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Role of psychology in improving the longevity of user interaction with Interface design

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ABSTRACT

User experience promotes Human Machine Interaction. It enables a user to interact with technology on daily basis. However, humans tend to change and adapt their behavioral pattern quite often, On account of doing so, we need to understand the connection and the psychological aspects of user to technology. This will enable user longevity and loyalty through the utility and ease of use. Hence, understanding mental models of user is a needful. There are many studies and theories which guarantee user engagements but they are all short lived. The psychological theories that have been proposed are quite few in numbers. The UX/UI designer tends to get in a state of uncertainty to which theory should be used for gaining longitudinal user relationship. In this paper, study of the standard and best psychological practices that will bring positive outputs in the field of UI/UX has been looked upon. Also, the various intrinsic and extrinsic factors which affect the user behavior has been analyzed. The study on the major triggers and the right way to approach user has been done. Moreover, understanding of the basic but rather important platforms where psychology can be put to use is been highlighted. The different psychological theories like Fog's behavioral model, Hick's Law and Color psychology where studied and its sequential and synchronized implementation on UI wireframes and lay outing was identified. A mixed study on samples explains the needs and requirement of psychological interpretation to get best UI outputs. The idea is to understand the psychology of both creator and end user so that a standard pathway can be streamlined.

1. Introduction

Persuading people for a certain output is an extremely difficult task especially when the process is required to gain output that needs to be performed repeatedly. The field of User experience and User interface is inclined in understanding and analyzing the ways to provide such user friendly conditions. In this process of interpretation to the favorable circumstances psychology plays an important role. In fact, psychology behind human behavior and UI/UX goes hand in hand. One must understand the particulars and hedonic aspects of behavioral psychology to perceive any conclusion; which ultimately leads to major/minor changes that can help in creating a successful user interface.

The UI/UX researchers as well as practitioners try to create the best usability scenarios for users. Yet, the most user friendly interfaces sometimes are not enough to engage user for longer time. Using psychology in design can often feel like it jars with the creative aspects of design. Applying science to design can somehow feel unnatural. There are some scientific and psychological aspects that would fit with design aspects whereas many would not. For instance, Shoehorning psychology, that has been mentioned by the famous UX and product management consultant Joe Leech, in his book "Psychology of Designers" explains that force-fitting things which are not very relevant to the design will lead to create a bad design. For bringing out exemplary outcomes, a UX/UI designer must understand the mental model of his/her end user. Until and unless one does not understand user's perspective, they won't be able to analyze their need and fulfill them. To understand the cause, understanding the human behavior and psychological aspects and use of these insights to identify best practices that can provide longitudinal usability must be done. Human beings can be easily get disconnected. If they use anything for longer time, they tend to develop monotony. Therefore, frequent revisions and improvisation of the User interface has to be done. Great design is judged on how it makes you feel, hence emotion is the key. (Leech, 2018) In this research, identification of how to find, apply and advocate the theories which are commonly used and the theories which are most effective for create user longevity have been emphasized.

Therefore, the objectives of the research are:

- To identify various psychological aspects that affect UI/UX of a mobile app.
- To study these psychological aspects that impact user stability with the mobile app.

2. Literature review

To a creator who designs any service or a product, the end user and his satisfaction with that service or product is a must. It fulfills the requirement of the end user. In order to do so, we look into the methods to understand user psychology.

2.1 UX curve:

For analyzing the user engagement with the service a method of UX curve can be used. These methods talk about

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the perceived attractiveness. The aesthetical value has power to attract customer with the word of mouth. The user might get attracted to the looks of the design but the convenient usability of the design plays a vital role in providing customer satisfaction. Hence, if the internal look and feel comes into picture with the help of lay out by using the mental models of consumers, they find it feasible and more relevant in use. A UX curve monitors this aspect of the user and helps in identifying the most relevant output

2.2 Psychologies Behind UI:

If we talk about the interfaces of mobile applications, they are sometimes not enough to connect with the user for longer span of time. The reasons that drive a user to use any interface and to have a longevity of usage is hidden in the human psychology. The best practices that make a user stay loyal to the interface for a longer time was analyzed(Kintscher, 2017).

The three major practices that have been identified are:

- Extrinsic and intrinsic motivations
- Identify right trigger
- Combining motivation with ability and trigger

(a) Extrinsic And Intrinsic Motivations:

The research begins with understanding what motivates the change in behavior. When it is said that analysis of the extrinsic and intrinsic behavior is done, it means, someone can be driven to do something either by external factors, like the prospect of receiving a reward, such as money, or by internal factors, like the enjoyment derived from doing an activity(Kintscher, 2017).

For instance, an application software (app.) that cater users who would like to exercise. There can be two kinds of users that will use that app., one that do not like to exercise and another who are very motivated to have exercise/work out sessions on daily basis. In this case, we can provide external factor to the user who do not like to work out to push them to use the app. wherein, if we do the same to other set of user, it can have a negative effect. This effect is called the “over justification effect”. Although rewards are best way to divert customer’s attention and tempt them, but if the customer is already convinced with the user interface, giving rewards makes one feel like a push-over.

(b) Identify Right Triggers:

Further, identification of the triggers motivates the user to use an interface or at least have a look into it. It intrigues the user’s interest and motivates them. **Triggers** like notifications and updates of ongoing offers are generally used. A user always differs at the choice of trigger that pushes them to use a service design. Some might prefer notifications that are mere alerts in words, other might get motivated if there are images that support those offer alerts. Not only does a trigger well works with the above mentioned approach but it also depends on user’s need of the moment. The technological advancement has led to a new way of pushing right triggers. One must have noticed that if a user searches a certain keyword (can be a name of the app. Or a website) or uses an app. to keep the product in a cart for buying it later, they will keep getting triggers in form of alerts, advertisements, gifs etc. Looking at triggers sometimes motivate the user to use the app. and buy the product but otherwise it can also aggravate user. Unfortunately, motivation and triggers to motivate are not always enough to initiate a behavior. For instance, one is motivated to learn how to ride a bike and the trigger for him /her was his/her peers who already are well equipped and are good at riding a bike. But, to actually ride the bike one needs the ability to do it.

(c) Combining Motivations with Ability and Trigger

Incorporation of right points for change in user behavior is an extremely important task. Triggers cannot be generalised .Not all triggers go well with each and every consumer . The thorough understanding of target audience enables the pick of right triggers. To know the end user , one needs to understand them end to end. It includes their past experience, present and probable future expectations. This can be understood by analysing the user , their experience with the product, creating user personas out of these outputs.

The **BJ Fog’s behavioral model** explains the connectivity of motivation, ability and triggers. Therefore, the Fog’s behavioral model states that; (Kintscher, 2017).

BEHAVIOR= MOTIVATION* ABILITY*TRIGGER (B=MAT)

Interpretation from (Kintscher, 2017)

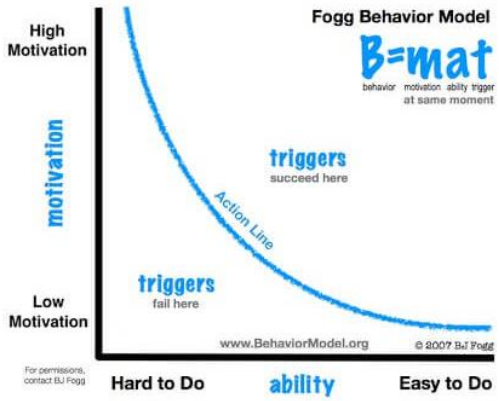


Figure. 1. BJ Fog’s Behavioral Model (Kintscher,2017)

2.3 Procedural Knowledge and Declarative Knowledge

By means of **contextual enquiry,** a relevant data gathering can be done. (Kintscher, 2017), This is more like an experiment on a chosen sample to identify certain psychological aspects. If observation technique is merged during contextual enquiry, a refined form of output comes out. Through research paper, it has been analyzed that different modes of hand gestures can have major change in psychology. There are times when the accidental touch of app. leads to unnecessary inconvenience. Swiping and tapping are two common ways of using an app. The research (Kintscher, 2017) interprets that swiping an app. is less accidental than tapping. Hence, such barriers must be overcome to have smooth flow of task. Human being remembers things sequentially rather than random. For example: Right tighty, lefty loosy is a way to remember how to tie a shoe lace. (Leech, 2018)

Hence, human brain synthesizes two kinds of knowledge;

- Declarative knowledge – that deals with facts
- Procedural knowledge- that deals with sequence (mental model)

"Design for procedure and not for declarative knowledge in UI" (Leech, 2018)

To further explain Procedural knowledge, take an instance of search engine. Search engine is a design axiom if we remove that option and hyperlink words; it is a major break of procedural knowledge. User tends to take time to adjust with new procedures. Initially, it always brings a negative output. Hence, all new app. updates get negative remarks at the beginning.

So, we conclude,

Break procedural knowledge = 1/ cognitive load

Interpretation from (Leech, 2018)

2.4 Mental Models:

The term mental models are widely used to identify the task flow of an application software. It helps in understanding the flow and the gap between human mind and the application flow. The UI designer uses this model to make their app user friendly as it moves in the same pace and with the same logic as that of the end user.

However, mental models are created on the beliefs of how user will react to the design rather than facts. Given that human psychology tend to incline on the fact that behavioral change happen from time to time. The reason for the same can depend upon the surrounding of the user. Influencing or aligning with the user's mental model is a key element. Hence, user testing helps in understand the most relevant mental model which applies to major set of users.

While we create a mental model, one also needs to look into the decision making capability of the consumer. It is evident that the more the choices, the difficult the decision making becomes. Cognitive load can incur. (Boyle, 2015).

Hence, according to **Hick's Law,**

Cognitive load= over *(thinking+reasoning+deciding)

Interpretation from (Leech, 2018)

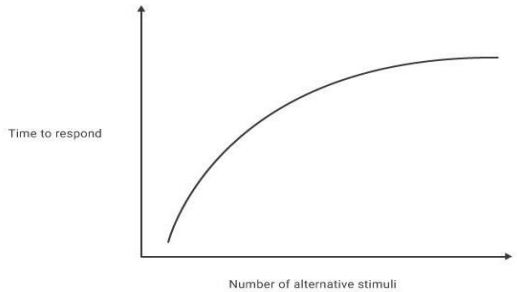


Figure. 2. Hick's Law (Boyle, 2015)

There also comes of point in decision making where it becomes extremely difficult to come up with a relevant solution. This point is referred as**analysis paralysis**. (Boyle, 2015) This explains that if there is cognitive overload, then state of analysis paralysis occurs where user gets irritated, agitated and confused and tends to leave an app. and switch to another. This happens when excessive options are provided by the app.

The above mentioned analysis of theories explains the psychological aspects of human choices and motivations. The UI/UX and psychology go hand in hand. As rightly said by Boyle that "Psychology doesn't have all the answers, but it's a damn good place to start."

3. Research Methodology

3.1 Methodology:

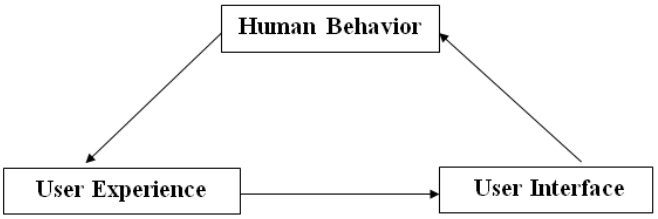
To achieve the research objective, an exploratory research was carried outwith mixed study of the samples. In the research, analysis of certain psychological aspects that trigger end user engagement with a mobile app. was done. To interpret the same, a quantitative analysis was done in the form of survey and content analysis. For further clarity, a qualitative analysis was done in the form of telephonic interview with professional practitioners of UI/UX in the industry. The three different samples chosen where design students, UX scholars and end users. The sample size taken for survey over design students and end users is 100 and the depth interview conducted via telephonic interaction is on 4 UX scholars. The referential mobile application taken for interpretation was online food ordering application software, which is Swiggy, Zomato, Food Panda and Uber Eats solely to understand user psychology. The food apps. were chosen for study as food is a common ground for universal experience. The questionnaire prepared for survey had 11 questions which comprises of multiple choice and ranking questions. Each question that was framed, gave answer to one psychological interpretation of a user behavior. In order to get better insight of the current layout and wire framing of these apps. , a content analysis was referred from the previously existing research that had been done on the same apps. Moreover, the information architecture of apps. were also looked upon. The outcome of it was identification of independent variable that is "human behavioral factors" and the dependent variable that is "Interface design".

Therefore, the hypotheses acquired are:

H 1- understanding user behavior leads to efficient interface design

H 2- efficient interface design gains longevity in user's interaction with the app.

3.2 Framework:



4. Findings

Through the study, it has been identified that, users prefer a simplistic task flow for the use of an application. Although, extrinsic factors like offers and services also play a major role in selecting a preferred app. which cannot be controlled. Users want to finish off with the formalities of login credentials quickly and enter into their private digital space to go ahead with further activities. Digital privacy is still a major factor in decision making to keep things under control. Moderate change in

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terms of updates should be done after undertaking user testing outputs to break the monotony and provide better user interface. Offers trigger customers and make an impact in their subconscious mind to use an app and help them make a decision. Appealing visuals overpower decision making of a user. Users are more comfortable in texting than calling for food customization, they prefer digital interaction more than a personal audio via phone calls. Conditioning plays a major role in how a user interacts with an interface.

While studying the information architecture, analysis of no. of clicks to complete the order and movement of one browser to another was analyzed. A comparison of the same was done with four food apps. Taken for reference. It was found that Zomato attracts more customers with their intriguing offer. Moreover, it has less no. of clicks that is 5-6 clicks and it filters the user's choice clearly, making it less confusing and user friendly. Following the app. is Swiggy with less offer availability, 6-7 clicks to complete and order but extensive choices for making the user confused.

5. Limitations

The research that is carried out has been done in a limited time. The time constraints led to many limitations of further exploration and depth research. Another limitation was the demography, as it hampers smooth access to much important information like inconvenience in approaching certain age group, less scope of primary research through personal interviews and language barrier.

6. Conclusion

With the research it has been concluded that human psychology plays a pioneer role in the user experience and creating an efficient interface design. All the theories about human behavior well explain their mental models which influences their behavior and its interaction to the technology. The referral apps taken help us to understand the implication of the theories explored in the research paper.

The rapid globalization and innovation in human psychology and its interaction will keep changing with time. In fact, at this very moment the human brain is evolving and contemplating to a new interaction. Hence, this opens the gates for scope of further research.

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