What is Human Computer Interaction?

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- HCI (human-computer interaction) is the study of **how people interact** with computers and to what extent computers **are or are not developed** for **successful** interaction with human beings.

What is Human Computer Interaction?

- The Interdisciplinary Design Science of Human-Computer Interaction (HCI) combines knowledge and methods associated with professionals including:

  - Psychologists (incl. Experimental, Educational, Social and Industrial Psychologists)

  - Computer Scientists

  - Instructional and Graphic Designers

  - Technical Writers

  - Human Factors and Ergonomics Experts

  - Anthropologists and Sociologists

What is Human Computer Interaction?

- Human-computer interaction (HCI) is an area of research and practice that emerged in the early 1980s, initially as a specialty area in computer science embracing **cognitive science** and **human factors engineering**

- The broad project of **cognitive science**, which incorporated cognitive psychology, artificial intelligence, linguistics, cognitive anthropology, and the philosophy of mind, had formed at the end of the 1970s.

WORKING MEMORY

VISUAL IMAGE STORE

$\delta_{VIS} = 200\ [70\sim1000]$ msec

$\mu_{VIS} = 17\ [7\sim17]$ letters

$\kappa_{VIS} = $ Physical

AUDITORY IMAGE STORE

$\delta_{AIS} = 1500\ [900\sim3500]$ msec

$\mu_{AIS} = 5\ [4.4\sim6.2]$ letters

$\kappa_{AIS} = $ Physical

$\mu_{WM} = 3\ [2.5\sim4.1]$ chunks

$\mu_{WM^*} = 7\ [5\sim9]$ chunks

$\delta_{WM} = 7\ [5\sim226]$ sec

$\delta_{WM}\ (1\ \text{chunk}) = 73\ [73\sim226]$ sec

$\delta_{WM}\ (3\ \text{chunks}) = 7\ [5\sim34]$ se

$\kappa_{WM} = $ Acoustic or Visual

Cognitive Processor

$\tau_C = 70\ [25\sim170]$ msec

Perceptual Processor

$\tau_P = 100\ [50\sim200]$ msec

Motor Processor

$\tau_M = 70\ [30\sim100]$ msec

Eye movement = 230 [70~700] msec

The Model Human Processor was an early cognitive engineering model intended to help developers apply principles from cognitive psychology.

Where HCI came from?

- Until the late **1970s**, the only humans who interacted with computers were information technology professionals and dedicated hobbyists.

- This changed disruptively with the emergence of personal computing in the later **1970s**.

- **Personal computing**, including both **personal software** (productivity applications, such as text editors and spreadsheets, and interactive computer games) and personal **computer platforms** (operating systems, programming languages, and hardware),

- This made **everyone in the world a potential computer user**, and vividly highlighted the deficiencies of computers with respect to usability for those who wanted to use computers as **tools**.
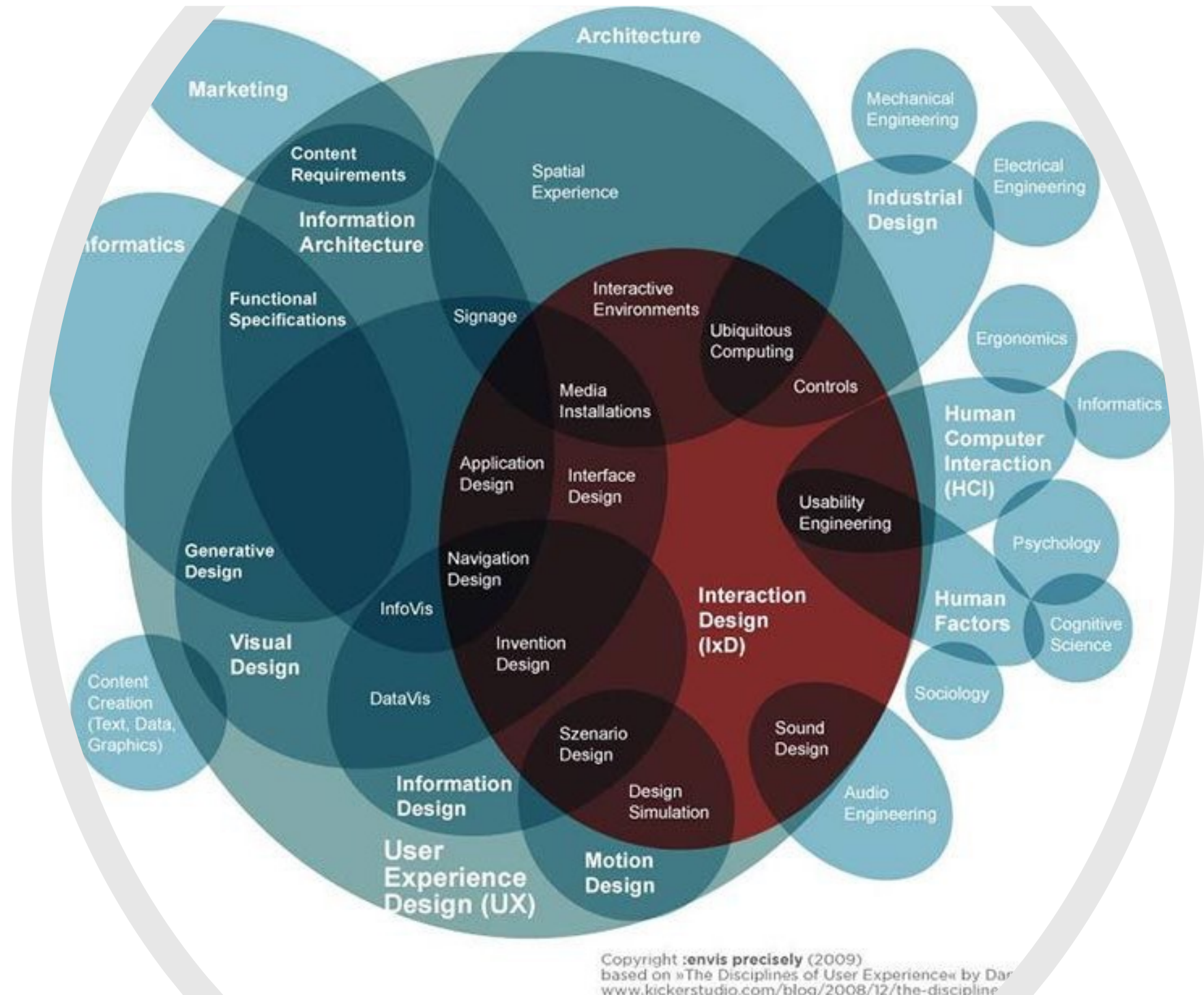
Where HCI came from?

- Software engineering, mired in unmanageable software complexity in the 1970s (the "software crisis"), was starting to focus on **nonfunctional requirements**, including **usability** and maintainability, and on empirical software development processes that relied heavily on **iterative prototyping** and **empirical testing**.

- **Computer graphics** and **information retrieval** had emerged in the 1970s, and rapidly came to recognize that interactive systems were the key to progressing beyond early achievements.

- All these threads of development in computer science pointed to the same conclusion: The way forward for computing entailed **understanding** and **better empowering users**

From cabal to community

- The original and abiding technical focus of HCI was and is the concept of **usability**. This concept was originally articulated somewhat naively in the slogan "**easy to learn, easy to use**". The blunt **simplicity** of this conceptualization gave HCI an edgy and prominent identity in computing.

- Usability now often subsumes qualities like *fun, well being, collective efficacy, aesthetic tension, enhanced creativity, flow, support for human development, and others*.

- A more dynamic view of usability is one of a programmatic objective that should and will *continue to develop as our ability to reach further toward it improves.*

From cabal to community

- Indeed, it no longer makes sense to regard HCI as a specialty of computer science; HCI has grown to be broader, larger and **much more diverse than computer science itself.**

- HCI expanded from its initial focus on individual and generic **user behavior** to include **social** and **organizational computing**, **accessibility** for the elderly, the cognitively and physically impaired, and for **all people**, and for the widest possible spectrum of human experiences and activities.

- It expanded from **desktop** office applications to include **games**, **learning** and **education**, commerce, health and medical applications, et.

- It expanded from **early graphical user interfaces** to include myriad interaction techniques and **devices**, **multi-modal interactions**, tool support for model-based user interface specification, and a host of emerging **ubiquitous**, **handheld** and **context-aware interactions**.

Architecture

Marketing

Mechanical Engineering

Content Requirements

Spatial Experience

Electrical Engineering

Informatics

Information Architecture

Industrial Design

Functional Specifications

Signage

Interactive Environments

Ubiquitous Computing

Ergonomics

Media Installations

Controls

Human Computer Interaction (HCI)

Informatics

Application Design

Interface Design

Usability Engineering

Generative Design

Navigation Design

Psychology

InfoVis

Interaction Design (IxD)

Human Factors

Cognitive Science

Visual Design

Invention Design

Content Creation (Text, Data, Graphics)

DataVis

Szenario Design

Sound Design

Sociology

Information Design

Design Simulation

Audio Engineering

User Experience Design (UX)

Motion Design

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based on »The Disciplines of User Experience« by Dan
www.kickerstudio.com/blog/2008/12/the-discipline

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The task-artifact cycle

- HCI is about understanding and critically evaluating the interactive technologies people use and experience.

- But it is also about how those interactions evolve as people appropriate technologies, as their expectations, concepts and skills develop, and as they articulate new needs, new interests, and new visions and agendas for interactive technology

Adoption, appropriation, use

Tasks

Artifacts

Requirements and design ideas
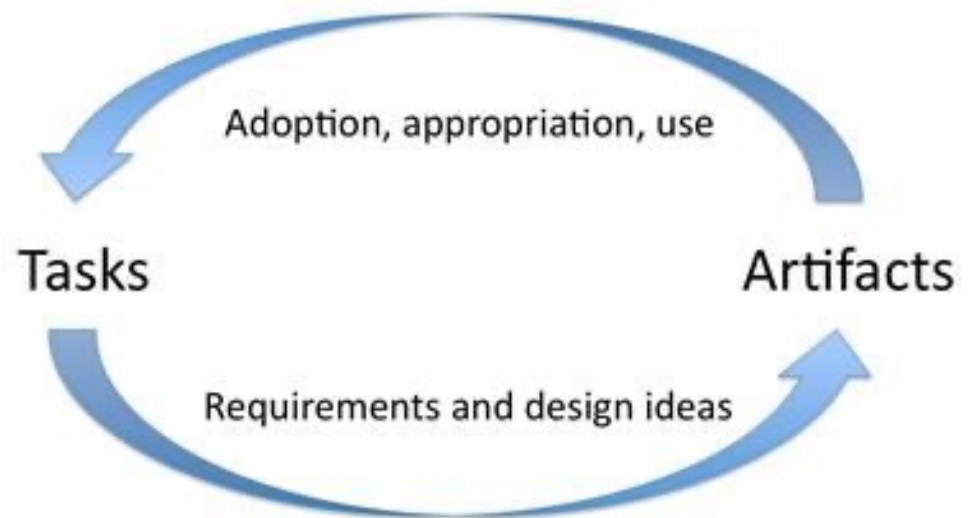
UX and IxD

- user experience design and interaction design were among the first exports from HCI to the design world

https://chi2023.acm.org/

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