

TRANSFORMING MUSEUM EXPERIENCE USING USER-EXPERIENCE BASED NEW PRODUCT DEVELOPMENT

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Abstract. *Museum is a public space in which the society can find both educational and recreational values. According to Hooper-Greenhill (1999), museum should function as one of educational media for society, therefore the relevance of its product and its function is considered important. However, along with the vast development modern civilization in big cities in Indonesia, museum becomes less popular compared to other public spaces such as mall. The problem lies on the uninnovative product presented in museum, which is described as stagnant, not interactive and unattractive by its target market: children and family. Therefore, researcher attempt to solve the problem through proposing new product development (NPD) method. In today's world, industrial-age product development methods which only focused on feature is proven to be ineffective, leaving company to build something people don't need. Thus, new product development method is invented, putting user research as first step of the entire product development process. Taking also into account, a great product is not merely build based on feature, but experience. That's where researcher need to consider User Experience as the core of the product. Therefore, this research is conducted to examine the first step of product development process based on Crawford & Benedetto Model with focus on User Experience. Bandung Geological Museum is chosen as the site of research based on its significance toward West Java people, specifically Bandung people. Researcher attempt to asses current need of museum visitors compared to the current experience presented using Laddering Method interview proposed by Zaaman & Abeele in 2010 based on following aspect: motivation, feel, thought and learn. Later, researcher presented them with three different level of product interactivity based on Fragidis et al model proposed in 2014. The result shows that the most desirable experience desired by children as Bandung Geological Museum visitors are related to these keyword: co-creation interactivity, familiarity and dinosaurs-themed. As a response to the finding, researcher propose an idea of creating buildable paper dinosaurs mask with voice changer feature. This idea is a result of brainstorming session, produce and build with PT Sembilan Matahari, a creative design studio based in Bandung.*

Keyword: museum, user experience, new product development(NPD)

Methodology

The data gathering process is done through qualitative data gathering in form of interview toward 100 children as the visitors of the museum age 3-15 years old along with interview toward 12 parents and teachers, and on-site survey. The interview data is analyzed based on these following aspects: motivation, feel, thought, learn about the museum and product choice. In the interview, researcher shows three benchmark video with different level of interactivity: self-service, co-design and co-creation, to the children. While for the on-site survey, researcher create a visitor journey map to help researcher to see to see the whole experience created by the museum and frame the consumer's motivations and needs in each step of the journey, creating design solutions that are appropriate for each pain point. Later, user experience(UX) analysis is conducted toward the product idea generated as the recommendation based on five consideration of user experience design for children proposed by Idler(2013) that consist of: entertainment, visual appeal, usability, age appropriate content and encouraged learning.

Literature Review

In this paper, researcher use NPD Model as developed by Crawford and Benedetto(2008), since it is seen as the most suitable model for this research, since there are some review points between these phases where everyone who is involved in the process meet together and discuss the development of the process. There are five stages in this model, followed by review process. The first stage is opportunity identification and selection. Crawford and Benedetto stated this phase as "the most difficult to describe or define".

In product design and development, empathizing with user problem is a basic principle. The result in with this empathy will resulting on a design that fulfill user's need – in other word, providing great user experience. User experience is summarized as the experience generated from user experience with every touch point of a product or service. In this research, researcher will see user experience from marketing perspective, which mostly focus more understanding the need and want of the user to create desirable product in line with business objectives.

Since children are possessing different way of perceiving and interacting with the product, there are certain consideration toward user experience designed for children. According to Idler (2013), there are five special consideration of designing user experience for children: entertainment, visual appeal, usability, age appropriate content and encourage learning.

Research on children's learning shows by Rafaeli (1988) show that the extent of interactivity involved in an experience with media may affect the learning process. Interactivity in user experience is described as the ability to send two-ways communication, where message is not merely received as it is but it also enables to receiver to send their response to the sender. In this research, interactivity also taking co-production into account, which means there are execution of task done by the user (Fragidis, Konstantas, Tsourela, & Paschaloudis, 2014). Co-production consists of different 4-level of activities: Self-service, do-it-yourself (DIY), co-design and co-creation, which has the highest level of interactivity. While in this research, researcher only use three different level: self service, co-design and co-creation.

Research in this paper is done through interview using Laddering method developed by Reynolds & Gutman in 1988 with a purpose to discover how consumer relate attributes of products into meaningful associations with personal value based on Means-End Theory (Gutman, 1982). In this interview method, interviewees are presented with a series of question. Each question followed by a "Why" question following the previous answer, discovering the range of product attributes(A), consequences (C) and values(V). According to Zaaman & Abeele (2010), Laddering method is applicable to do a user experience research toward young children aged five and older.

Opportunity Identification & Selection

New product development begin with the problem identification that generates opportunity. The first step of opportunity identification is done through interview to children within the age of 3-15 which generating primary data for the trend and problem of the museum. The interview is done to explore about motivation of children going to museum, their feeling toward their visit to museum, their perception, the educational purpose of the museum and their product choice based on three presented video with different level of interactivity. Researcher propose three level of interactivity: self-service, Do-it-Yourself(DIY) and co-design (thinkstudio.com).

The interview is done with Laddering Method proposed by Gutman(1982). However, the interviews don't generate expected result which reach to the value because children find it hard to express their though. They can only express their thought by mentioning attributes and consequence of the product, not reaching to the value.

Based on the interview, researcher find that 91% of the kids who visiting the museum are driven by external factor, which is a mandatory school organized trip or encouraged by their parents. This means school is playing a big part in encouraging (or forcing) the kids to come visit the museum. Hence, in order to persuading the parents to visit the museum with their children, the museum will need to expand its educational and recreational value.

In the feeling analysis, there's a massive 98% visitors whom feeling happy regardless they have had a visit to the museum or not, or whether they out of their own will, while only 2% of total visitors are feeling indifferent or unhappy being in museum, which happened because the visit was not done in their own liberty.

Out of 98% visitors who feel happy when visiting museum, a good two-third of them (64%) was due to the museum's exhibit which is the visitor's own object of interest (dinosaurs, shiny stones, animals) while the rest of one-third's motive (34%) was a pure interest of knowledge.

Dinosaurs consistently appearing as the reason of happiness of the visitors in kindergarten, elementary and junior high school age, which are the museum own target market. Therefore, it suggests that dinosaurs should be hero product for the entire museum. It is also an important point to be noted regarding the shift in visitor's reason for visiting the museum from object of interest to pursue knowledge would grow as they grow older, as per accordance to the true objective of an educational museum. As for perception toward the museum, generally a 95% of visitors are having a good impression about the museum leaving only 5% visitors with negative thoughts about it.

Visitors Journey Map

Visitors journey map allows researcher to see the whole experience created by the museum and frame the consumer's motivations and needs in each step of the journey, creating design solutions that are appropriate for each pain point. From this map, researcher can discover and analyze museum visitors need based on pain points found.

The main pain point researcher find in this museum is almost all the information about exhibits are written. Researcher notice that almost 80% of the museum content are understandable and perceivable through reading, which requires children ability and interest to read. While through these kind of attraction, visitors only abled to receive information in one way, allowing no room for interactivity. Moreover, for children in kindergarten age, researcher need to understand that reading are not included in their set of skill or included in very limited degree. Researcher finds the gap between the need of younger children and the fulfillment of the needs. Therefore, researcher decide to make younger children within kindergarten-elementary school age group(3-12 years old) as our target market to serve.

Brainstorming Session

The brainstorming session is done in two session in form of unstructured brainstorming and structured brainstorming. The first session is participated by researcher and Mr. Budi Permadi Iskandar as an advisor for this project. This brainstorming session objects to explore all possible idea for an interactive museum product related to geological attributes. Based on the principle of design thinking, in the ideation stage is where researcher should in this process, researcher don't consider technical possibility and cost projection but just let the ideas flow. The objective of idea generated in this session is to provide maximum interaction through innovation. In the first session, we produce some product ideas such as interactive running with T-rex attraction and The second brainstorming process is done with Sembilan Matahari team. Researcher is coming up with the idea of creating self-build paper dinosaur mask that can transform children voice into dinosaur voice. The idea of the feature is generated by some inspiration of another product created by PPP, a creative studio based in Japan, called Wa!sk. This former product has won a special recognition award by 3rd Digital Ehon Award. Furthermore, researcher got inspired by a cardboard dinosaur mask created by neighborhood

children in Sembilan Matahari studio. Together with the feature, researcher aim to combine these idea into an interactive product to transform the museum experience.

User Experience Analysis

In the brainstorming session, we come with the idea of creating buildable paper dinosaurs mask. With this product, interaction is provided through feature that can transform children voice into dinosaurs' voice. Children are provided with the cardboard template which they can customize according to their creativity. This model provide more opportunity for children in the co-creation of the product and boost their creativity.

From the interview, we also know that dinosaurs is consistently popular amongst children of kindergarten to junior high school age. Therefore, it is relevant to keep dinosaurs as the main theme of the product. While mask is chosen due the ease of making the product and relatively familiar as a children toy.

There are five criteria of a good user experience for children (Idler, 5 Key Criteria Of A Good User Experience For Children, 2013) that we're trying to solve in this product:

1. Entertainment purpose
In this product, entertainment is provided through feature and the building process of the product. Children can find fun in the process of making the product according to their creativity and when they play with the voice changing features.
2. Visually appealing
In this product, we make them colorful and uniquely shaped to attract children visually. The color pallete that will be used in the product is bright and eye-catching, such as red, that is said can attract direct attention; yellow, to improve readability; green, to enhance learning and improve comprehension (Ozgen, 2004).
3. Usability
To accomodate the children need, we aim to design simple usability for this product. The buildable model consist of a paper template that can be glued into a mask, and then children can glued other particular dinosaurs part such as eyes and horn according to their creativity. However, we'll also provide a guide on how to shape certain dinosaurs species for learning purpose. We design the process of the mask building to avoid scissors and paint used by the children since it requires parental guidance and can be harmful for the children.
4. Age appropriate content
Based on Piaget theory (1936), children from age 3-12 lies in the category of preconception thought and intuitive thought. It means that these children need activity that doesn't require too much logic processing and language skill. Children in this age also have short attention span, therefore we need to create a product that's attractive enough for them to stay on it and doesn't require too much dedication in solving the problem. Therefore, by this product idea, we aim to create product that's simple enough to understand, attractive and encourage creativity.
5. Encourage learning
By making this product into dinosaurs themed and shaped, we encourage learning process through this product. Children can learn about the shape of each dinosaurs species in a fun way. Moreover, this product can enhance remembering abilitiy of children by presenting the learning process with interactivity.

Conclusion

Bandung Geological Museum still has a lot of room for improvement, in term of product and collection presented, especiall attraction dedicated to children in kidergarten-elementary school age group(3-12 years old). Since 56% choose product two, therefore researcher can conclude that product with co-creation level interest target audience the most. Moreover, by exploring the reason behind product preference, researcher also find that familiarity to everyday's life activity is also one of the key factor preferred by children. We also find that dinosaurs is constantly popular amongts children

in kindergarten and elementary school age. Therefore, based on the assessment conducted through interview, researcher comes with these product attributes keyword: **familiar, interactivity level: co creation and related to dinosaurs.**

Recommendation

From the finding and brainstorming, researcher recommend a buildable interactive paper dinosaurs mask idea as a product recommendation for further development. This product idea fulfill three core product design keyword, which are: familiar to everyday life, co-creation allowed, dinosaurs-related. A new product development research should be a continuous research. Product development process itself doesn't stop at opportunity identification and concept generation, but should be also followed by evaluation, development, testing and launching. Therefore, researcher recommend that the museum management should continue the product development process to the launch, and keep evaluating the experience created by Bandung Geological Museum. Museum management should continuously do research to find pattern in creating product in repeatable way, scalable and minimum technical and design debt.

In the interview process, researcher find that researching with children as target audience is more difficult than researching with adult as target audience. This happened because children has limited ability in expressing their thought, making open end question impossible to answer. However, in this case, researcher overcomes the difficulty by presenting idea in more tangible and visible way through video of project references. Therefore, there should be more in-depth research on how to conduct a user research toward children audience.

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