

Interaction Design

Recap Session (Previous lecture April 21, 2016,
9am-12pm): Process Models, Elements and Usability

Recap Day 2:



Bill Verplank

1. “How do you do?”

How do you affect the world?

You can grab hold of a handle and manipulate it, keeping control as you do it.

2. “How do you feel?”

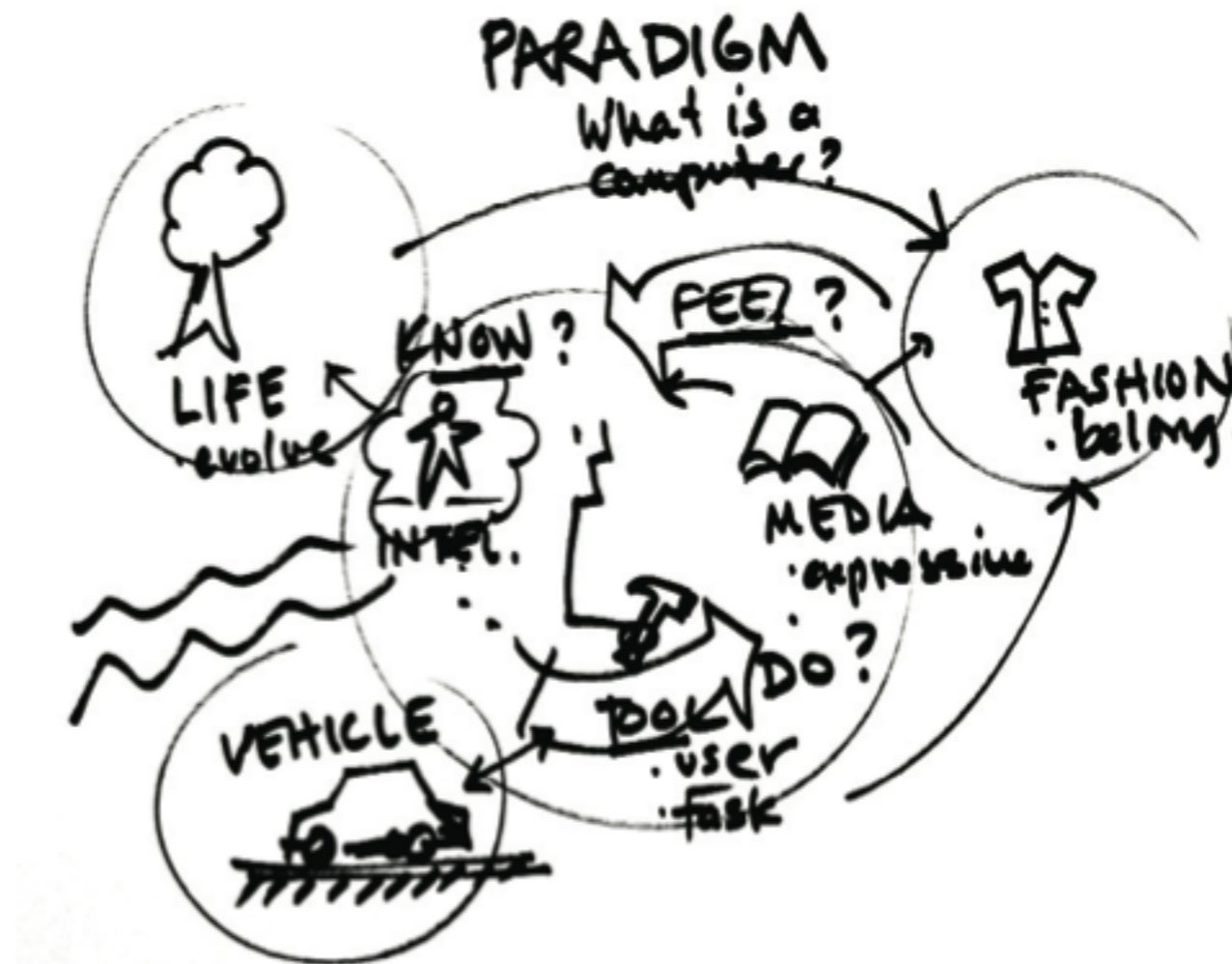
How do you get feedback?

That’s where a lot of feelings come from; a lot of our emotions about the world come from the sensory qualities of those media that we present things with.

3 “How do you know?”

The map shows the user an overview of how everything works, and the path shows them what to do, what they need to know moment by moment

Interaction Design Paradigms

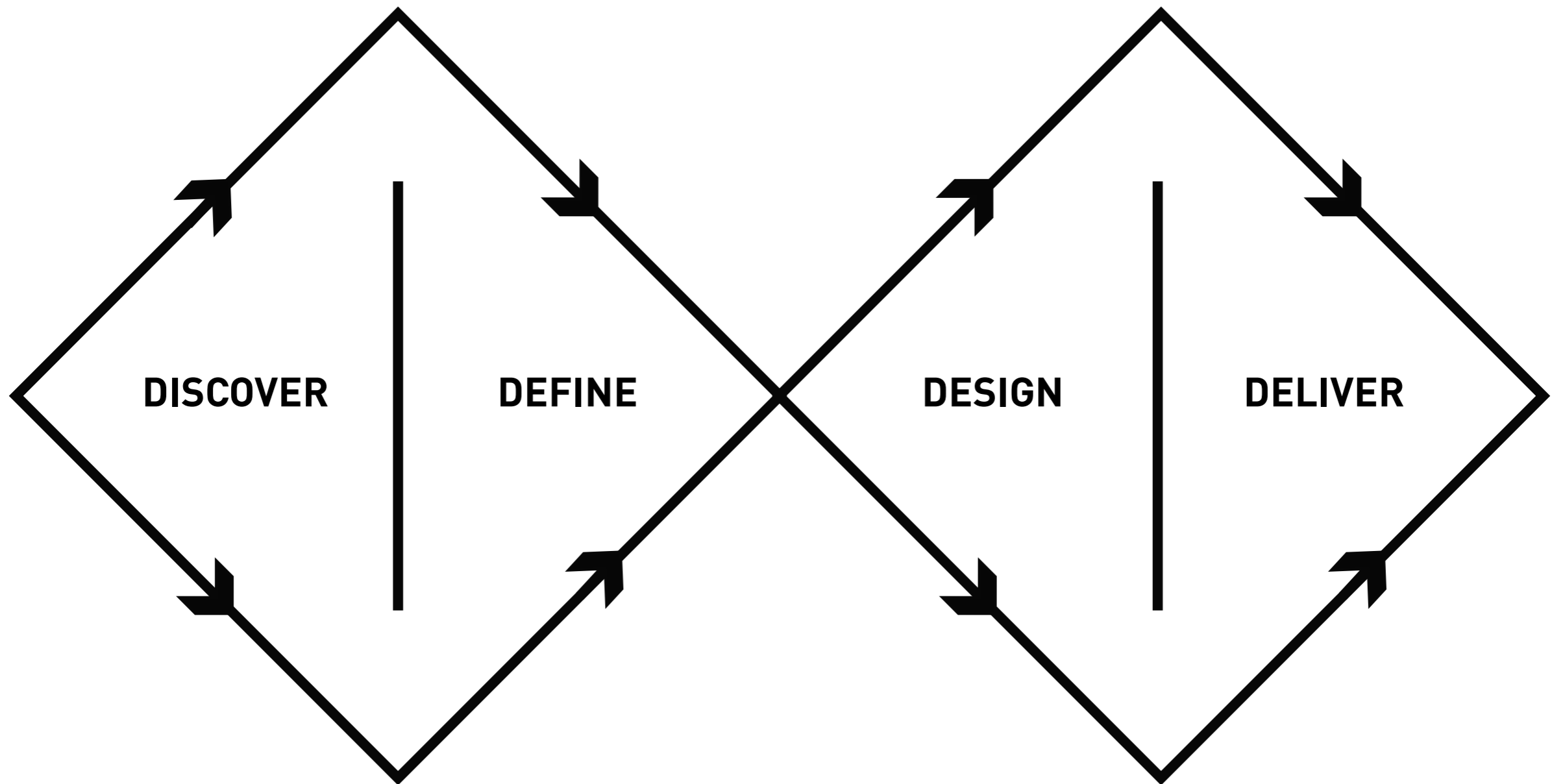


A paradigm is an example that serves as a pattern for the way people think about something.

It is the set of questions that a particular community has decided are important. For interaction design there is often some confusion about what paradigm you are working with. The basic question is, What is a computer?

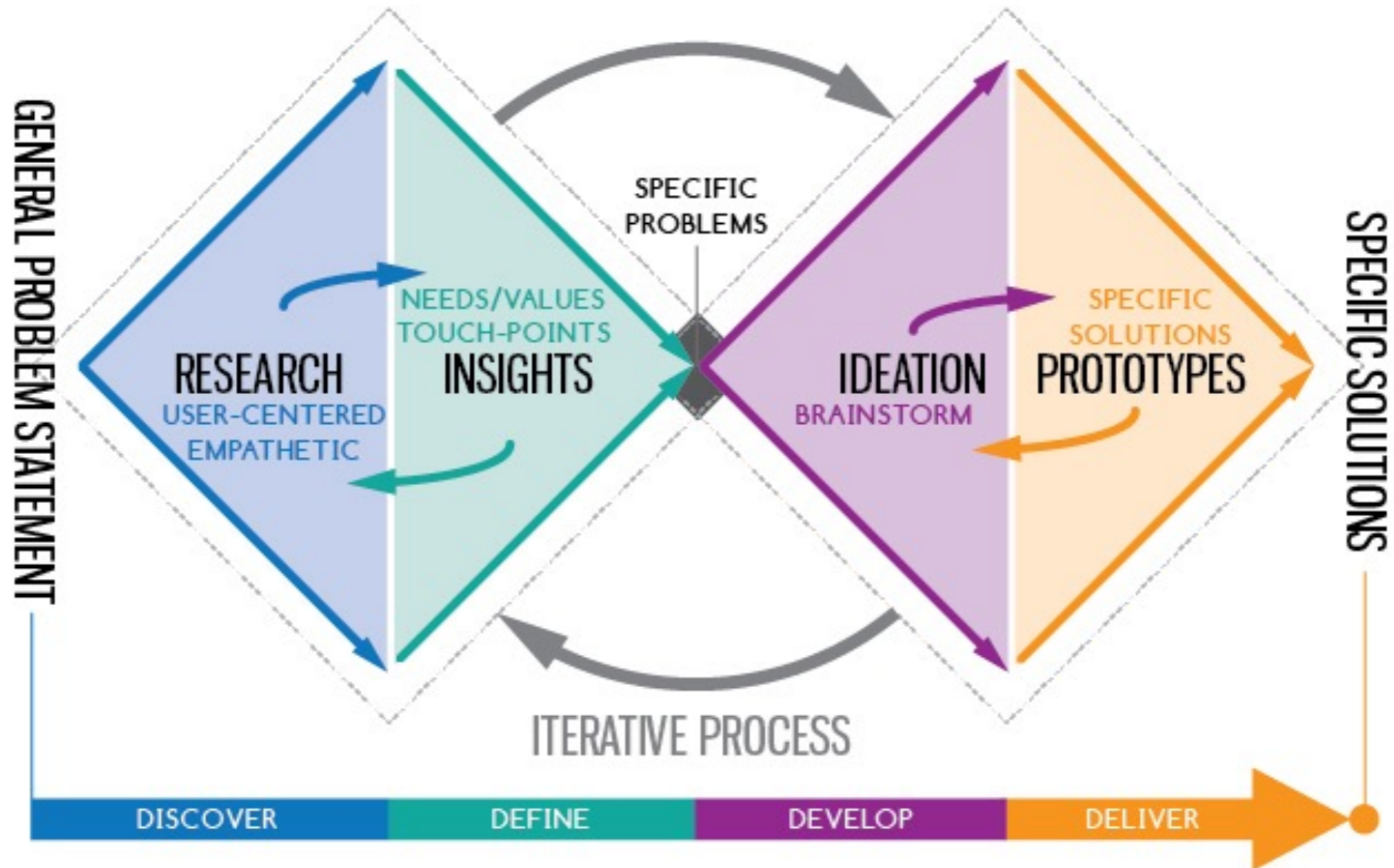
source: [3]

Double Diamond



source: [2]

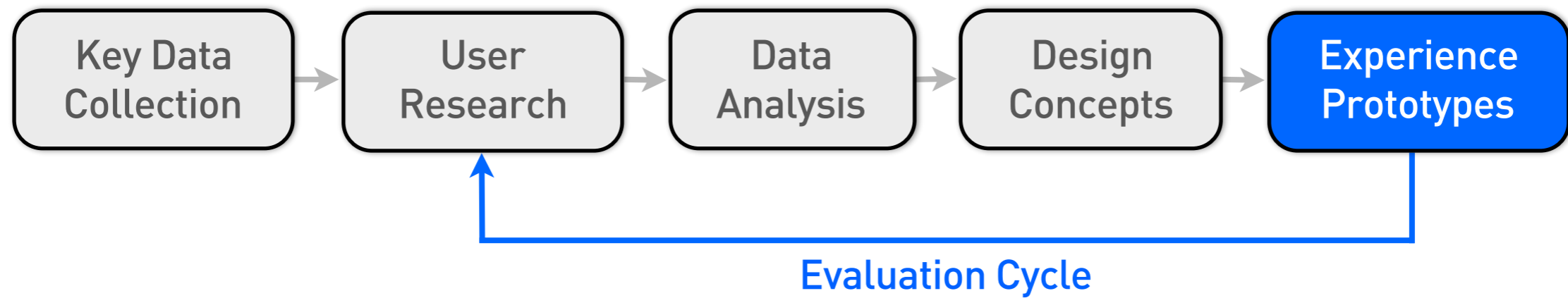
Double Diamond DESIGN PROCESS



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UCD Design Process Model



source: [2]



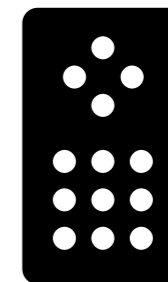
Appearance/Affordances

Appearance

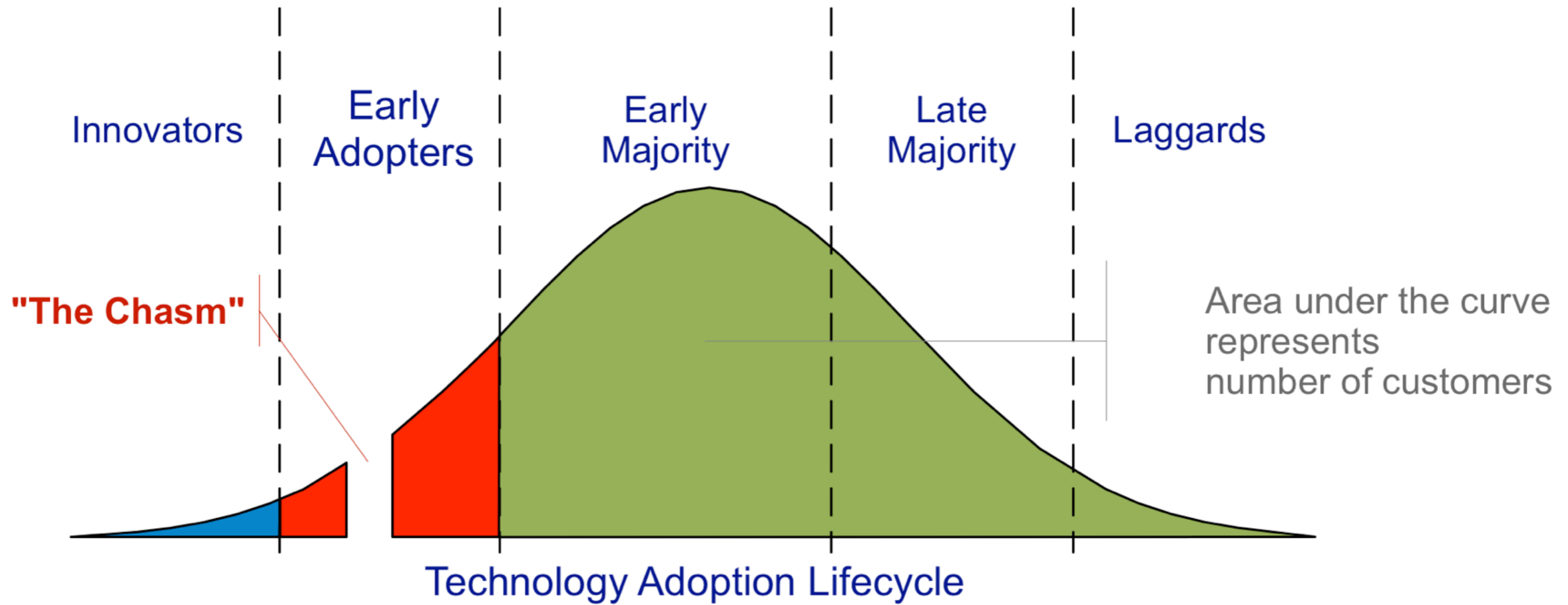
Appearance is the major source (texture is the other) of what cognitive psychologist James Gibson, in 1966, called **affordances**.

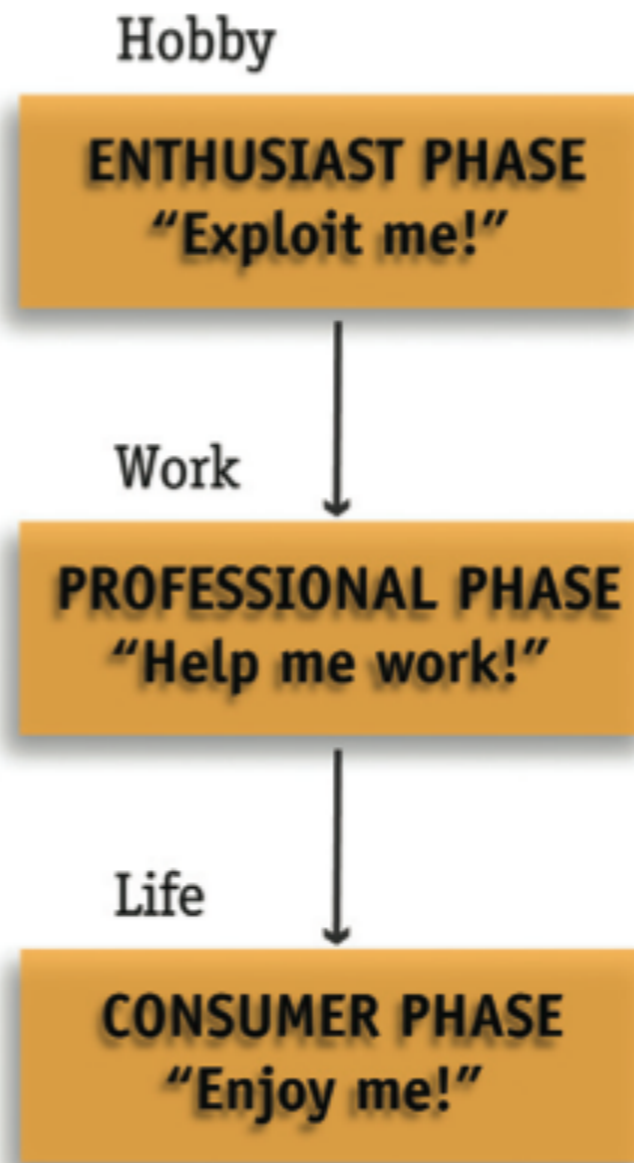
Gibson explored the concept more fully in his 1979 book *The Ecological Approach to Visual Perception*, but it wasn't until Don Norman's seminal book *The Psychology of Everyday Things*, in 1988, that the term spread into design.

An **affordance** is a property, or multiple properties, of an object that provides some indication of how to interact with that object or with a feature on that object.

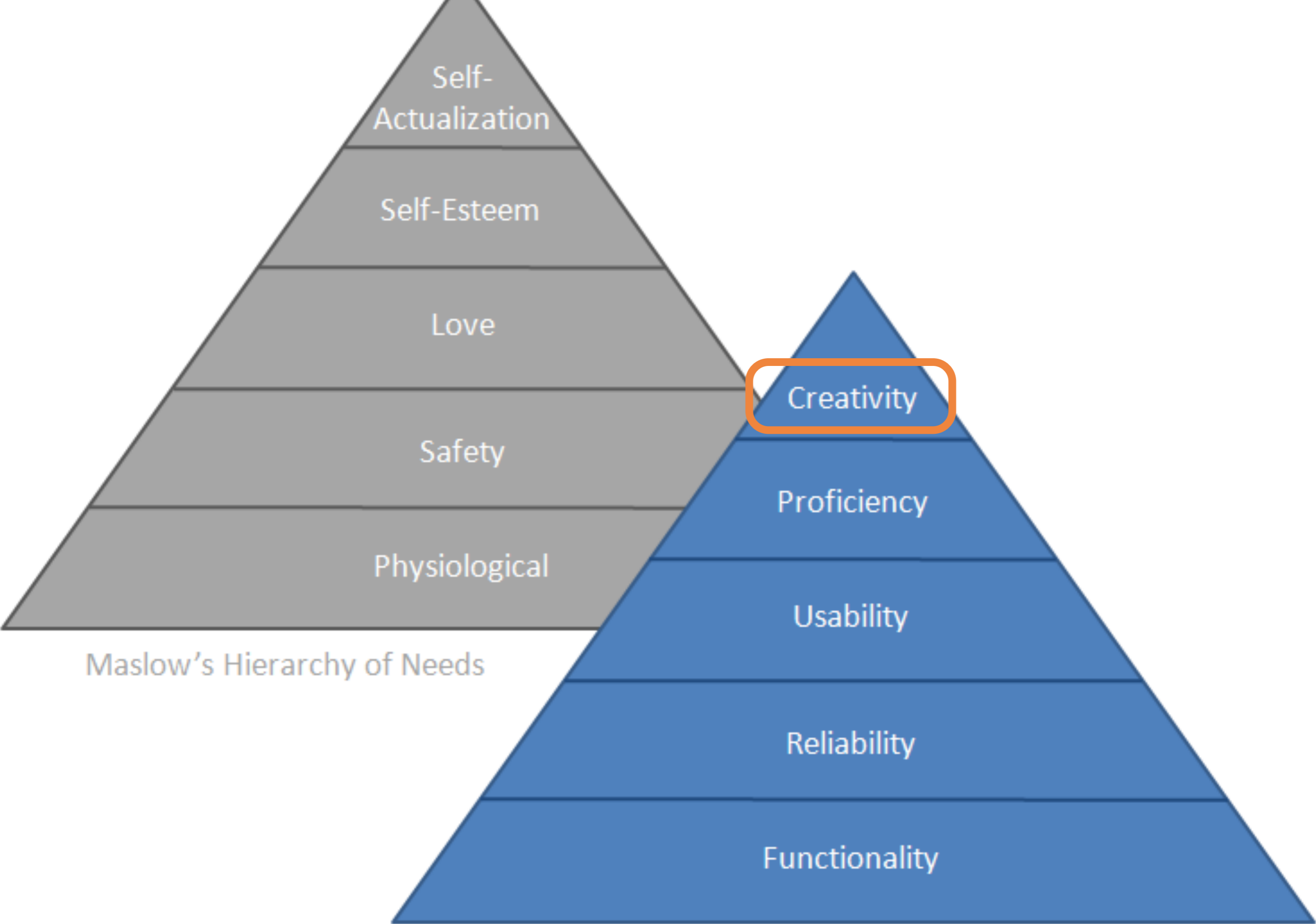


source: [2&5]





source: [3]



Maslow's Hierarchy of Needs

Design Hierarchy of Needs

source: [7]

Visibility of system status

Match between system and the real world

User control and freedom

Consistency and standards

Error prevention

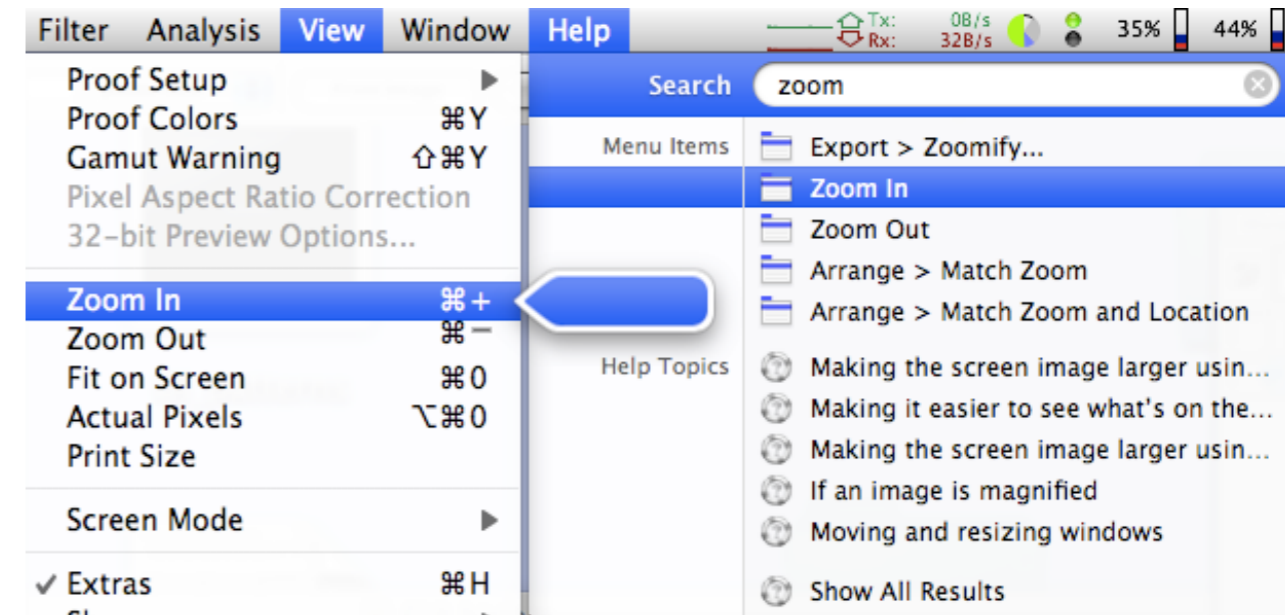
Recognition rather than recall

Flexibility and efficiency of use

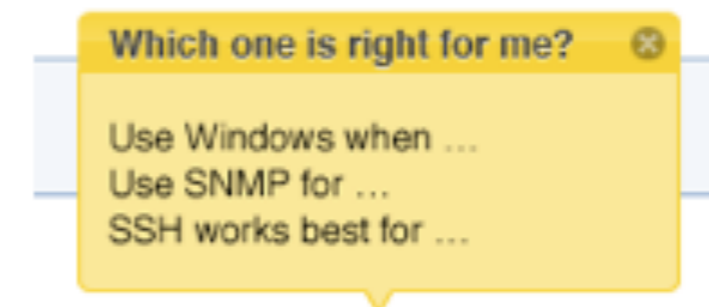
Aesthetic and minimalist design

Help users recognize, diagnose,
and recover from errors

Help and documentation



Mac OS X 10.5 (Screenshot)



e following: 

Zenoss

EUROPÄISCHE NORM

EUROPEAN STANDARD

NORME EUROPÉENNE

EN ISO 9241-10

1995-02-09

ICS 331.101.1.-651.2.,681.31.022

Deskriptoren: Ergonomie, Büromaschinen, Datenverarbeitungseinrichtung, Textverarbeitung, Dateneneinrichtung, Bildschirmgeräte, Leistungsbewertung, Grundlagen, Softwaregestaltung

Deutsche Fassung

**Ergonomische Anforderungen für Bürotätigkeiten mit Bildschirmgeräten
Teil 10: Grundsätze der Dialoggestaltung
(ISO 9241-10 : 1995)**

Ergonomic requirements for office work
with visual display terminals (VDTs) -
Part 10: Dialogue principles (ISO 9241-
10 : 1995)

Exigences ergonomiques pour travail de
bureau avec terminaux à écrans de
visualisation (TEV) - Partie 10: Principes
de dialogue (ISO 9241-10 : 1995)

Diese Europäische Norm wurde von CEN am ... angenommen.

ISO 9241-10

Die CEN-Mitglieder sind gehalten, die CEN/CENELEC-Geschäftsordnung zu erfüllen, in der die Bedingungen festgelegt sind, unter denen dieser Europäischen Norm ohne jede Änderung der Status einer nationalen Norm zu geben ist.

3 Grundsätze der Dialoggestaltung

Die Grundsätze der Dialoggestaltung werden zusammen mit einer kurzen Beschreibung und typischen Empfehlungen, gefolgt von Beispielen, dargestellt. Die Beispiele veranschaulichen mögliche Realisierungen. Empfehlungen und Beispiele wurden zur Verdeutlichung ausgewählt und sind nicht erschöpfend.

3.1 Aufgabenangemessenheit

Ein Dialog ist aufgabenangemessen, wenn er den Benutzer unterstützt, seine Arbeitsaufgabe effektiv und effizient zu erledigen.

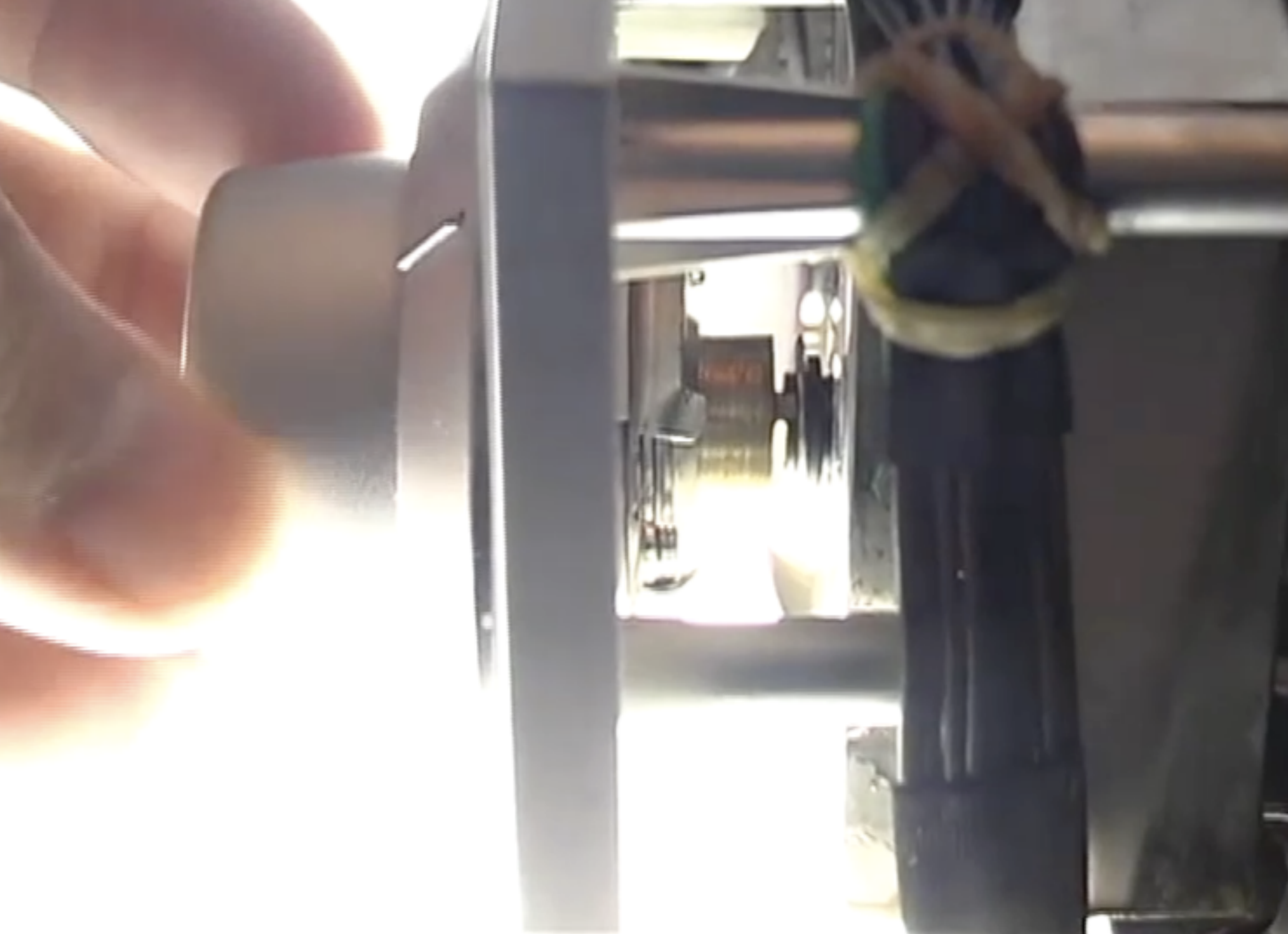
Empfehlungen:	mögliche Beispiele:
Der Dialog sollte dem Benutzer nur solche Informationen anzeigen, die im Zusammenhang mit der Erledigung der Arbeitsaufgabe stehen.	Formatierungen wie z.B. Farbe und Informationen wie z.B. Wochentag, Datum usw. werden nur angezeigt, wenn sie die Erledigung der Arbeitsaufgabe erleichtern.
Die angezeigte Hilfe-Information sollte von der Aufgabe abhängen.	Wenn der Benutzer Hilfe aufruft, zeigt das Dialogsystem Informationen zur gegenwärtigen Aufgabe an (z.B. während des Editierens eine Liste der Editierbefehle). Wenn eine Dialog-Box angezeigt wird und der Benutzer Hilfe aufruft, zeigt das Dialogsystem Informationen zu dieser Dialog-Box an.
Alle Aufgaben, die sinnvollerweise dem Dialogsystem zur automatischen Ausführung übertragen werden können, sollten durch das Dialogsystem ausgeführt werden, ohne den Benutzer damit zu belasten.	Die Positionsmarke wird automatisch auf das erste Eingabefeld positioniert, das für die Arbeitsaufgabe relevant ist. Startprozeduren des Systems laufen automatisch ab.
Bei der Gestaltung des Dialogs sollte der Komplexität der Arbeitsaufgabe unter Berücksichtigung der Fertigkeiten und Fähigkeiten des Benutzers Rech-	In einem öffentlich zugänglichen Dialogsystem wird dort, wo es eine Reihe alternativer Eingabemöglichkeiten gibt, ein Menü verwendet, um die

Interaction Design

Chapter 3 (May 19, 2016, 9am-12pm):
Approaches to IxD

Approaches to Interaction Design

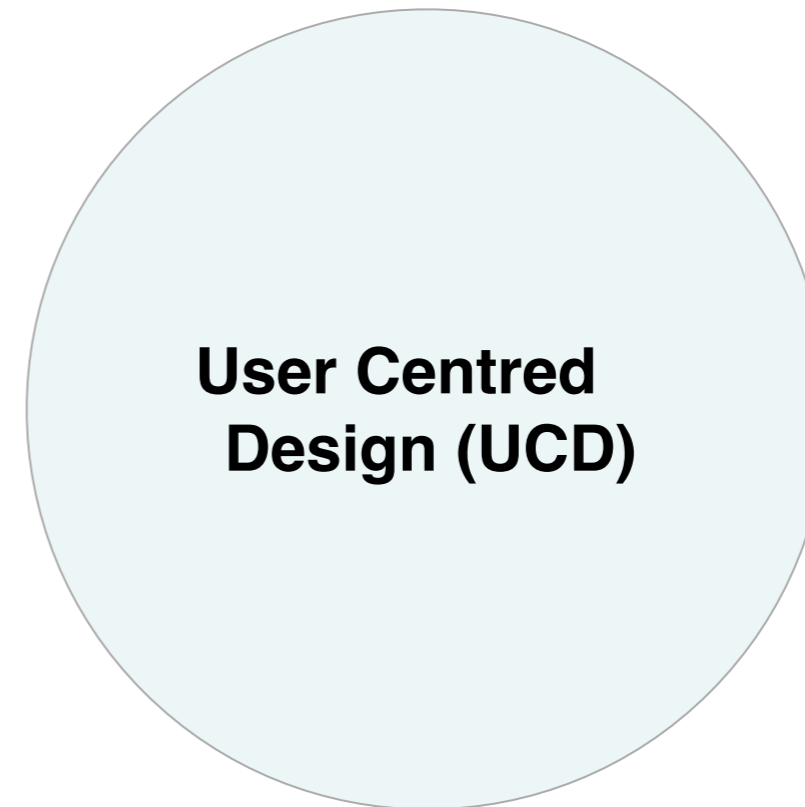
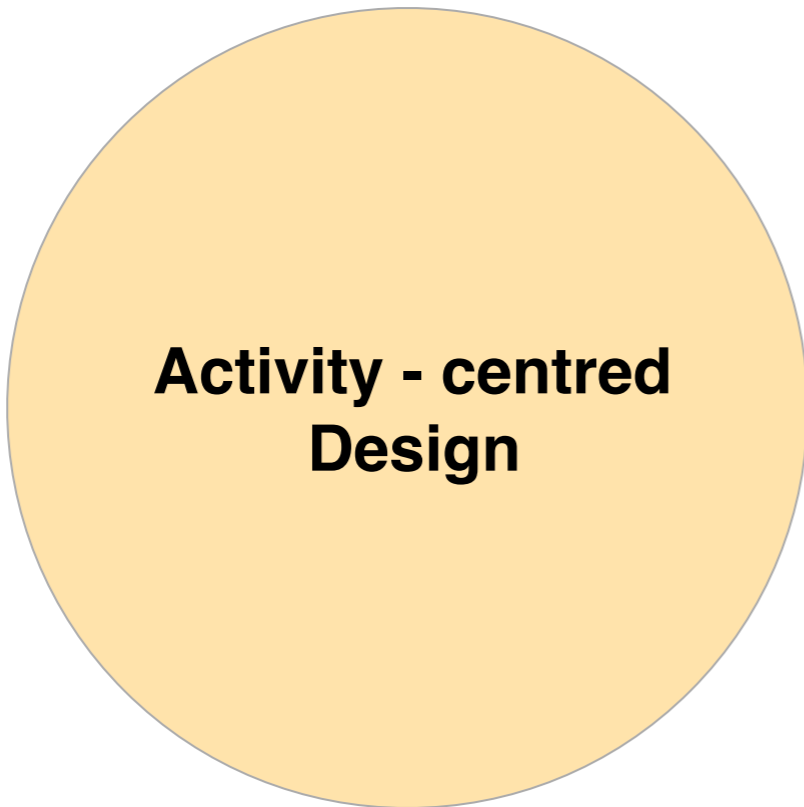
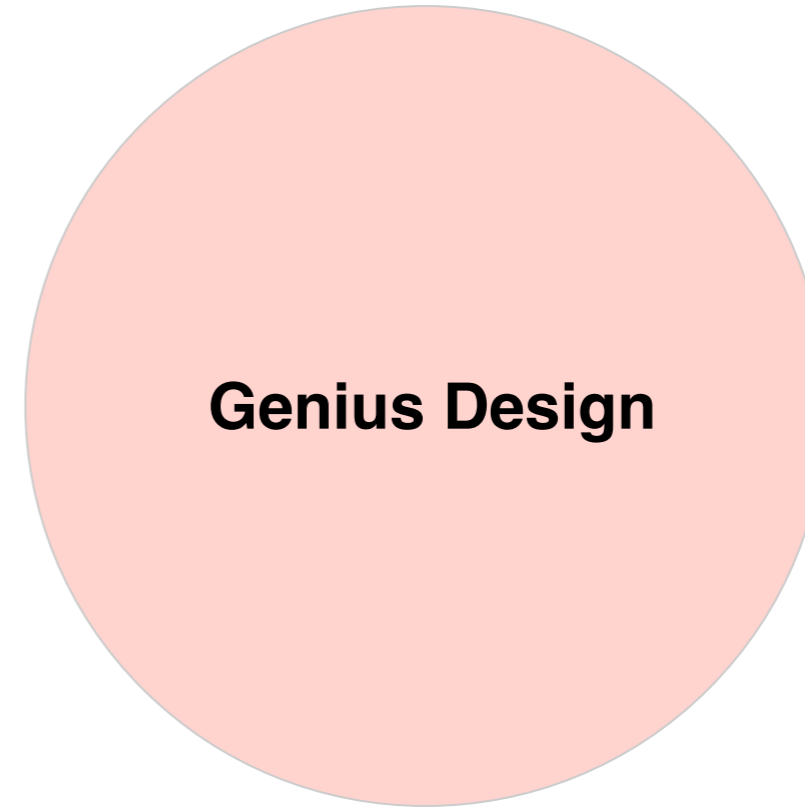
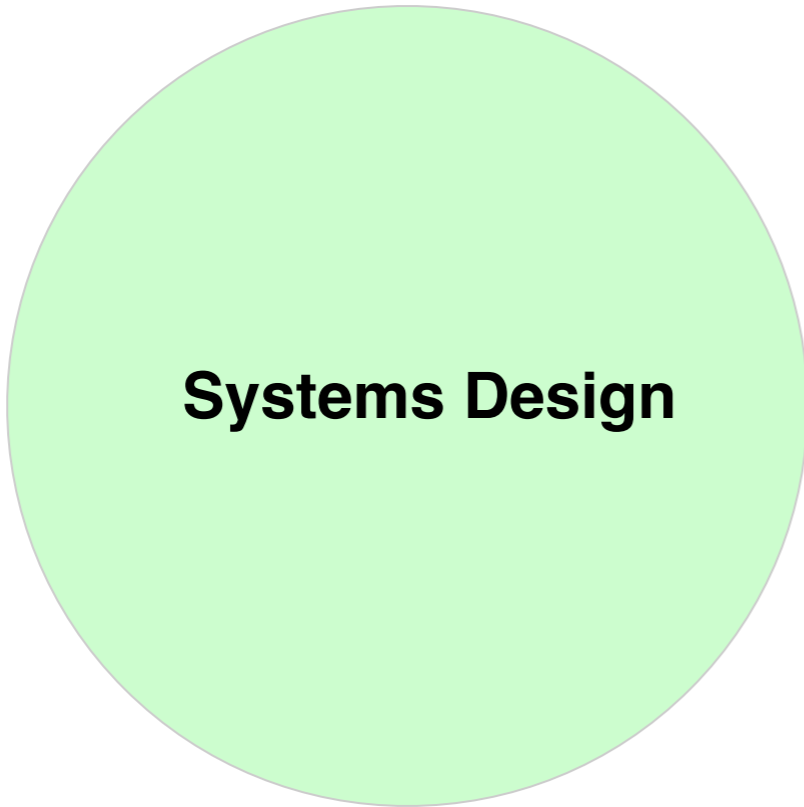
- The Purpose of Different Approaches
- Four Main Approaches
- User Centred Design (UCD)
- Activity Centred Design
- Systems Design
- Genius Design





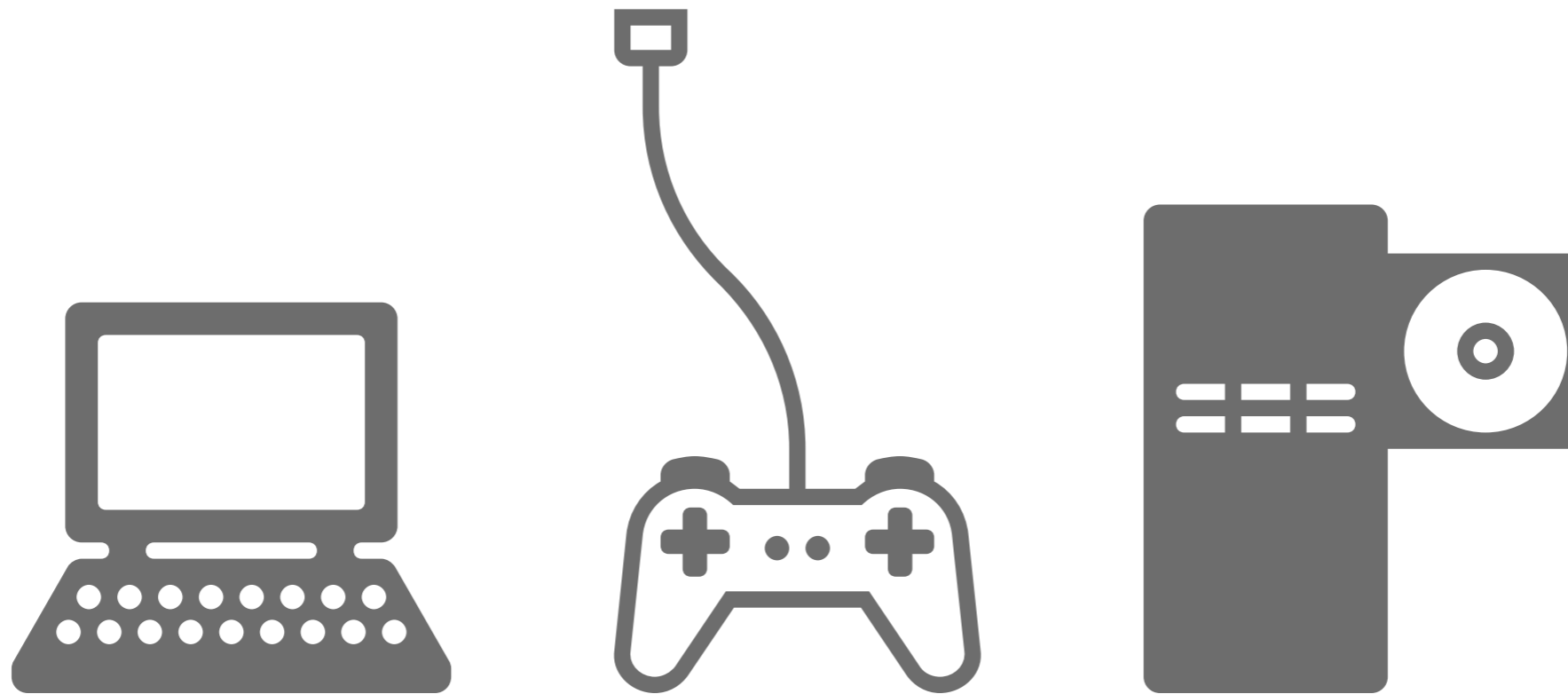
Approaches to Interaction Design

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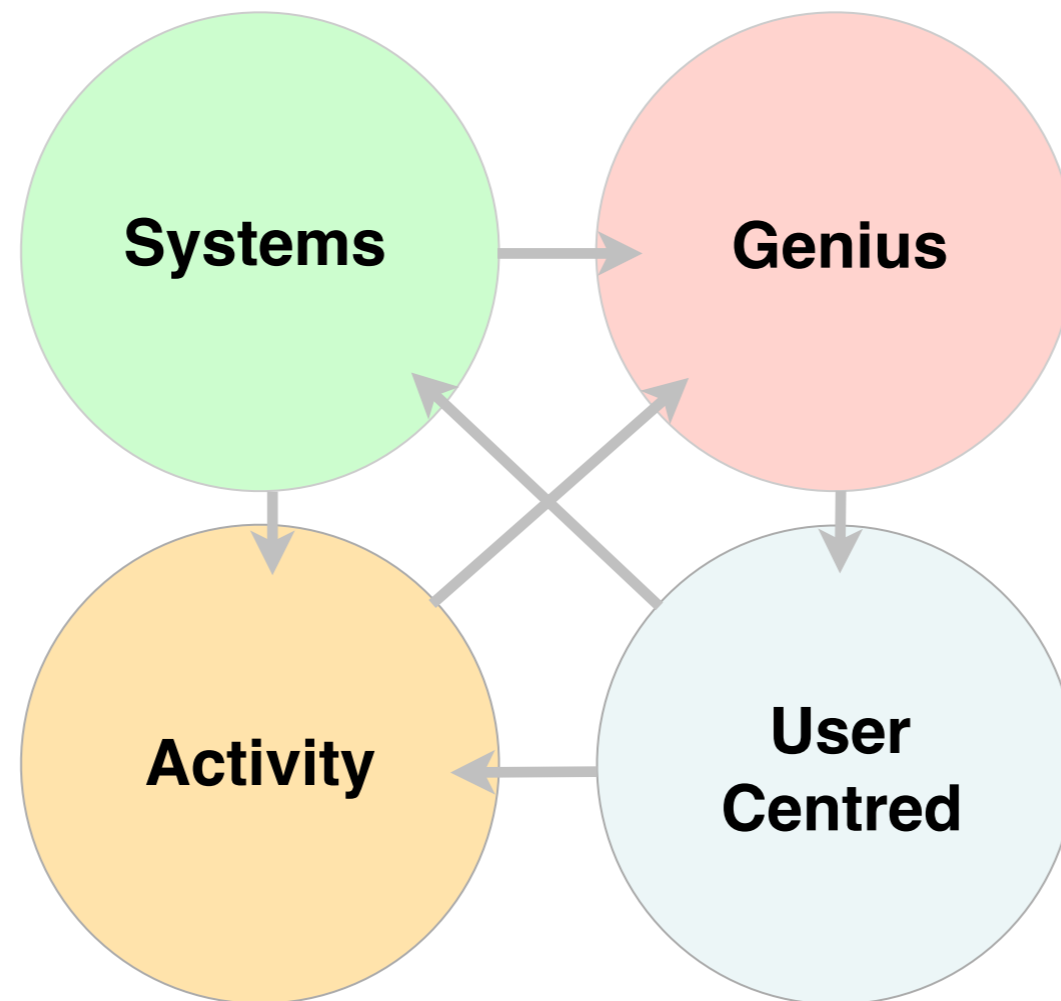
source: [5]

- can be used in many different situations to create vastly different products and services,
- e.g. Web sites, consumer electronics or nondigital services.



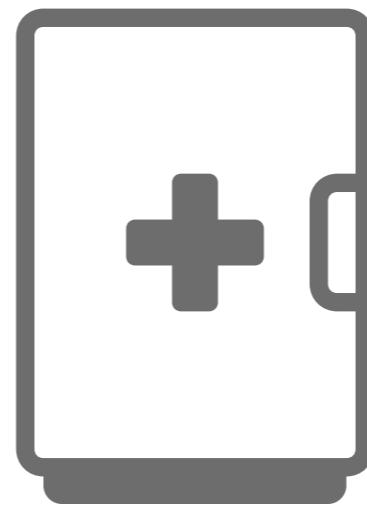
source: [5]

- move between approaches, applying the best approach to the right context
- sometimes applying multiple approaches even within a single project.



source: [5]

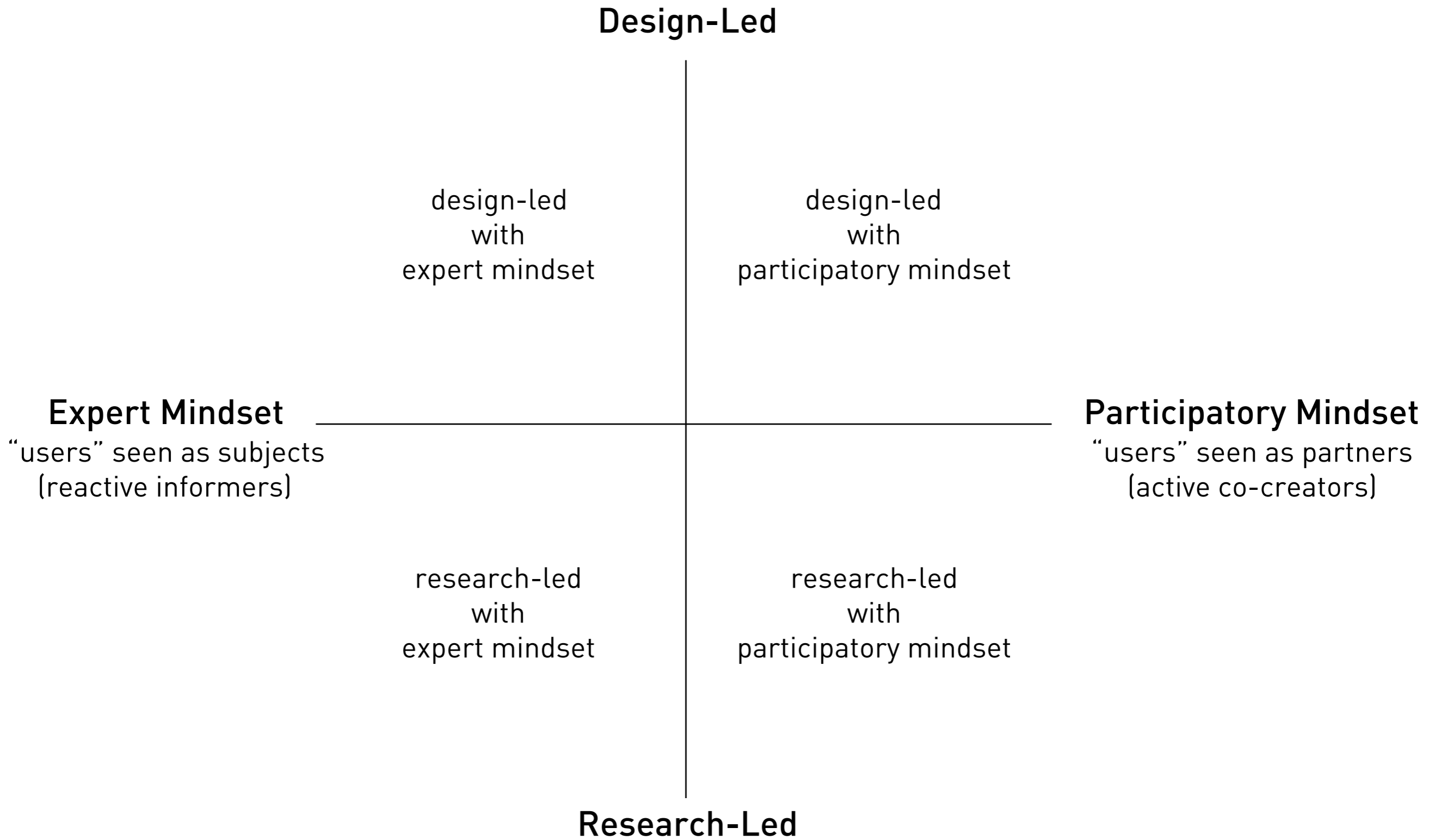
- problematic situations can be improved by developing at least one of these approaches



Four Approaches to Design

<i>Approach</i>	<i>Overview</i>	<i>Users</i>	<i>Designer</i>
User-Centered Design	Focuses on user needs and goals	Guide the design	Translates user needs and goals
Activity-Centered Design	Focuses on the tasks and activities that need to be accomplished	Perform the activities	Creates tools for actions
Systems Design	Focuses on the components of a system	Set the goals of the system	Makes sure all the parts of the system are in place
Genius Design	Relies on the skill and wisdom of designers used to make products	Source of validation	Is the source of inspiration

source: [5]



source: [6+7]

Approaches to Interaction Design

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Case Study:

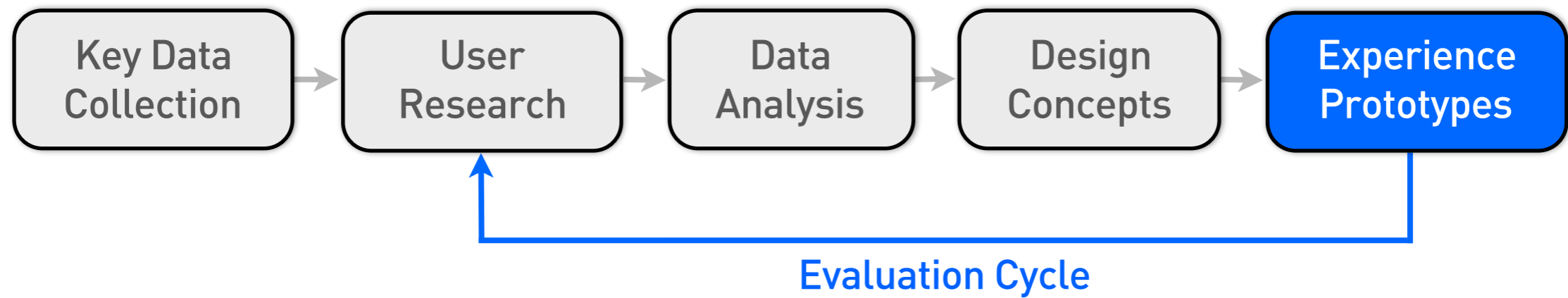
Paul Bradly

- designed the “Microsoft Mouse”
- followed an established “User Centred Design Process” (UCD)
- helps Interaction Designers at IDEO developing their prototypes

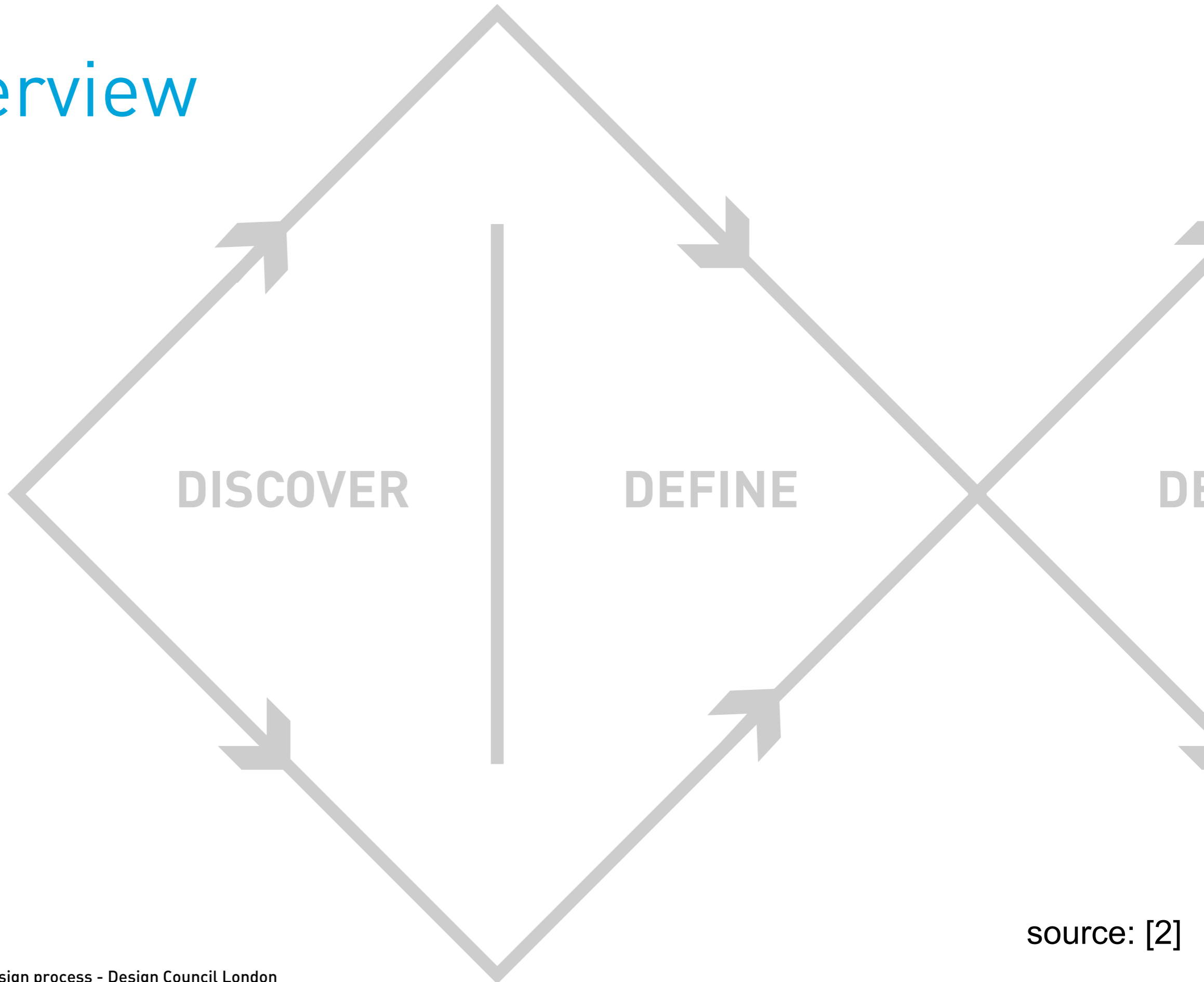




Looking back...



Overview



source: [2]

User Centred Design (UCD)

Philosophy: Users know best

- People who will be using a product or service know what their **needs, goals** and preferences are
- Designers aren't the users.
- Participation from users at every stage of the design process.
- Roots in industrial design and ergonomics:
Industrial designer Henry Dreyfuss (Bell) popularised the method with his 1955 book "Designing for People".
- Software designers were long time unaware of the method

source: [5]

- With increased memory and processor powers and color monitors different forms of interfaces were now possible
- In the early 1980's a movement began **focusing on the users** not on computers.



source: [5]

What is a user centred approach?

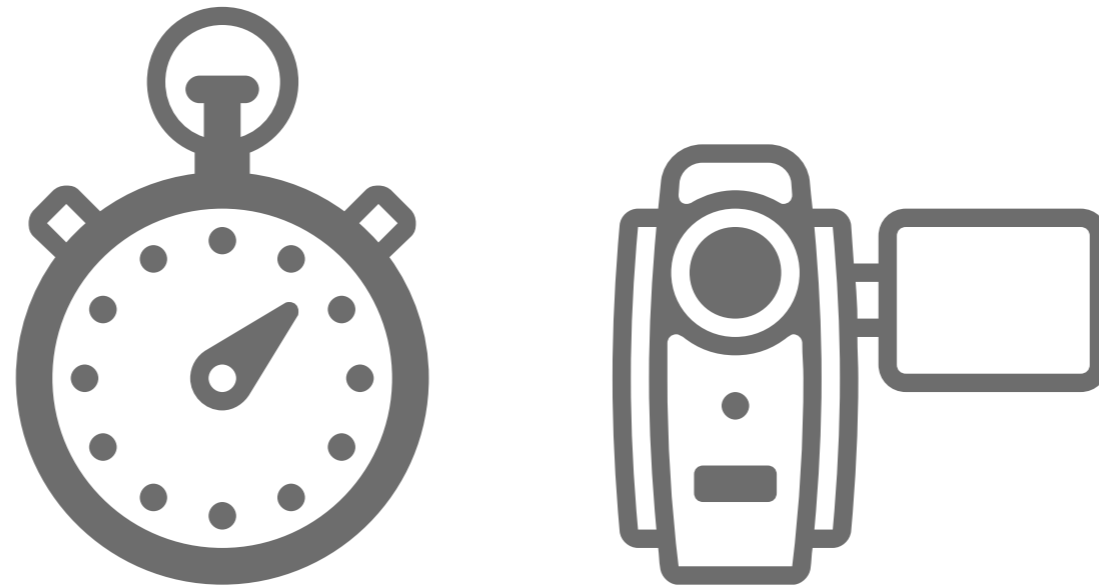
- User centred approach is based on:
 - **Early focus** on users and tasks: directly studying cognitive, behavioural, anthropomorphic & attitudinal characteristics



source: [4]

What is a user centred approach?

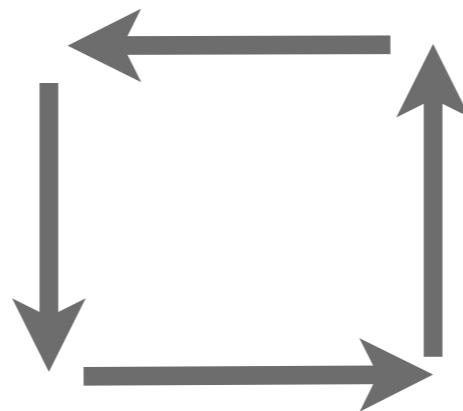
- User centred approach is based on:
 - **Early focus** on users and tasks: directly studying cognitive, behavioural, anthropomorphic & attitudinal characteristics
 - **Empirical measurement:** users' reactions and performance to scenarios, manuals, simulations & prototypes are observed, recorded and analysed



source: [4]

What is a user centred approach?

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 - **Early focus** on users and tasks: directly studying cognitive, behavioural, anthropomorphic & attitudinal characteristics
 - **Empirical measurement:** users' reactions and performance to scenarios, manuals, simulations & prototypes are observed, recorded and analysed
 - **Iterative design:** when problems are found in user testing, fix them and carry out more tests



source: [4]

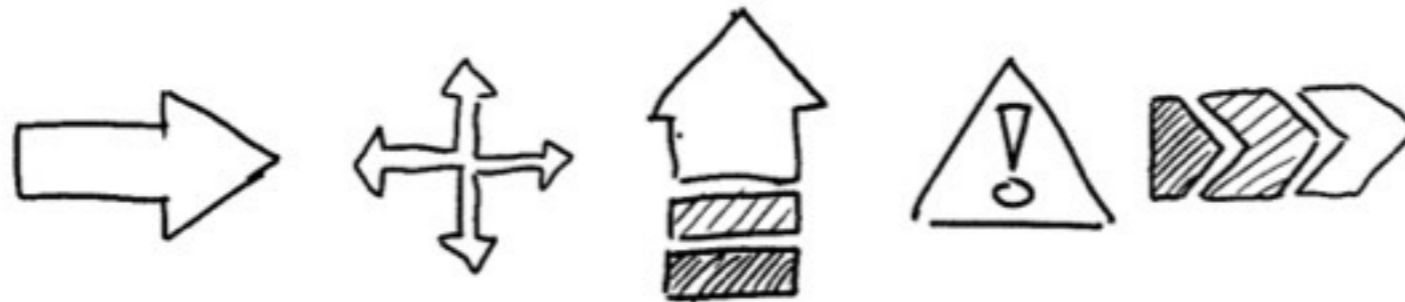
Four basic activities

- Identifying needs and establishing requirements



Four basic activities

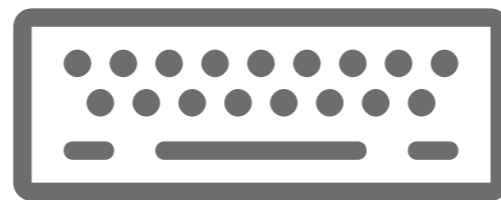
- Identifying needs and establishing requirements
- Developing alternative designs



source: [4]

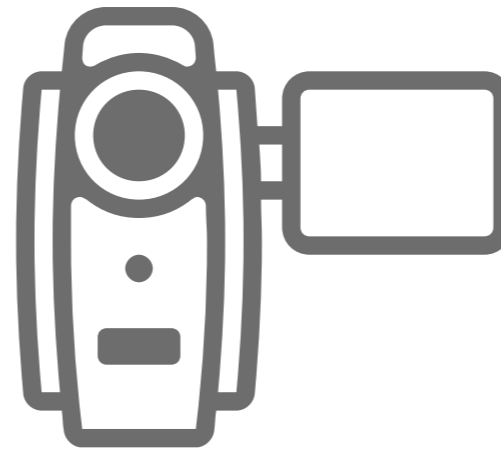
Four basic activities

- **Identifying needs and establishing requirements**
- **Developing alternative designs**
- **Building interactive versions of the designs**



Four basic activities

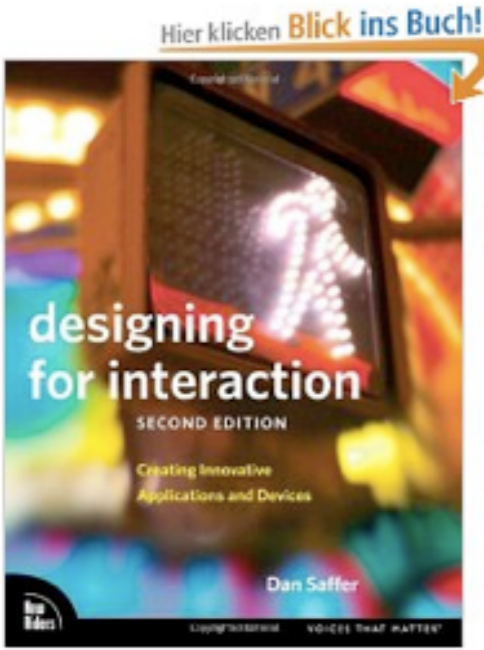
- **Identifying needs and establishing requirements**
- **Developing alternative designs**
- **Building interactive versions of the designs**
- **Evaluating designs**



source: [4]

Summary:

- **Goals** are important in UCD -> interaction designer focus on what the user ultimately wants to accomplish.
- Interaction designer determines the user's task and means necessary to achieve those goals -> always with the users needs and preferences in mind
- Interaction designers involve users at every stage of the process
- Users are consulted of the very beginning of a new project
- Interaction designers conduct extensive research (Chapter 4) up front to determine what the users goals are in the current situation
- Interaction Designers test and try prototypes of a system with users
- **User data is a determining factor throughout the project when making decisions**



Designing for Interaction: Creating Innovative Applications and Devices (Voices That Matter) [Taschenbuch]

Dan Saffer (Autor)
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Wird oft zusammen gekauft



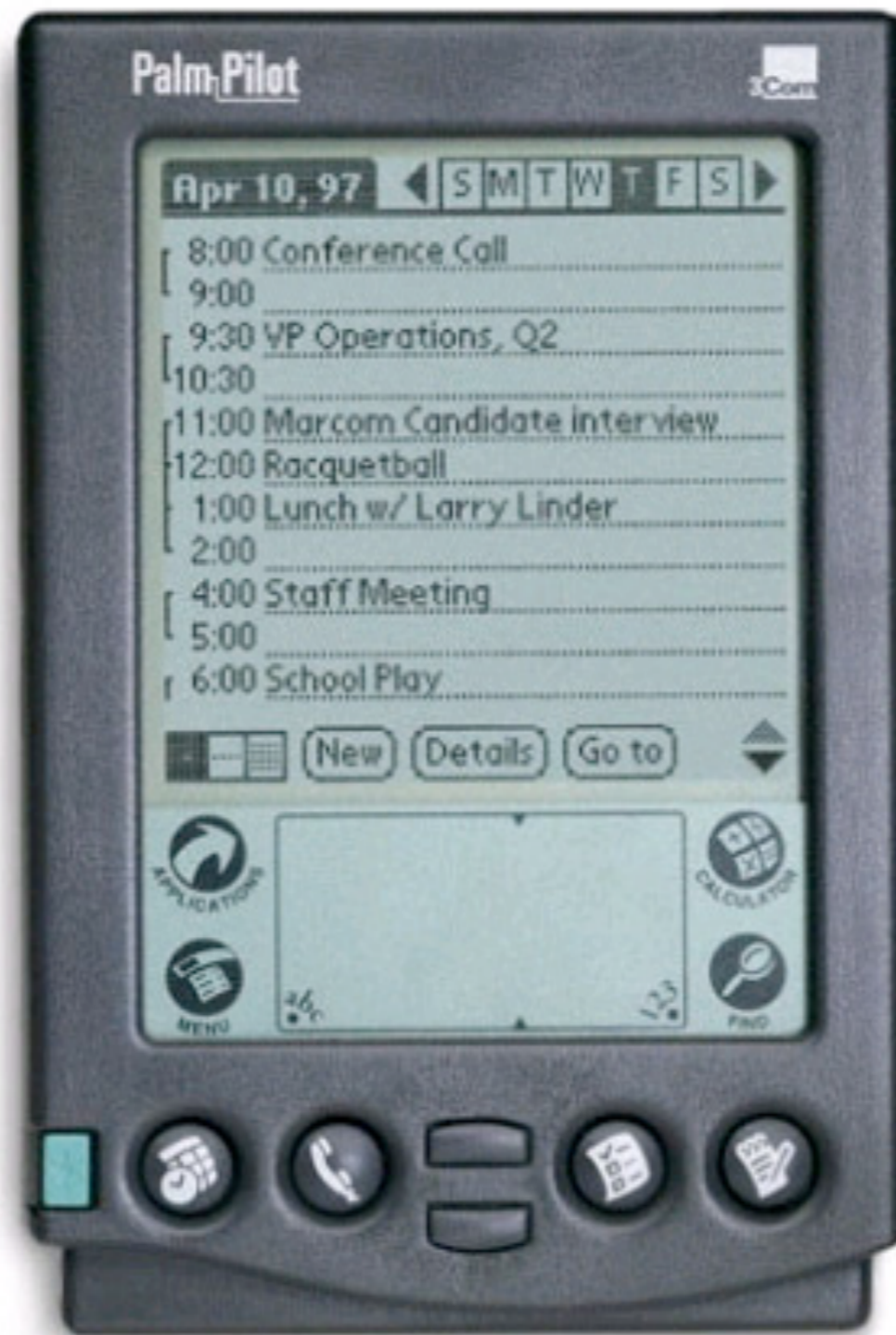
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Approaches to Interaction Design

- The Purpose of Different Approaches
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Case Study:

Jeff Hawkins

- worked with the team that developed the first laptop, the Compass by GRID
- developed the first tablet PC, the GRIDpad
- started PALM computing

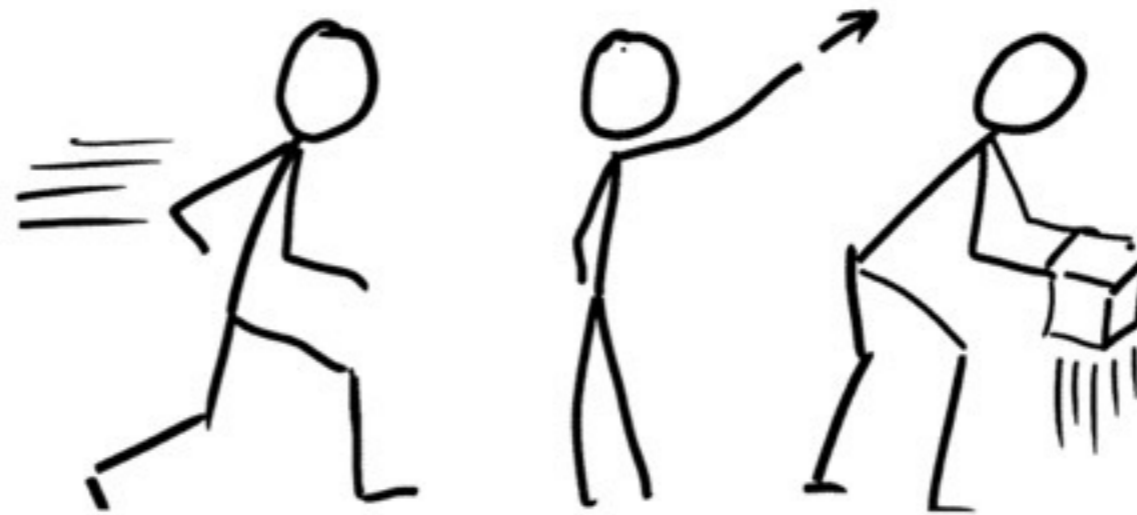




Looking back...

Activity Centred Design

- Philosophy: Activities as the main design focus
- Activities are a **cluster of actions and decisions** that are done for a purpose (**tasks**)
- The purpose of an activity is not necessarily a goal
- Purposes are more focused and tangible than goals



source: [5]

Case Study:

Dennis Boyle

- worked for a tech-consulting firm later known as the interaction design consultancy IDEO
- worked on the PalmPilot Os & Graffiti
- introduced the “Tech Box”





Graffiti® Alphabet (•) Heavy dot indicates starting point.

A B C D E F G H I J K L M N O P Q

R S T U V W X Y Z space backspace return caps shift caps lock

0 1 2 3 4 5 6 7 8 9

Punctuation Shift = tap once (Write → to exit a shift mode.)

! ? - ! / () ; : " & @ \$ %
~~. , ' ? - ! / () ; : " & @ \$ %~~



505719N70332

3Com PalmPilot PERSONAL
MADE IN MALAYSIA

CE FC RESET

Summary:

- The difference between a task and an activity can be fairly minor
- Some tasks have enough parts to be considered as sub activities themselves
- Like UCD, activity centred design relies on research as the basis for its insights, albeit not as heavily
- Interaction designers catalog users' activities and tasks which leads to a specific design solution to help users accomplish the task, not to achieve a goal per se
- The **activity**, not the people doing the activity **guides the design process**

A danger in **activity centred design**
is that designers might not look for solutions for the
problem as a “whole”
(Not see the forrest for the trees)

source: [5]

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Systems Design

- Analytical method of approaching design problems
- A set of entities that act upon each other is center of the design process
- Systems can range from simple (heating system in a house) to the enormously complex (power-plant)
- Systems design is a structured, rigorous design methodology
- Excellent for tackling complex problems
- Holistic design approach (focus on the context of use)
- Systems design outlines the components that systems should have:
A **goal**, a **sensor**, a **comparator** and an **actuator** (these parts are shaped by the interaction designer)
- Compared to other approaches systems design provides a clear roadmap for designers to follow

source: [5]

705 ALMA ST.

ALL SYSTEMS NORMAL

01:53P Wed 09/04/02

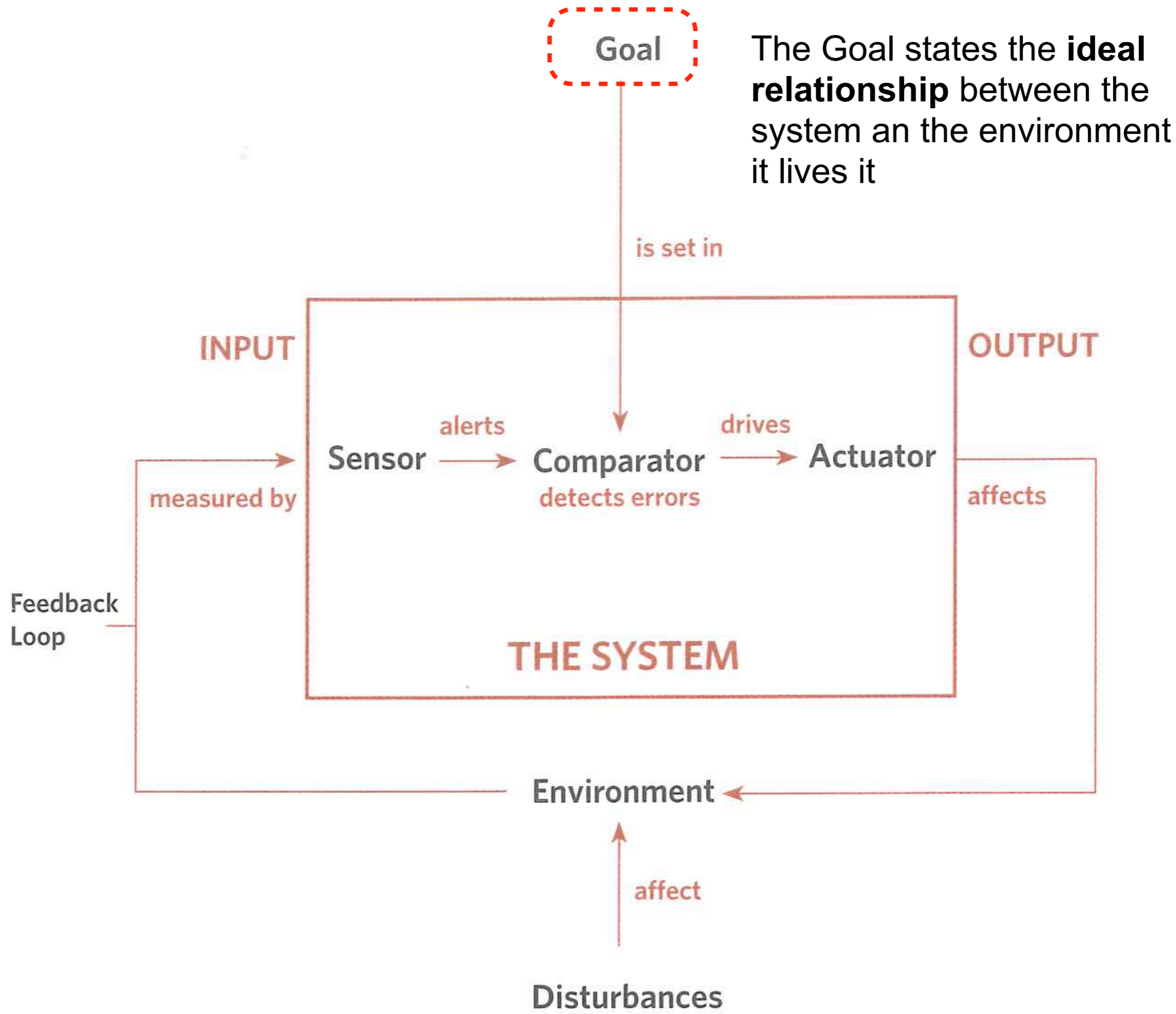


AC POWER

ACKNOWLEDGE
STEP



FIRE



The Goal states the **ideal relationship** between the system and the environment it lives in

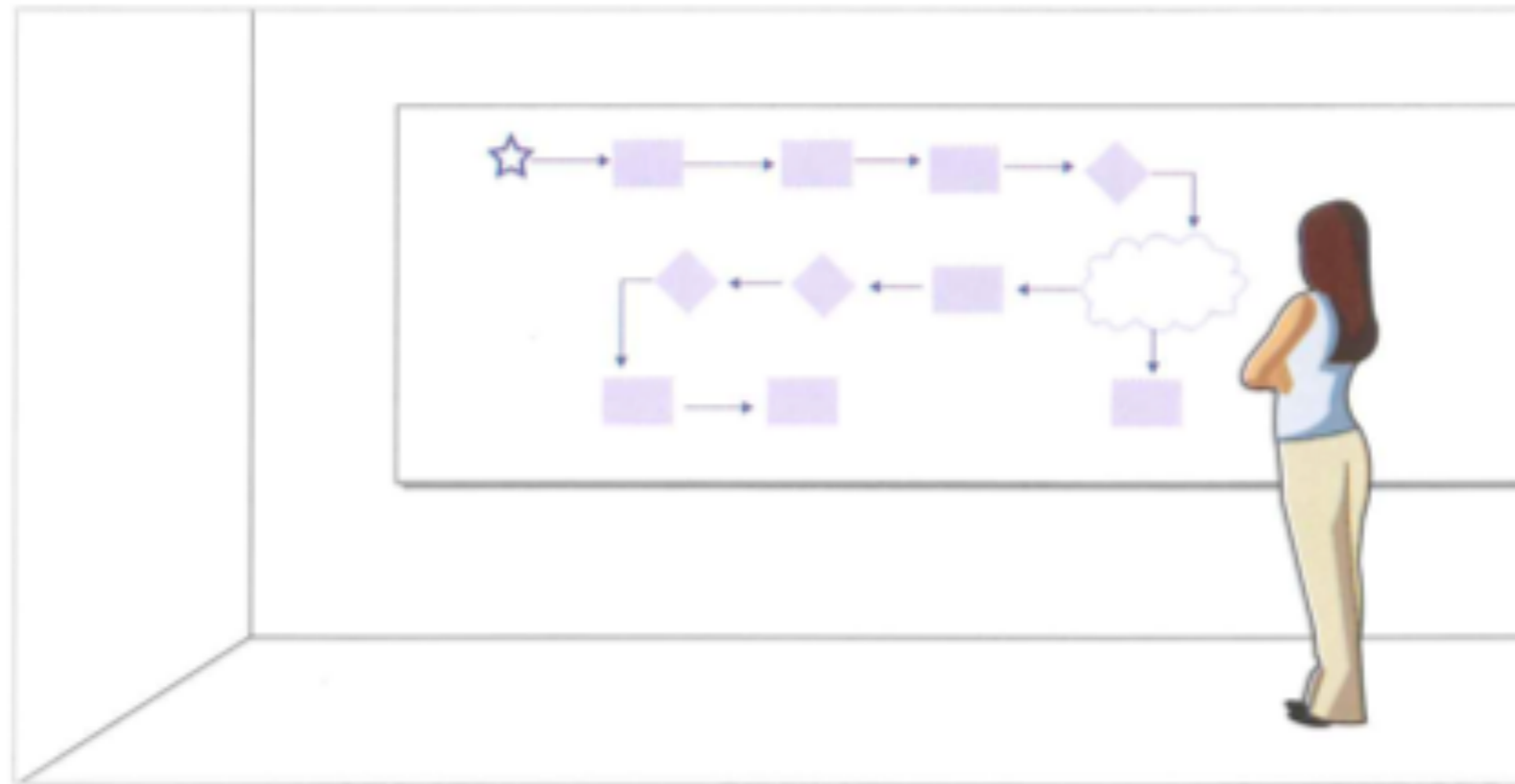
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source: [5]

Flow Diagram



Represent a series of events, actions or processes of different actors.
Usually have a beginning and an end point.

Systems Design

- What is the environment ?
- What goal does the system have in relation to its environment ?
- What is the feedback loop by which the system corrects it's actions ?
- How does the system measure whether it has achieved its goal ?
- Who defines the system, environment, goals and monitors it ?
- What resources does the system have for maintaining the relationship it desires ?
- Are the resources sufficient to meet the systems purpose ?

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Genius Design

- Philosophy: Design relies almost solely on the wisdom and experience of the interaction designer making the design decisions.
- Probably best practiced by experienced designers who have encountered several types of problems and can draw solutions from previous design issues







JONATHAN IVE

<http://www.loopinsight.com/wp-content/uploads/ive.jpg>

"Great design is as much about prospecting in the past as it is about inventing the future."

Bill Buxton



Beau Brownie Camera 1930



iPod Shuffle 2004

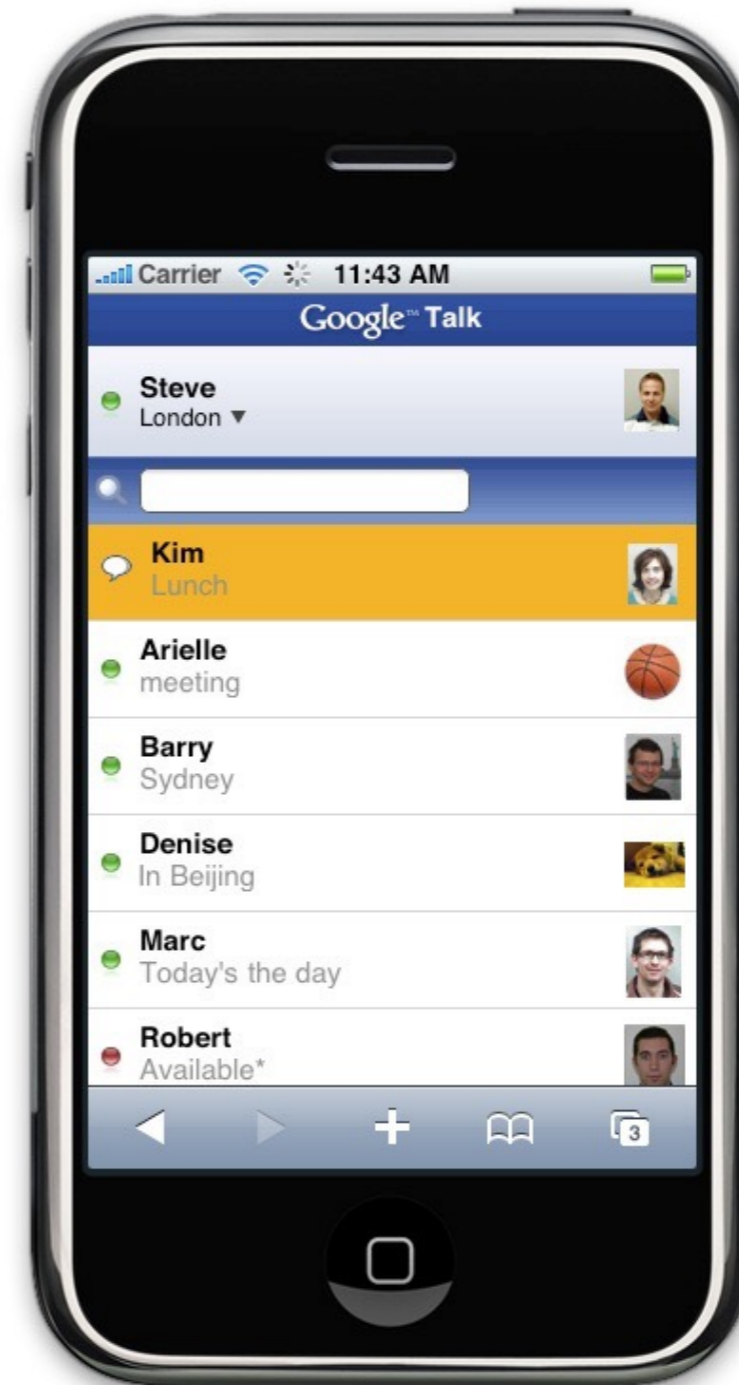


source: [8]

"A mobile device with a touch interface and only one physical button ?"



IBM Simon 1993



Apple iPhone 2007

source:[8]

References (Books):

- [1] Buxton, W. Sketching User Experiences, *Morgan Kaufmann* 2007.
- [2] Norman, D. The Psychology of Everyday Things, *Basic Books* 1988.
- [3] Moggridge, B. Designing Interactions, *MIT Press*, 2006.
- [4] Rogers, Y., Preece, J. & Sharp, H. Interaction Design, *Wiley & Sons* 2011.
- [5] Saffer, D. Designing for Interaction, *New Riders* 2009.

References (Papers):

- [6] Sanders, E. An Evolving Map of Design Practice and Design Research. *In ACM Interactions* 15,6 2008
- [7] Sanders, E. Stepping Stones Across the Gap. Essay in DAIM – Rehearsing the Future, *DKDS Press* 2010.

Articles:

- [8] http://www.businessweek.com/innovate/next/archives/2008/12/what_apple_lear.html