Human-Computer Interaction (HCI)

DECO2500/7250

Dr Chelsea Dobbins

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01

Course Overview and Introduction to HCI

In this session…

- Course introduction
- Introduction to Human-Computer Interaction (HCI)
- Background to the Interaction Design Process

Course Overview

- The aims of this course are to:
  - Introduce the theory and methods underlying the practice of Human-Computer Interaction
  - Gain experience in researching user needs and goals
  - Gain experience in developing appropriately targeted design solutions to the needs and goals that have been identified

Teaching Team

- **Lecturers**
  - Dr Chelsea Dobbins, Senior Lecturer, School of ITEE
  - Dr Maxime Cordeil, Senior Lecturer, School of ITEE

- **Tutors**
  - Julia Drugova
  - Amraj Singh
  - Moya Baldry
  - Rostislav Gusev
  - Jade Taylan
  - Shiva Kamalzadeh
  - Summer Yang
  - Sanya Ahmad
  - Shivam Shipankar
  - Harland Jensen
  - Maryam Khan

Studio Schedule

Cohort	Studio	Day	Time - Start	Time - End	Tutors		
DECO2500 (internal/ external)	STU01	Tuesday	8:00 AM	10:00 AM	Amraj	Maryam	
	STU02	Tuesday	12:00 PM	2:00 PM	Julia	Shivam	
	STU03	Tuesday	4:00 PM	6:00 PM	Amraj	Jade	
	STU04	Thursday	8:00 AM	10:00 AM	Rosti	Harland	
	STU05	Thursday	2:00 PM	4:00 PM	Moya	Sanya	
	STU01 (external)						
DECO7250 (internal/ external)	STU01	Friday	8:00 AM	10:00 AM	Julia	Shiva	
	STU02	Friday	2:00 PM	4:00 PM	Moya	Summer	Shiva
	STU01 (external)						

Cohort Activity

Head to menti.com and enter code: 5205 6025

Expectations

- ***Attend*** and ***participate*** in lectures and studios
- Complete reading and take your own notes
- Understand the fundamentals by keeping up with the lectures/studios
- Attend (or at the very least watch) the lecture *prior* to attending your studio
- Complete all assessments on time
- All communication (e.g., email/ Ed Discussion / SECaTs) must be professional, courteous and polite
- The lecture will start at 4pm. Please arrive on time
- Understand what constitutes academic misconduct and don't risk getting on the academic misconduct register
- Please let the teaching team know of any issues early and propose a solution if possible
- Please do not make any recordings of your own. Studio sessions will not be recorded.

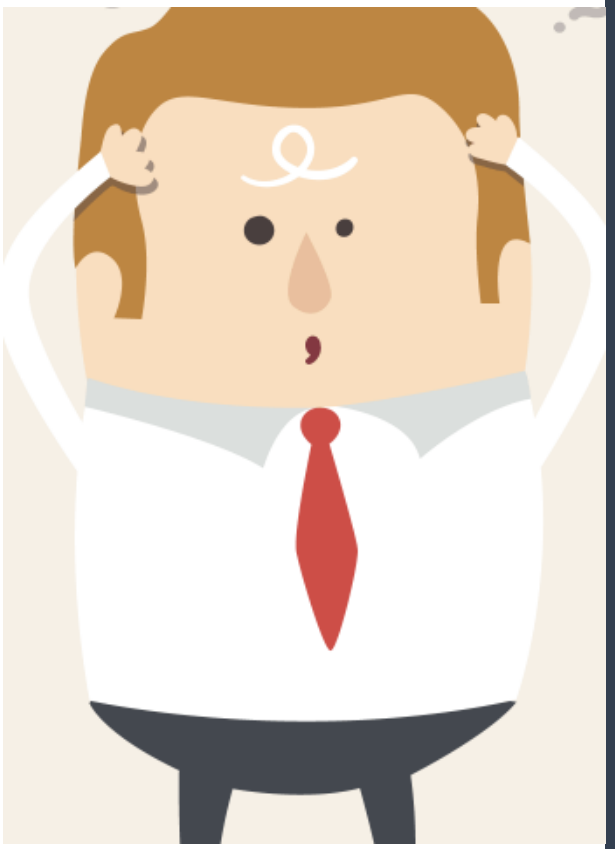


Image source: https://www.thrivingtalents.com/the-importance-of-setting-expectations/

Student Access Plans (SAP) and Exam Adjustments (EA)

It is important you arrange your SAP or EA as soon as possible. Aim for the first four weeks of semester.

Who?

Students who:

- have a disability
- are neurodivergent (i.e. ADHD/Autism)
- have a mental health condition
- have a medical condition
- have an illness or injury
- have caring responsibilities

Or:

- are pregnant
- are experiencing exceptional circumstances
- are an elite athlete
- have commitments to religious observance
- are engaged in defence service

What?

Student Access Plans:

- extension to assignments
- occasional absences
- alternative assessment formats
- placements, pracs, and lab adjustments
- accessible formatting
- assistive technology

Exam Adjustments:

- additional examination working time
- rest breaks
- use of a computer or a writer
- ergonomic furniture
- food, drink, or medication
- a separate room

Other adjustments based on your needs

How?

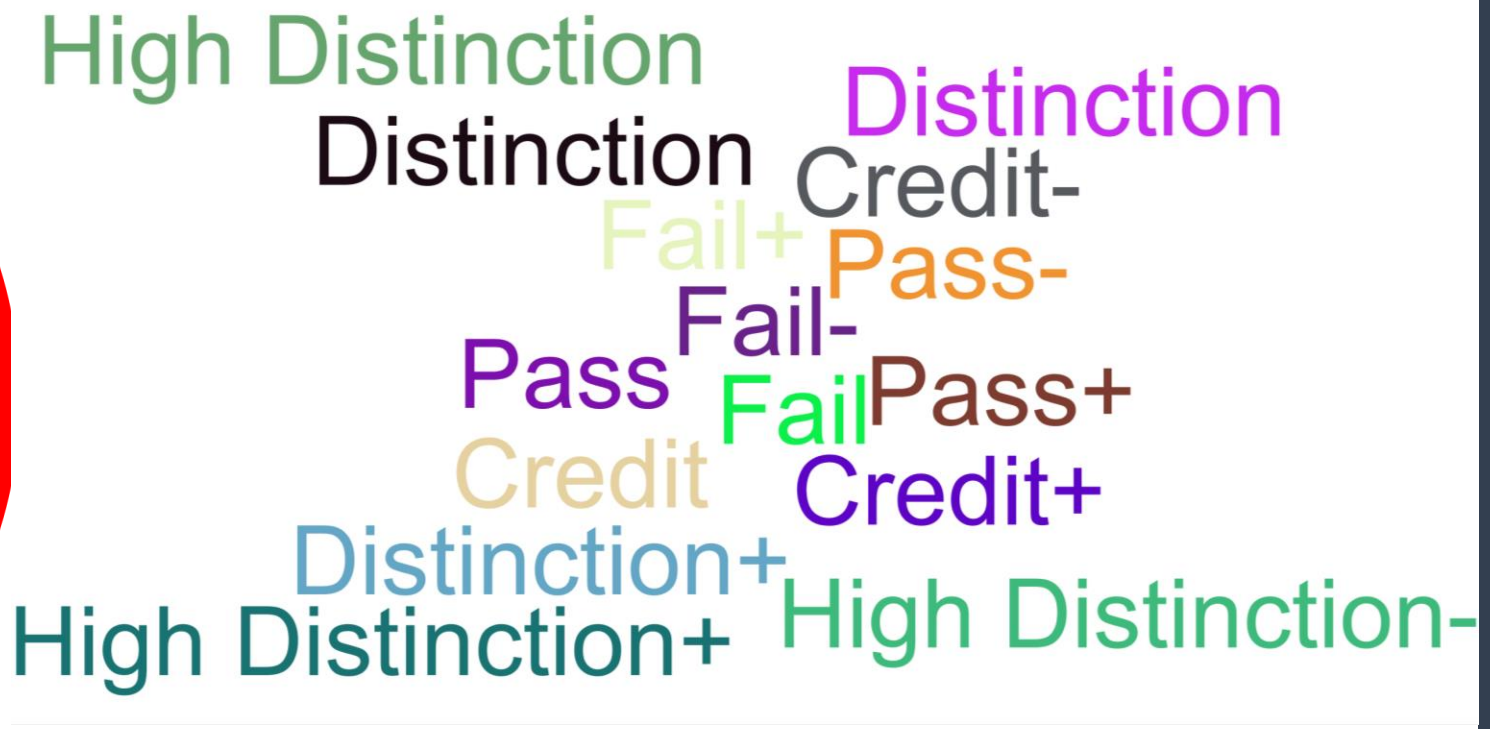
Meet with a Student Adviser

- visit Student Central
  - Building 42 St Lucia
  - Google: UQ Student Adviser
- contact Student Services
  - student.services@uq.edu.au
  - (07) 3365 1704

Get in touch as soon as possible if you need support for your study.

Support can be provided throughout semester.

Expectations

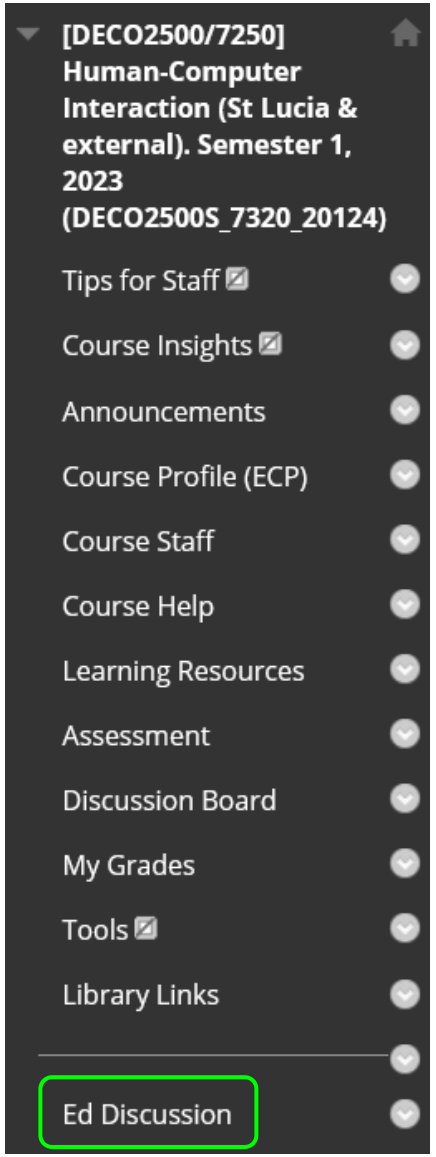


How to get the most out of each session

- Come prepared
- Make notes
  - Either handwritten or add electronic comments to the PDF lecture notes
- Get involved
- Use the studio to apply the things you have learned during the lecture
- Don't be afraid to ask questions and seek clarification
- There is no such thing as a stupid question!
- Email etiquette

How to keep in touch/ask questions

- We will be using Ed Discussion for Q and A
- Anyone can answer questions, and keeping things open stops repeat questions
- Private questions will almost always be answered publicly
- Don't expect responses from teaching staff in the middle of the night/weekends we do observe office hours.
- For official messages and/or sensitive/private matters, please use the course mailbox: deco2500@itee.uq.edu.au



Activities and Assessment

- 2hr lecture and 2hr studio per week

In-Class Quiz (I)
- 20%

Interface Inquiry and Critique (I)
- UG 40% / PG: 30%

Design Proposal (G)
- UG 40% / PG: 30%

Annotated Bibliography (I)
- PG: 20%

Provisional Plan*

Teaching Week	Lecture Date	Lecture Number	Studio Number	Lecture Topic
1	20/02/2023	1	1	Course Overview and Introduction to HCI
2	27/02/2023	2	2	Interaction Fundamentals
3	06/03/2023	3	3	Mental Models and Conceptual Design
4	13/03/2023	4	4	Interaction Paradigms and Modes
5	20/03/2023	5	5	Cognition
6	27/03/2023	6	6	Interaction - Usability and Interfaces
7	03/04/2023	7	-	UX Goals and Metrics
-		-	-	Mid-Semester Break
8	17/04/2023	8	7	User-Based Evaluations and Data Analysis
9	24/04/2023	9	-	Evaluating Usability: “Expert” or “Non-User” Evaluations
10	01/05/2023	-	8	*Monday 01 May is a public holiday. No lecture*
11	08/05/2023	10	9	In-class Quiz
12	15/05/2023	11	10	Tying It All Together
13	22/05/2023	12	11	Human-Centred AI
				Revision Week
		-		EXAM PERIOD
		-		EXAM PERIOD

*may be subject to change

Academic Integrity

- Ignorance can result in plagiarism/misconduct through:
  - Working too closely with other students
  - Failing to reference properly
  - Submitting the same work to multiple courses
  - **Ignorance is not a defense!**
- Solutions:
  - Complete your assignments separately to other people
  - If quoting directly use " " and **always** reference
  - Check with the teaching team and/or UQ guidelines if unsure
  - **Get familiar with Academic Integrity at UQ**
- Don't risk getting on the academic misconduct register
- ITEE expects all students to know the following:
  - https://www.uq.edu.au/integrity/
  - https://web.library.uq.edu.au/node/4221/1#1
  - https://my.uq.edu.au/information-and-services/manage-my-program/student-integrity-and-conduct/academic-integrity-and-student-conduct
  - http://ppl.app.uq.edu.au/content/3.60.04-student-integrity-and-misconduct

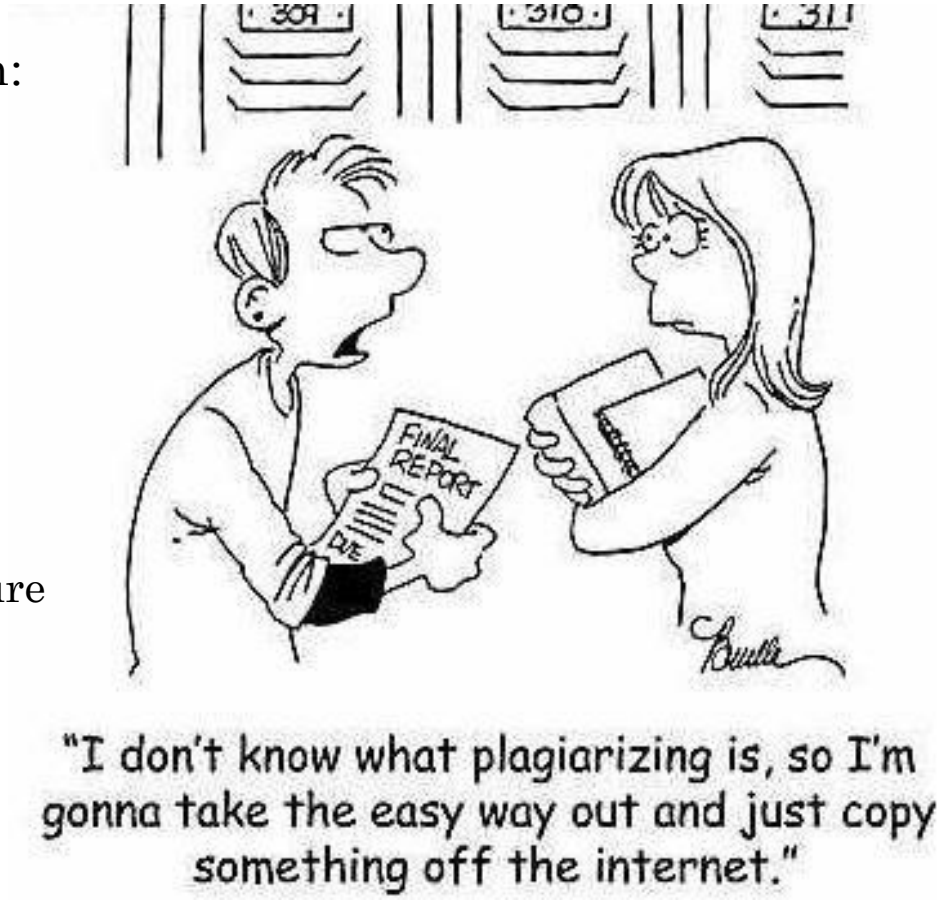


Image source: https://www.pinterest.com.au/wassef87/academic-dishonesty-and-integrity/

Academic Integrity

- Acting with the values of honesty, trust, fairness, respect and responsibility in learning, teaching and research.

(Universities Australia, 2017)

Academic integrity = Professional integrity = Personal integrity

Benefits of Academic Integrity

- High standards of academic integrity protect you, the University and the community:
  - You have the pride and confidence that comes with knowing you have developed your knowledge and learnt new skills
  - You understand how new knowledge is created and how to apply that knowledge to your studies and future career
  - You model the practices of integrity we want for society
  - The community has faith in the value of a UQ qualification
  - Your employer, your clients and your patients know you are knowledgeable and skilled

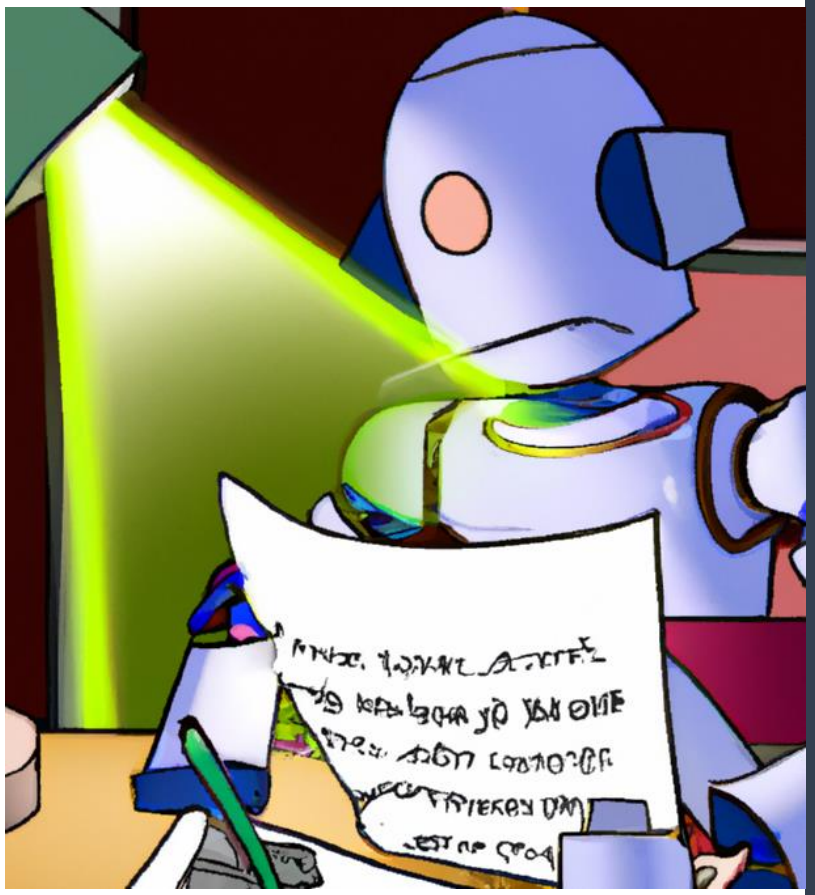
Types of Academic Misconduct

- Staff know that cheating occurs and will be looking for:

Plagiarism	Collusion
Falsification	Fabrication
Impersonation	Contract cheating

Generative Artificial Intelligence (AI)

- Generative AI tools create content based on a text prompt, including images, code and text
- Recent releases (particularly ChatGPT released in late Nov 2022) have made significant advances in the quality of text-based content produced
- Generative AI are now powerful tools but have a range of limitations. The ChatGPT system acknowledges it:
  - May occasionally generate incorrect information
  - May occasionally produce harmful instructions or biased content
  - Limited knowledge of world and events after 2021
- **<u>At UQ, the assessment you submit must be your work</u>**



https://www.linkedin.com/pulse/chatgpt-consistently-fails-most-parts-assessment-tasks-jason-m-lodge/

Generative AI in Assessments

- **<u>Use of generative AI in any assessment is not permitted.</u>**

- You will not be permitted to use generative AI tools in any assessment task in this course
  - Check what is appropriate *for each* course you are enrolled in
- Attempted use of AI in these tasks may constitute student misconduct under the (PPL 3.60.01) Student Code of Conduct.

Adapted from Institute for Teaching and Learning Innovation (ITaLI)

OK? Let’s begin…

Introduction to HCI

What is HCI?

- Focused on developing first-hand understanding of users
  - Study of the **interaction** between **humans** (users) and **computers**
- Definition of HCI is quite broad
  - Covers almost all forms of information technology (IT)
- HCI is the study of designing computers and machines so that they best serve their users (i.e. humans)

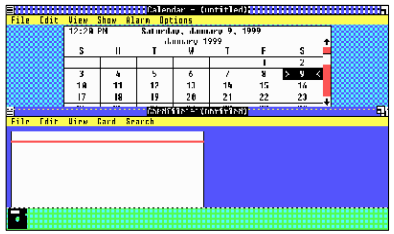
What is HCI?

- Closely related to the field of User Experience (UX) design
- The user interface is where the interaction between humans and computers occurs
  - Includes both software and hardware
- HCI investigates, develops, and harnesses new areas of possibility, not just as technologies or designs, as means for enhancing human activity and experience

Why is HCI important?

- HCI is the study of how computers and machines can better help us
- Invaluable in making sure that computers are designed for *successful* and *intuitive* human use

History of HCI

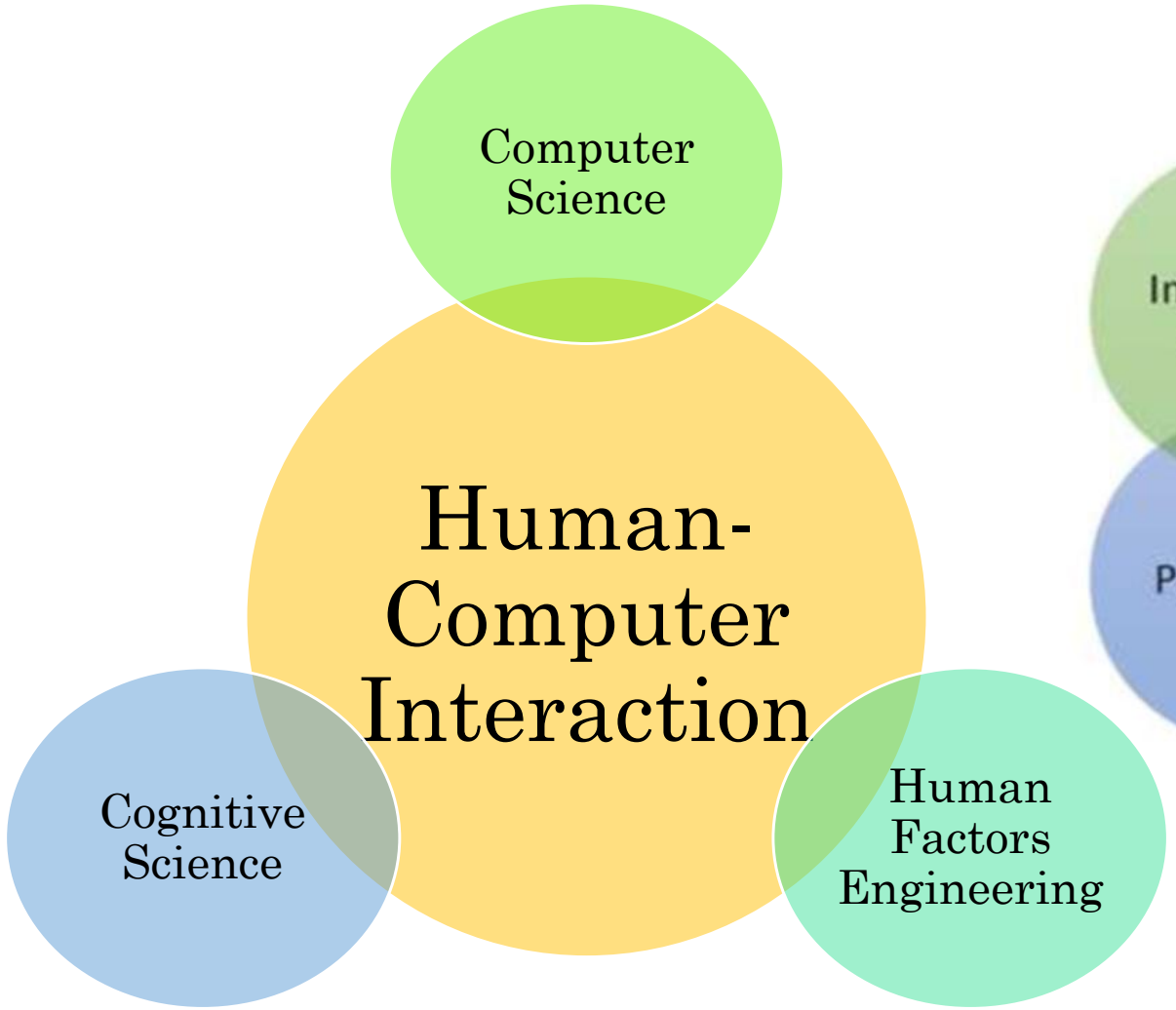


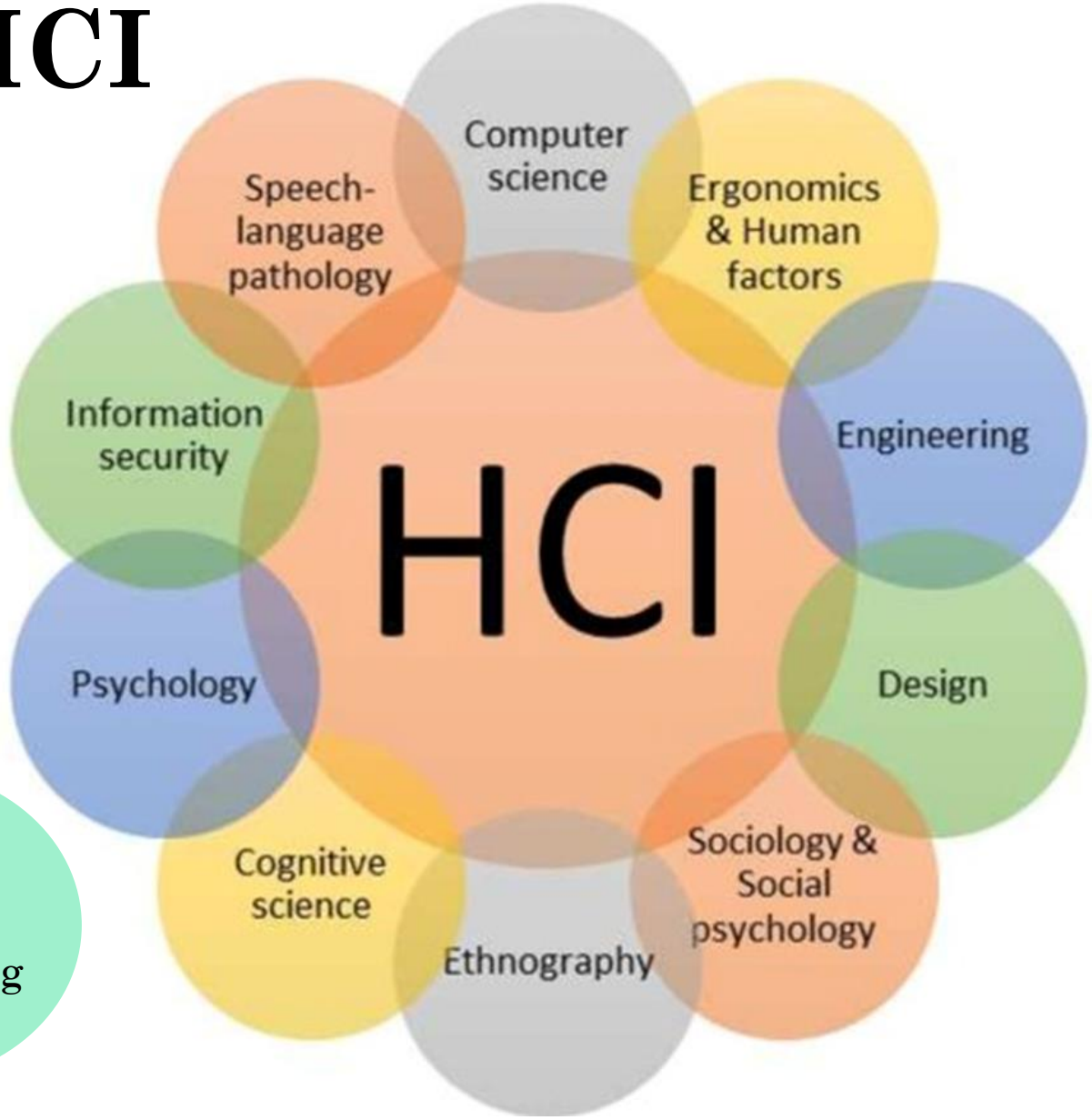
Windows 1.01.

1970s	1980s	1990s	2000s	2010s	2020s+
• Personal Computer	• Graphical User Interfaces	• The Internet	• Mobile Computing	• Wearable Computing	• AR/VR, Earables, etc.

Image sources: https://bobscomputerserviceandrepair.com/computer-history/1970s-2/ http://toastytech.com/guis/win101.html https://www.telegraph.co.uk/technology/2016/06/08/how-everyday-gadgets-looked-when-they-were-first-invented/googles-beta-homepage/ https://www.amazon.com/Nokia-000070169-3310-Blue/dp/B00005KBGR https://www.jewellermagazine.com/Article/10291/Apple-Watch-speculation-10-years-on-from-the-first-predictions https://mixed-news.com/en/the-google-glass-flop-and-what-can-be-learned-from-it/ https://www.vesta-go.com/advocacy-ugc/2020s-trend-2-experience-is-the-new-content/

Introduction to HCI



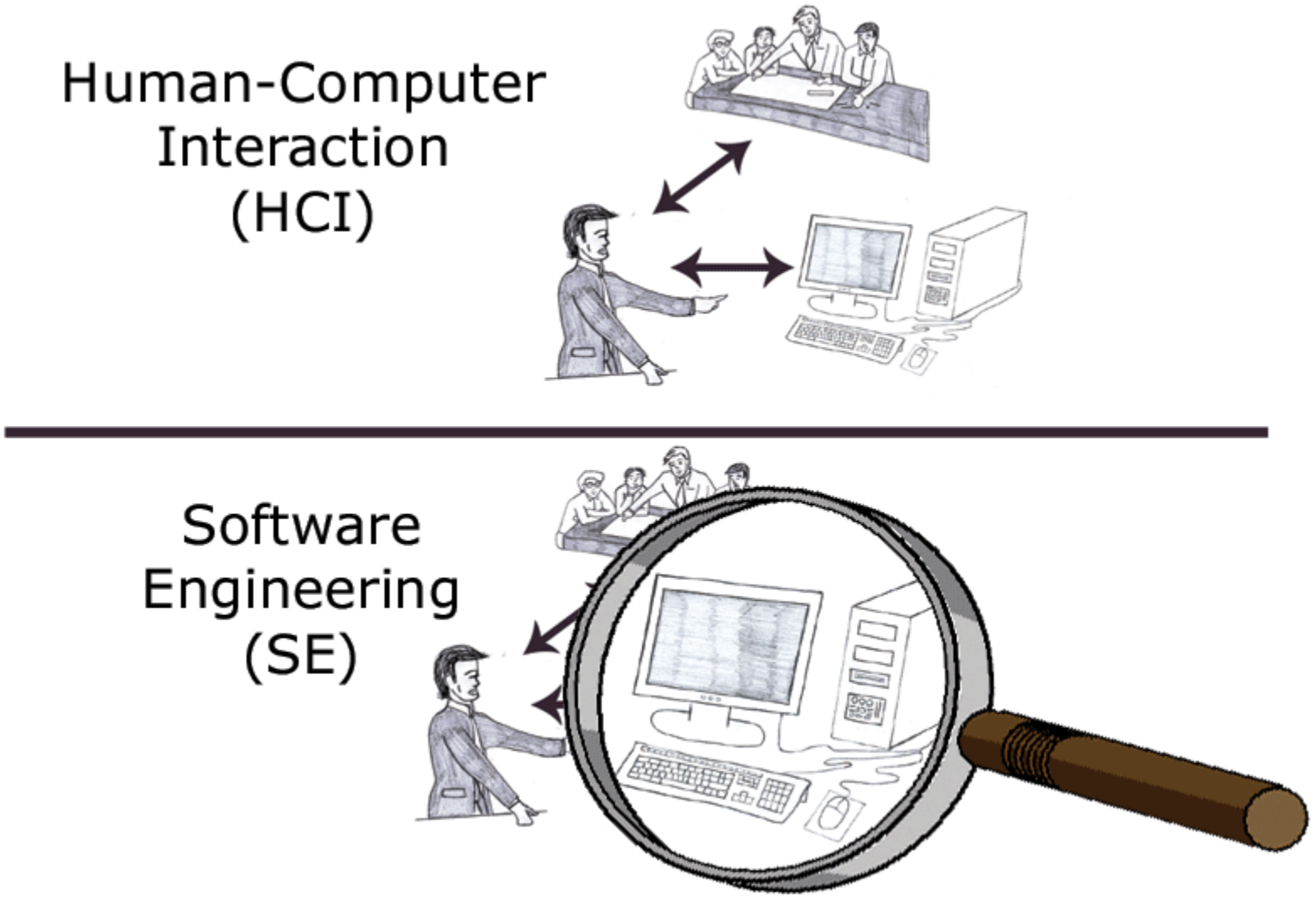


B. K. Chakraborty, D. Sarma, M. K. Bhuyan and K. F. MacDorman, "Review of constraints on vision-based gesture recognition for human–computer interaction," in *IET Computer Vision*, vol. 12, no. 1, pp. 3-15, 2 2018. Doi: 10.1049/iet-cvi.2017.0052

Goals of HCI

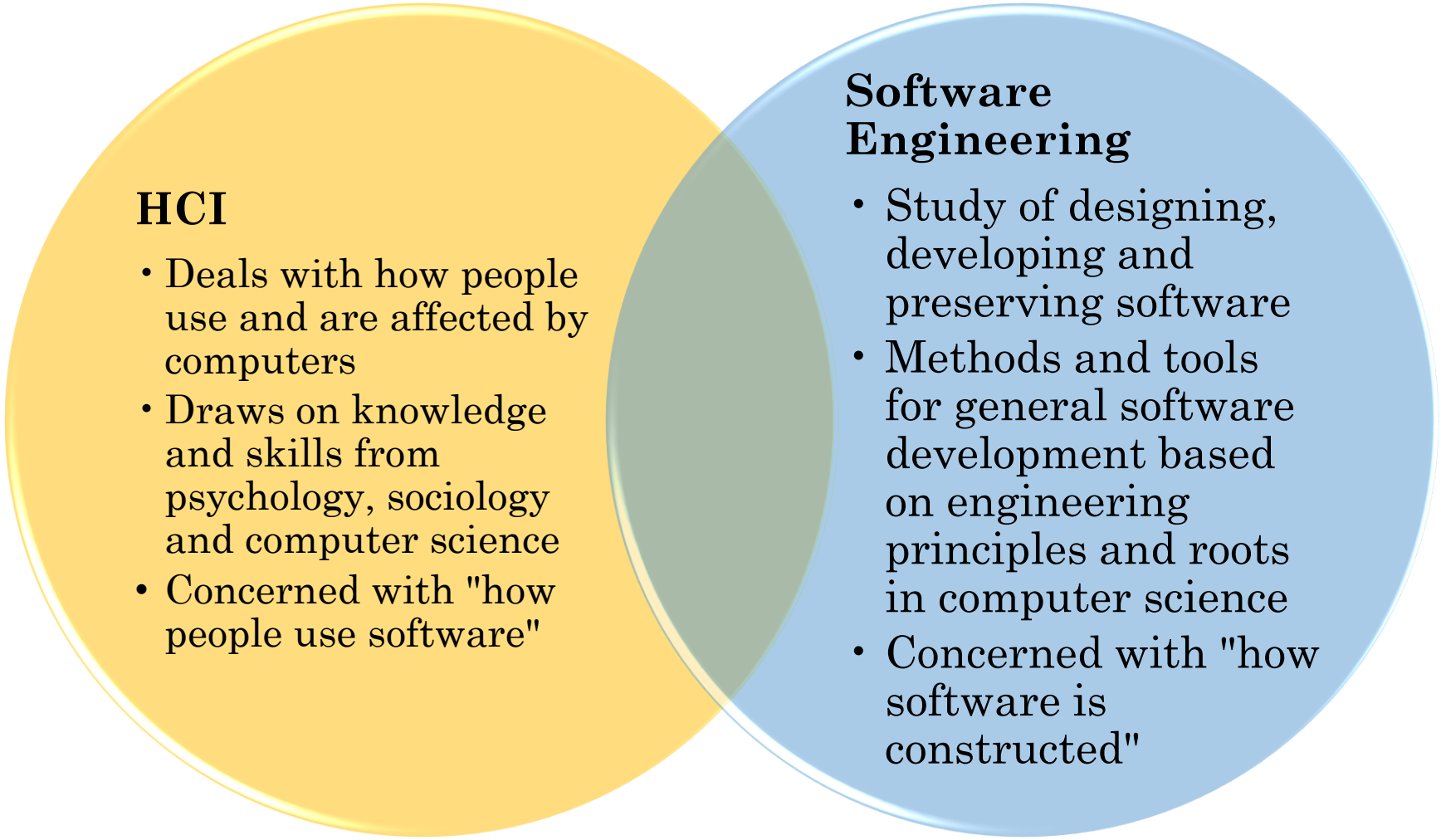
- Produce usable, safe and functional systems
- To produce systems with good usability, developers must attempt to:
  - Understand the factors that determine how people use technology
  - Develop tools and techniques to enable building suitable systems
  - Achieve efficient, effective, and safe interaction
  - Put people first

HCI and SE Development Approaches



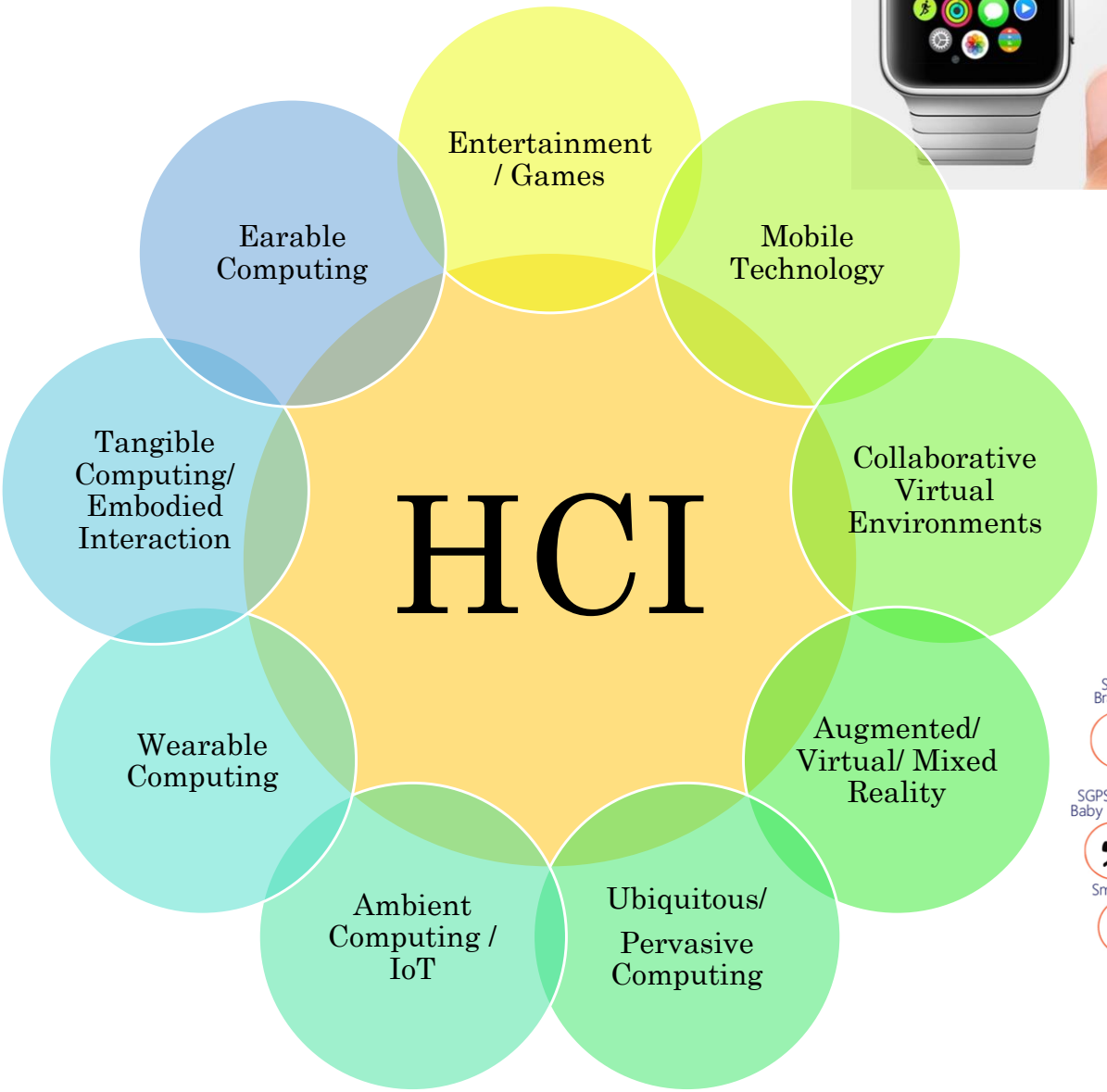
X. Ferre and N. Medinilla, "How a Human-Centered Approach Impacts Software Development," in *International Conference on Human-Computer Interaction: Interaction Design and Usability*, pp 68-77, 2007. Doi: 10.1007/978-3-540-73105-4_8

HCI and SE Development Approaches

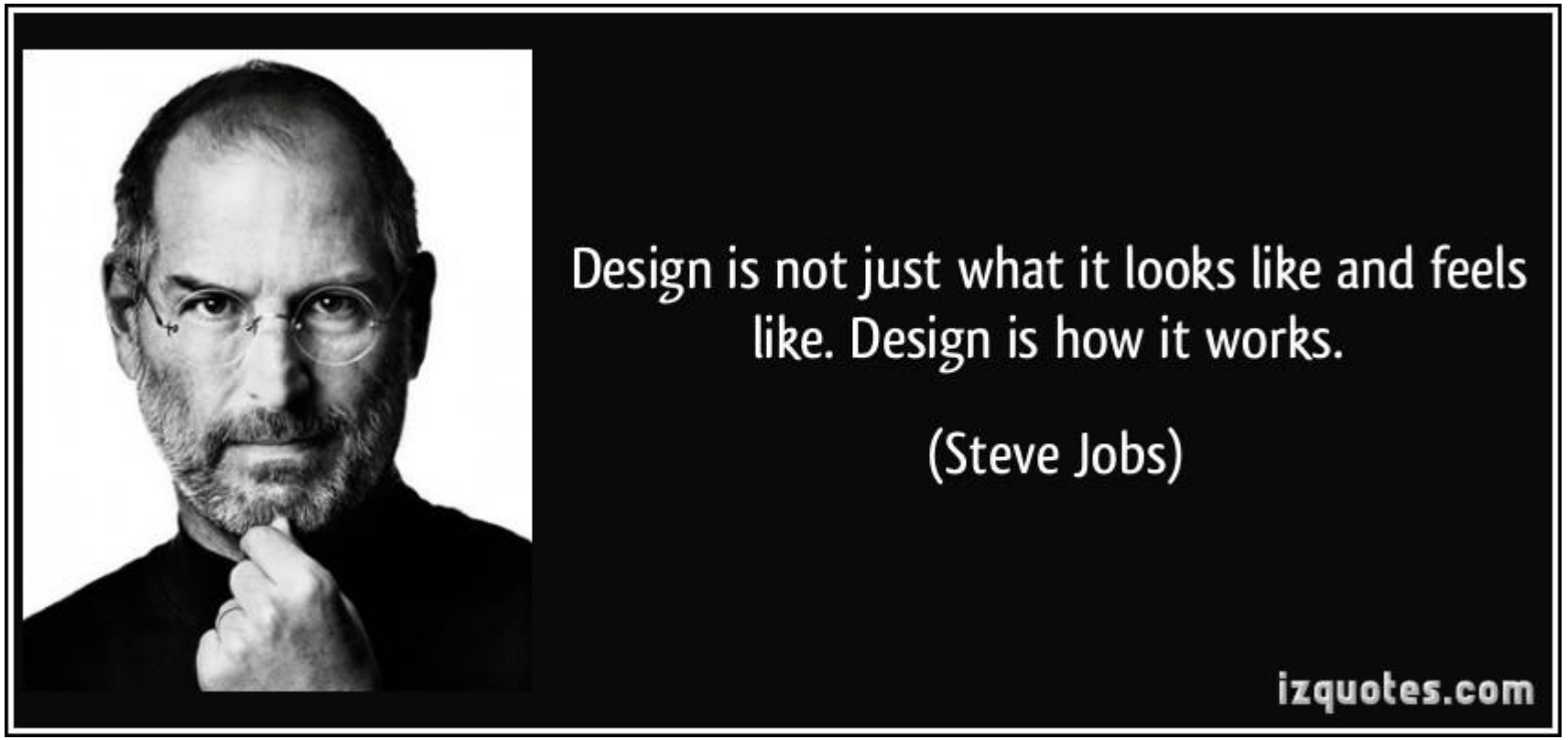


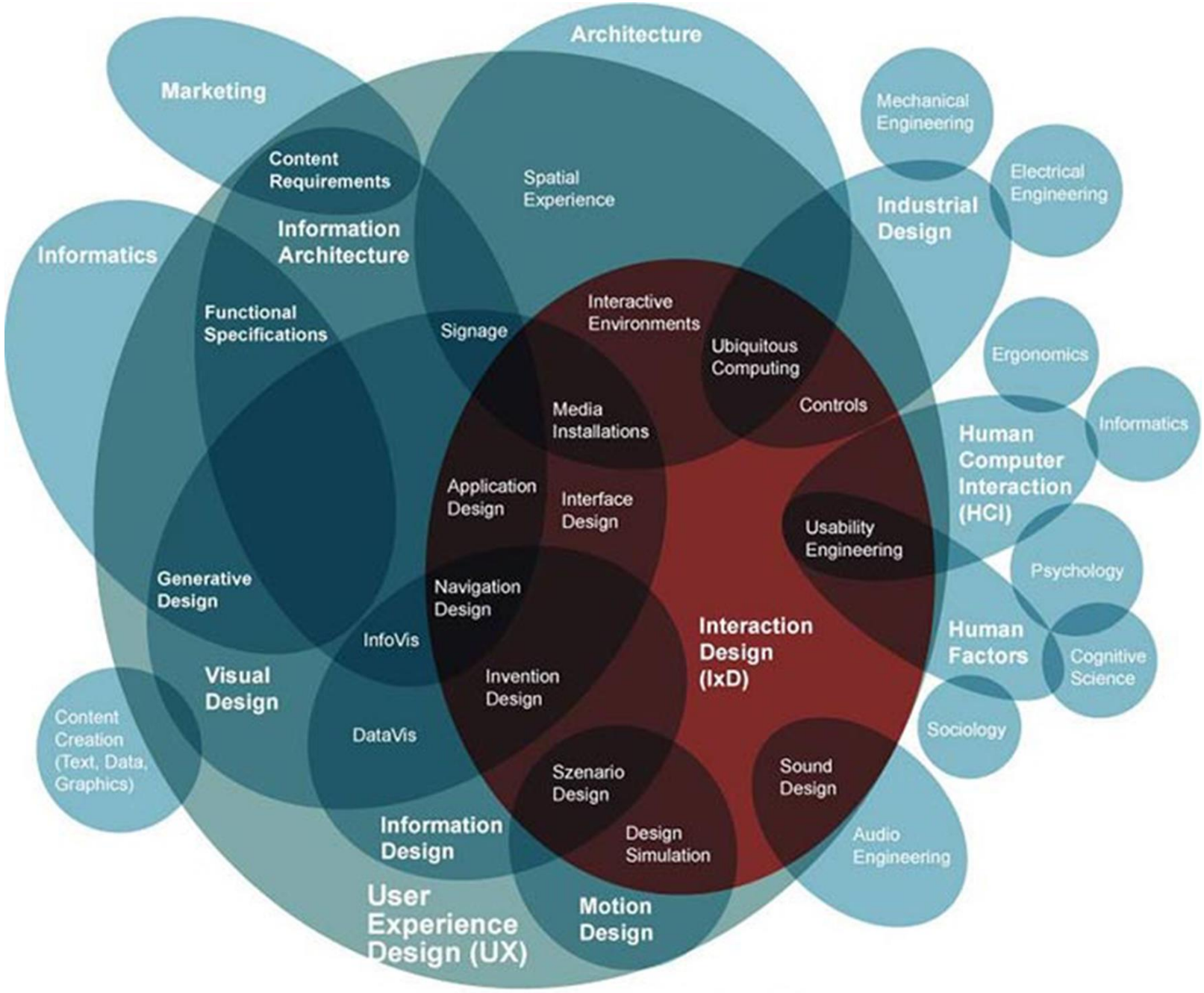
Preece, J. and Rombach, H.D., 1994. A taxonomy for combining software engineering and human-computer interaction measurement approaches: towards a common framework. *International journal of human-computer studies*, *41*(4), pp.553-583.

Beyond the Desktop…



Interaction Design

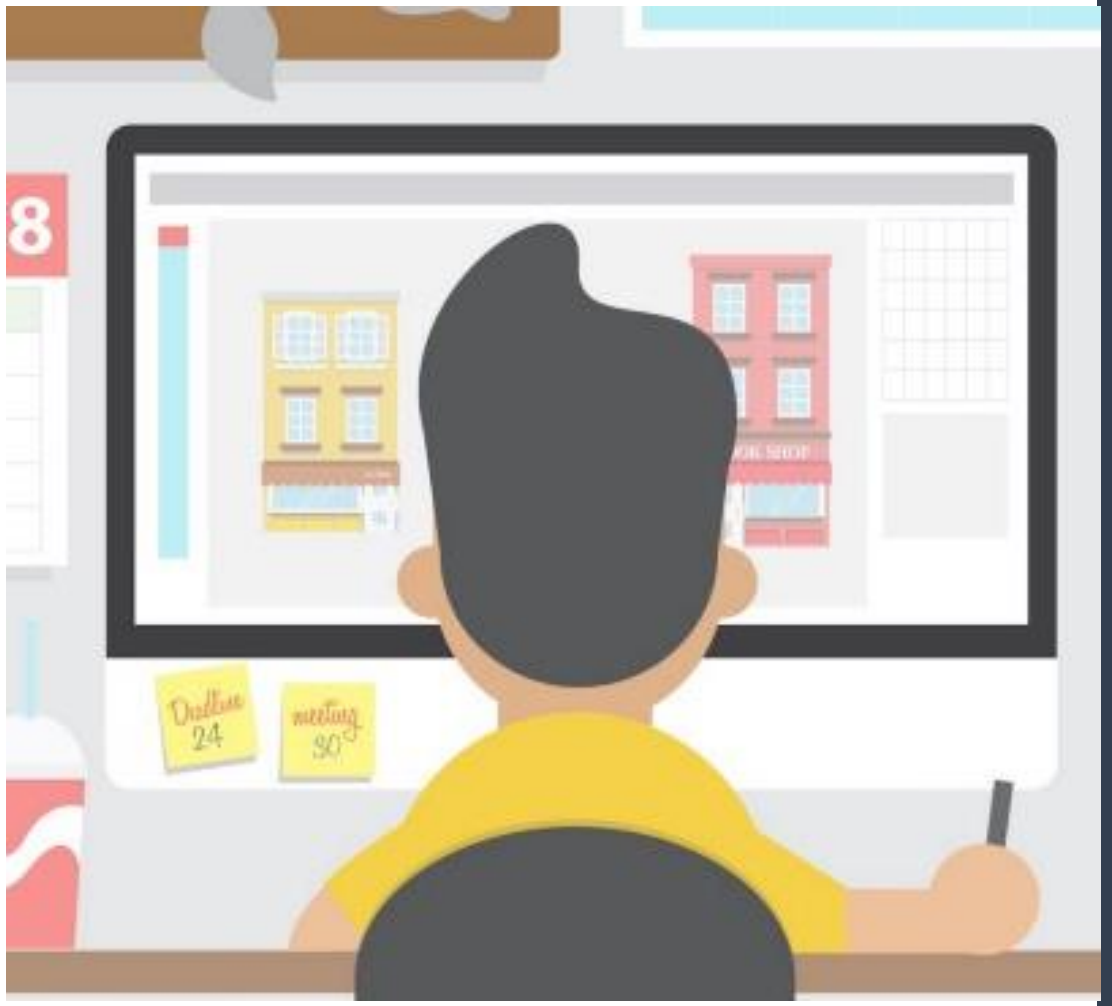




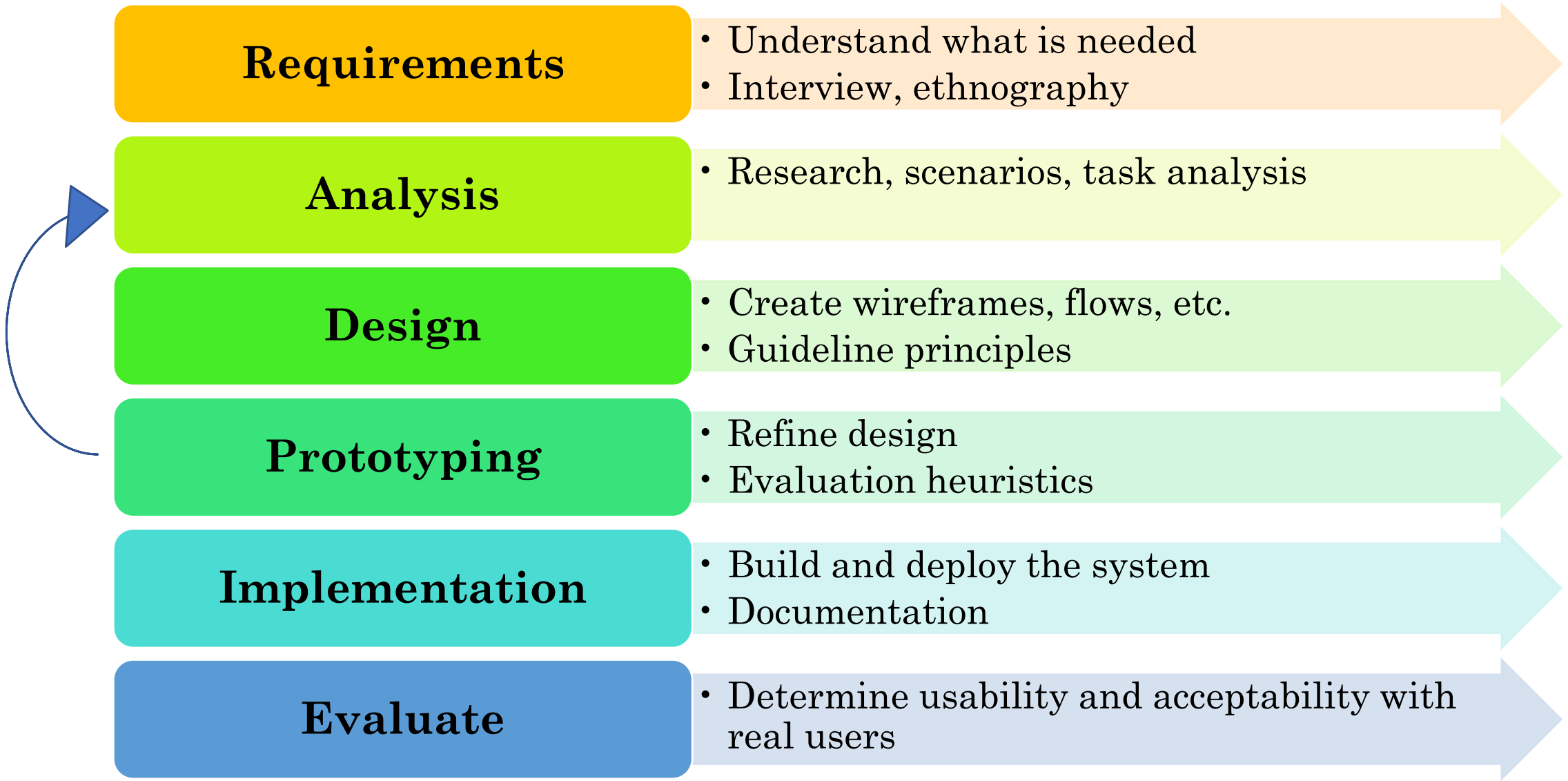
Copyright :envis precisely (2009)
based on »The Disciplines of User Experience« by Dan Saffer (2008)
www.kickerstudio.com/blog/2008/12/the-disciplines-of-user-experience

Interaction Design

- Interaction design is the design of the *interaction* between *users* and *products*
- Aim is to create products that enable the user to achieve their goals in the best way possible
- Users are involved throughout the development of the project
- Design is about balancing trade offs and generating alternative solutions
  - Cost vs. effectiveness
  - Time vs. budget



The Interaction Design Process



Interaction Design Lifecycle Model

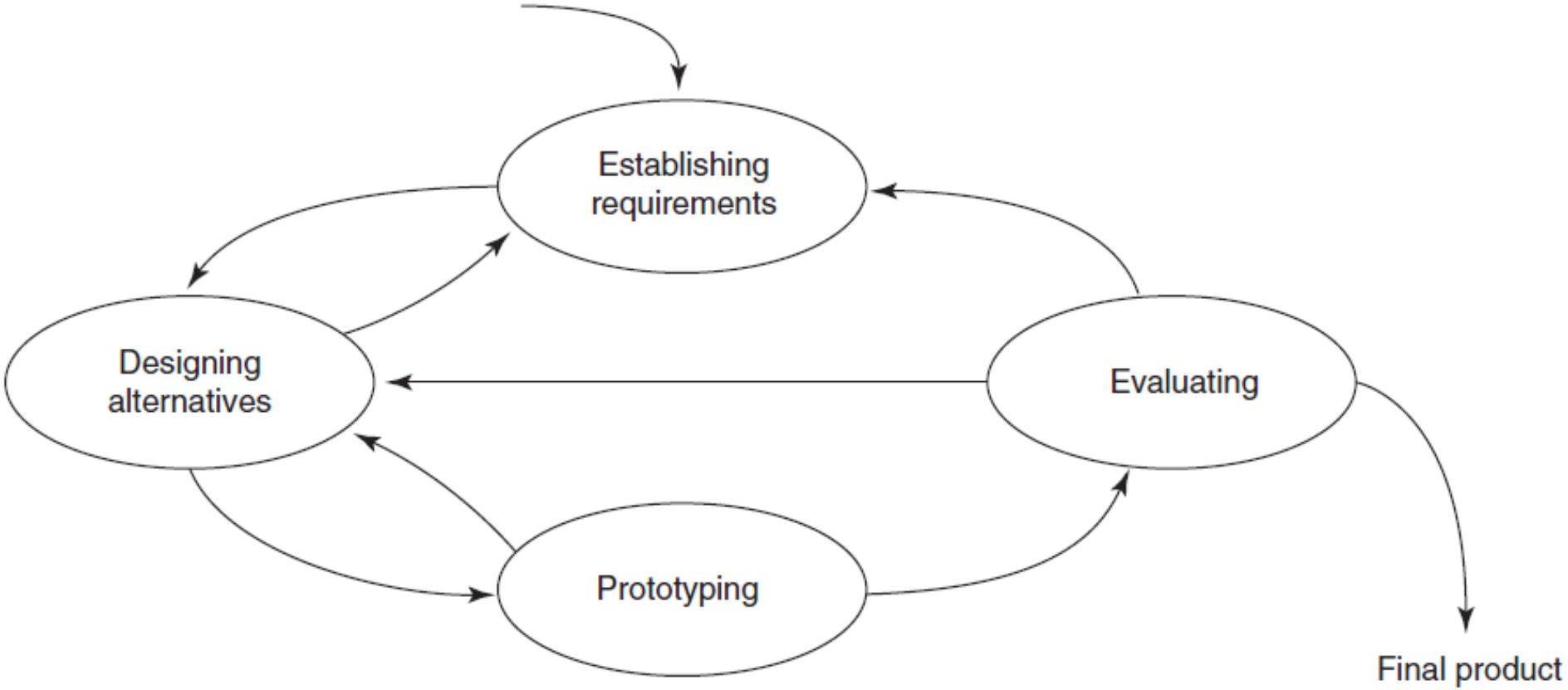
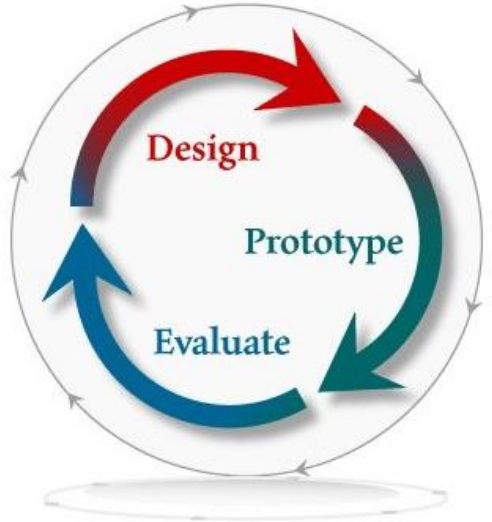


Figure 9.3 A simple interaction design lifecyle model

Preece, J., Rogers, Y., & Sharp, H. “Interaction design beyond human-computer interaction” (Fourth ed.)

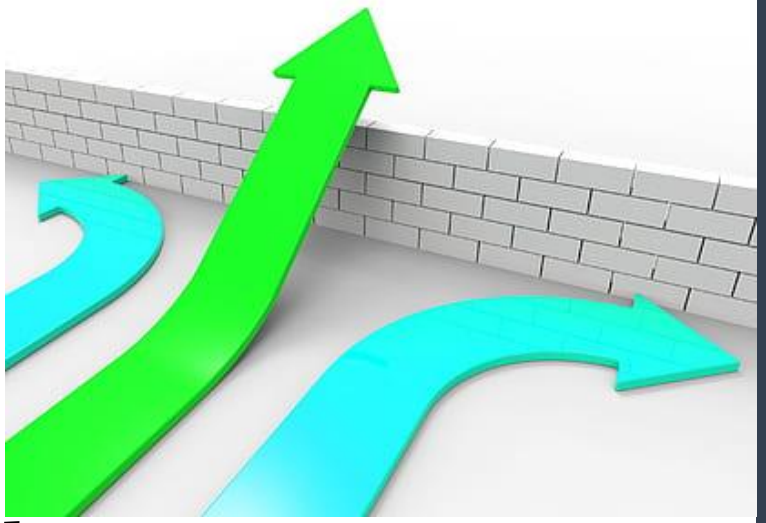
The Importance of Involving Users

- Is vital in order to better understand the users' requirements and to manage expectations
- Users are involved in the design process as active stakeholders
- Errors are corrected earlier
- Higher user acceptance
- Adopting a user-centred approach
  - Early focus on users and tasks
  - Empirical measurements – reactions/performance to scenarios
  - Iterative design – problems are identified, fixed and tested



Interaction Design Issues

- Understanding and supporting human activity away from the workplace
- Implicit input
- Output on different scales
  - Inch, foot, yard
- Integrated digital and physical worlds
- Understanding, representing, and developing technology that supports *context*



Summary

- Technology is increasingly embedded in the world around us and is still driving the agenda
- Interactive technology is more than just windows, a keyboard and mouse
- Pervasive/ubiquitous computing implies a shift in focus away from workplace settings
- Interaction Design/User Experience Design is constantly adapting
  - New technologies
  - New contexts of use
  - New understandings of how people function
- Multidisciplinary perspective vital
- The challenge is to apply this to the design of better systems

Next Time…

- In our next session, we will look at **Interaction Fundamentals**