Interaction Design

Recap Session (Previous lecture April 22, 2015, 9am-12pm): Process Models, Elements and Technology

Recap Day 2:

Bill Verplank

http://rpmedia.ask.com/ts?u=/wikipedia/commons/thumb/9/9b/Billverplank_ciid_2010.jpg/180px-Billverplank_ciid_2010.jpg

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?”

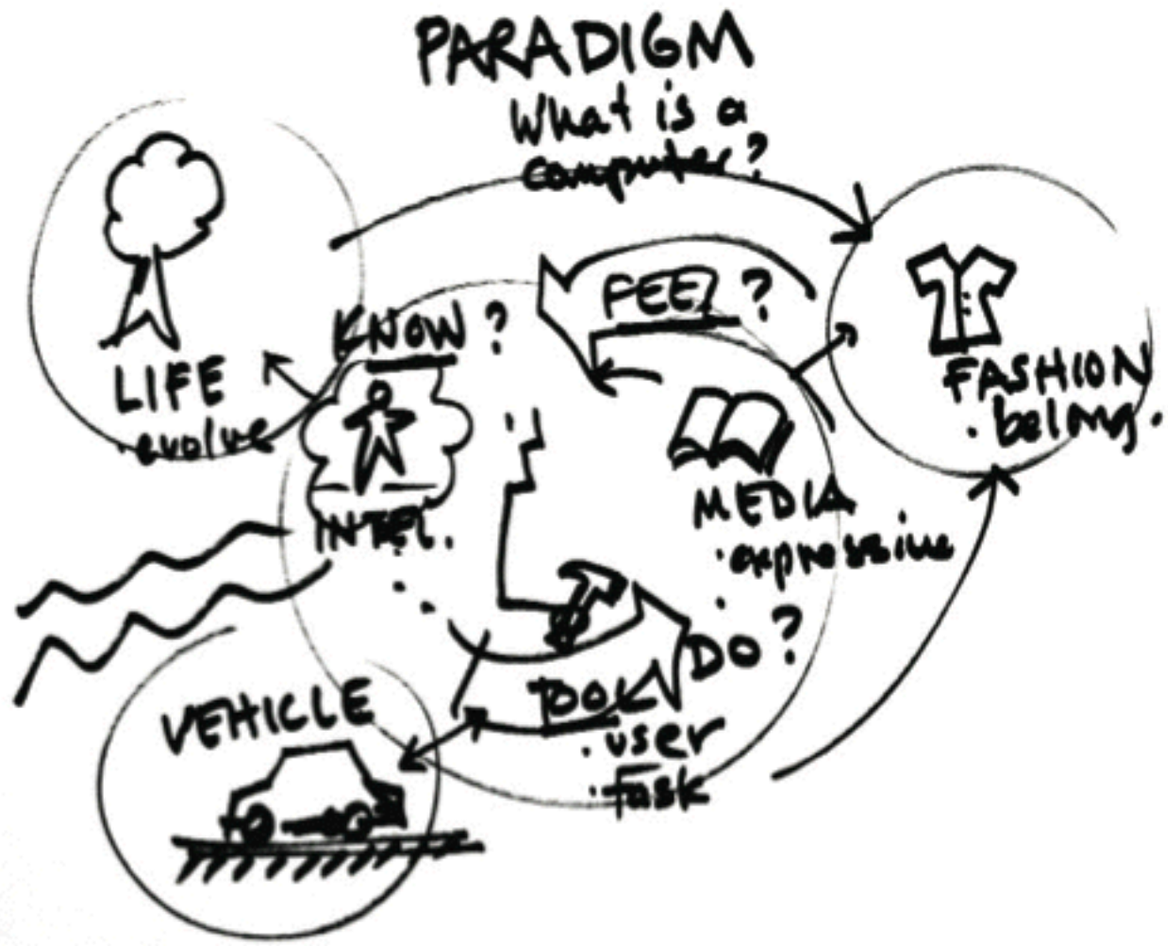
How do you get feedback?
That’s where a lot of feelings come from; a lot of our emotions about the world come from the sensory qualities of those media that we present things with.

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

source: [3]

Interaction Design Paradigms

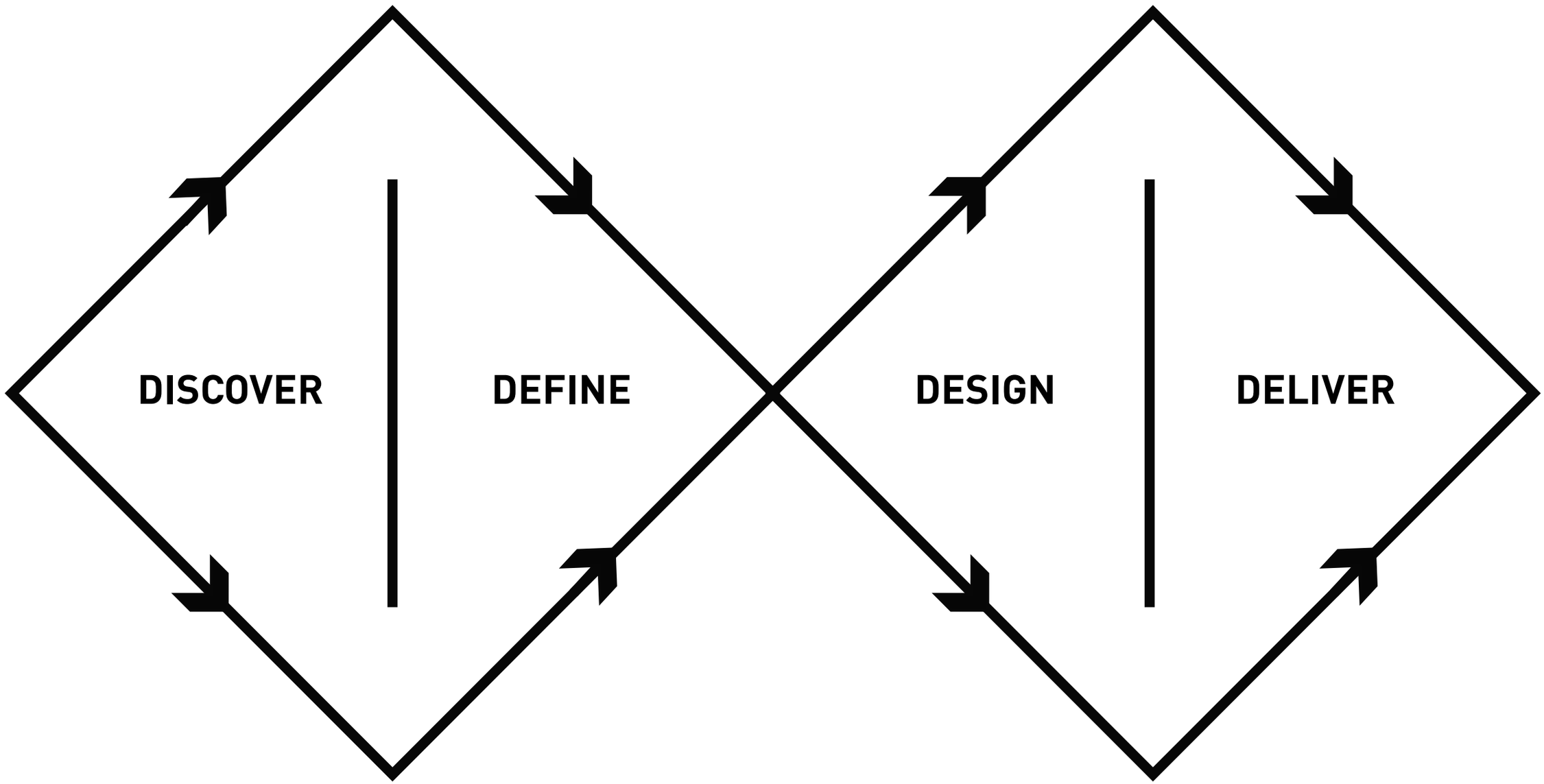


A paradigm is an example that serves as a pattern for the way people think about something.

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?

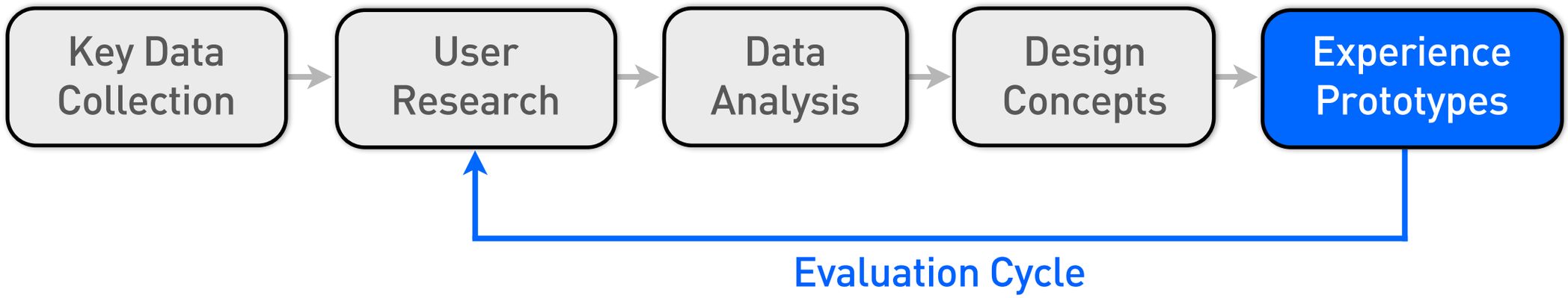
source: [3]

Double Diamond



source: [2]

UCD Design Process Model



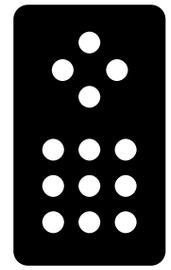
source: [2]

Appearance/Affordances

Appearance

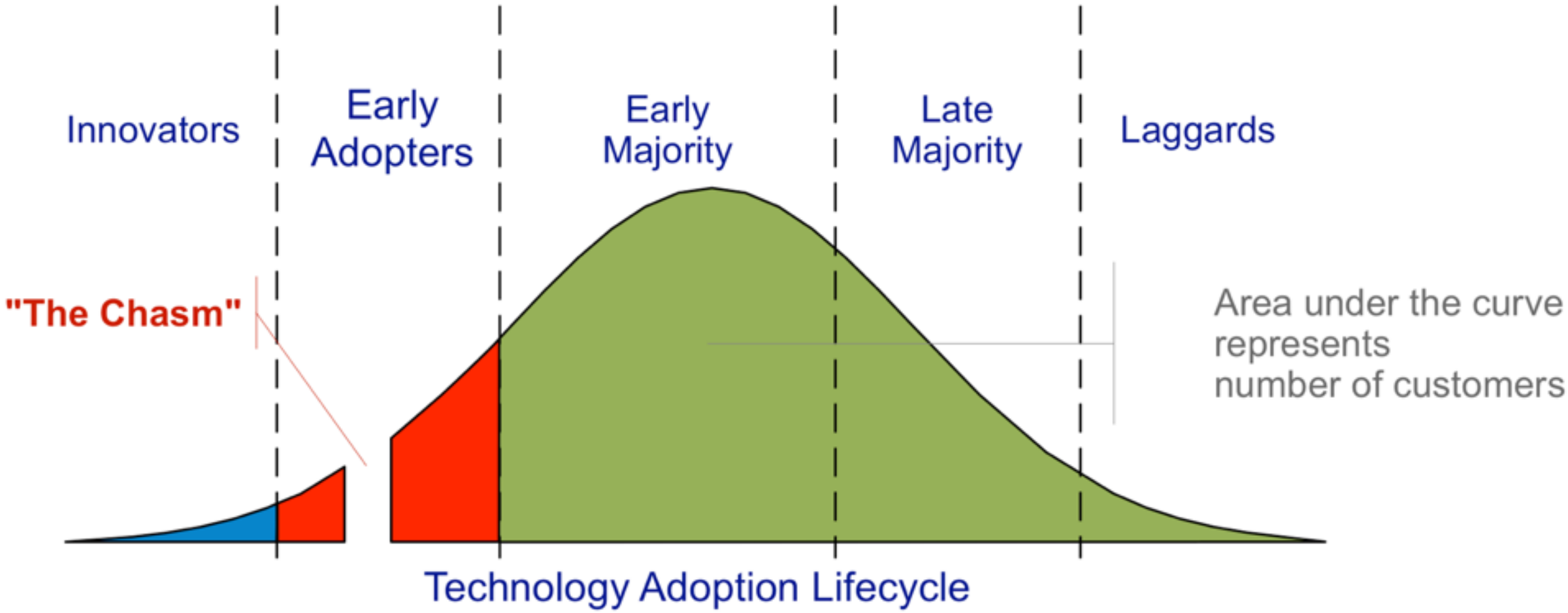
Appearance is the major source (texture is the other) of what cognitive psychologist James Gibson, in 1966, called **affordances**.

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.

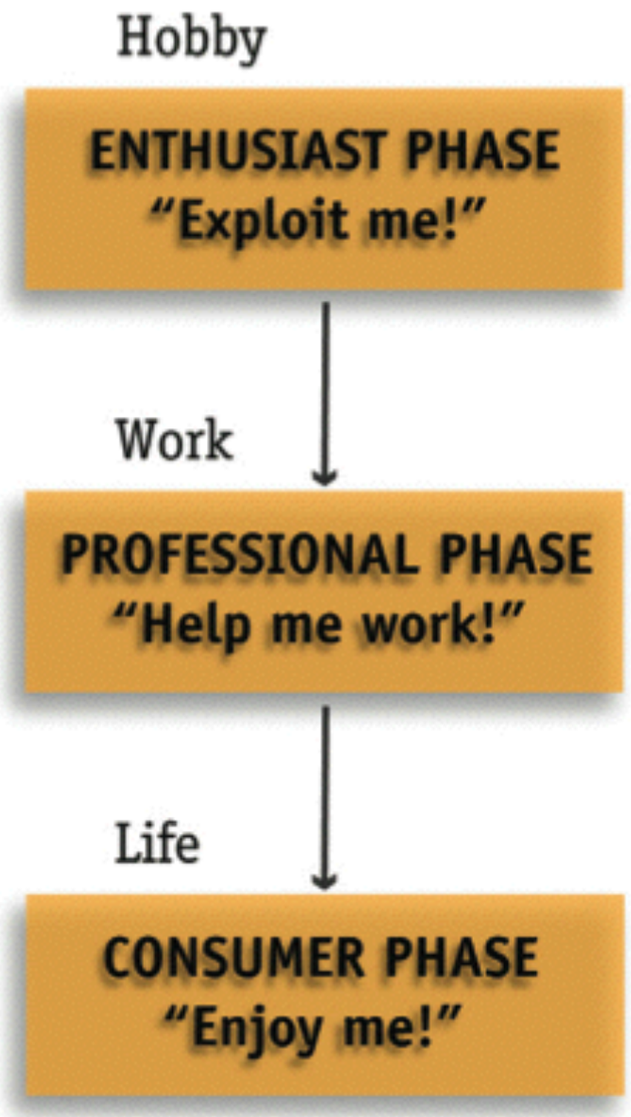


An **affordance** is a property, or multiple properties, of an object that provides some indication of how to interact with that object or with a feature on that object.

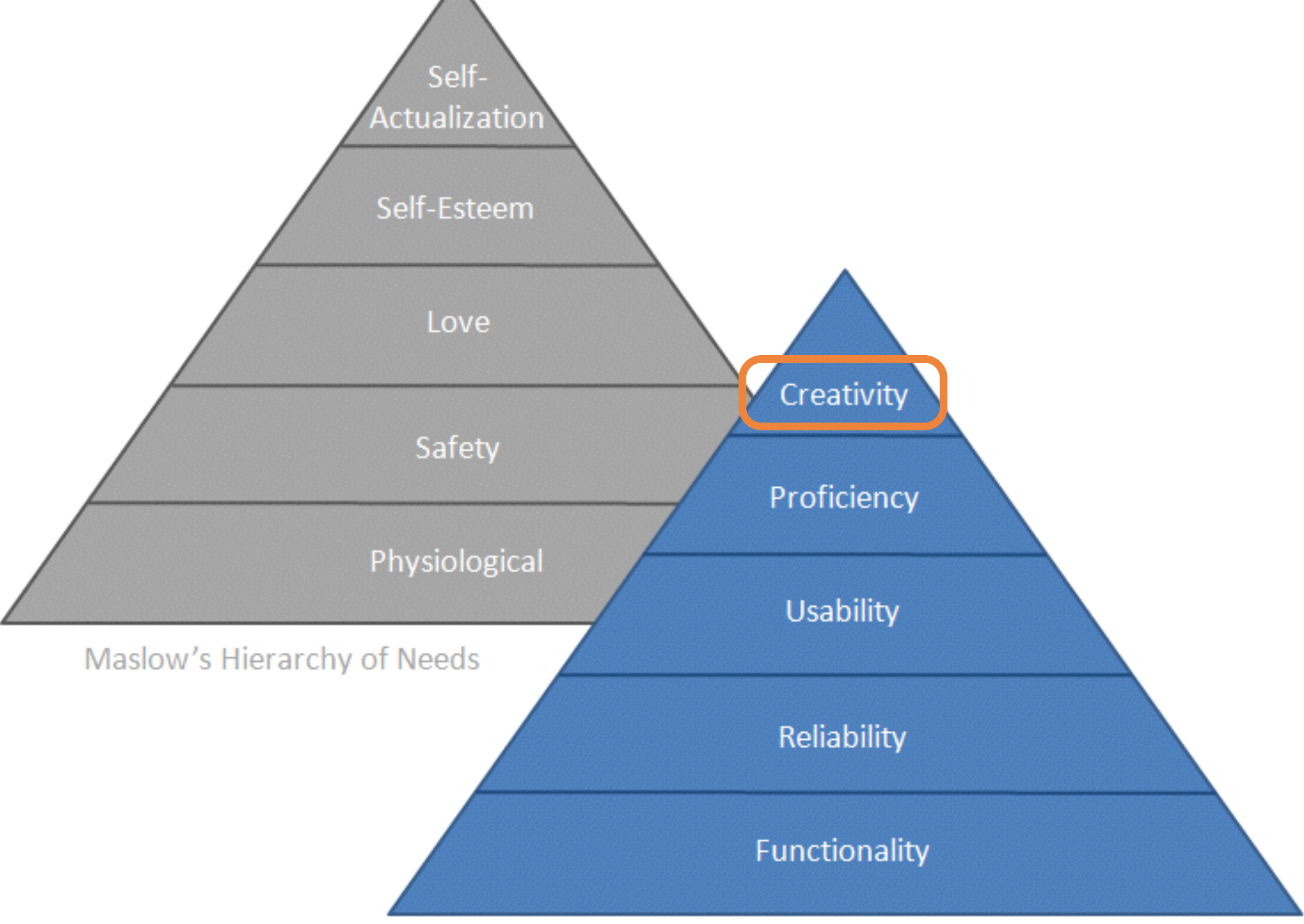
source: [2&5]



http://www.directimpactnow.com/blog/wp-content/uploads/2010/03/Technology-Adoption-Lifecycle.png


Hobby
ENTHUSIAST PHASE
"Exploit me!"
Work
PROFESSIONAL PHASE
"Help me work!"
Life
CONSUMER PHASE
"Enjoy me!"

source: [3]


Self-Actualization
Self-Esteem
Love
Safety
Physiological
Maslow's Hierarchy of Needs
Creativity
Proficiency
Usability
Reliability
Functionality
Design Hierarchy of Needs

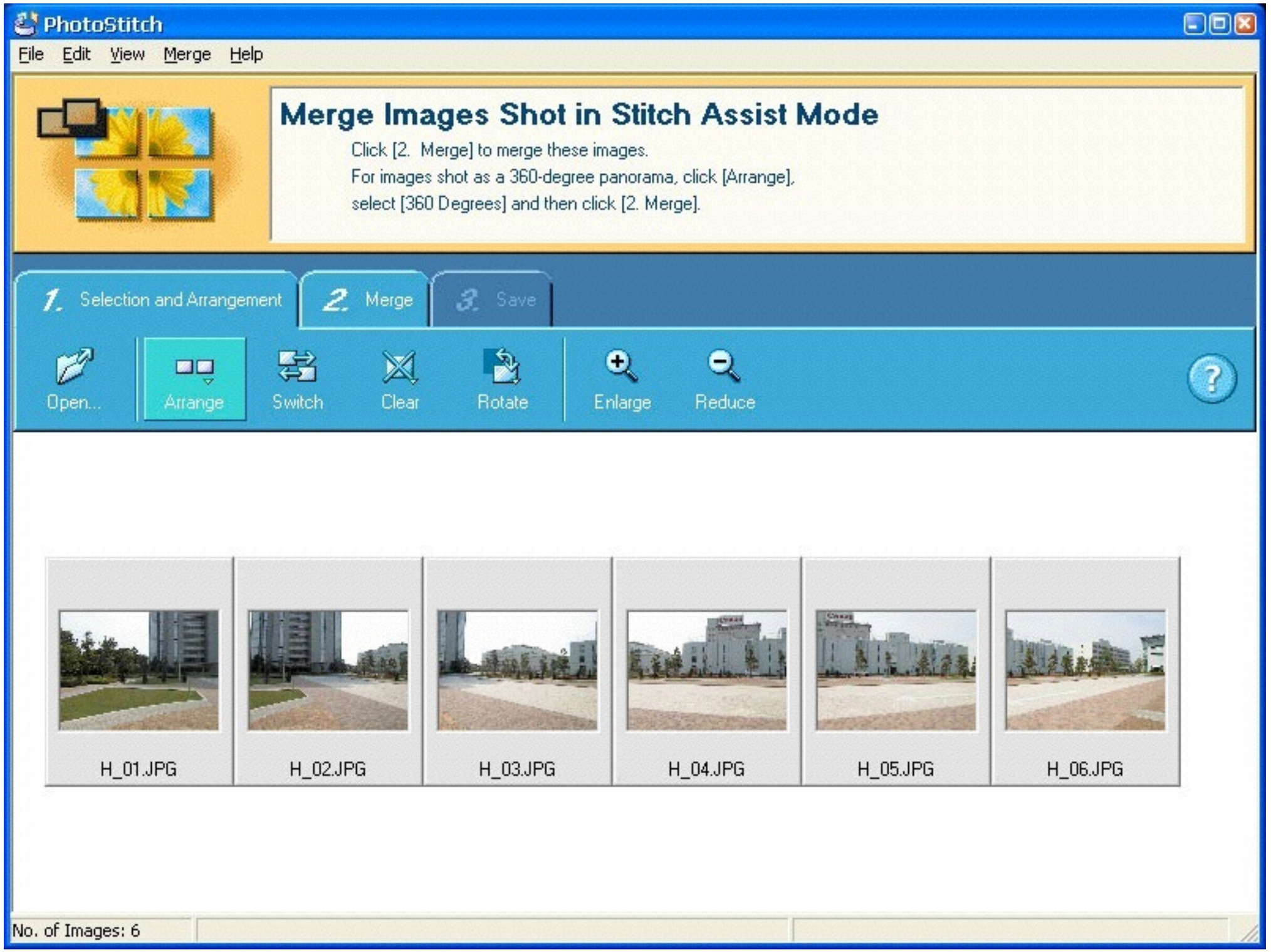
source: [7]

Rikako Sakai

-received an MA in interaction design from the Interaction Design Institute Ivrea (IDII)
-worked for Canon Design Center Tokyo
-developed the Photo-stitch Application

http://www.designinginteractions.com/interviews/MatHunter

source: [3]



http://a.img-dpreview.com/reviews/CanonG3/Images/Software/photostitch01.jpg


Canon
1
2
L
SET
MENU
DISP.
FUNC.

Looking back...

Looking back...

-observing people on how they were behaving in the real world
-creating concepts to perform the tasks more easily
-step by step interfaces related to the metaphor of a light-table
-implementation of digital prototypes and testing with co-workers

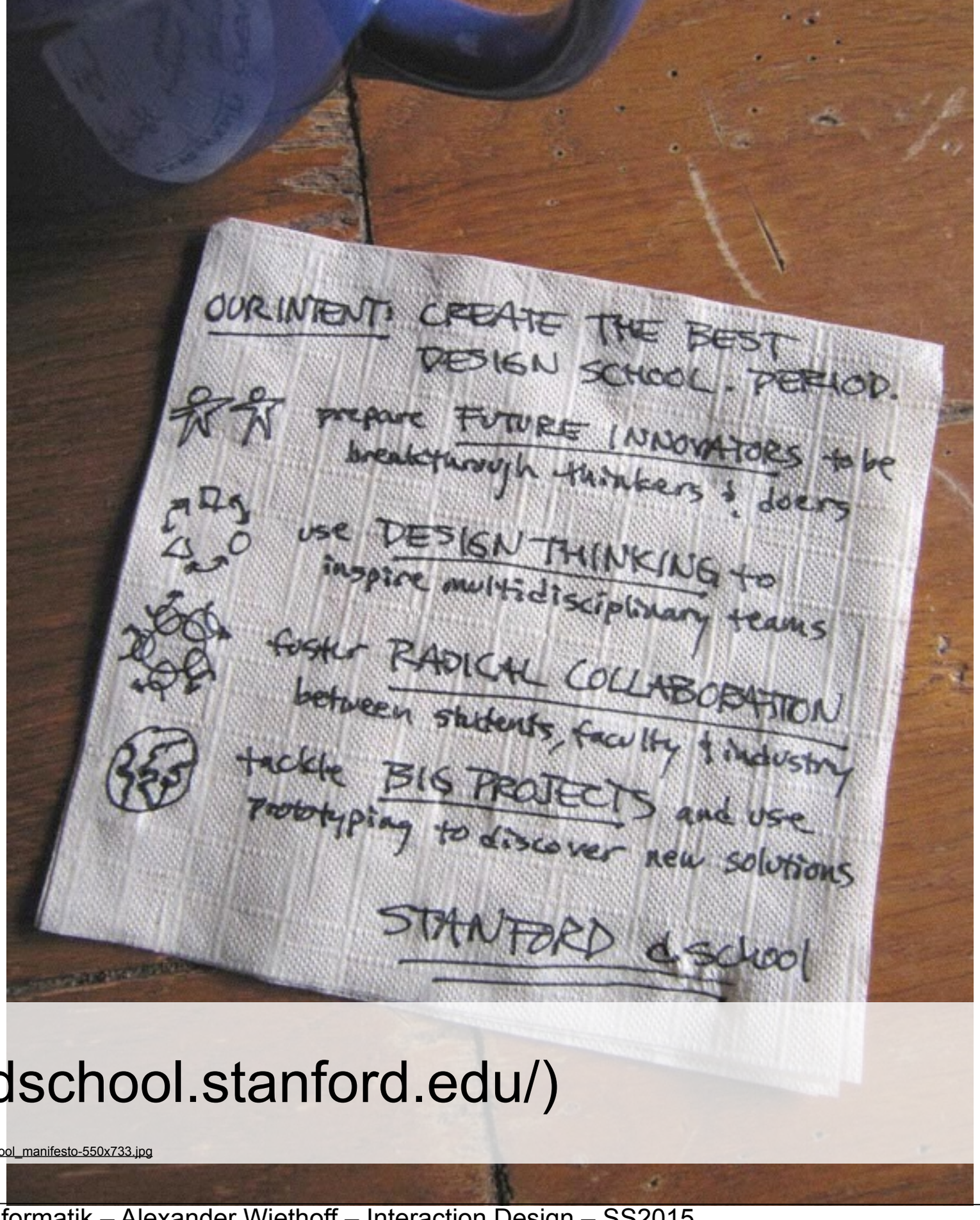
Design adopts Technology

David Kelly

-founded the company IDEO
-developed the curriculum for the Hasso Plattner Institute of Design Thinking at Stanford the: *d-school*

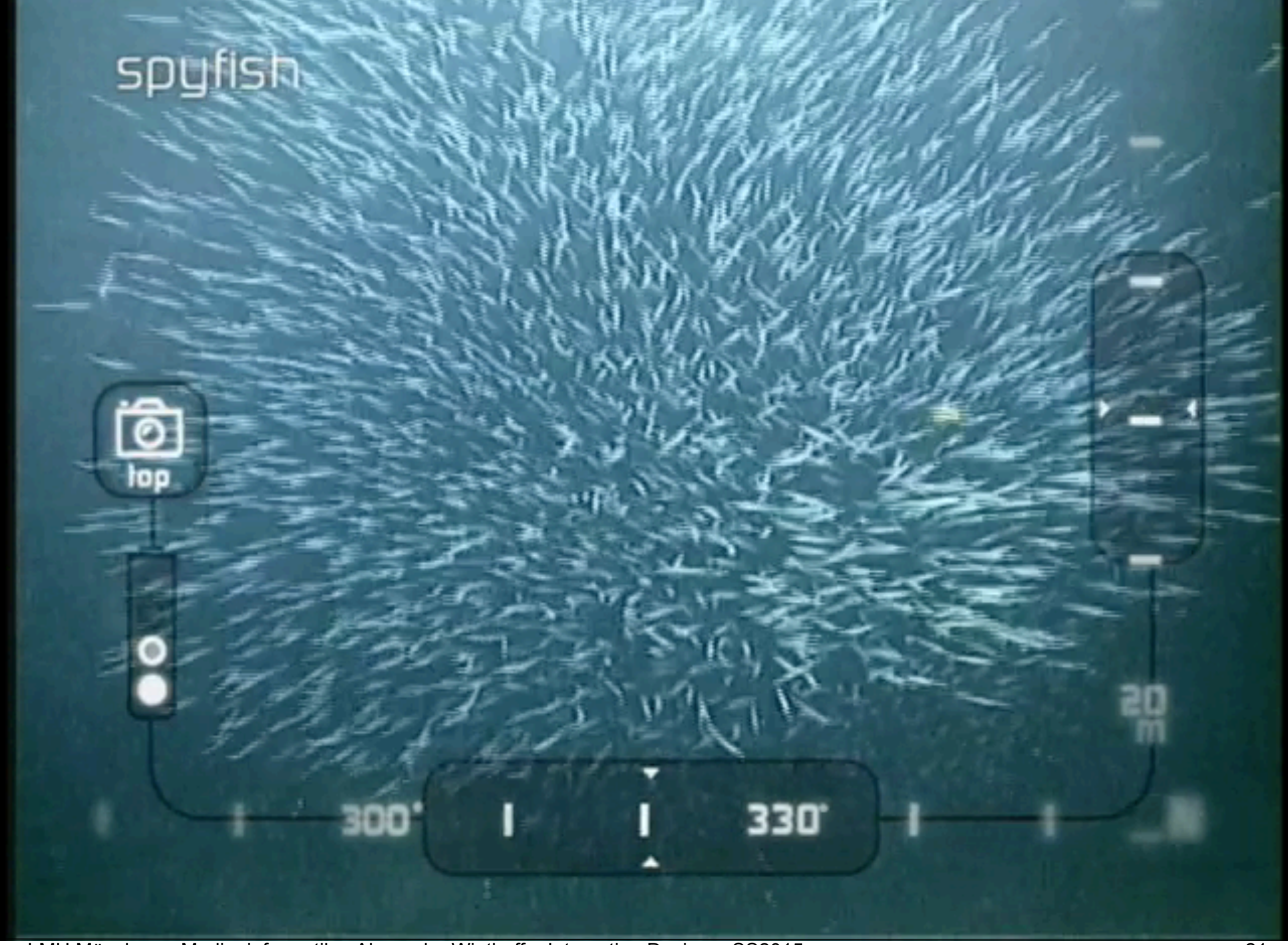
http://www.designinginteractions.com/interviews/DavidKelly

source: [3]



dschool (dschool.stanford.edu/)

http://www.stby.eu/wp/wp-content/uploads/2010/11/dschool_manifesto-550x733.jpg


spyfish
top
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Looking back...

Looking back...

-special purpose devices / new products / individual controls
-through increased use of technology the conventional design has become much more complex and not only involves developing the physical artefact
-sensor networks as the future (design) challenge
-new devices demand new prototyping techniques
-the focus on the user and their needs is much more important than the focus on new technology and what we can do with it
-sketching the user experience through quick mockups

Interaction Design

Chapter 3 (April 29, 2015, 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 and the Role of the Users

Design-Led

design-led
with
expert mindset

design-led
with
participatory mindset

Expert Mindset
“users” seen as subjects
(reactive informers)

Participatory Mindset
“users” seen as partners
(active co-creators)

research-led
with
expert mindset

research-led
with
participatory mindset

Research-Led

source: [6+7]

Approaches to Interaction Design

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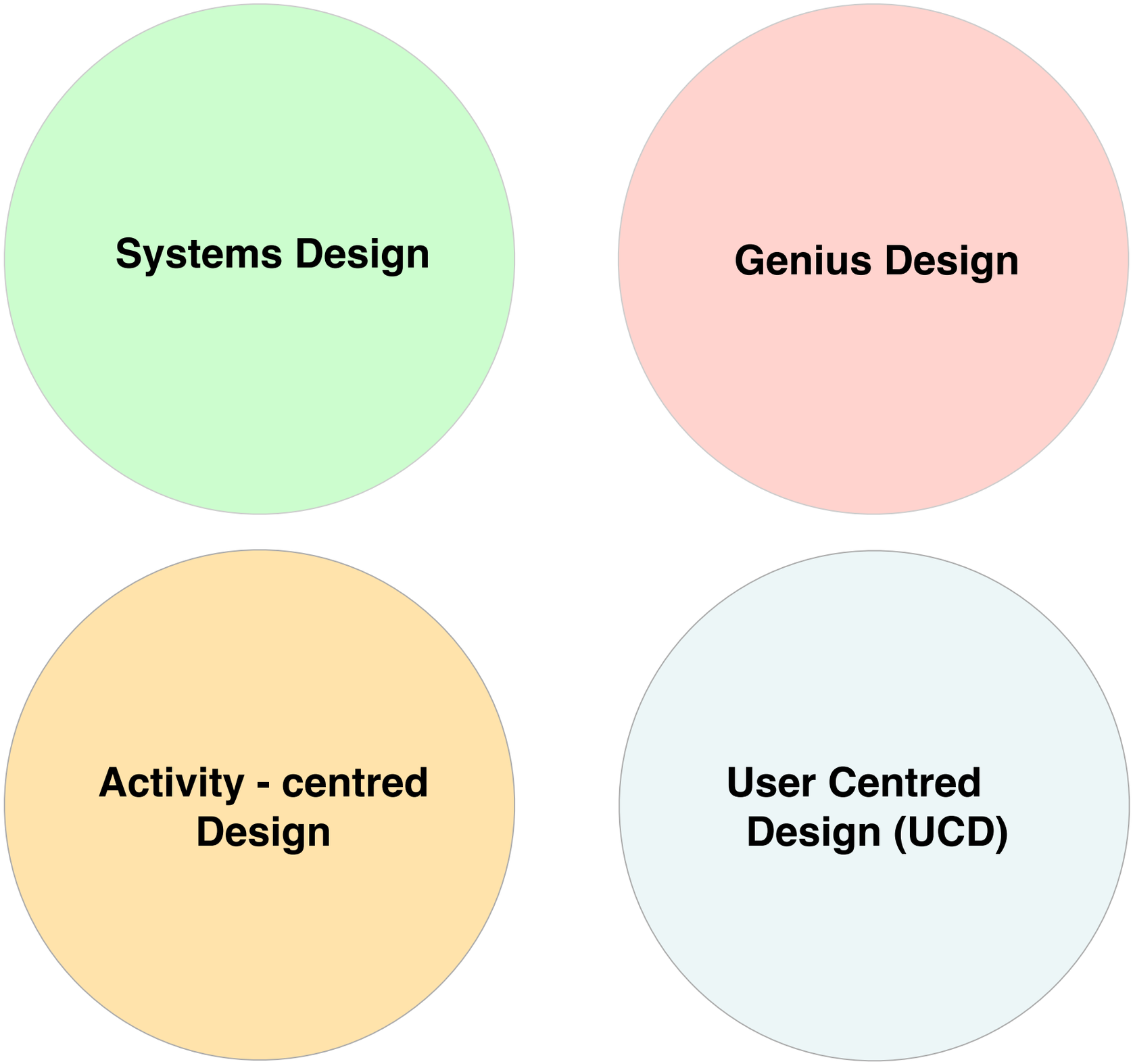
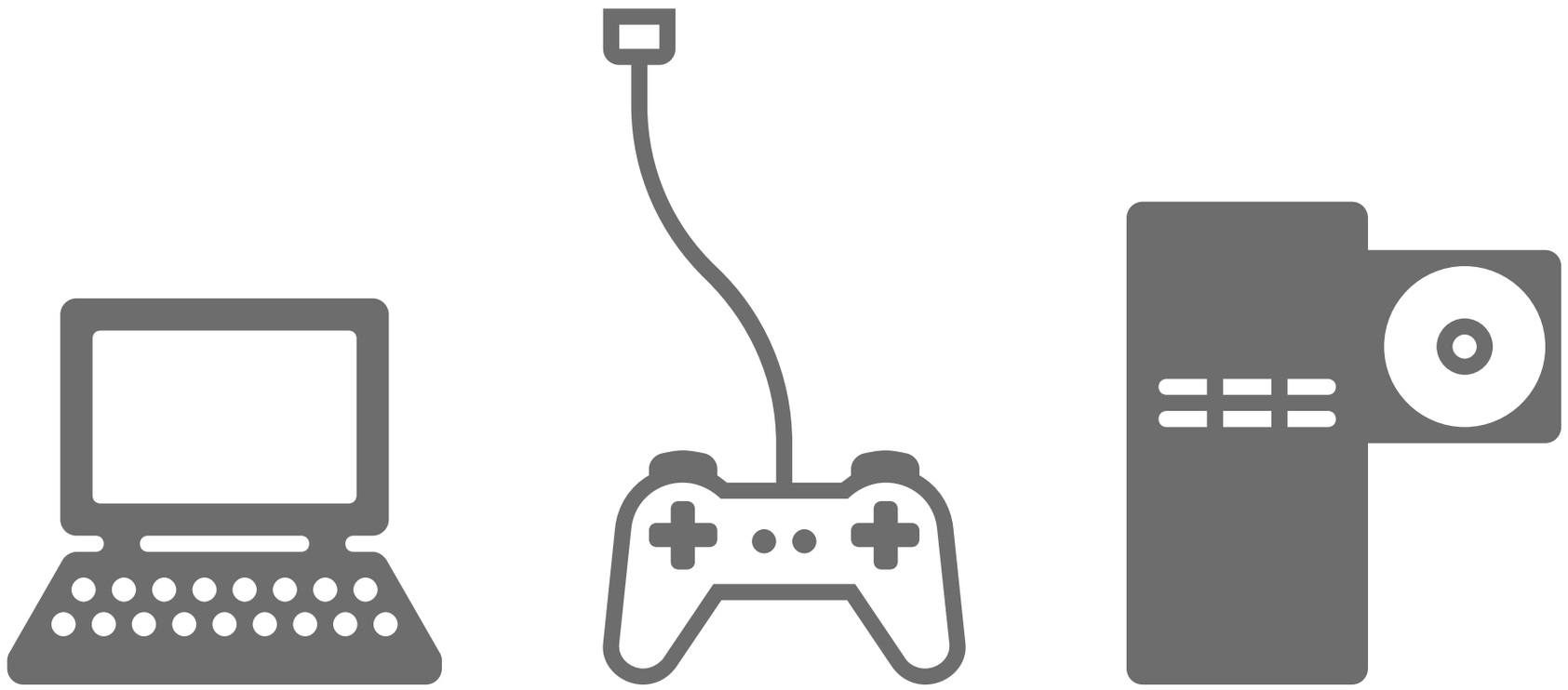
- Four Main Approaches
- User Centred Design (UCD)
- Activity Centred Design
- Systems Design
- Genius Design


Systems Design
Genius Design
Activity - centred Design
User Centred Design (UCD)

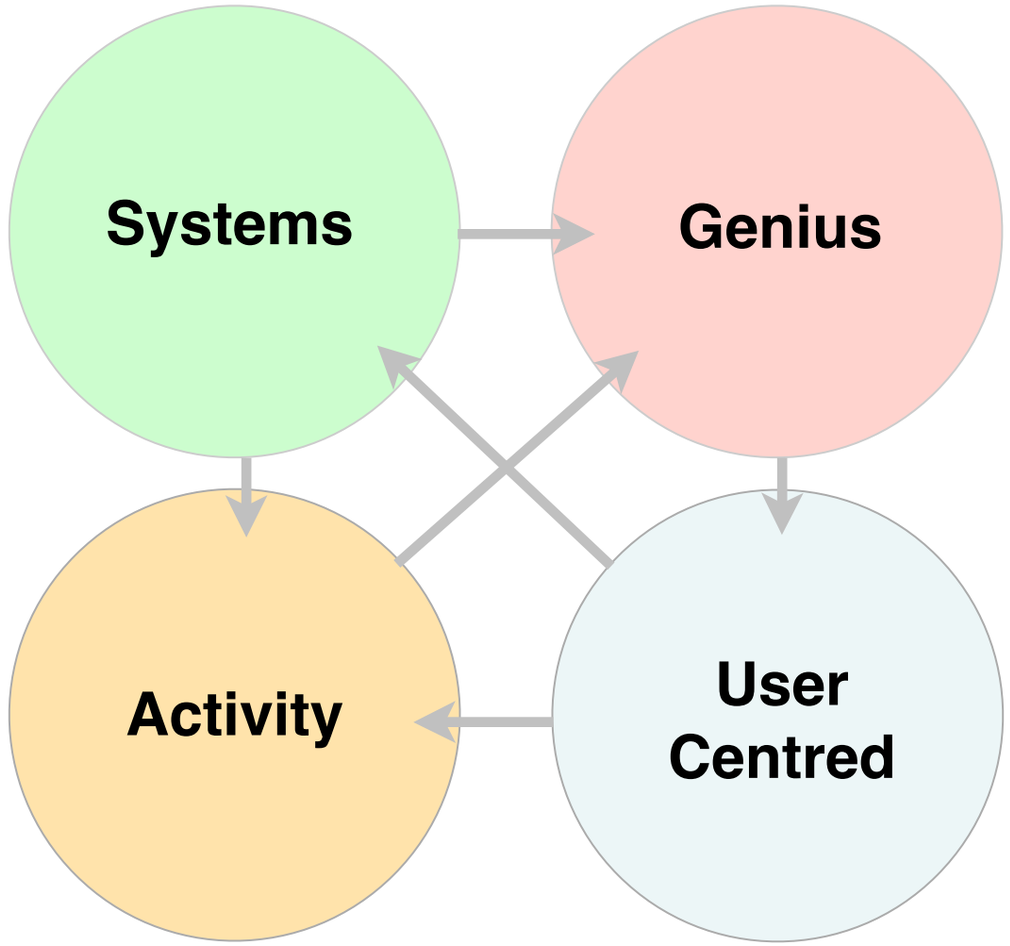
source: [5]

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



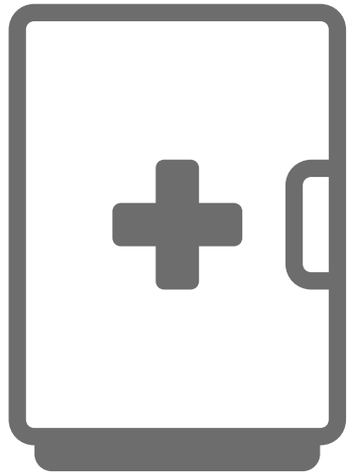
source: [5]

• 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



source: [5]

Four Approaches to Design

Approach	*Overview*	*Users*	*Designer*
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]

Approaches to Interaction Design

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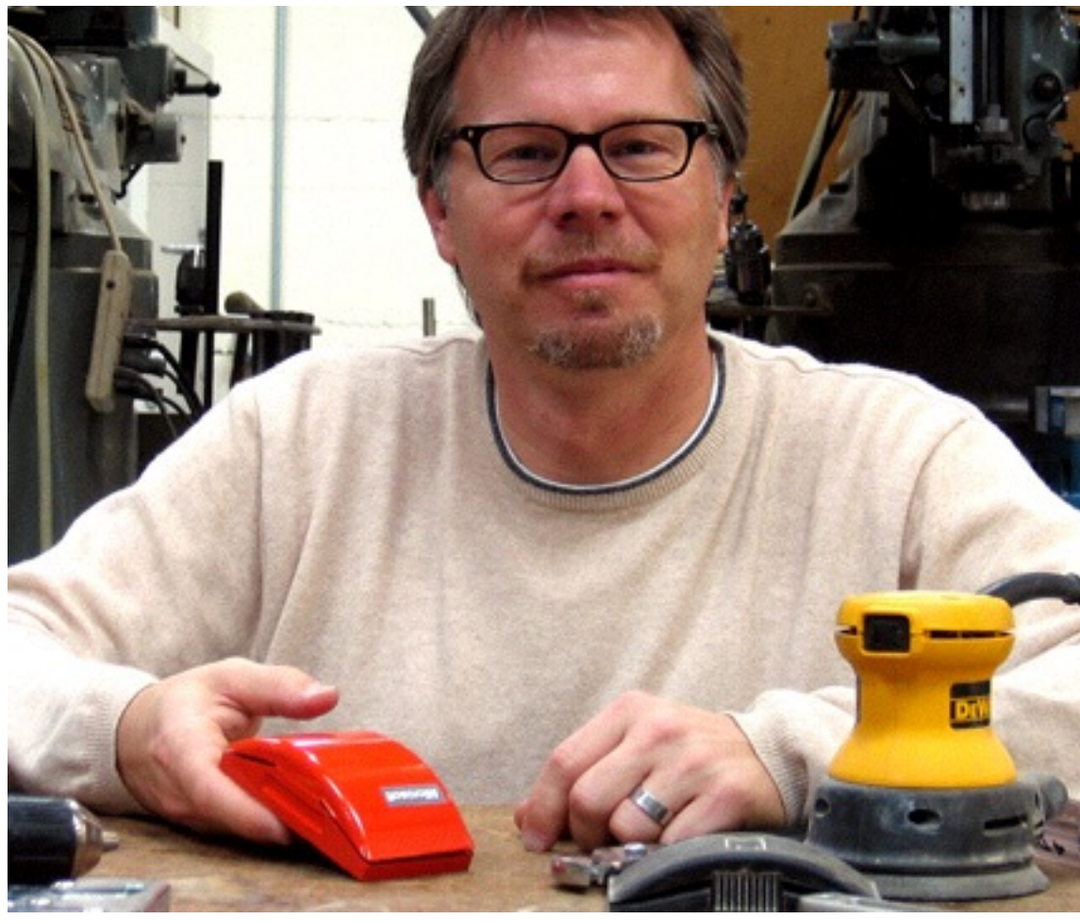
- Activity Centred Design
- Systems Design
- Genius Design

Case Study:

Paul Bradly

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

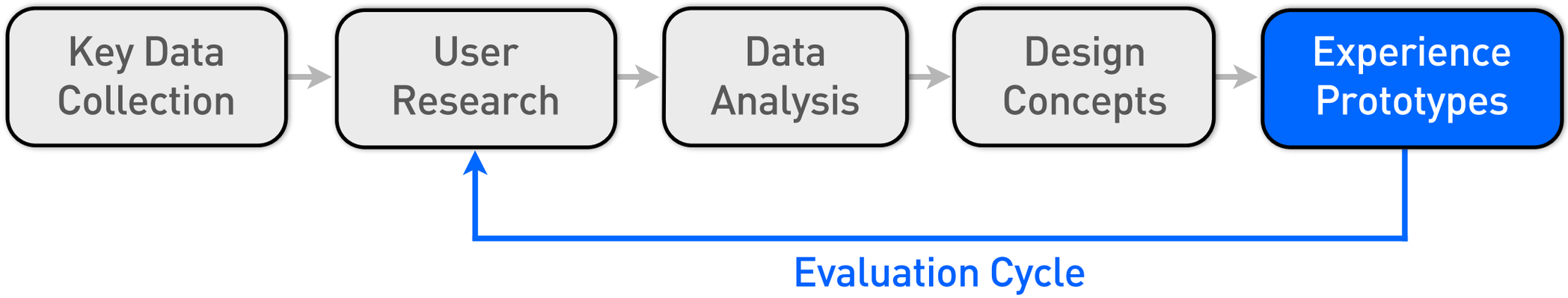


http://www.designinginteractions.com/interviews/PaulBradly

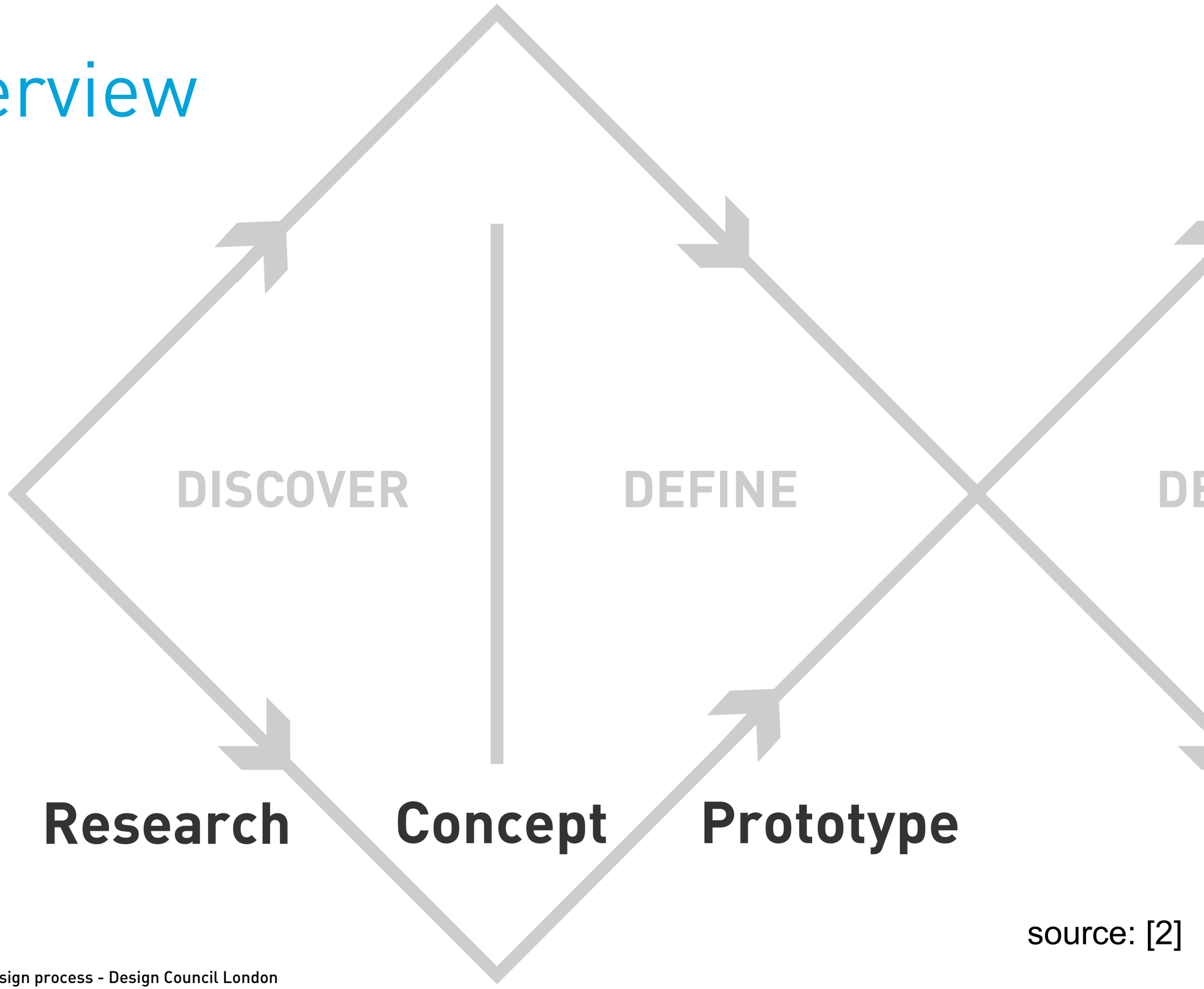
source: [3]


Microsoft

Looking back...


Key Data Collection
User Research
Data Analysis
Design Concepts
Experience Prototypes
Evaluation Cycle

Overview



source: [2]

© A study of the design process - Design Council London

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]

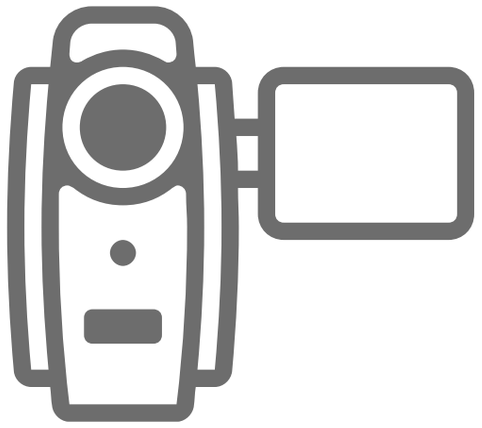
What is a user centred approach?

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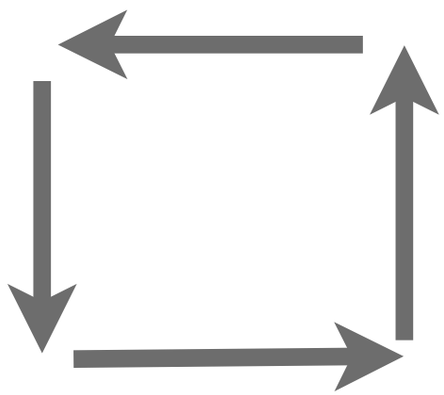
  - **Early focus** on users and tasks: directly studying cognitive, behavioural, anthropomorphic & attitudinal characteristics
  - **Empirical measurement:** users' reactions and performance to scenarios, manuals, simulations & prototypes are observed, recorded and analysed
  - **Iterative design:** when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



source: [4]

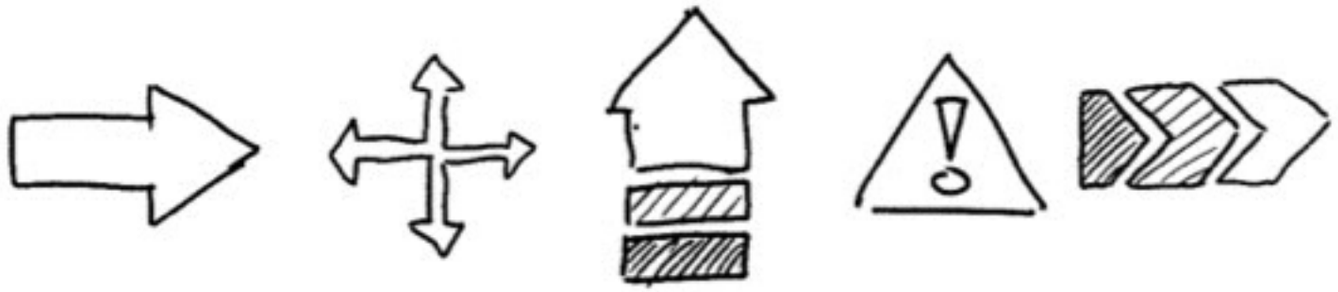
Four basic activities

- **Identifying needs and establishing requirements**

source: [4]

Four basic activities

- **Identifying needs and establishing requirements**
- **Developing alternative designs**



source: [4]

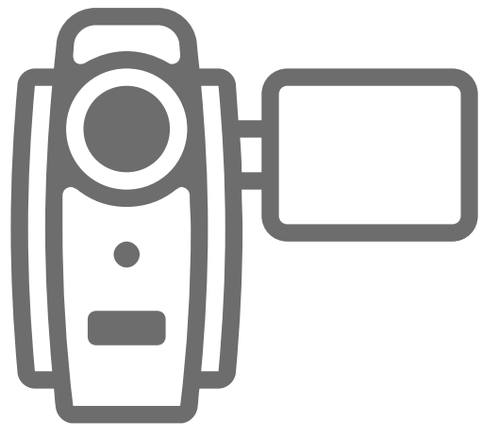
Four basic activities

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

source: [4]

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**

source: [5]

Designing for Interaction: Cr

www.amazon.de/Designing-Interaction-Creating-Innovative-Applications/dp/0321643399/ref=sr_1_2?ie=UTF8&qid=1297680244&sr=8-2

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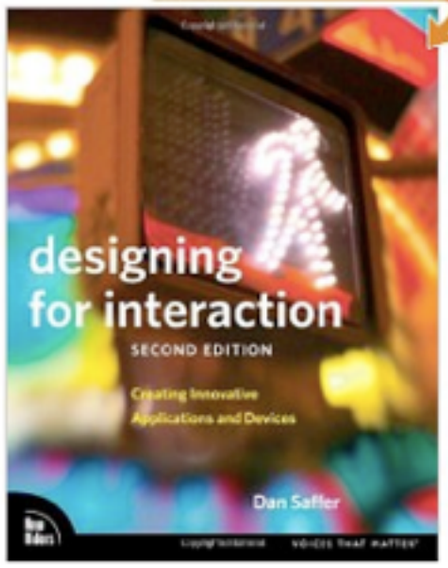

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Approaches to Interaction Design

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- Four Main Approaches
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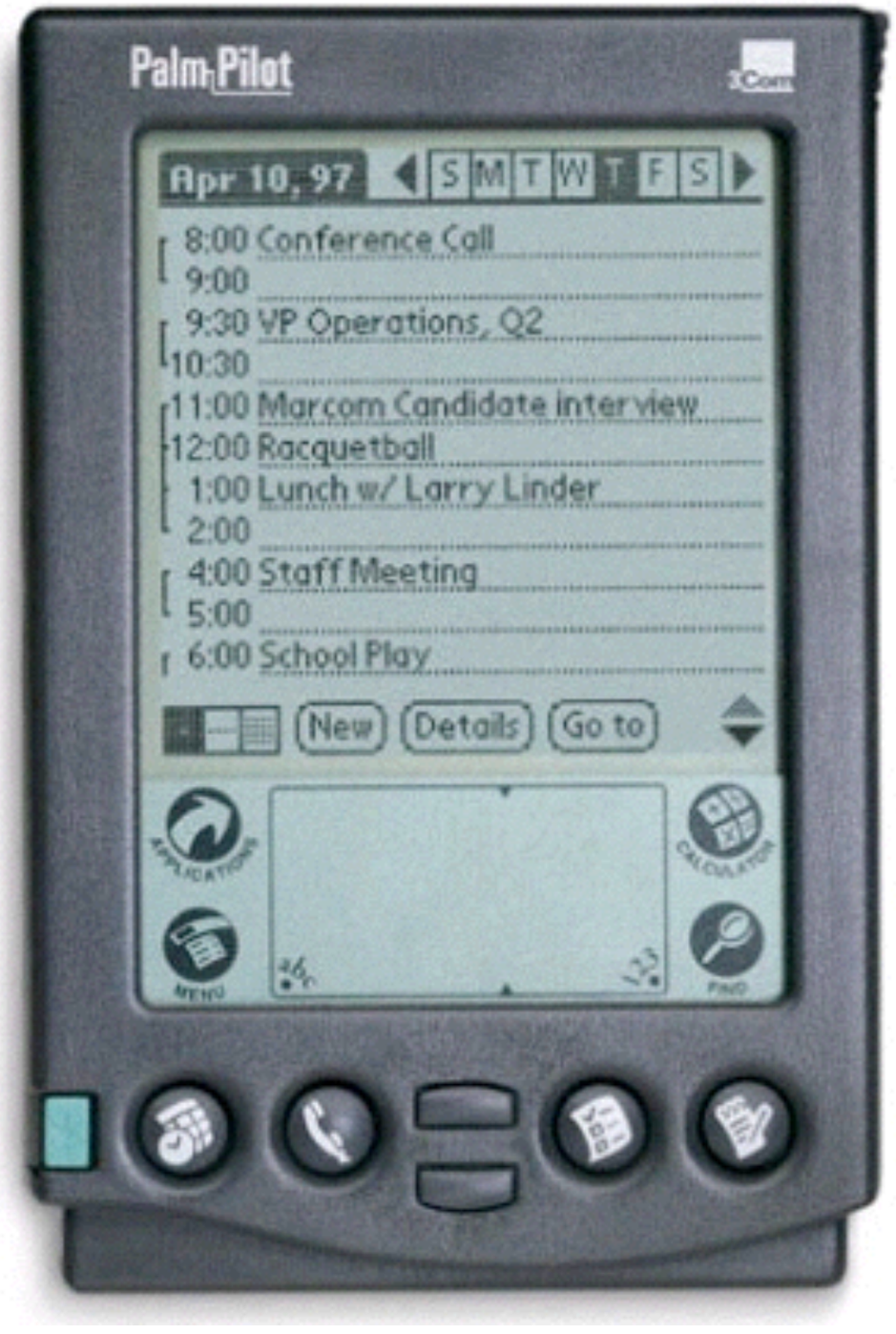
- Genius Design



http://www.computerwoche.de/i/detail/artikel/199577/1/2025886/EL_124634802131280312731/

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

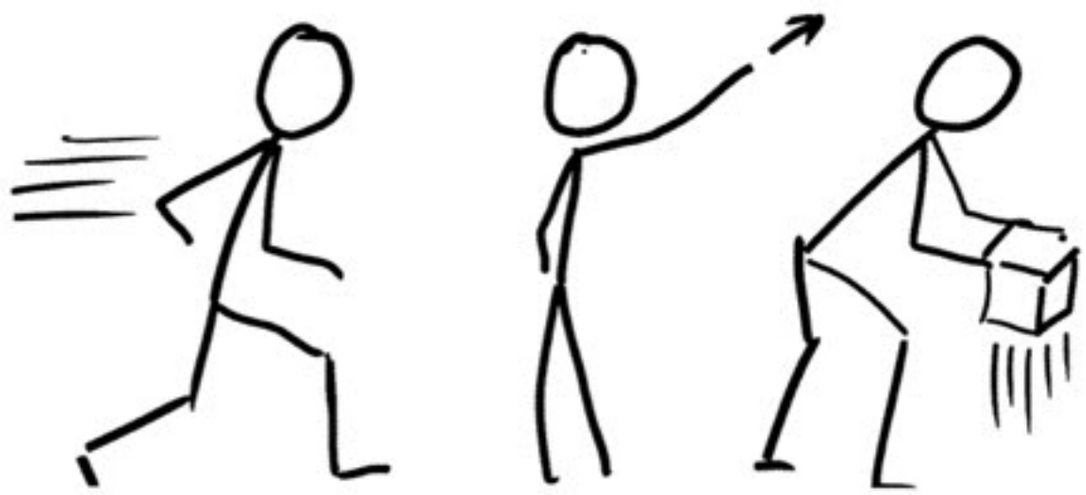
http://www.designinginteractions.com/interviews/JeffHawkins

source: [3]

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

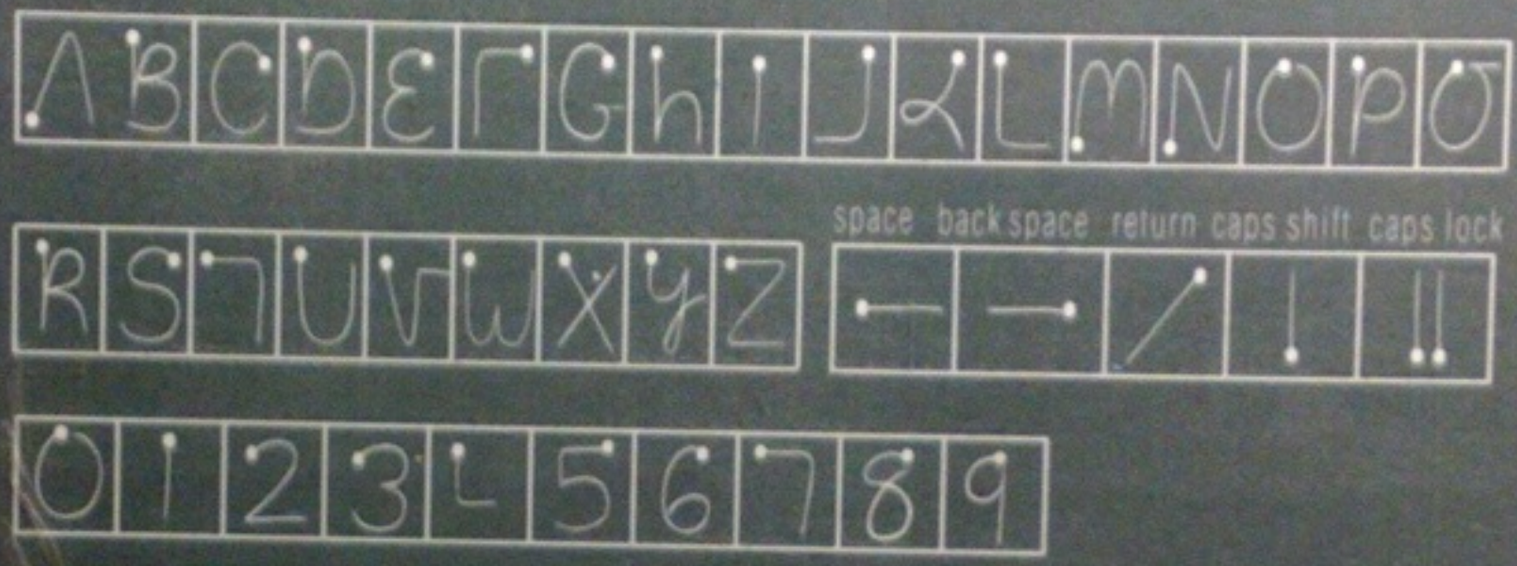
-worked for a tech-consulting firm later known as the interaction design consultancy IDEO
worked on the PalmPilot Os & Graffiti
-introduced the “Tech Box”

http://www.designinginteractions.com/interviews/DennisBoyle

source: [3]


Palm Pilot
3Com
Address
Calc
Date Book
Expense
Giraffe
HotSync
Mail
Memo Pad
Memory
Prefs
Security
To Do List
10:41 am Battery

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



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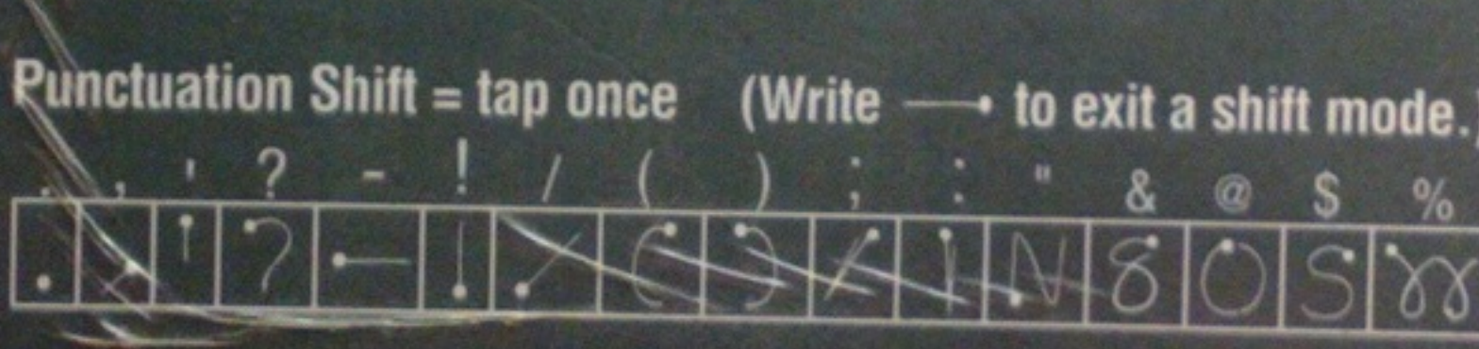

http://www.flickr.com/photos/youraccount/5594455000/

http://www.ideo.com

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**

source: [5]

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]

Approaches to Interaction Design

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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

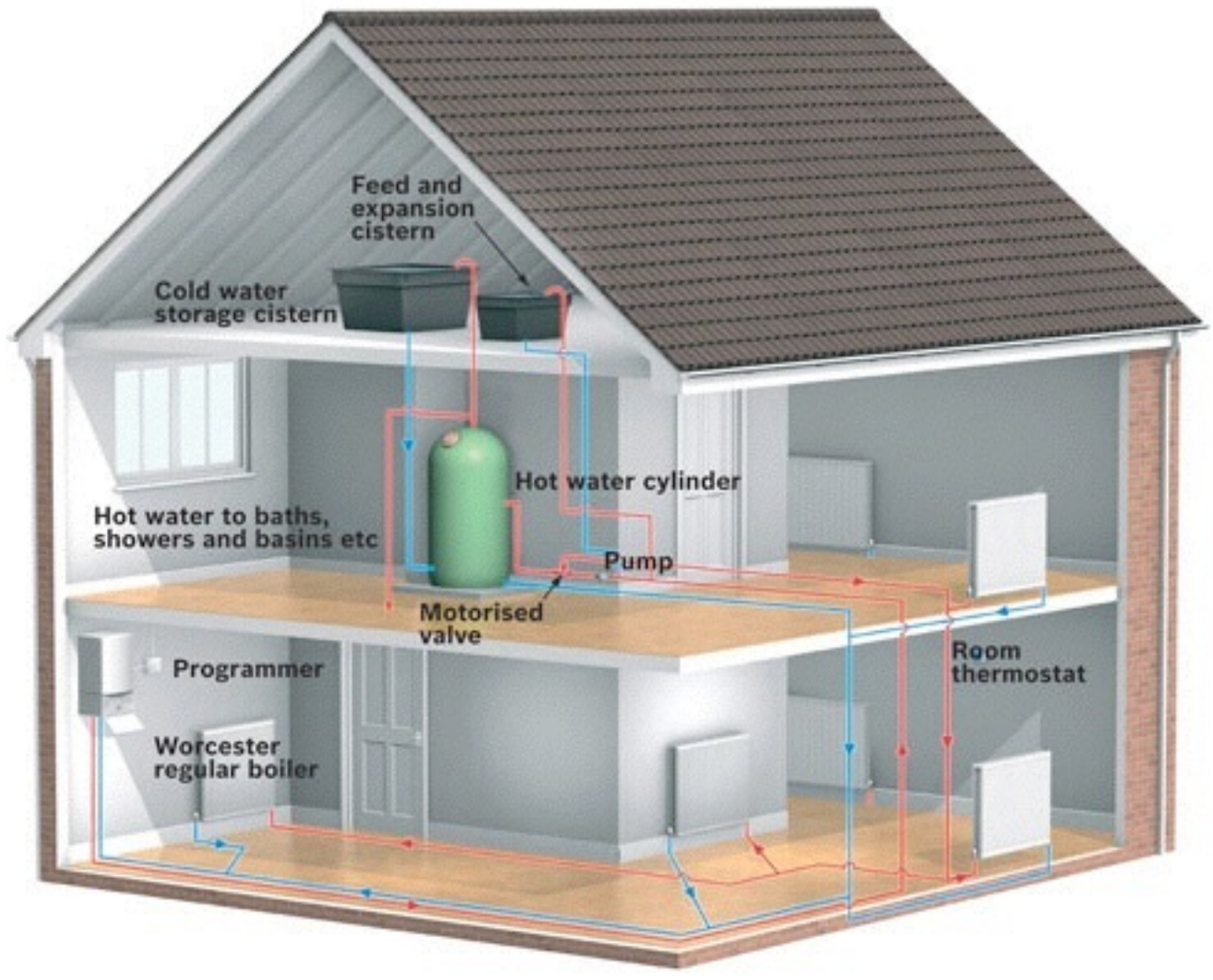
• Excellent for tackling complex problems

• 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]



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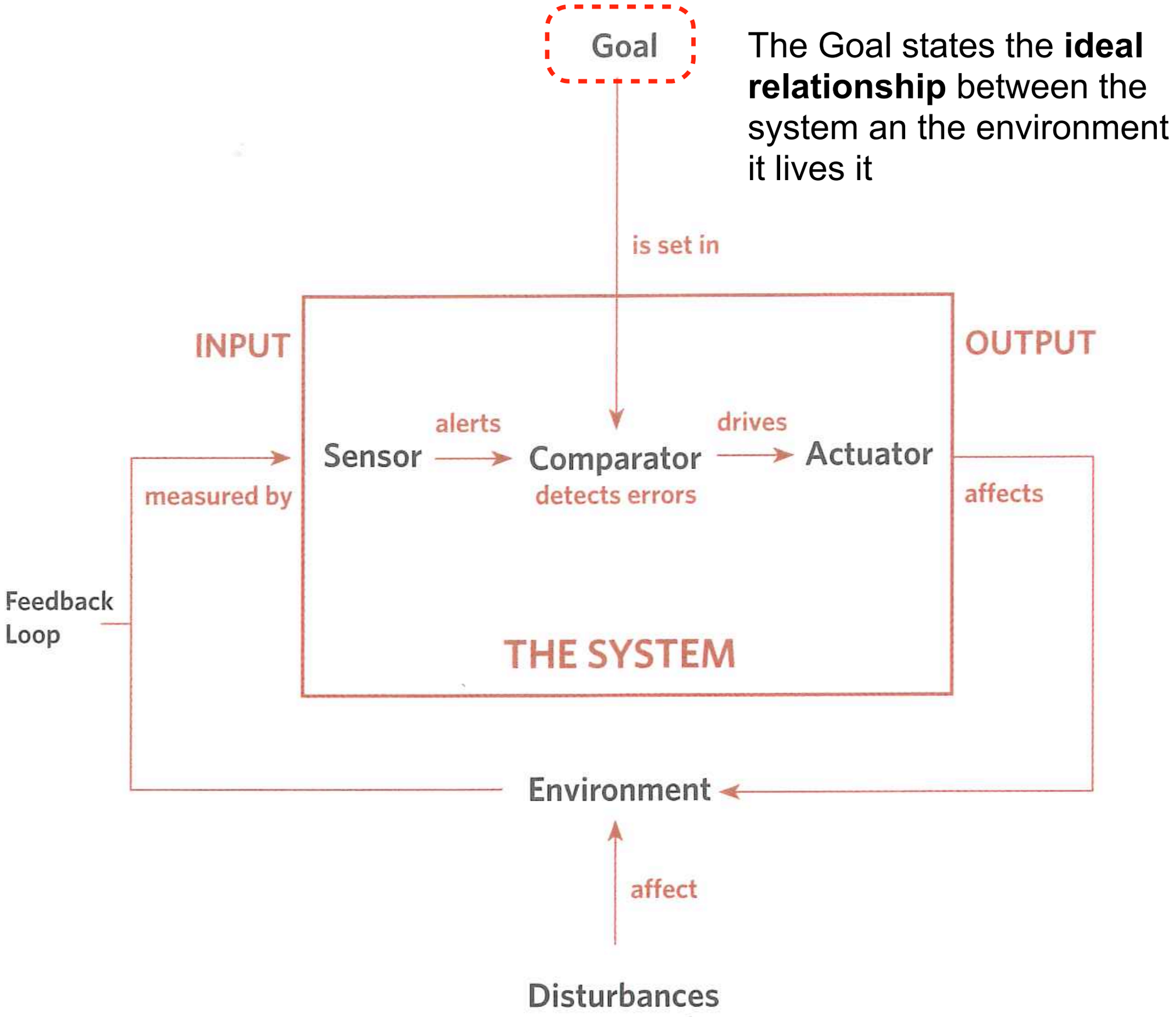
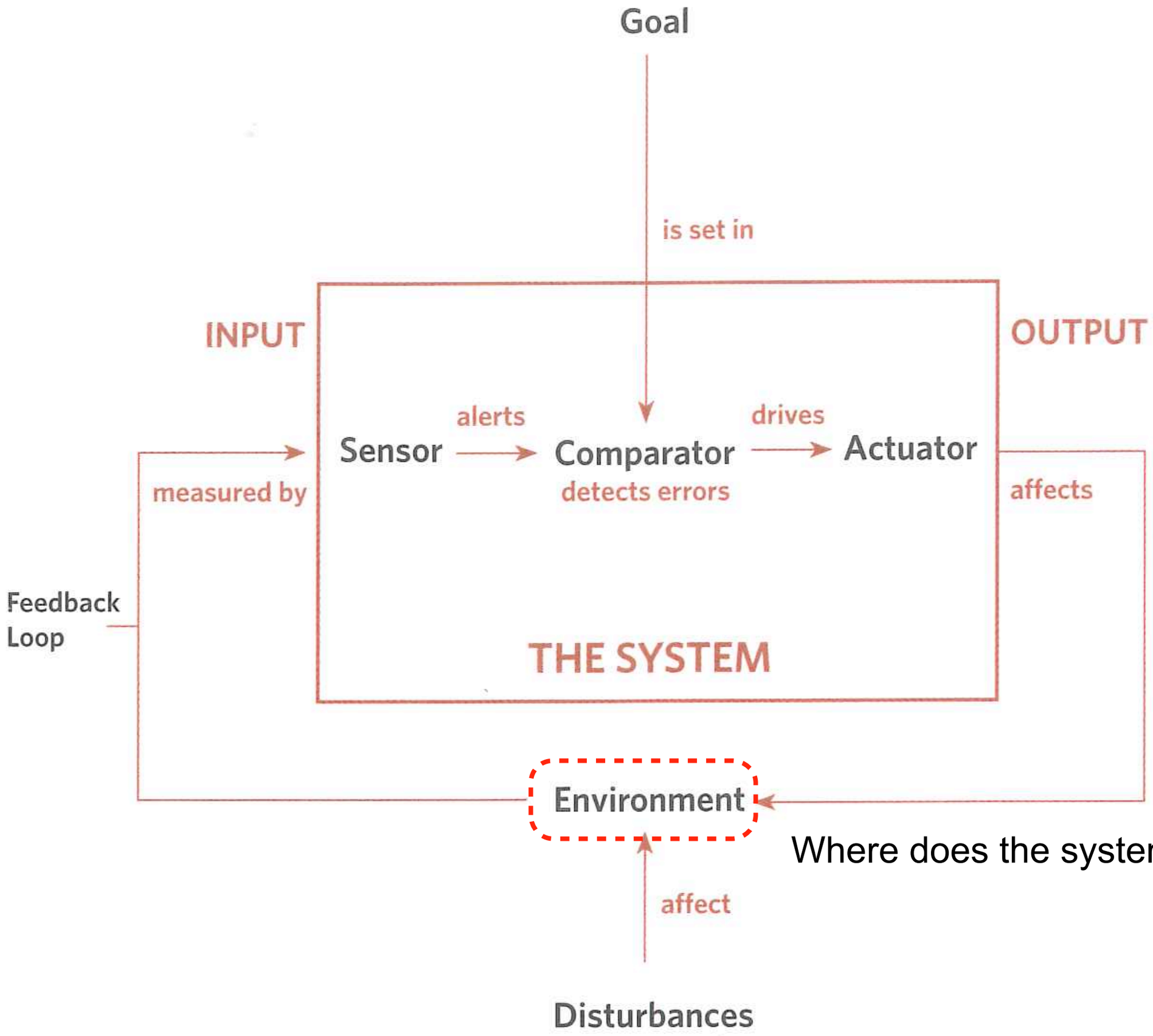


The Goal states the **ideal relationship** between the system an the environment it lives it

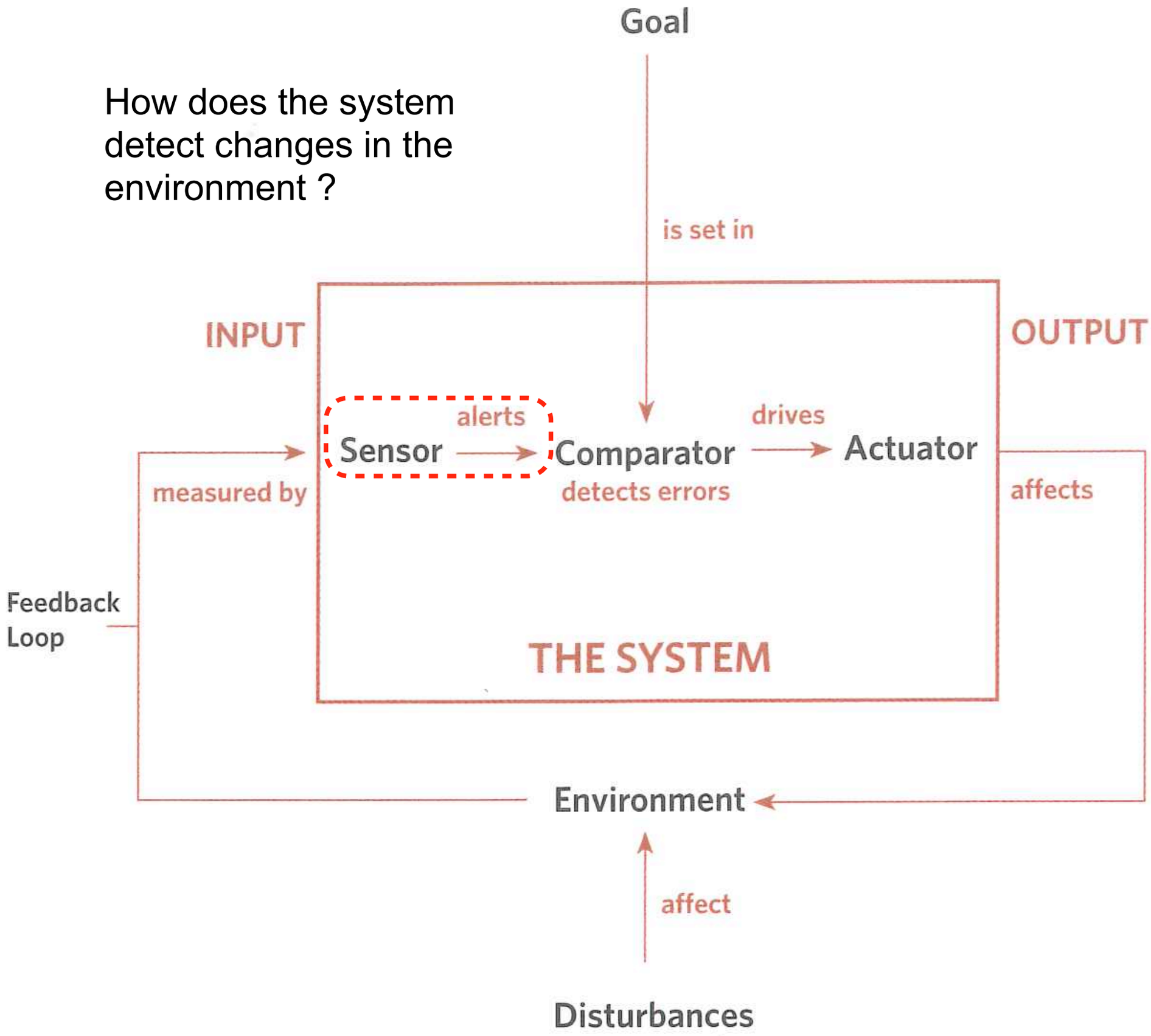
source: [5]



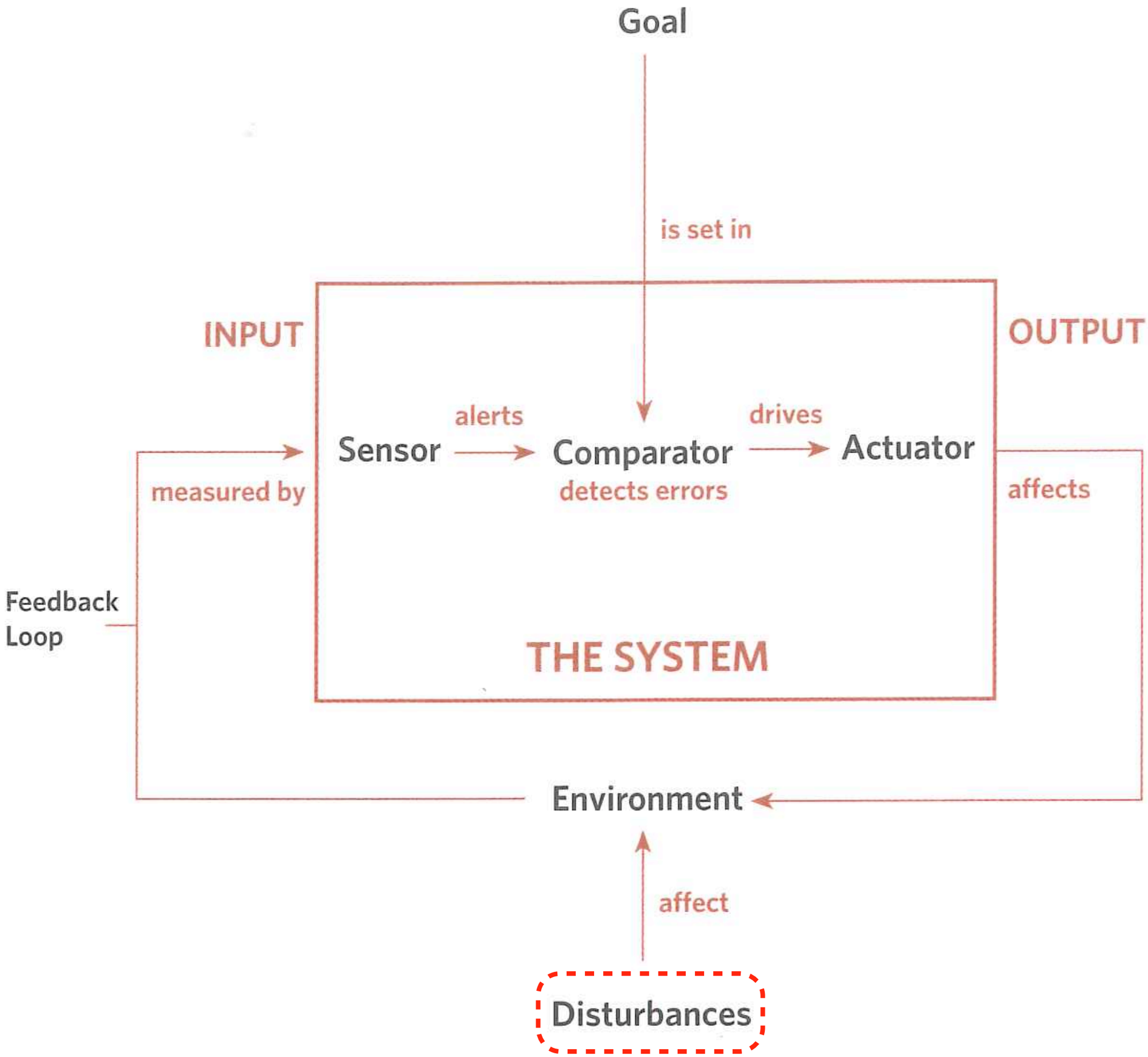
Where does the system “live” ?

source: [5]

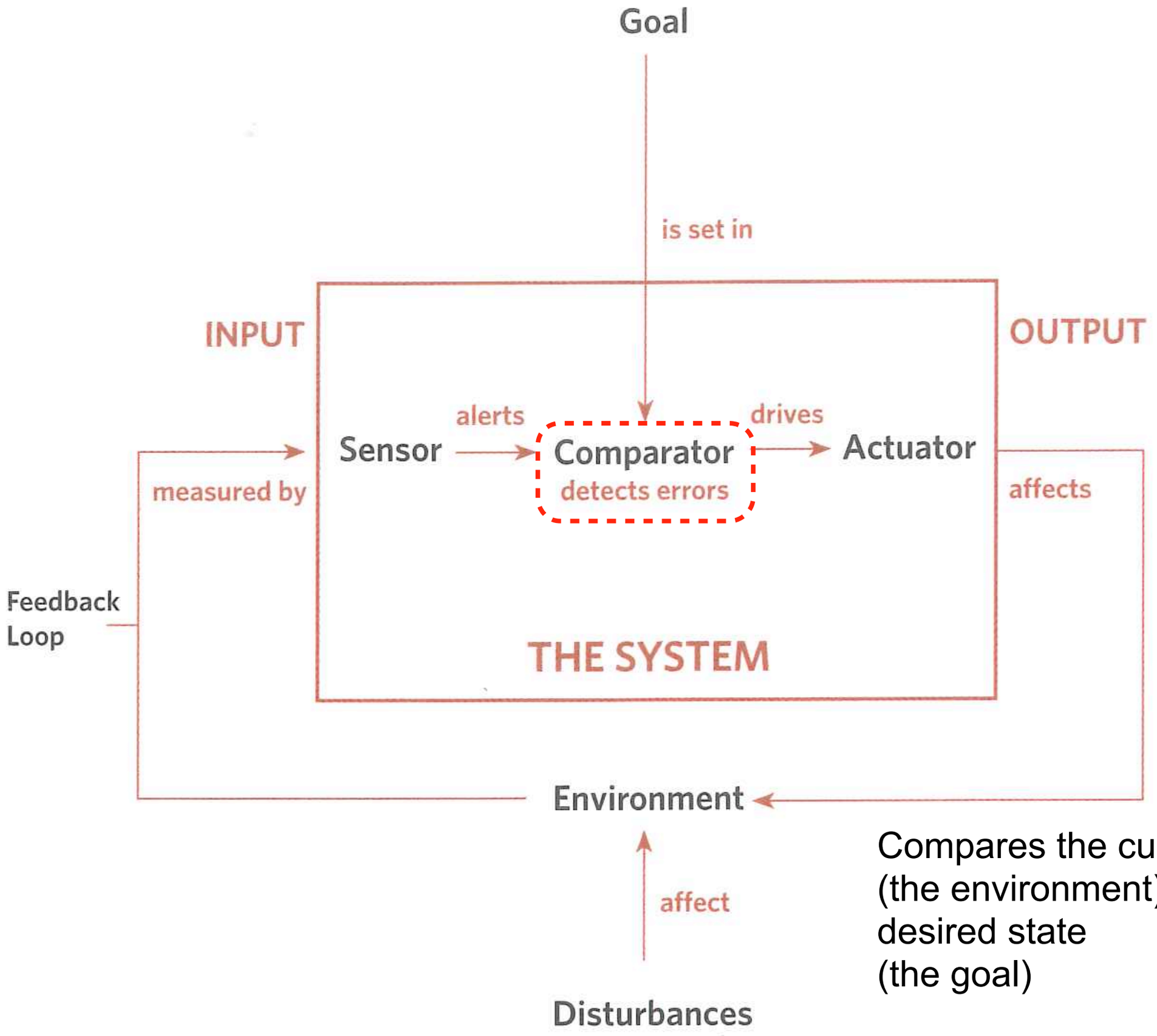
How does the system detect changes in the environment ?



source: [5]

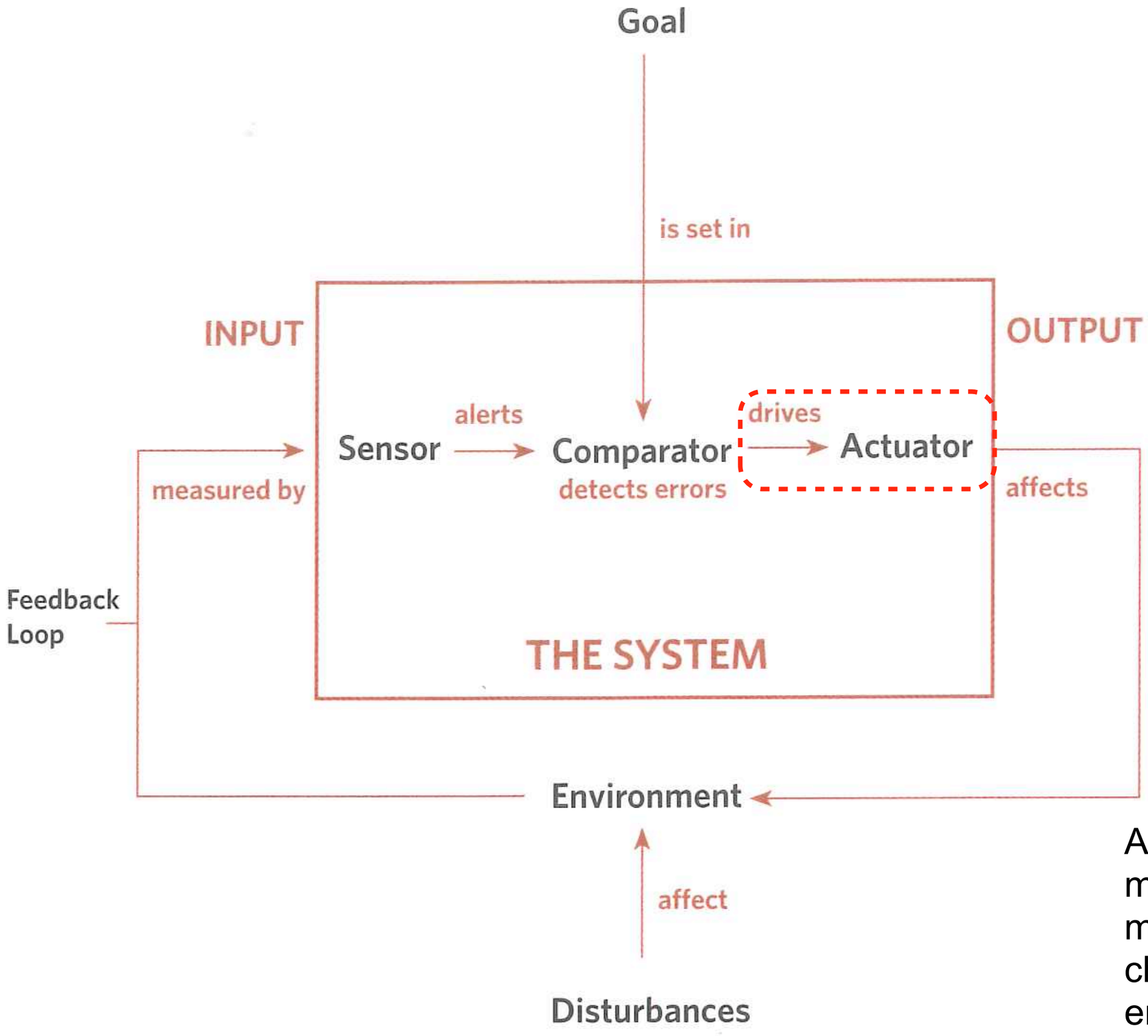

Goal
is set in
INPUT
OUTPUT
alerts
drives
Sensor
Comparator
Actuator
measured by
detects errors
affects
Feedback
Loop
THE SYSTEM
Environment
affect
Disturbances

source: [5]



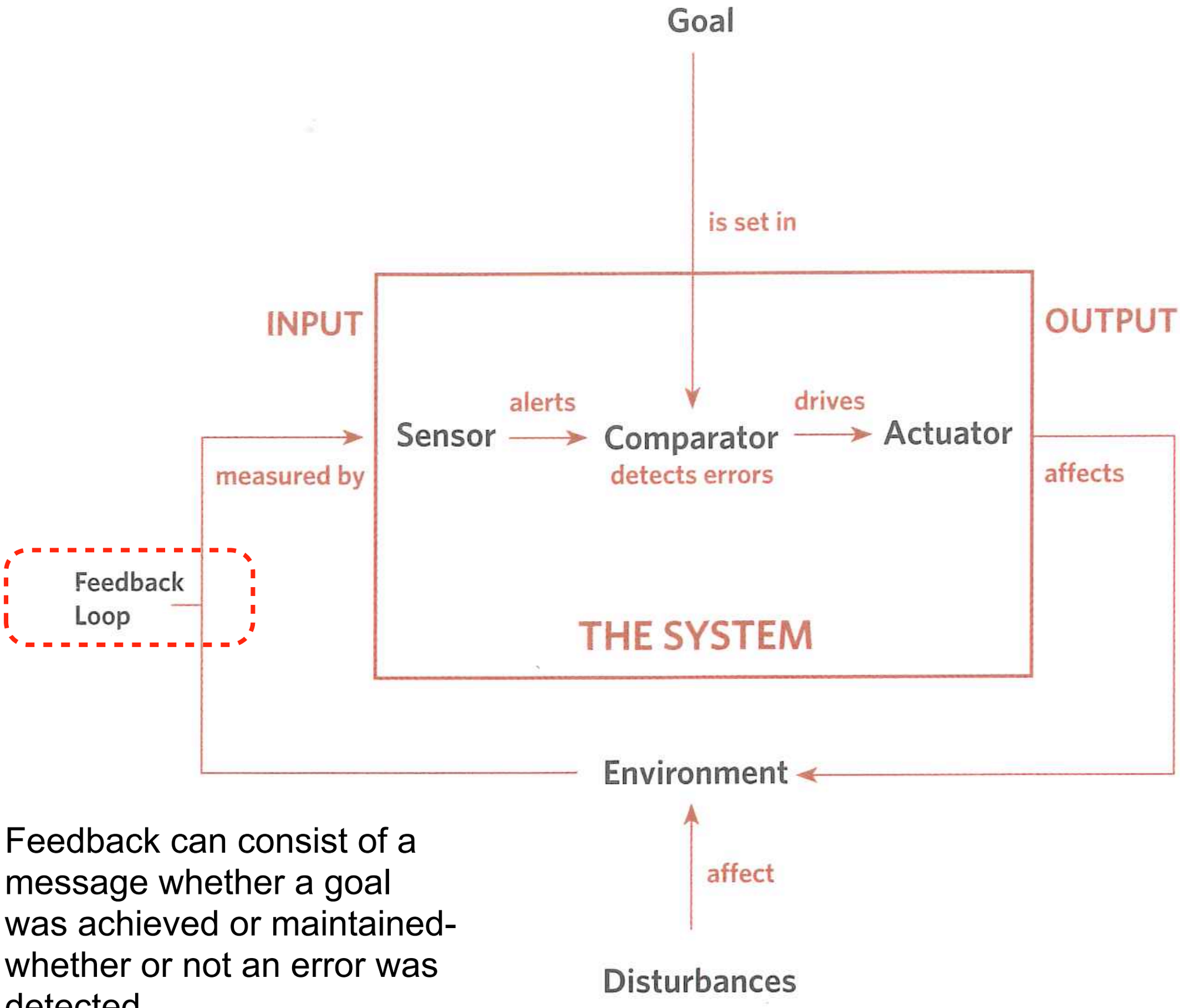
Compares the current state (the environment) to the desired state (the goal)

source: [5]



Actuators are means of making changes to the environment

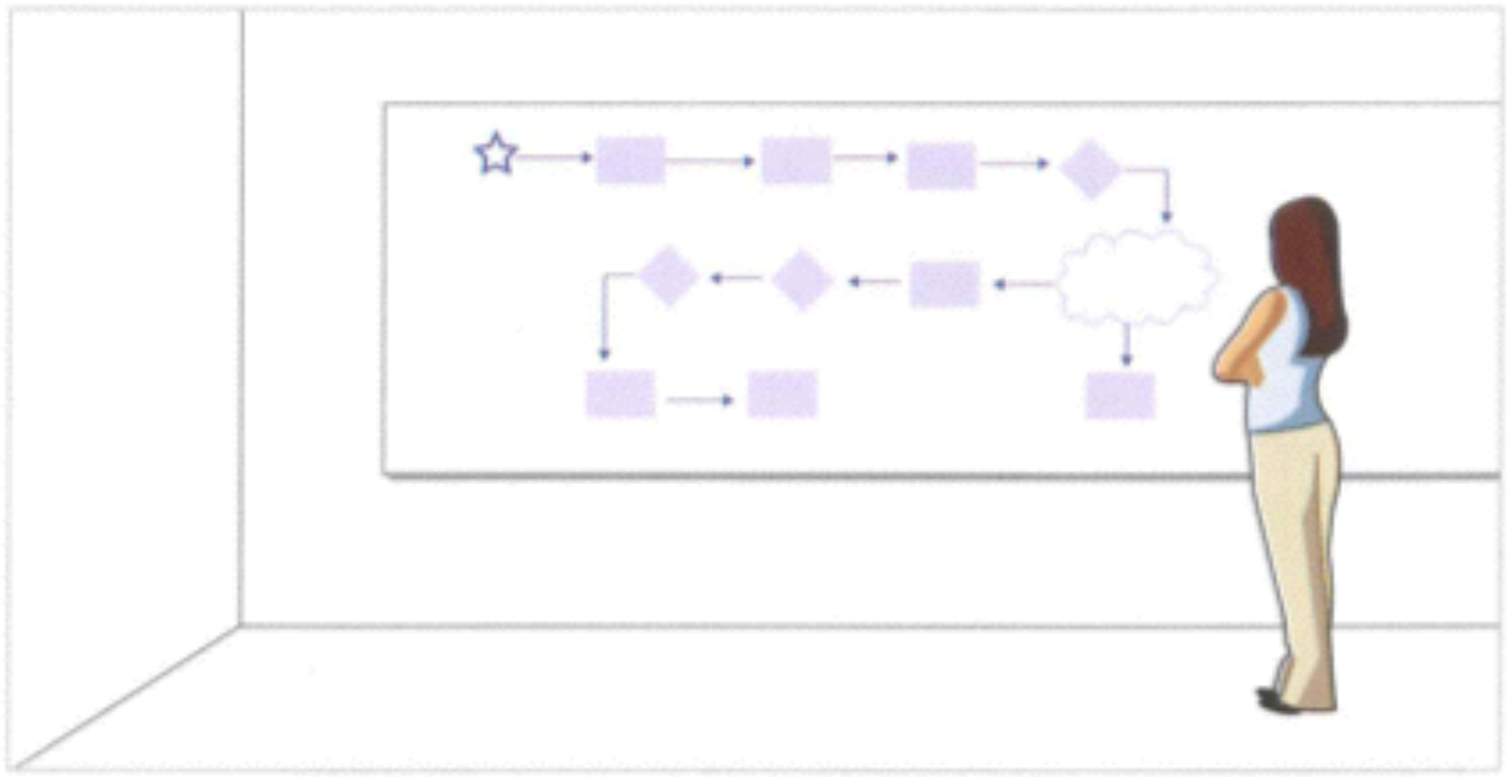
source: [5]



Feedback can consist of a message whether a goal was achieved or maintained- whether or not an error was detected

source: [5]

Flow Diagram



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

Unexpected disturbances

• things that fall outside of the expected range of input

• to make unexpected disturbances expected (and thus make the system more stable), systems need what´s called ***requisite variety***

• the system needs an assortment of responses to deal with a range of situations to prevent the system from failing

• systems without requisite variety can crash

source: [5]

By focusing on the broad context of use and the interplay of the components,
interaction designers gain a **better understanding** of a product or a service

source: [5]

Approaches to Interaction Design

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

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

source: [5]

http://upload.wikimedia.org/wikipedia/commons/1/11/IPod_family.png

http://www.flickr.com/photos/moparx/5321857668/sizes/l/in/photostream/

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

[2]

Beau Brownie Camera 1930

iPod Shuffle 2004

http://wwwapple.com
http://www.businessweek.com/innovate/next/archives/kodak_ipod.jpg

source: [8]

http://www.businessweek.com/innovate/next/archives/kodak_ipod.jpg

source: [8]

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

[2]

IBM Simon 1993

Apple iPhone 2007

source:[8]

http://upload.wikimedia.org/wikipedia/commons/0/0c/IBM_SImon_in_charging_station.png

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[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):

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[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