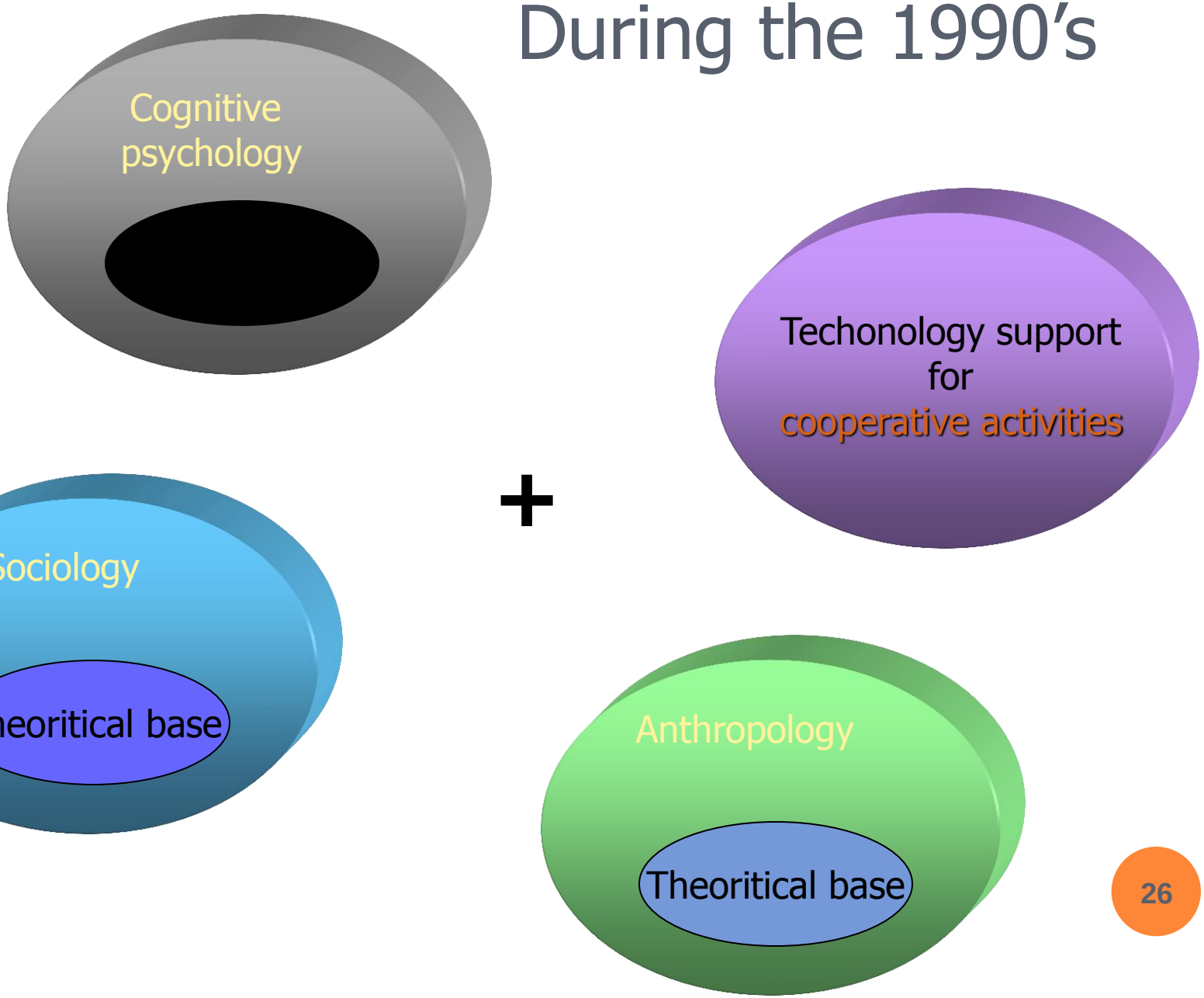
Human-centred design

HCI

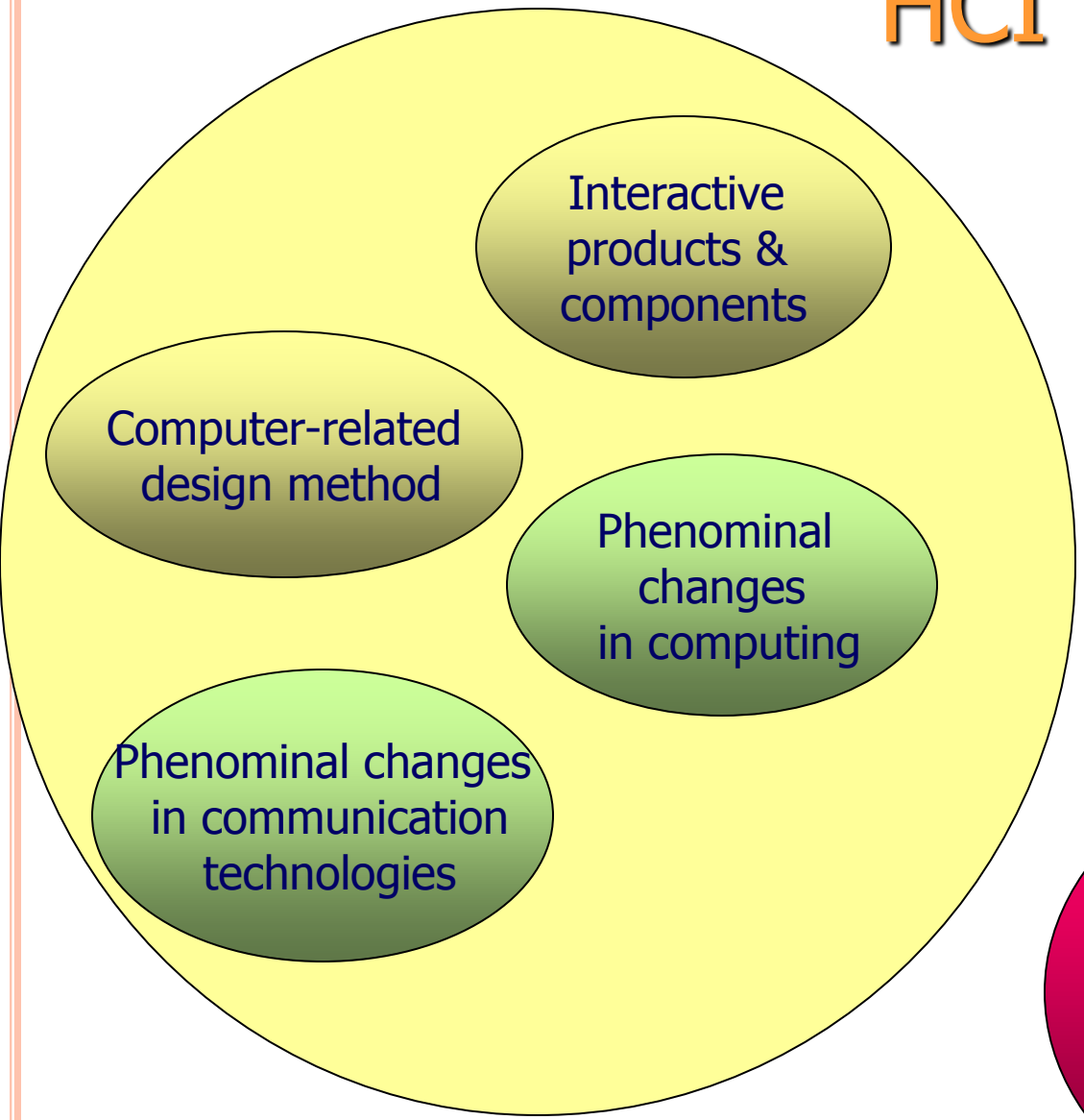

Early
1980's
Cognitive
psychology
Software
engineering
drew
on
HCI

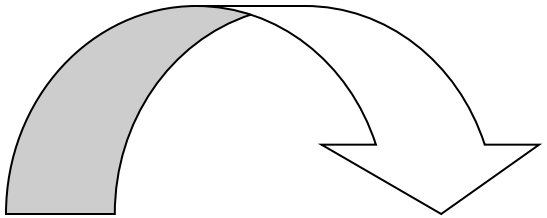
HCI

During the 1990's

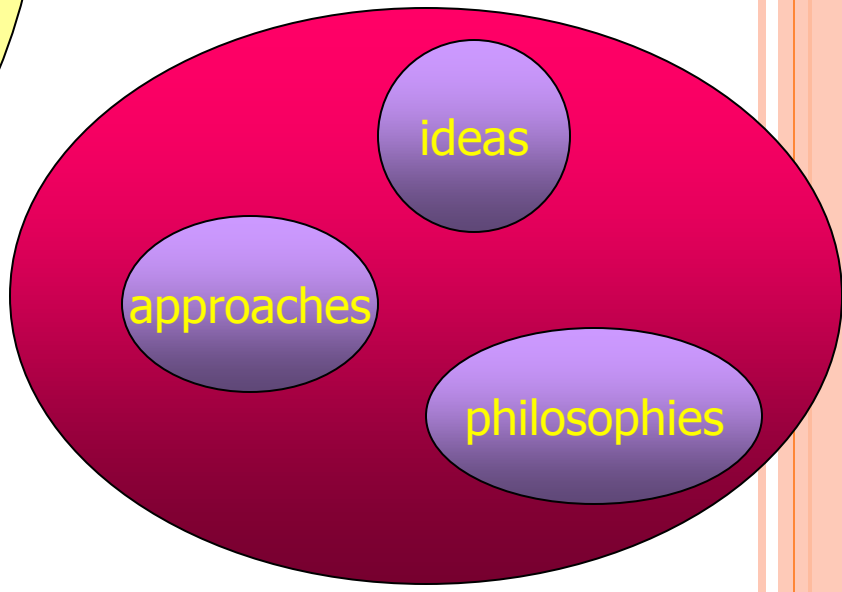


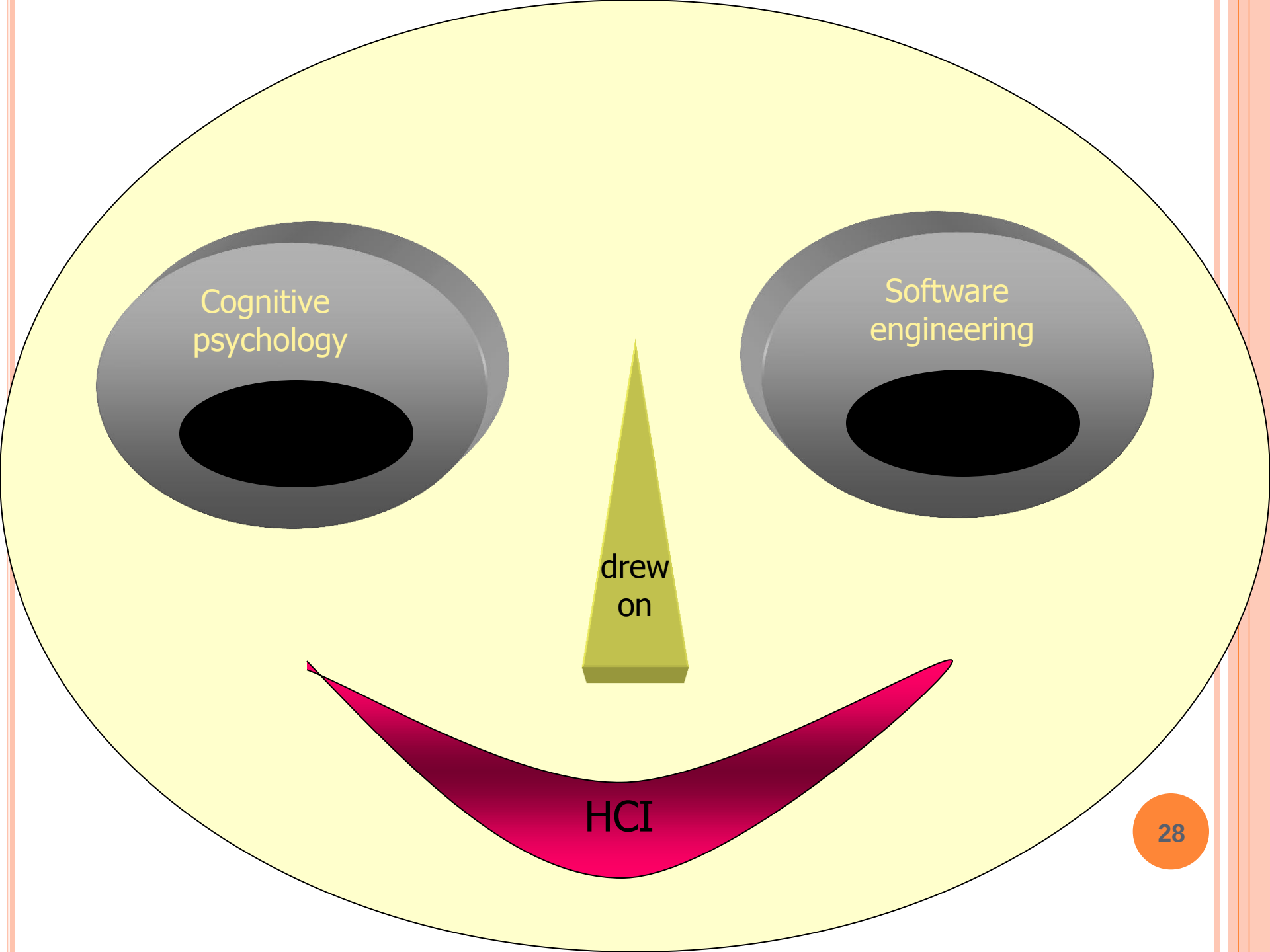
HCI Today





Interactive systems & products design

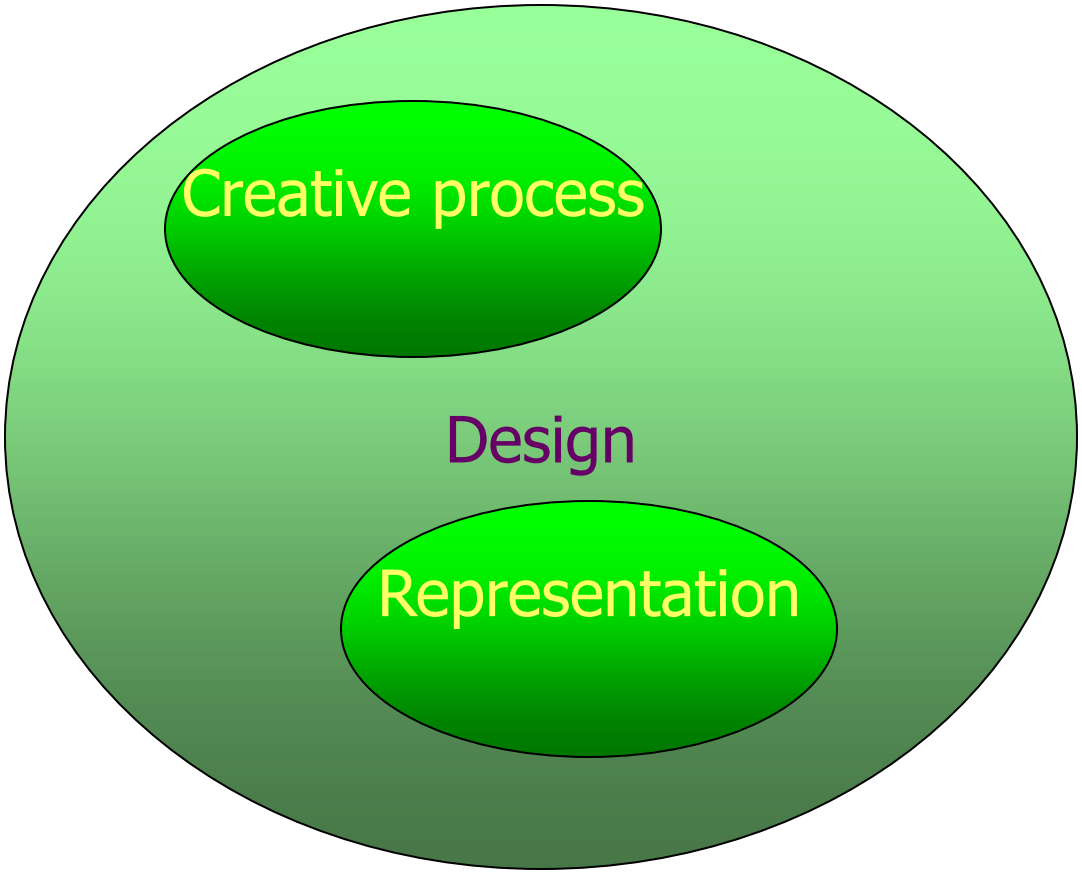



Cognitive psychology
Software engineering
drew on
HCI

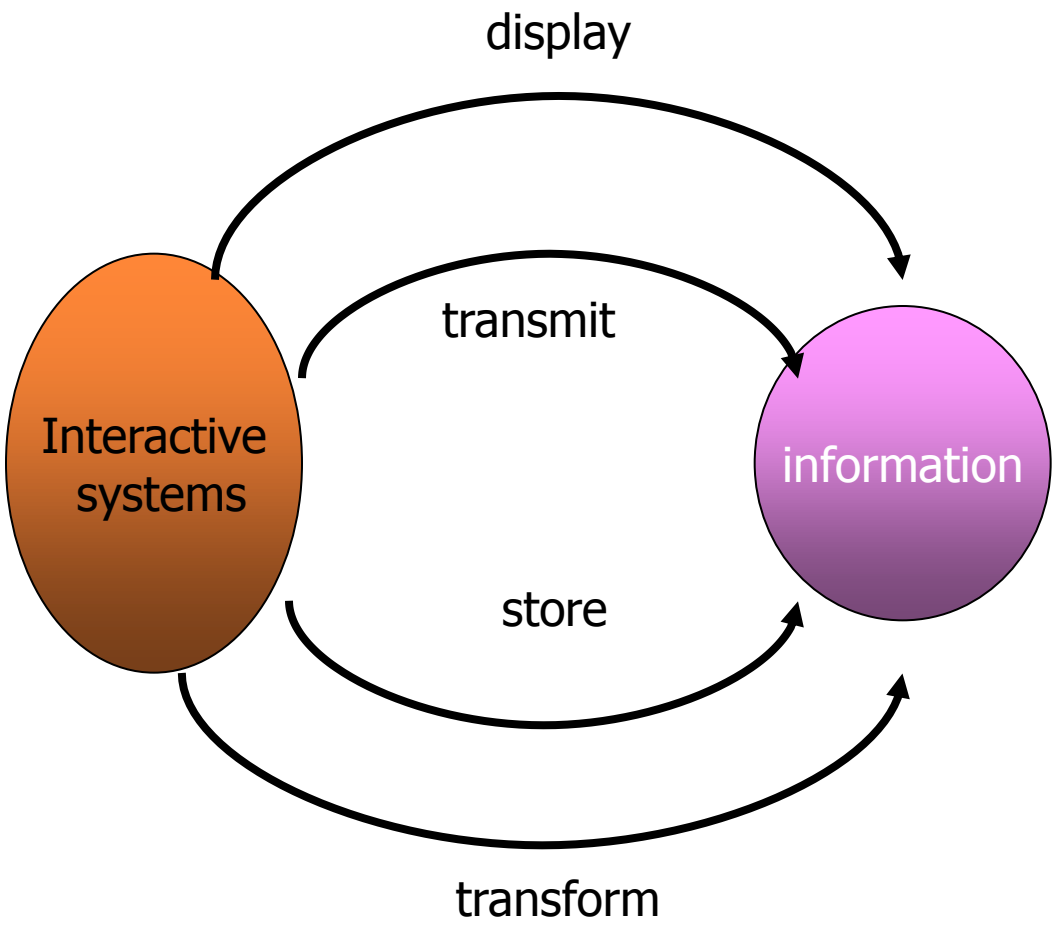
1.2 The concerns of interactive systems design (2)

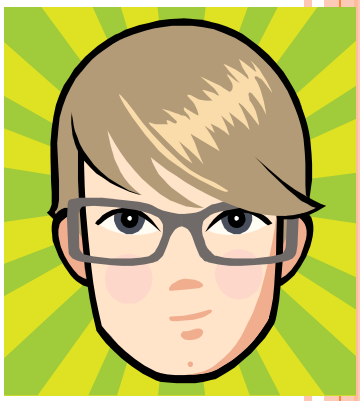
- The keys concern of interactive systems design:
  - Design
  - Technologies
  - People
  - Activities and contexts

Design

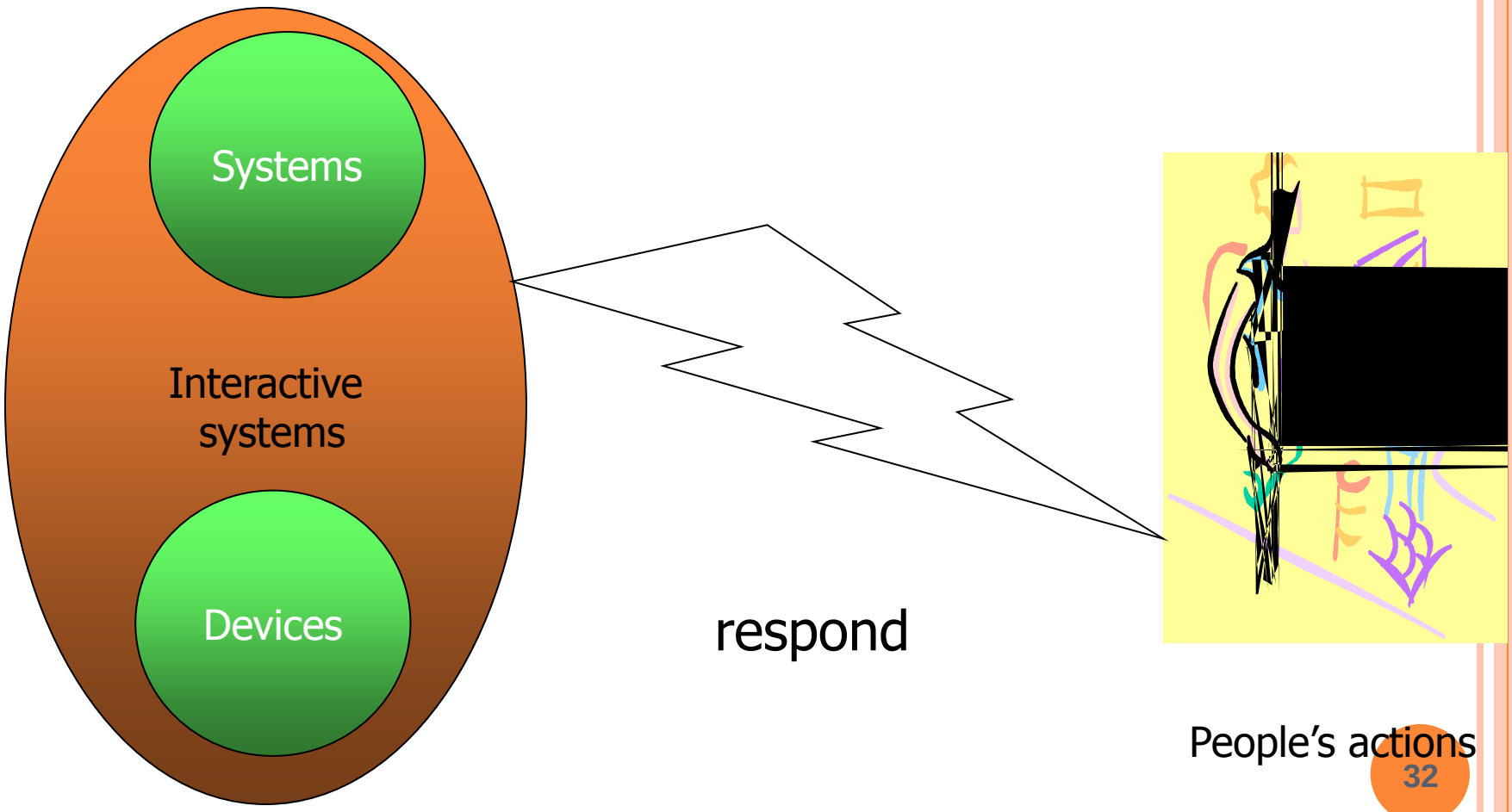


People and technologies





People and technologies



1.3 BEING DIGITAL

- Ergonomics:
  - Is the study of the “fit” between people and the things they use.
  - Until the late 1950s, it had to consider only physical characteristics of interaction.
  - With the arrival of computers, it was forced to take on the psychological fit between people and devices as well.
  - Sometimes: cognitive ergonomics= HCI

Evolution of HCI

- During the 1970s:
  - The method of interaction for most people was still primary “batch”.
  - Interest in HCI and computing began to grow.
  - At the end of decade, keyboards and screens became more common.

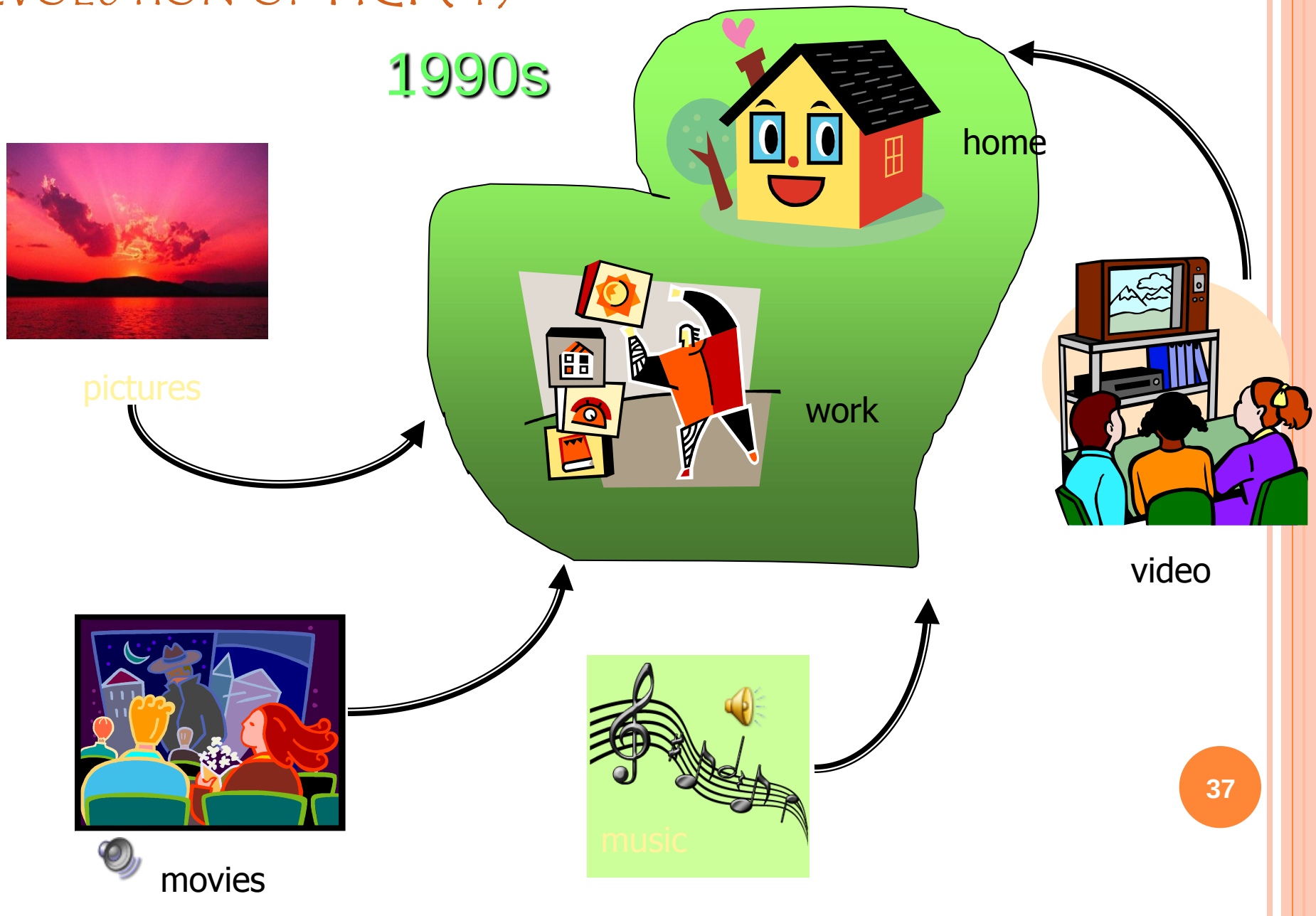
Evolution of HCI (2)

- During the 1980s:
  - That was the decade of the micro-computer
  - 1982: the 1st real graphically based interfaces used a bit-mapped display ⇒
    - GUI (Graphical User Interface)
    - Interaction through pointing at icons
    - Commands grouped into menus
  - 1985: Windows OS appeared on PCs
  - Game consoles were popular
  - Network, Internet began to grow based around email
  - HCI came of age as a subject, big conference on HCI held in USA and Europe.

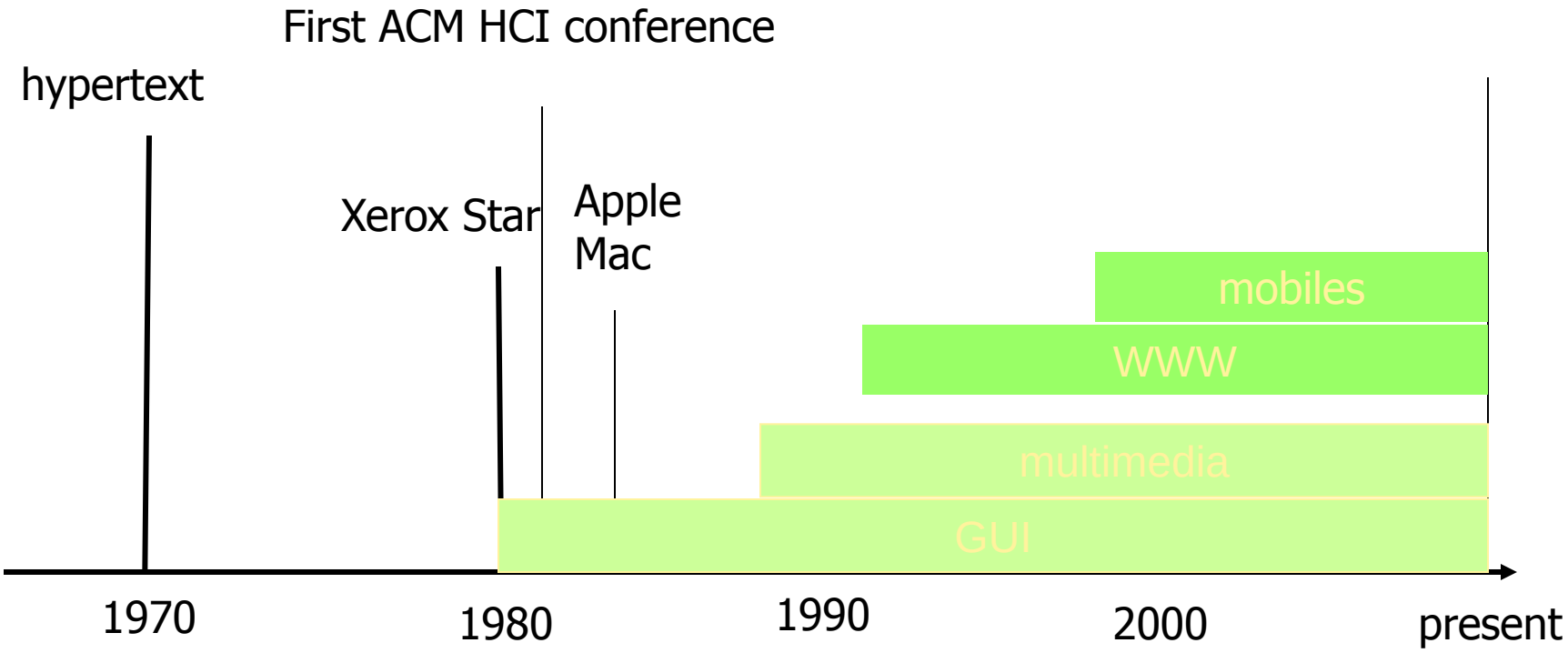
Evolution of HCI (3)

- During the 1990s:
  - Colour and multimedia arrived on PC which had begun dominate the computer market.
  - 1993: new interface take advantage of HTML ⇒ WWW came about and revolutionized the whole process of transmitting and sharing files.
  - Pictures, movies, music, text and live video links: suddenly available to everyone at work and at home.
  - The growth of personal, community and corporate websites = phenomenon

Evolution of HCI (4)



Evolution of HCI (5)



Characteristics of Information Appliances

- *Efficacy*: Appliances should be everyday things requiring only everyday skills to use.
- Appliances have a *clear, focused function* that can be *used in a variety of circumstances*.
- *Peer-to-peer interaction*: Appliances work together without the central control or uploading or downloading.
- *Direct user interface*: Appliances need to be simple and intuitive to use.

Characteristics of Information Appliances (2)

- *Closure*: Appliances should focus on a completion of tasks rather than an open-endded serie of tasks.
- *Immediacy*: Appliances
  - can do something on impulse, and
  - are aimed at situation where:
    - User may be engaged in another task, or
    - Their attention is diverted
- *Personal* and *portable*.

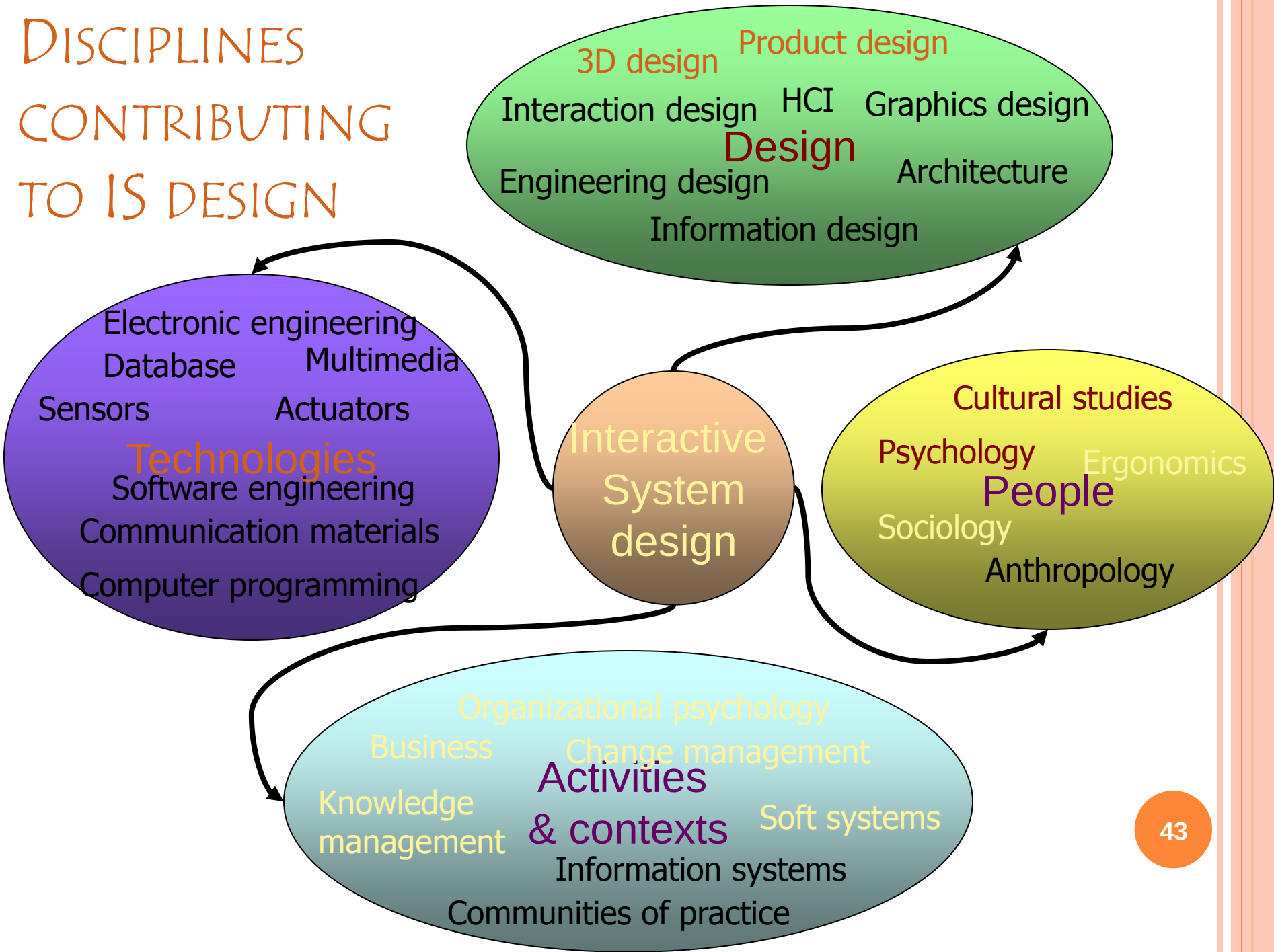
1.4 Skills of the interactive systems designer

- 1. Study and understand the activities of people and the contexts within which technologies prove useful ⇒ generate requirements for technologies.
- 2. Know the possibilities offered by technologies.
- 3. Research and design technological solutions that fit in with:
  - People
  - Activities they wants to undertake
  - Contexts surrounding theses activities
- 4. Evaluate alternative designs and iterate until a solution is arrived at.

1.4 Skills of the interactive systems designer (2)

- It is often that no single person possesses all the skills needed for some interactive system (IS) design ⇒ a design team.
- Designer of an IS can not be expert in all fields, but must be aware enough to:
  - Take techniques from different areas
  - Access research in different disciplines when appropriate.

Disciplines contributing to IS design



Disciplines contributing to IS design (2)

- People= social beings
- ⇒ Approaches & techniques adopted in the social sciences should be used to understand people and technologies
- Technologies: include both software and hardware
- Activities and contexts: Interaction take place usually in the context of some "community of practice"= groups of people:
  - sharing interests and values
  - engaging in similar activities
- Design: Principles and practices of design from of all manner of design disciplines are used in designing interactive systems.

1.5 Importance of being human-centred

- Being human-centred in design: is very expensive, involves:
  - Observing people
  - Talking to people
  - Trying ideas out with people

  ⇒ takes time !

  ⇒ but is advantageous
- Reasons:
  - Safety
  - Effectiveness
  - Ethics

1.5 Importance of being human-centred – Safety

- Human- centred design techniques would help to avoid:
  - 2 fundamental design errors:
    - Technical error
    - Organizational error
  - Disasters attributed to:
    - Faulty display
    - Operators not understanding or interpreting correctively displays
- It's no good claiming "human error" if the design was so bad.
- ⇒ Systems have to be design for people and for contexts

1.5 Importance of being human-centred – Effectiveness

- 2 key features of effectiveness:
  - Acceptability
  - Productivity
- Acceptability: ensures that systems fit in with people's ways of working ⇒ Involving people closely in the design.
- Productivity: Systems will be more effective if they are designed from a human-centred perspective, and people will be more procductive.
  - Ex: Web design, e-commerce sites: turning "browsers" into 'buyers" ⇒ sales increased by 225% !

1.5 Importance of being human-centred – Ethics

- Designers are truthful and open in their design practices. They need to be more vigilant: People know the origin of the data they give and how the data might be used.
- Intellectual property ⇒ privacy, security, control, honesty for a interacive system designer.
- Ethical design is needed because the systems produced should be easy and enjoyable to use and affect the quality of people's lives ⇒ standards and legal requirements for the designs

Summary of the chapter 1

- Interactive systems design needs to be human-centred.
- It draw upon many areas, including both artistic design and engineering design.
- It is needed because we live in a digital age.
- It is necessary for the safe, effective anf ethical designs.