_____

Understanding the role of emotions, usability components and design features in HCI

Deepak Aggarwal
Department of CS
Maharishi Dayanand University
Delhi, India
Deepakaggarwalmailsbox@gmail.com

Somya Jain
Department of CS & IT
Jaypee Institute of Information Technology
Noida, India
somya.nsit@gmail.com

Abstract— This paper has discussed the observations of various emotions which are invoked in the human computer interface and how these emotions affect the decisions of the users online. This paper has also discussed usability test methods in the human computer interface design and its relation with the usability of the interfaces. Also some principles are put forward which should be implemented for the development of better interfaces.

Keywords-emotions; human computer interaction; styling; usability component; design features

_____*********_____

I. INTRODUCTION

Whenever we think about interaction design, we think about our phones, laptops and different devices, but without humans there is nothing interesting to talk about. Interaction design implies really at what we design as man-made objects is complete only when there are people who are using it. Products have changed our behavior and for these things to change our lives better or enabling us do the things we couldn't do earlier in a way that feels natural and feels like a conversation and what interaction design does is it makes those experiences natural and it makes them more about the content, or experience, or what we are trying to do and less about using a device, or using a screen, it is understanding the ecosystem where the human is at the center and understanding the network of things and how they work and every time one interacts with the design there is an emotion attached to it, these emotions change our thinking process, they modify our lifestyle, and affects things around us, although not apparently this is because of the emotions we invoke when we are using the design Usability is the science of ease of use and learnability to the users, we are living in an era where access to facebook.com can change the fate of the country, and emotions for the million users cannot be ignored and this is what makes usability, emotions and their relation so important because it has the potential to change our lives.

II. COMPONENTS OF USABILITY

Wherever Times is specified, Times Roman or Times New Roman may be used. If neither is available on your word processor, please use the font closest in appearance to Times. Avoid using bit-mapped fonts if possible. True-Type 1 or Open Type fonts are preferred. Please embed symbol fonts, as well, for math, etc.

A. Satisfaction

This is the property by which the user feels pleasant by the overall experience of the interface and the interactions. A good design is as natural as possible and this is the underlying principle of this component as the user who is already interacting with the natural behavior of the products is more likely to gain a pleasant experience while interacting with web components or graphic interfaces. For example, flipping pages while reading an e-book on a tablet or i-pad is a natural thing we do while reading paper-books as Shown in Fig. 1.

B. Learnability

This is the component where the ease of access for the users are checked when they use the website or the software for the first time. This component is very crucial when the software application or the website has some complex task to perform and if the user is interacting with the interface for the first time, it becomes very important to understand the target users.

C. Efficiency

This property is judged for the users who were already once visited the interface of the software or website, and also how the users react to the system when they use it for the second and subsequent times. This is also a very important factor as once the users have learned the design, then how quickly can they perform tasks, the success over this factor will return the website their users.

D. Memorability

This Principle of memorability states that of being how easy to recall the design for user and their aptness if not being used for so many years. This could be directly associated with the property of Learnability as here too the users could be assumed of using the design for the first time.

E. Errors

Another vital aspect is the errors the users make while using the design, this could drastically affect the usability of the design questions like, how many errors do users make?, how severe are these errors?, how easily can they recover from these errors could change the design, a sheer usability research and testing on users and observing their actions can answer these questions.
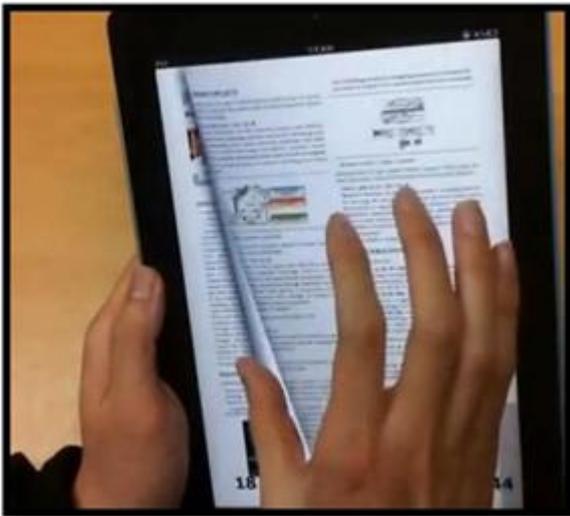
Figure1. Flipping pages on i-pad

III. FACTORS AND THEIR INVOKED EMOTIONS

Before you begin to format your paper, first write and save the content as a separate text file. Keep your text and graphic files separate until after the text has been formatted and styled. Do not use hard tabs, and limit use of hard returns to only one return at the end of a paragraph. Do not add any kind of pagination anywhere in the paper. Do not number text heads-the template will do that for you.

Finally, complete content and organizational editing before formatting. Please take note of the following items when proofreading spelling and grammar:

A. Color

There are a lot of factors that influence the users, a large part of every decision is based on visual cues, and the strongest and most persuasive is color. Color increases the brand recognition by 80% [1]. Brand recognition links directly to consumer confidence, also color plays a significant role for e-commerce websites, three color palettes is universally preferred over rainbow palette, neutral colors should be used over bright colors as neutral colors give a more pleasant look and better visibility also too similar colors should be avoided and contrasting colors i.e., dark and light for text and background or vice versa should be used, But colors can build trust and affect decisions, below table I shows the colors, their roles and the emotional triggers invoked.

TABLE I.   CATEGORIZATION OF THE COLORS, THEIR ROLES AND EMOTIONAL TRIGGERS INVOKED

Color	Role	Emotional Trigger
Red	Increases the heart rate, Creates Urgency.	Energy, Attention, Enthusiasm, Confidence
Orange	Often used to grab attention of window shoppers.	Optimistic, Youthful Clarity
Yellow	Creates a call to action: Subscribe Buy or Sell.	Aggressive, Creativity, Ambition
Blue	Creates sensation of trust and security ,often seen with banks and businesses	Trust, Youth, Integrity, Openness
White	Used in Minimalistic designs.	Peace, Transparency, Purpose
Black	Used in market luxury products	Powerful, Sleek
Pink	Used for market products to women and young girls	Romantic, Feminine

B. Typography

Typefaces like everything build reputation which is in direct contrast with the company profile and the customer confidence. It plays a major role in customer satisfaction and invoking different emotions ranging from confusion and frustration to trust and reliance. Similar proportions and simpler styles used over different proportions and stylized fonts which create satisfaction over confusion. Too decorative type for body contents is not legible where simple and clear type for paragraphs should be used, also too small body copy is hard to read and strenuous on the viewer's eyes, for this clear and legible font size brings clarity to the users. The array of different font styles can make the graphic too busy and hard to read whereas similar style fonts with appropriate sizes can make the graphic organized and easy to read and to follow.

C. Layout

The user Experience is not just interacting with the interface, it is the navigation from one component to another and to achieve a good user experience layout has to be very well set in accordance to the users, following are the components which are the three pillars of layout design.

- Order and hierarchy: A confusing workflow of elements is hard to comprehend; the flow of the elements has to be decided by the priority of the work on the other hand a logical flow is easy to follow.

- Balance: If not perfectly symmetric then a good balance should be maintained among the elements of the interface, clump random elements to one area while isolating others often leaves users unsatisfied and leave without accomplishing tasks, whereas objects which are laid out evenly makes it easy to highlight info.

- White Space: *"Perfection is achieved, not when there is nothing more to add, but when there is nothing left to take away"…Antoine De Saint-Exupery*

A Good design is not the one which fills up the screen with graphics, people are more aligned towards the designs which are simple to use, cluttering and not letting the background to show is not a good way to organize data but allowing the background to show helps the eye to organize data.

IV. DESIGNING FEATURES FOR BETTER USABILITY OF HUMAN COMPUTER INTERACTION

A. Design to invoke emotions

Humans have a lot of options of using different products

2523

(web applications or soft ware's) if yours doesn't interact with them, identify what emotions are necessary for your business, invoke those emotions in your product, for example: if you have an online shopping website then emotions like attraction, control to the user, trust and clarity are the triggered emotions. A better user experience will definitely lead you with returning or more customers.

B. Design for skimmability

It is hard to digest for the web content writers and web designers that the user don't invest that long time reading to the documents and the content they have in their website [2]. Users use a faster way to extract information (which is important to them) and that is scanning, they extract for the triggering words, needless sentences, introductory talks and long instructions bore people and therefore they should be omitted. Define why people should visit your website; give the triggering words right in front of the people [3]. *Figure 2* shows comparison between two web pages where first one on left hand side is easy to skim as it was organized and structured where as web page on right hand side is unorganized.

C. Design to give control

People love to be drivers of their own car, a good design is what which understands this and let them drive, they don't like to be pushed to the back seat, let them have the control they ought to get as a user at least enough so that they stop worrying about their basic need, people hassle through the design when they find out they don't have any control, for example, in the elevator of Apple Store shown in *Figure 3* in Tokyo have one factor missing: control, there are no buttons to call the elevator and neither inside of the elevator, this leaves the users anxious, unsettled and frustrated, even forcing the users to think -Will it stop? Why is it stopping when no-one is getting on or off [4].
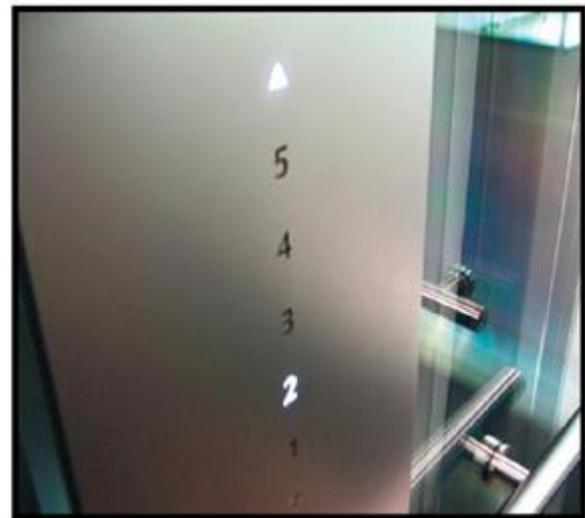
D. Design to function

Design is not just the appearance of the product, it behaves to function. Design's first priority is to cater the function of the user and this is the interface through which the user can perform his tasks. The theory adopted should be -"The user should always win", the navigation should not make the user to go for leap of faith, the users should be able to predict the design, because it's natural, functionality should be the core of the behavior of the design.

E. Design for people

Products are people too. A good designer is first a good observer of users and design products which interact with the users and has its own emotional quotient with the human as the centre. User experience is more understanding people than understanding technology, a product is not an end in itself, and it is a means towards providing a good experience to the user.

F. Design to understand study, design, build, evaluate and reiterate

Design need not to be perfect in the first go, design is a

Figure2. Skimmability comparison

Figure 3. Elevator design

process, it is not just an input to the development process it is a process in itself. It should be flexible to changes, a good design is understandable both to users and designers, it is a process of understanding the constraints of product and study them, designing wireframe, building them to applications and evaluating the final product and reiterating the process [5].

V. CONCLUSION

In this paper, a clear picture of the relation between invoked emotions and user experience is drawn. We have discussed different emotions and the impact they cause on the environment which is online and how it pays its contribution to the ergonomics, how the decisions are changed in a changed interface and how different factors could be used to better the experience of the user. We've also discussed that a good design need not to be a great design, it just have to be as natural and as little as possible. But clearly there is a lack of understanding to measure and quantify emotions and to quantify the effects of incorporating better usability which are goal-oriented and user-centered. Also the definition of user

experience is different for everyone, which is both good and bad. Future works include collaboration with different branch of technology working in groups and discussing different methodologies, and further understanding the literature of User Experience [6].

REFERENCES

[1] W. Arruda , 16 ways to use color to bolster your personal brand, http://www.forbes.com/sites/williamarruda/2013/08/12/16-ways-to-use- color-to-bolster-your-personal-brand/

[2] S. Krug, "Don't make me think a common sense approach to web usability", New Riders, ISBN-10: 0321344758, 2005 C.H. Yu, and R. C. Miller, "Enhancing web page skimmability", CHI'12, Austin, Texas, USA, May 5-10, 2012.

[3] G. Coborne, "Simple and usable web, mobile and interaction design" , New Riders Publishing, ISBN: 0321703545, September 16th 2010.

[4] R. Harper, T. Rodden, Y. Rogers, and A Sellen, "Being Human, Human Computer Interaction in the year 2020", Microsoft Research, Microsoft Research Ltd, ISBN: 978-0-9554761-1-2, 2008

[5] V. Roto, M. Obrist, and K.V.V Mattila, "User Experience Evaluation Methods in Academic and Industrial contexts".http://www.cs.tut.fi/~kaisavvm/UXEM09-Interact_ObristRotoVVM.pdf

[2] S. Krug, "Don't make me think a common sense approach to web usability", New Riders, ISBN-10: 0321344758, 2005 C.H.