

User Experience in Product Design and Development: Perspectives and Strategies

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Abstract

Product design and development can be an overwhelming process especially for those who want to produce a product that is usable for most people. Designers and developers are always finding ways to involve the user in the production of a product. The objective of this study is to provide insight into the users' involvement and to determine strategies involving users in product design and development. Systematic review with the analysis of research articles has been done to achieve the objective. Results show the proposed framework for user experience in product design and development needed to involve users' perspectives and strategies for high-quality products. User perspective on the product can give valuable user experience information. For the designers to have good perspectives, a good strategy must be created to obtain the user experience information from users.

Keywords: user experience (UX), usable, production, user perspective, elements.

Introduction

User experience (UX) is one of the important elements in product design and development. It helps in the process of product designers and product developers to know what their audiences need and want in the product that they are working on. The experience from users encompasses all the feelings, thoughts, sensations, and actions of interacting with a product such as the interface of a website or mobile application (Benyon, 2019). A UX plan is a way toward producing items that give significant experiences to clients (Washington, Soumahoro, & Saxena Arora, 2020).

These experiences from the users' interactions with the product can be measured by using methods that are specifically made for knowing users' interactions with a product. The process. Mainly, the well-known methods in evaluating UX are questionnaire, interview, observation, card sorting, and prototype (Zarour & Alharbi, 2017). The result of a method can be interpreted into useful information to be used for producing an end-product that satisfies the existing customers' needs and potentially attract new customers.

This paper presents a review analysis of UX in product design and development by analysing research papers about product design and development. Perspectives and strategies in product design and development are what is keeping the product designers and developers in a track of what should be done to the interface of the product. This study aims to provide insight into the users' involvement and to determine strategies involving users in product design and development.

Related Works

Research on UX is continuously progressing as new types of user interfaces emerge. In order to produce high quality products that satisfy customers and potential customers, methods in involving UX in product design and development are also evolving to adapt with the emerging new user interfaces. Methods of UX in product design and development can be divided into two which are “traditional methods” and “new web-based methods” (Moultrie, Ye, & Liu, 2019). The "traditional methods" do not involve the help of social media, for example, face-to-face interviews, focus groups, and prototype testing. Meanwhile the “new web-based methods” are mostly involving feedbacks gained from social media, online forums, and online questionnaires.

One of the easiest ways to include users in product design is allowing users to give their feedback on the product they used which in short is known as product or customer reviews. Product reviews commonly contain a variety of feelings that users felt while using a product (Jang & Yi, 2017). A case study on smart mobile phone reviews is conducted where valuable UX data can be found in the reviews based on the methodology of establishing a UX knowledge base from customer online reviews they proposed (Yang, Liu, Liang, & Tang, 2019). From the case study, the relevant UX information can be found through types of components in the UX knowledge base, for example, individual cases of UX, UX aspect groups, and UX network (Yang et al., 2019).

When designing a product, it is recommended to involve users in product development as it is highly important and their roles are significantly high especially for producing a new product (Alli, 2018). The design thinking approach is often integrated into the designing process of a product. It emphasises accessibility and relevance for creative, innovative, and potentially strategic problem solving across various disciplines, whether one is a professional designer or not (Shapira, Ketchie, & Nehe, 2017). The basic stages in design thinking are empathise, define, ideate, prototype, and test (Wolniak, 2017). Designers are advised to include the users starting from the early phase of product development as early as the “empathise” stage (Alli, 2018). According to a study, there are over 75% of people who are working in the design industry work closely with end-users frequently or very frequently (Carthy, Cormican, & Sampaio, 2021). This will ensure the release of a product runs smoothly as errors or mistakes in production can be solved in the earlier stages.

Furthermore, there is another way in involving users in product design which is crowdsourcing. In the UX context, crowdsourcing is when involving users that are willing to volunteer themselves in contributing to the design of the product (Niu, Qin, Vines, Wong, & Lu, 2018). Since crowdsourcing involves willing participants, brands with popular products can take advantage of this method as crowds’ willingness to provide design solutions is strong (Jiao, Wu, & Lu, 2021). Popular brands who take advantage of their popularity are able to produce high quality products within a given time scale and with as low a cost as possible because of crowdsourcing (Niu et al., 2018).

Methodology

A review of the literature was conducted to discover additional information regarding e-learning on what, why, and how. In online databases, extensive searches of ACM Digital Library, Scopus, Springer, IEEE, Google Scholar, Science Direct and Research Gate journal were performed. Journals, e-book, conferences, and articles posted throughout the previous 3 in accordance with the 5 years are examples of sources. In this study, the case study of users' involvement in product design and development is performed. The objective of the case study is to know the perspectives of users that are involved in product design and development, as well as to determine the strategies used. Research papers about product design and development that includes users are gathered. The two research articles are about the involvement of children and older adults respectively. The two groups are chosen as they are the least involved groups in the studies of UX in product design and development.

Findings and Discussion

From the previous studies, perspectives and strategies of UX in product design and development are determined. Various perspectives and strategies are obtained based on the research papers gathered.

Perspectives

Different users will have different opinions and perspectives on a product that they are interacting with. Some user communities and populations are still often perceived as technologically illiterate or deficient, due to prevailing misconceptions about their computer and internet use (Smith, 2019). Therefore, it is needed to include all different types of users from various backgrounds to ensure the product can be used by everyone. Targeting a certain group of users is a different story, hence, filtering users can be done in order to achieve the targeted audience participation in product design and development.

The same technological devices that adults operate regularly have infiltrated the lives of children (Slutsky & DeShetler, 2017). Nowadays, children know better on how to interact with modern devices because most of them grow up with technology products since they are an infant. Children as low as aged 4 years old can interact with digital products by themselves by viewing their favourite videos from Youtube for example from the Cocomelon Youtube channel. For that, Youtube launched a sub-platform which is called Youtube Kids in 2015. Designers and developers might need to include children in their product design and development as most of the children have access to digital products. It can be challenging as children are not used to interviews with lots of questions or giving an effective response based on a user evaluation questionnaire.

As for the older adults aged 60 and over, they are not exposed to digital products as young as the current generation. This is because modern digital products are not accessible to everyone before 2010. This group of people may have trouble interacting with websites and mobile applications properly. Older adults are not seen as ideal or even possible users of digital products (Smith, 2019). However, designers and developers should try to include users from older adults in product design and development as some of them are enjoying using digital products in their daily lives. Of course, filtering this group of users is highly needed as older adults tend to have vision loss or some of them are suffering dementia which can cause errors to the UX evaluation results.

Strategies

Strategies in gaining users input for the product design and development are changing every time a new product is in the development process. This is because designers and developers will constantly learn from their previous product design and development process to improve the development stages of their product. Involving users in product design and development need to have a proper protocol as it involves public users that are not working in the product development company.

When trying to involve users from the children group, it is advisable for them to be supervised by one or two guardians because some of the children are still not fully capable of processing a question. Designers and developers should try to simplify UX questions for children and make them fun for example, allowing children to draw and colour the interfaces that they have drawn (Kraleva, 2017). This method will give product designers and developers a better idea of how to improve the UX for children.

Trying to get UX information from older adults should have experience moderator and observer. It is better to have face-to-face interaction between the users from older adults and the designers and developers as older adults are comfortable giving spontaneous reactions (Frederico, Pereira, Marte, & Yoshioka, 2021). As older adults have less experience with digital products, a person to assist them in interacting with the product would be helpful. However, the observer present should be able to differentiate between basic interaction and complex interaction since the purpose of UX evaluation is to identify the problem with the interface.

Proposed Framework

Based on the review analysis, it is found that when designers and developers have gained the full perspectives from the users, a product can satisfy many groups of users and targeted users. Figure 1 shows the proposed framework of UX in product design and development.

Based on Figure 1, perspectives from users such as the usability and reliability of a product is useful information in UX design and development. Moreover, a strategy that is made to adapt to the users is also a big contributor to producing a high quality product.

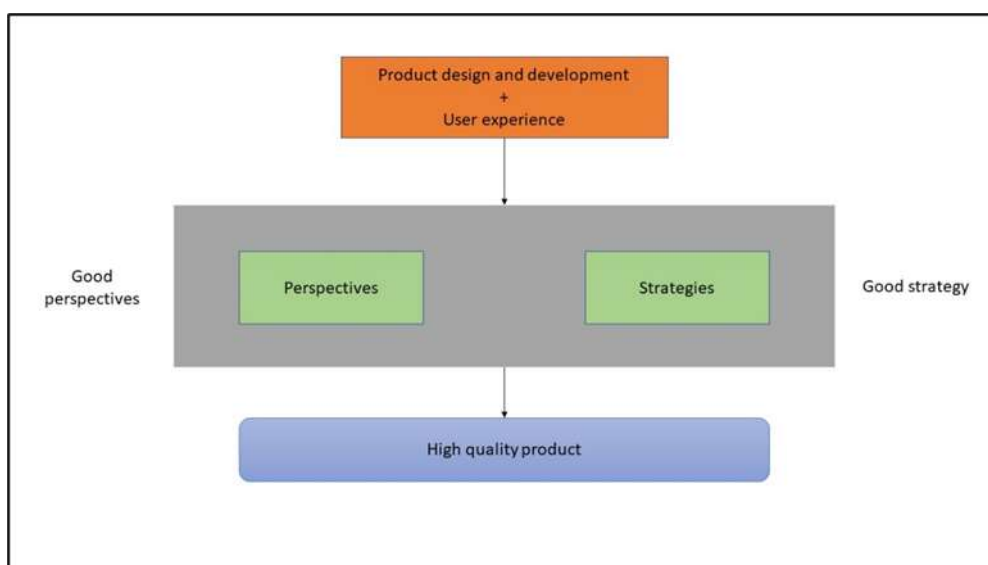


Figure 1: Proposed Framework of UX in Product Design and Development

Conclusion

In this study, users' points of view of product design and development are provided especially from the children and older adults. The strategies of product design and development are also determined for the children and older adults so, product designers and developers are able to get an idea on how to involve these two groups of people more in the product design and development process.

The limitation of this study is that it does not provide a more in-depth perspective and strategy as children and older adults are seldomly involved in the product design and development process. Most of the previous works do not usually include children and older adults when it comes to the development of a new product because these two groups are not really that much of a user of complex products such as computer software and mobile application.

In the future, product designers and developers should try to include more children and older adults in UX evaluation. The world is evolving towards modern technology-oriented; therefore, children and older adults will be forced to use more complex products as the traditional technology keeps innovated by innovators and entrepreneurs.

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