

Four cornerstones of user-centered design

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In my Graphic Design in Context study, I focused on User Experience and Interaction design. I studied the relation between the user and the interface, conceptual models and the User Experience design process from the Strategy Plane to the Surface Plane. The aim of this essay is to introduce the conclusions of my study – four important rules every User Interface and Interaction Designer should follow.

Sometimes everyone struggles using a computer, a mobile phone, website, or even a device of everyday use such as a cooker or a car radio receiver. When we do not understand the mobile application, have difficulties using our company's ERP software or simply do not know how to use all functions our camera features, we are used to blaming ourselves. We think our own technical incapability is the cause of our errors and mistakes. But this assumption is not correct.

The design of the interface determines if the user is able to use the product successfully without errors and with joy. Often, there are no sales representatives, user manuals or guides, which can help the user to use the product. I believe it is the mission of the designer to create a user-friendly, self-explanatory interface.

Fortunately, today's designers have many tools which can help them to design great products, which will reflect both manufacturer's and customer's needs - the demographic and psychographic research, personas, wireframing, prototyping, user testing – and of course a set of fundamental guidelines of user-centered design – Visibility, Feedback, Affordances and Constraints.

Visibility

Visibility is one of the principles of the user-centered design and is closely linked with conceptual models, Affordances and a Feedback. Visibility is probably the most important prerequisite defining if the user is able to use the product, perceive potential errors and make decisions how to accomplish a desired action. Visibility simply means that the important parts and controls of the product are perceivable to the user.

When the crucial parts, serving to operate the product, are visible, user can create an appropriate conceptual model – his conception of how the product works. Basically, Visibility informs the user what options he has and what is important.

If we want a user to have the most smooth and seamless experience with the product, we need to make the product's interface self-explanatory. Many products suffer from the lack of Visibility - it can be difficult to recognize what are the important controls or which buttons or levers a user should employ to perform a desired action. Designing all controls in a similar shape and size is the victory of the form above the content. The other example is the product, which offers much more functions than controls dedicated to operate them. Then, a user is forced to create complicated conceptual models and remember them. This can often lead to frustration and errors.

The contrary case is the excess of Visibility. When product has too many controls and offers too many options, it can be rather confusing. Again, users have to mind-map the options provided and remember them. Everybody knows office telephones with many rows of similar-looking buttons, offering many different functions, which nobody knows how to use. Another good example can be car CD players and radio receivers or complex software ERP systems. At once, the excess of Visibility damages users' experience with the product.

I strongly believe it is the designers' responsibility to provide the degree of Visibility that will help the user to tell the state of the device and to determine what actions are available.

Feedback

In natural world, we are used to getting a Feedback for our actions all the time. When we enter an elevator, after pressing a particular button we start to feel the motion, to hear the engine and see the lights signaling on which floor we currently are. When we get off, we can see the interior of the floor we arrived at. We get enough Feedback to judge if our action – using an elevator – was successful.

The purpose of a Feedback is to provide information about the state of the product we use and to assure if our actions led to success or error.

When the user meets a device for a first time, he often uses all experience gained in life to understand it and to estimate how to operate it. According to IBM (2008), many first-time computer users expect the computer to provide an immediate Feedback as other machines – for example automobiles or elevators – do. Basically, users expect devices to provide enough information about their status and about the success of users' actions.

A Feedback does not necessarily need to be visual – it can be a sound, a movement or other perception. For example, when we “press” the shutter button in the camera application in our touch-screen mobile phone, we can hear a characteristic sound of camera taking picture. That assures us that the action was successful.

Designer's role is to give users a device which will provide an accurate immediate Feedback and therefore assure them about the conceptual model they created. On the basis of the Feedback, users can compare what they see with what they originally wanted. This approach can precede errors or help to find that an error happened.

Affordances and Signifiers

The term “Affordance“, invented by perceptual psychologist J. J. Gibson (1977) as part of his theory of visual psychology, describes a relationship between an actor and an environment. Affordance represents all possible actions an actor can perform in an environment, whether he knows about them or not.

Donald Norman, a Professor Emeritus of Cognitive Science at University of California, San Diego and a Professor of Computer Science at Northwestern University, revolutionarily used the term “Affordance“ in design.

Norman (2002) talks about “Perceived Affordance“ – a characteristics describing what relations an actor perceives in the environment – in a simplified way what actions the environment affords. A ball affords to bounce, glass affords to be looked through, a button affords to be pressed, a form-field to be filled in, a hyperlink to be clicked. Perceived Affordance invites an actor into an action.

Later on Norman (2008) introduces a concept of Signifiers, perceivable part of an Affordance. Even if Affordance exists, we may not know about it without a Signifier. Signifiers are Perceived Affordances which can be interpreted, the clues for what happens and what the alternative actions are. Signifiers carry important information and significant signs offering guidance and call to action.

One of the biggest challenges of the User Experience and Interaction Design is to design an interface that will be self-explanatory. Designers can use Affordances or, actually, Signifiers to guide the user. From looking on a submit button below a form on the website or from the shape of a cursor, when rolled over a hyperlink, users can understand what actions are available.

Signifiers can appear in the form of so-called Metaphors – a software representation of an object in a real world. Thus, users immediately know which part of the interface serves for. For example, a folder on a desktop of our computer is a software metaphor for a real folder we use to store our documents in.

Constraints

Constraints are factors limiting the actions the user can perform. Good use of Constraints leads the user and helps him to accomplish the desired action, forego errors and confirm important decisions.

According to Norman (2002), we can divide Constraints into 4 categories.

Physical Constraints represent physical attributes of an object – a size, an orientation, a value or weight. The limits resulting from physical constraints are very obvious prior to performing an action. The user does not need any special knowledge to understand the limitation.

For the Semantic Constraints, users need to know the context in which the situation takes place. Semantic Constraints are logical limitations of what is appropriate to use in a particular situation.

Cultural Constraints limit the user by culture, ethics and cultural knowledge. That can mean how we are supposed to read a text on a website (left to right), what meanings different colours or pictograms have.

Logical Constraints originate from the logic of the situation. For example, when playing a game, a left button operates a movement to the left while a right button operates a movement to the right.

One of the most important roles of Constraints in design is preventing errors, especially errors originating from automatized actions, for example deleting files. These Constraints force user to perform a confirming action before it is possible to accomplish the desired task – thus, they are called Forcing Functions.

These Forcing Functions often serve as a disruptor of an automatized task – to wake up an user and force him to consider relevant information before proceeding the action.

I think this is very important for user-centered design because making error can be very frustrating, or even fatal, and can disrupt the user experience. Designer should always use Constraints and Forcing Functions when there is a chance of a critical error - for example, a confirmation dialogue when deleting important files, a confirmation message after successful checkout on ecommerce website, or a system warning, when the user tries to install potentially harmful software.

Conclusion

Although these essential rules can guide the designer in creating a product which will be used with joy and without errors, I believe just following rules are not enough. From my Graphic Design in Context study I have learnt much more than just four rules – it helped me to understand better the mission of a designer and to form my opinion what the deliberate goal of a good design is.

I believe a designer should never stop asking questions about what the manufacturer wants to get out of the product. Careful research, prototyping and testing can help us understand user's real needs. Important portion of the product's success is our, designers', responsibility.

In my opinion, it is crucial for a designer to keep educating in fields of human-computer interaction, psychology, graphic design and visual communication. It is knowledge in conjunction with creativity that can result into the perfect product.

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