Functional metaphoric approach to be 'in the flow' with computer interfaces

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ABSTRACT

In creating a better human-computer interaction, psychologists and human-computer interaction specialists are speculating key factors to enhance user experience for long time, yet haven't succeeded fully. It has been found with our study and analysis that while using a computer, human sense that they are performing a task. Computer interfaces do not keep user 'staying in the flow' fully while working. At the same time in real life results are somewhat ironical. In this paper we are exploring the reasons behind not being in flow while using computer interfaces. On the basis of that, we are proposing functional metaphoric approach to build computer interfaces with better staying in the flow and user experience. In the end, the paper will explain the functional metaphoric approach with some examples.

Keywords

Functional metaphoric approach, staying in the flow, human-computer Interface, optimal experience

INTRODUCTION

Technological advancement has given numerous opportunities to human-computer interaction experts to design new user experiences. But still there is a wide gap between user perception in using a real life product and a computer based application for a similar purpose. Human-computer interaction experts and psychologists are constantly studying human behavior and their cognitive psychology to relate human-computer Interaction with their real life to keep user stay in the flow. We can understand the wide hiatus by a simple example of a key and a

password, functionally both are verisimilar. The experience people have with password and with key are totally different. We observed that people assume a key more secure and a computer application password extremely vulnerable.

This paper along with our concept of functional metaphoric approach for software interfaces is an upshot of our study during advance human-computer interaction course at Industrial Design Centre (Indian Institute of Technology, Bombay), established to conceptualize human centered products. The central concern is the development and evaluation of various approaches in the field of HCI & human psychology, with the aim to achieve the successful transfer of concepts to applications.

Generally, in real life human stay in the flow while persuading an activity, like reading a newspaper. At the same time while reading news on the web portal, the user does not feel being in the flow fully. Unlike the newspaper he has to click, scroll, etc to do the same in the portal. Similarly, selecting a color from a color palette in some graphic packages is somewhat related to picking a color from a color palette in real life while painting on a canvas. But, in some activities like mixing colors to make a desired color on a color palette in graphic packages does not give the same experience of a real palette.

We feel that there is a need in some cases to make a close relation and similarity between a human computer interface functionality and real world product functionality and to create a similar human perception that one has while using real life products. We studied why people perceive 'not staying in flow' while using a computer application like note taking tools and word editing softwares. In contrast, we found it interesting that a simple product like personal diary keeps them in the flow while they are using it.

STAYING IN THE FLOW

In his book "The flow: The Psychology of Optimal Experience" [6], Csikszentmihalyi has explored the characteristics for perceiving optimal experiences, with the issue of 'flow'. Csikszentmihalyi's research began by asking the question, 'When are people most happy?' That is, what exactly are we doing when we feel enjoyment or find ourselves fully involved? People in a state of 'flow' are those who feel that they are engaged in a creative unfolding of something interesting; athletes call it 'being in the zone', mystics have described as 'ecstasy', and artists 'rapture'. You and I may recognize our flow experiences as simply those activities (work, a hobby, some kind of service) which seem to make time stand still.

The best definition of flow comes from the ancient Taoist scholar Chuang Tzu. In a parable Carving Up an Ox, [10] Ting, the esteemed court butcher of Lord Wenhui, describes his way of working, "Perception and understanding have come to a stop and spirit moves where it wants. You stop 'thinking' and just do." We think these words best explain what we mean by 'flow'.

While, Csikszentmihalyi presented many characteristics of human optimal experience, like

> · Challenge and require skill
> · Concentrate and avoid interruption
> · Maintain control
> · Speed and feedback
> · Transformation of time

he did not apply these characteristics to the field of HCI. Later Prof. Ben B. Bederson has taken inspiration from Csikszentmihalyi's work to see the possibilities in keeping user 'staying in the flow' while they are using computer interfaces. His work [2] is a review of the literature based on Csikszentmihalyi's framework for being in the flow. Bederson's paper focuses on five of the characteristics of flow that Csikszentmihalyi observed, along with interfaces that exemplify those characteristics. With the help of products like Datalens [4], PhotoMesa [1], etc. he experimented the approach of keeping user in the flow to make user experience optimal with software interfaces while they are using them.

There is a wide gap between how human mind program a task and how a computer application follows a process to fulfill humans to complete that task. We can understand this gap by a simple example of "increasing font size in a word editing application". If after typing in the application human mind demands to see the written text in a bigger size (the size which satisfy human perception), the model human mind follows is very different from what he needs to do the same with the package. The package urges the user to be familiar with its terminologies of "font" and its "size" and

after knowing these terminologies he must know how to perform the task of increasing size of the written text.

"To write a letter, I just want to write a letter". We observed that some real life tools like pen, hammer etc have become almost an extension of one's body. While doing some task in real life people don't feel that they are performing some extra tasks because these have been fabricated in the main task the user wants to perform. Thus the user feels himself in the flow. Tools like pen, hammer also require the user to expertise them. Only the concepts like ease of use, minimizing users' memory or cognitive load etc. do not assure keeping user stay in the flow.

The challenge is to keep user 'stay in the flow'. In the next part of the paper we are proposing the Functional Metaphoric Approach (FMA) for software interfaces to do the same.

FUNCTIONAL METAPHORIC APPROACH (FMA)

User interface designers and psychologists are using metaphor driven approach for computer interfaces for a long, but till now, these metaphors are being used in major for easy recognition of user interface elements or to relate interface elements like icons, etc. with their real life appearance. In windows the metaphor for 'folder' appearance is being taken from real life folder in terms of its physical appearance so that we are able to identify that the icon is used for keeping files. In an icon driven approach interface designers speculate metaphors of user's real life to relate representation of interface elements [8].

To make it more convenient to remember and understand some definite aspect of an interface, designers have realized that it is easier to relate its features and actions semantically to something that is of a similar nature in the real world and is familiar to the user.

The functional metaphoric approach (FMA) is a heuristic to achieve the goal of keeping user 'staying in the flow' with computer interfaces, in which metaphor of usage/functionality of real life product is used to do the same with computer applications or their components. We can classify metaphors to majors like conceptual, visual and usage based/functional. While applying, one can have metaphor from one or more categories to gain the final goal. Like designers have used visual as well as conceptual metaphor from the product like folder to depict the storing functionality in computer. The metaphor of scroll in Scrollbar is a conceptual metaphor.

People found it easy & efficient to draw with a product like the stylus compared to the mouse when they are working with some graphic editing utility on computer. It is not an

example of FMA. But, this suggests us to explore the possibility of applying the way we use products in real life to our interaction with computers.

The FMA is not applicable to all products in all situations. It may happen that some products having ease of use may also give user optimal experience. The same applies with the products made with the concepts of minimizing user memory load, etc. To cater the need of implying FMA we must evaluate the possibility of having the real life functionality/usage of the product as metaphor to perform the similar task in computer interfaces. There is no advantage of using FMA in the interfaces where suitable functional metaphors are not available in the environment. While implying the FMA one should check the suitability of metaphor also.

To achieve the optimal experience as per Csikszentmihalyi's list of characteristics one can apply different approaches like ease of use, minimizing users cognitive & memory load, etc. There are several approaches leading user staying in the flow and thus providing optimal experiences. If we put all these in goals and heuristics, 'Staying in the flow' will be the final goal. With the help of heuristics like metaphors, feedbacks, error preventions, etc. one can get goals like ease of use, minimization of user's memory load, clear user conceptual model, learnability and so on [9]. We are proposing the FMA as a heuristic.

USING FUNCTIONAL METAPHORIC APPROACH

To validate our thoughts of using the functional metaphoric approach in software interfaces, we started exploring various real life products. At the same time we also started seeking opportunities for functionalities in computers applications where we desire to do almost similar tasks as done with real life products.

Our main concern was to see how people stay in the flow with real life products & check whether it is possible to achieve the same with computer applications, so that we can take advantage of computing as well. What we mean real life products here are simple products like pen, hammer, diary, paintbrush, etc.

With the help of various methods like activity theory [7] and contextual enquiry [5], we tried to understand how people deal with simple products like a diary or a personal notebook.
People use it for purposes like

1. Noting down important addresses, contact numbers,
2. Listing down work to do,
3. Noting down ideas,
4. Scribbling,
5. Keeping important papers in,
6. Task managements,
7. Memorize important dates
8. . . . . .

and it continues. People feel in complete flow when they do most of these tasks with their diary. One opens a page of it & notes down his friends mobile no., software serial no. or PNR no. of a train ticket, being in the complete flow. We observed people scribbling in it, making diagrams out of ideas, writing draft for some emails. They were totally concentrating on thinking of ideas for a project or on forming what to write in an email to Mr. Mistry. They were in the flow.

Our study shows that while performing a task to note down an address, users don't feel the sense of performing a task because it gives a degree of freedom. In noting down a contact info, you have the freedom to note it down in the back or front page or in any page, any color ink, any place on the page, and the format in which you want to write. Like name first, then contact info or name in the first line and contact no. in second line, may be you can make a box around it, etc.

In parallel, we wanted to provide the user the power of computing like searching, sorting, storing information. For example in a computer application you can search a contact by name or place etc. at the same time a product like diary which keeps the user in flow in real life can't facilitate the above functions.

Some experiments in interface design like Notelens for Microsoft Windows from Windsor interfaces, HogBay notebook for Mac from Hogbay software are good example of what kind of change the heuristics like FMA can give to user experiences.

To help support and verify our thought we came up with a paper prototype of product based on FMA of diary. We used how people use their diary to do things like noting down contact number without caring or worrying about in which font they are writing; where on the page they are putting it; what is the name of that page, unlike (file) in computer currently. The product supports user to choose what he wanted to do in his own way, rather let say in the way they do those tasks with their diary. User can jump around as per his wish with the product to do whatever he wants to do in the way he wants. For example he can note down the PNR number of his train ticket or list of things to do in month of December without worrying where he is storing it, in file with which name, which format, where that file is stored. In our paper prototype we tried to implement the same & results were at positive side for almost all users. We are in the process to actualize this idea fully to interaction of machines with humans based on daily life products like diary, pen, paintbrush & so on. We want the

user to feel the same as Chuang Tzu had described [10].

CONCLUSION

In the paper we are proposing Functional Metaphoric Approach and exploring the possibilities of using it to software interfaces.

On the basis of Csikszentmihalyi's work on 'the flow' & optimal experiences, B. Bederson has defined the concept of keeping user flow in using computer interfaces to provide optimal experience. We introduced the FMA as a possible way to actualize the same. With the help of various methods we tried to understand how & why people feel 'staying in the flow' with some real life products like, pen, diary, etc. In FMA we are proposing to use metaphors of usage/functionality of real life products to implement computer interfaces.

To verify our concept we have taken a real life product, 'diary'. How people use diary, is studied in detailed by various methods. We are proposing FMA as a heuristic for software interfaces, so that we can take advantages like searching and sorting provided by computing.

ACKNOWLEDGEMENTS

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