

12 October 2021

Every group has to choose one of the SDG - social developing goals.  
Then you have to know what to design for this kind of group.

You are not asked to design anything, you just have to apply tools and methods, because it's a theoretical course.

Examples of users: teacher with no digital literacy, child with specific ages ecc.  
The more you are precise of the user, the more you'll be able to set the questionnaire in a precise way.

The tricky part of the questionnaire because sometimes it's hard to translate the data

The main output is the design brief.  
Questionare: quantitative data + qualitative questions.

Try not to design for you, for what you know already (students).

15 questions is just enough, max 20.

Open questions is not just why -> you might get useless data.

Force the answers in the questionnaire or you'll have missing data.  
For the open questions you can force a minimum number of character.  
Quality check control, think about how to filter the data.

Apply a bit of statistics for example Mean-score ecc.

Clean the data after because, differently from the interview you won't be able to detect possible contradictions in the answers. **See critically the data.**  
Reinterpret the data and also double check with the papers you will find online. Time is a fantastic filter.

Before setting the brief, do the research key findings. The cake, percentages ecc. are not enough.  
-> they will be qualitative findings that came out of the data.

The brief in the example has 4 lines and you can understand everything from it. Then the system can be a panel, an application, a lighting system ecc.

Don't put the questions in the presentation.

Where to find users: Instagram / Facebook pages that have that users. Blogs online.

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## LESSON

Up until now we have seen the first block. Now we are gonna see the HOW and the WHAT of the interaction. Tools and methods to frame the how ion interaction.

How depends on the technology. It's also the aesthetic of the system that you are going to design.

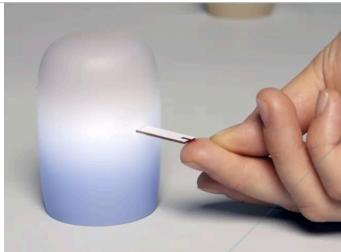
These are two different alarm clocks, you interact with these by using your foot and you interact with this by using your hand. Maybe these two ways are related to the WHY, so everything is interconnected.

A system could have the same purpose (what) but have different How and Why.

WHAT could be in any case different as well



The what is the glucose detection with the sensor



Why: Avoid frustration based on measurement

What: glucose detection (sensor to detect the glucose level)

How: Insert the strip and have feedback through colours (smart materials)

**Why**

- experience of interaction, emotions, needs, subjective impressions

e.g., perceived interaction character, interaction dramaturgy, social dynamics [1; 3; 5; 8; 9; 12]

**What**

- functionality

**How**

- form of interaction, concrete operations, motor-actions, elementary attributes

e.g., physical parameters, movement parameters, form of information presentation, technology involved, modality involved [6; 7; 13; 14]

Everything is interconnected


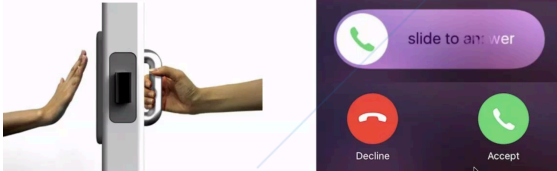
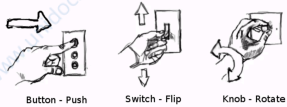
Static Vs Dynamic

**IxD**

This **dialogue** is both physical and emotional in nature and is manifested in the **interplay** between form, function, and technology as experienced over time.

Distinction between FUNCTION and EXPERIENCE

Interaction design is a dialogue between user and the system.

	<p>What is the difference between the function and the interaction?</p>
	<p>FUNCTION focuses on the operation, what you can and cannot do. No reelaboration. INTERACTION the way through which you experience a product that has a certain FUNCTION and it's related to the reason WHY.</p>
<p><b>IxD</b></p> <p>Interaction has per definition a <b>dynamic dimension</b>.</p> <p>Interaction is understood as <b>the way people use a system</b>, and it has to be seen separate from the <b>its function</b>, which is connected to the reason why people use it.</p>	<p>FUNCTION is separated from INTERACTION. Examples of the clocks.</p>
<p><b>IxD</b></p> <ul style="list-style-type: none"> <li>• People use cars to get from A to B (<i>function</i>), but different cars elicit different ways of driving them (<i>interaction</i>)</li> <li>• Glasses are used as containers to drink from (<i>function</i>), but differ in the way one holds them (<i>interaction</i>)</li> </ul>	<p>INTERACTION different according to user, shape glass, context of use ecc.</p>
<p>The concept of <b>Use</b> adds to <b>Function</b> a cultural and social dimension.</p>  <p>Smoke Glass, Joe Colombo 1964, Arnolfo di Cambio</p>	<p>Add a new way to interact with the glass in order for the user to have a cigarette in the hand while drinking a cocktail. FUNCTION is the same -&gt; contain the cocktail INTERACTION is different</p> <p>Other examples: car same function but interfaces are different. On one we have massive, impressive comment control and on the other one we have a digital interface.</p>
<p><b>Affordances</b></p> <p><i>The How of the Interaction is tightly connected to the concept of Affordances</i></p> <p>Affordance is a <b>property or feature of an object which presents a prompt on what can be done with this object</b>.</p> <p>Affordances are cues which give a <b>hint how users may interact with something, no matter physical or digital</b>.</p>	<p>HOW of interaction - remember AFFORDANCE</p> <p>Is a property of the system</p> <p>You have to shape it in order for the user to understand the HOW of the system. Could be digital or not but it has to communicate that an action is feasible or not.</p>
<p><b>Affordances</b></p> <p>Affordances <b>support our interactions</b> with the world of <b>physical things</b> and <b>virtual objects</b>.</p> 	<p>The ways the buttons are shaped tell me what I can do and what I can't do.</p> <p>On one side it suggests you to push on the other side to pull.</p>
<p><b>Affordances</b></p>  <p>Button - Push    Switch - Flip    Knob - Rotate</p>	<p>Without thinking, without reinterpretation the button tells you to push. A five years old kid, without knowing anything, will be initiated to push.</p>

<p><b>Affordances</b></p> 	<p>If I swipe on one direction is ON, if I swipe on the other direction is OFF.</p>
<p><b>History of the term Affordances</b></p> <p>Introduced by the psychologist James Gibson defined in 1979 the book 'The Ecological Approach to Visual Perception'</p> <p><i>Affordance describes all actions that are made physically possible by the properties of an object or an environment.</i></p>	<p>We moves from the psychological world to the design world. 1979 James Gibson in the books "The Ecological Approach to Visual Perception". The physical property of a system tell me what to do without knowledge.</p>
<p><b>Gibson's Affordances</b></p> <ul style="list-style-type: none"> <li>Action possibilities in the environment in relation to the action capabilities of an actor;</li> <li>Independent of the actor's experience, knowledge, culture, or ability to perceive;</li> <li>Existence is binary — an affordance exists or it does not exist.</li> </ul>	<p>- According to GIBSON the affordance is binary</p> <p>Example. I know this is a button to push</p>
<p><b>Gibson's Affordances</b></p> 	<p>It's related to the capabilities off the user. Door designed for cat, dog or human being.</p>
<p><b>Affordances in Design</b></p> <p>Norman, in his famous book "The Design of Everyday Things", has replaced the notion of affordance by Gibson with the notion of "perceived affordance":</p> <p>"... the term affordance refers to the <b>perceived and actual properties of the thing</b>, primarily those fundamental properties that determine just <b>how the thing could possibly be used</b>... Affordances provide strong cues to the operation of things."</p>	<p>Us designers we don't care about the psychological point of view of the affordance but we have to care about the communication and the perception of the affordance. It's tightly related to how you give an hint on how to perform that kind of action.</p>
<p><b>Affordances in Design</b></p> <p>"When affordances are taken advantage of, the user knows what to do just by looking: <b>no picture, label, or instruction needed</b>"</p> <p>A user's perception and understanding of affordances might vary according to their <b>ability, goals, beliefs, context and past experiences</b>.</p>	<p>If you are a good designer, you don't need instructions or pictures on how to use the system.</p> <p>Affordances are related to the ability, goals, beliefs, context and past experiences.</p> <p>If you are designing for a visually impaired you have to take into account the abilities to shape the affordance based on that.</p>
<p><b>Affordances in Design</b></p> <p>Designers' main goal is to <b>actualize the knowledge and experience people</b> already have to <b>simplify the interaction flow</b>.</p> 	<p>Which one would you click? The first one is perceived as clickable.</p> <p>On the second one the action is there, I'm telling you buy but I'm not telling you in the correct or simple way.</p> <p>The more the system is complex the more you should make the affordance simple</p>
	<ul style="list-style-type: none"> <li>- You can perceive something that is not existing</li> <li>- The affordance has to give you a clue on what to do</li> <li>- Can be dependent on the experience, it's not true that is there on not there, it depend on the user</li> <li>- Can make an action difficult or simple</li> </ul>

<ul style="list-style-type: none"> <li>Perceived properties that may not actually exist;</li> </ul> 	<p>The light was perceived as a button so you can perceive something that is not there, so they had to put an arrow there.</p>
<ul style="list-style-type: none"> <li>Suggestions or clues as to how to use the properties;</li> </ul> 	<p>Icon interface and the physical slide are matching.</p>
<p>Can be dependant on the experience, knowledge, or culture of the actor. Can make an action difficult or easy.</p> 	<p>In Texas the dyson was misunderstood as an urinator.</p> <p>It's not true that the affordance is there or not there. So dyson is going back to the traditional shape of the hand-dryer</p>
<h3>Norman's Affordances</h3> <p>Affordance when used as a tool, makes a system easier to use and <b>encourage the users to undertake the intended actions.</b></p> <p><b>Effective affordance results in higher conversion, registration rates and desired outcomes</b></p>	<p>You have to do so so that the user can guess the outcome and understand if the outcome is desirable or not.</p> <p><b>AFFORDANCE</b> as the substrate that will make the action possible / impossible, understandable / not understandable.</p>
<h3>Different Types of Physical Affordance</h3> <ul style="list-style-type: none"> <li><b>Perceptible Affordances</b></li> <li><b>Hidden Affordance:</b> When an object has affordances that are not so obvious.</li> <li><b>False Affordance:</b> There is a perceived affordance; but no results happen from the possible action.</li> </ul>	<p>3 types of physical affordance:</p> <ol style="list-style-type: none"> <li>1. Percptible: action possible and clearly communicated</li> <li>2. Action is there but I'm not communicated well</li> <li>3. 'm perceiving something that is not possible</li> </ol> <p>Pic 1.</p>
<ul style="list-style-type: none"> <li>Hidden Affordance</li> </ul>  <p>First picture</p>	<ul style="list-style-type: none"> <li>False Affordance</li> </ul>  <p>here you have to pull and rotate</p>

### Different Types of Digital Affordance

- Explicit (Obvious) and Implicit (Hidden) Affordances;
- Pattern Affordances;
- Negative Affordances;
- False Affordances.

5 types of Digital affordances

- explicit - easy and natural way (example website)
- Implicit - some things appear, you don't know what kind of info you'll get when you click there, sometime designers want the wow effect, to be different from the others, but sometimes this means that the affordance will get implicit

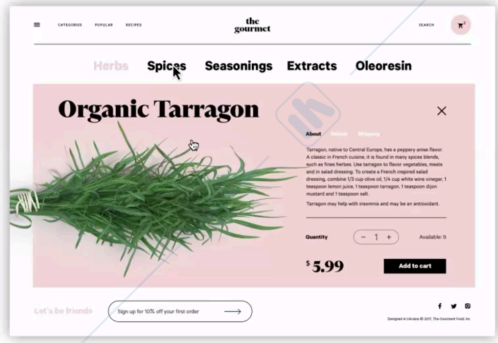
### Explicit and Implicit

- **Explicit affordances are based on widely known and typical prompts that direct the user to a particular action.** A button designed as an obviously clickable element, if it is supported by a text or icons the affordance becomes even more clear
- **Implicit affordances are not that obvious.** They are hidden and may be revealed only in a particular flow of users' actions. The cases when we get tooltips or explanations hovering on a layout element are the ones.

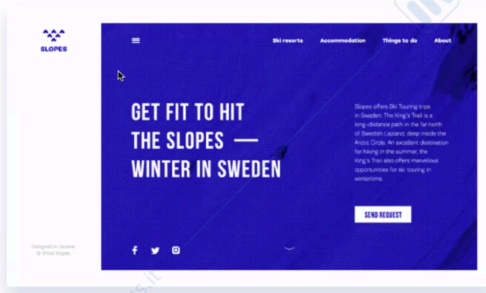
I know that from the experience I can make an action with a button. You shape a button in a way that you can shape it so that the user knows that he can do that action.

Flow of action, you have to go step by step to understand the proper flow through which you have to navigate the website.

### Explicit



### Implicit



### Pattern Affordances

Pattern affordances are based on the power of habit: Patterns that the user identifies the moment he/she sees it:

- Clickable logos in website headers which usually open a home page. Click [here](#) to learn how to drive a car
- Underlined text. [Learn how to drive a car](#)



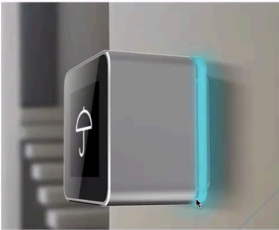
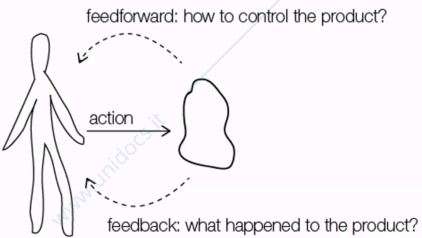
It is related to the habits. We know that when we see an underline text we will open a link. It's a pattern that we recall.








Two patterns that both communicate clearly the action and the outcome.

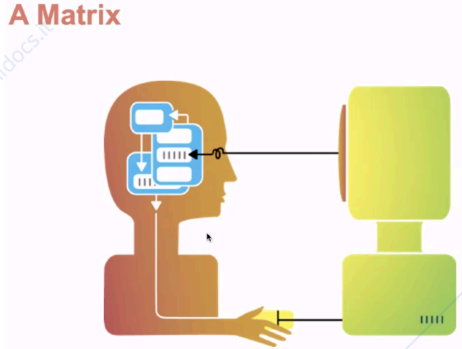
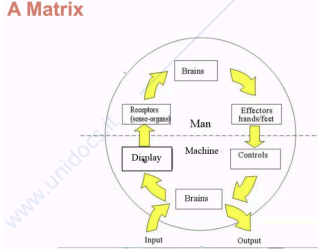
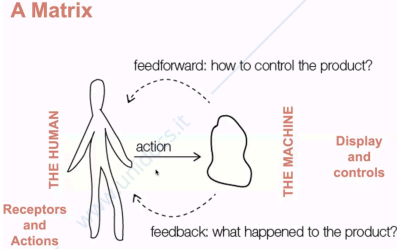
### Pattern Affordances



Block of information, hierarchy, click and enlarge.

<p><b>Negative Affordances</b></p> <p>Negative affordances also play a big role in positive user experience. Use negative result is a designerly way.</p> <p>The purpose of a negative affordance is <b>to give users a prompt that some elements or operations are inactive at the moment</b></p>	<p>Could be a choice of the designer, to tell you that that action is not possible, that it's locker. But its could be done in a bad way</p>
<p><b>Negative Affordances</b></p> 	<p>The clickable button is related to the bedroom, the others are switched off, not possible.</p>
<p><b>False Affordances</b></p> <p>Users expect something to happen when they notice an element that has certain characteristics (e.g. a button).</p> 	<p>This is not a button. False affordance is something that you will never use.</p>
<p><b>In brief</b></p> <p>The How of Interaction relates to the the form ( the way) of the interaction.</p> <p>&gt;&gt;&gt;&gt;&gt;&gt;<b>Communicate what will be the result of an action</b></p> <p>Feedforward - action - feedback</p>	<p>We use a system made of three elements.</p>
<p><b>In the Interaction Design activity you blend both physical and digital world!</b></p> 	
	<p>If the system gives me a prompt I do an action The elements of a system that you are suggesting the user the proper actions to be made.</p>

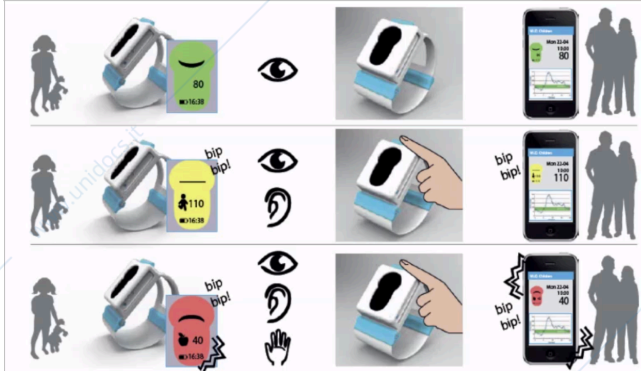
<p><b>FEEDFORWARD</b></p> <p>How can we make the controls <b>communicate</b> their <b>purpose</b>?</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px dashed black; border-radius: 50%; padding: 10px; text-align: center;"> <p><b>Semantic Approach (cognitive)</b></p> </div> <div style="border: 1px dashed black; border-radius: 50%; padding: 10px; text-align: center;"> <p><b>Direct Approach (bodily)</b></p> </div> </div>	<p>Two approaches.</p> <ul style="list-style-type: none"> <li>- semantic approach / cognitive - digital affordance</li> <li>- Direct approach / bodily</li> </ul>
<p><b>SEMANTIC APPROACH</b></p> <p>Labels and Icon</p> <div style="display: flex;">   </div>	<p>In the over I'm dividing the ...</p>
<p><b>DIRECT APPROACH</b></p> <p>Affordances</p> <p>Exploit the <b>action potential</b> of <b>physical objects</b> as carriers of meaning</p> 	<p><b>DIRECT APPROACH</b></p> <p>Affordances</p> 
<p><b>Semantic approach + Direct approach</b></p> 	<p>More complex the system, more you have to combine the two approaches.</p>
<p><b>FEEDBACK</b></p> <p>= Effect of the action (evident)</p> 	<p>You also have to design the <b>FEEDBACK</b>.</p> <ul style="list-style-type: none"> <li>- computer charging -&gt; green 100%</li> <li>li don't know if I can burn myself.</li> </ul>
<p><b>FEEDBACK</b></p> <p>= Effect of the action (evident)</p> 	

<p><b>INHERENT FEEDBACK</b></p> <p>= Feedback should have a relation with the action performed: there should be a <b>proper coupling between action and feedback.</b></p>	<p>ACTION is matching my thoughts.</p> <p><b>MISSING IMAGE EXAMPLE</b></p>
<p><b>A Matrix</b></p> 	<p><b>FRAMING THE INTERACTION</b></p> <p>Example- you're in the metro station and you don't hear the sound, but you can feel the vibration</p> <p>We are still talking about the feed-forward. The senses are very much important, and the senses I want to trigger.</p>
<p><b>A Matrix</b></p> <p><i>Display:</i> What kind of media can be applied in the man-machine system for informing the user?</p> <p><i>Controls:</i> What kind of physical or virtual devices is applied to receive input from the user?</p> <p><b>THE MACHINE</b></p>	<p>From the machine point of view we have 2 elements: display and controls</p> <p>Display is not the display.</p>
<p><b>A Matrix</b></p> <p><i>Effectors:</i> What means (actions) are employed to give feedback to the machine?</p> <p><i>Receptors:</i> What kind of human sensory is employed to 'sense' the machine and its intention?</p> <p><b>THE HUMAN</b></p>	<p>Receptors stimulated by the machine.</p> <p>Effectors are the actions that you make</p>
<p><b>A Matrix</b></p> 	<p><b>A Matrix</b></p> 



### EXAMPLES

Sensors that continuously detect your glucose level. Bracelet used by child, app used by parents



### USE CASES

I see or not see the levels of the bracelet

Green silhouette - happy face  
 Yellow silhouette + beeping - an icon that tells you to to make an activity, you have to push to make the beep stop  
 Red silhouette, sad face + beep increasing - you need to eat / or insuline injection -> call to the parents

### A Matrix

- The feedforward :** icons, the wristband button, colors, text, auditory signal.
- The Feedback:** auditory and visual, tactile.
- The Actions;** push the button.

Feedforward:  
**Direct Approach:** Physical Botton ( suggest me to push)  
**Semantic Approach:** icons and text

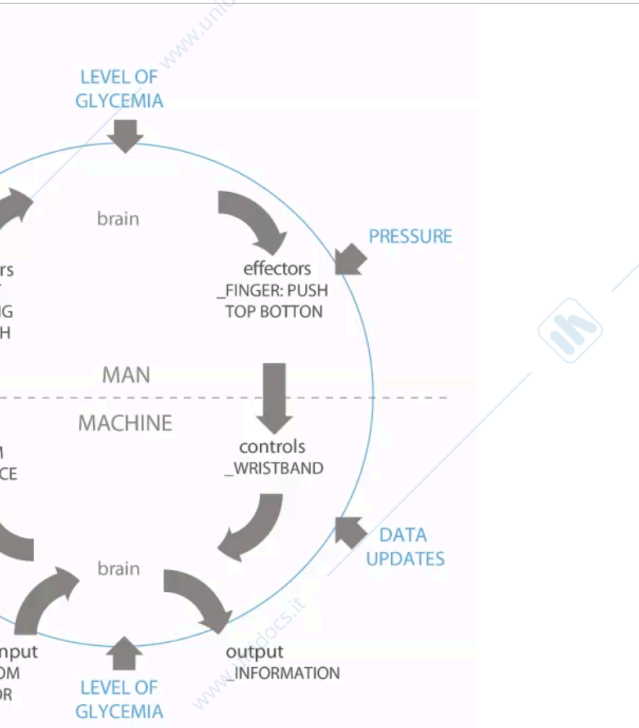
Auditory signal is also a feedforward because it informs you.

The only action here is push the button.


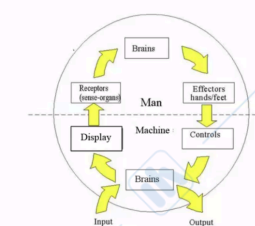
### A Matrix

The display affects the receptor  
 The receptor -> effectors

You have to use the matrix both to analyse and to design



<p><b>Direct and Indirect Interaction</b></p> <p>The system provides the user both a <i>direct and indirect interaction</i>. The sensor detect glucose level of the child and send the information to the device giving the user three different output:</p> <ul style="list-style-type: none"> <li>•Text.</li> <li>•Sound.</li> <li>•vibration.</li> </ul> <p>The user interacts directly with the device <i>pushing the button</i> and <i>giving feedback to the device or to the parents</i> according to the situations.</p>	<p>Glucose-meter: The system is giving me information without me interacting with me.</p> <p>Most of the time the system interacts with the user, indirectly.</p> <p>Tangible /intangible Direct / nderact EXAM QUESTION !!! Relisten audio she explains it.</p>
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<p><b>CUBE SENSOR</b></p> 	<p><b>EXERCISE:</b></p> <p><b>A Matrix</b></p> <p>Define:</p> <ul style="list-style-type: none"> <li><b>The feedforward</b> (bodily and semantic approach)</li> <li><b>The Feedback</b> (auditory, visual etc..)</li> <li><b>The Actions</b> (what the user does)</li> </ul> <p>Frame the Interaction:</p> <ul style="list-style-type: none"> <li><b>The display</b></li> <li><b>The Controls</b></li> <li><b>The Receptors</b></li> <li><b>The Effectors</b></li> </ul> <p>Define the direct and indirect interaction.</p> 
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<p>MATRIX, lots of errors in this cube</p> <p><b>Feedforward:</b> bodily: it's a small device so I can take it in my hand and shake it but there's nothing suggesting me to do this action, the shape tells you to grab it and put it on the desk semantic approach: icons and text in the app</p> <p><b>Feedback:</b> visual</p> <p><b>Actions:</b> shake the cube</p> <p><b>Display:</b> different colours blinking, the cube and the app <b>Controls:</b> you have to change an aspect of the house to actually make the light turn off <b>Receptors:</b> sight <b>Effectors:</b> the blinking light pushes you to control the app and hopefully fix the problem that the colour wants to communicate</p> <p>Indirect interaction - cube processing information Direct interaction - shake it</p> <p>Light is both for feedback and feedforward The cubes his symmetric, it isn't giving you the direction</p> <p>Words are not hell. You can write shake me or add an icon, It's not an error as you might think after Norman.</p>	
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