

APEC: A Framework for Designing Experience

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Introduction:

In this position paper, we introduce a framework called APEC to design for user-experience. It follows the most basic principle of user experience that is ‘communicating the intended meaning of an interaction between user and his environment through the coupling of action and feedback’ [2]. We argue that the APEC framework would help interaction designers to be able to provide the ‘total experience’ support for their systems.

1. Designing for experience

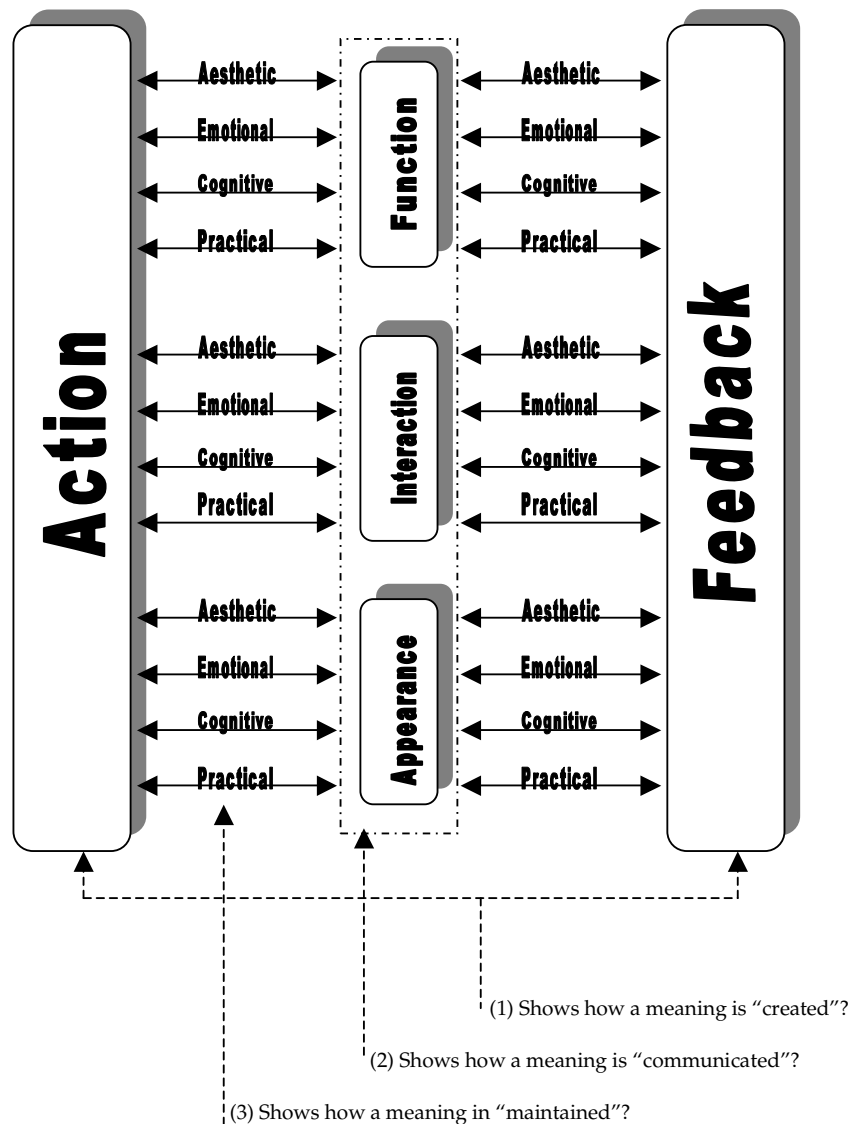
Design is a complex activity. It includes systematically analyzing and understanding the problem situation and its materials at hand, in order to achieve the ill-defined goals. It is likely to include trade-offs amongst its interdependent elements and requires skills and knowledge from different fields [1]. Designing for user experience requires extra knowledge to support for the subjective qualities like fun, pleasure, trust, persuasion, etc. Scientific theories and studies of design provide knowledge for technological development but they do not sufficiently help guide the ‘creativity’ - one of the major aspects of design. In experience design, designers should focus on providing an infrastructure that supports user's personal growth and self-expression [6]. Hence, experience design is also about providing users with extra control over the system and their environment. Gaver et al. [5] suggest that scientifically oriented assumptions about design are neither necessary nor sufficient. Scientific design theories manage to solve the known problems but these theories could not be applied to design for experiences where problems are vaguely known and there are no apparent solutions available. Designing for user experience is not about solving problems but it is about creating more opportunities for users.

In the process of designing for user experience, the designers should not focus on experience in general but should concentrate on the experience-of-use during user's interaction with the system. Wright et al. [9] argue that qualities like enjoyment, fulfillment or fun are not properties of technology but they should be thought of as the outcome of user's experience with the system. Here, we use an interaction-centred approach [4] to understand user experience. It follows a dynamic process where both the user and the system contribute towards an experience. Our interaction-centered approach is influenced by Dewey's [2] pragmatic view on experience.

2. The APEC framework

Simon [8] quotes, “...for a successful goal-seeking system it is very important that the external environment (product & other settings) adapts to the internal environment” (user). For our interaction-centric approach, we interpret this as: to design a system that could elicit desired experience during its interaction with a user, all the *relevant* properties of that system should adapt to all the *relevant* properties of the user. And in order to understand the experience we need to analyze this fit (relationship) between user and system. McCarthy & Wright [7] have also focused on understanding the relationship between people and interactive technologies in their “Technology as Experience” framework, especially on how these technologies support people in their everyday activities. They argue that traditional HCI design approaches fail to exploit user's felt life or emotional aspects with-or-through the system.

The APEC (Aesthetic, Practical, Emotional & Cognitive) framework goes a step further and provides design relevant support for interaction designers. The APEC framework focuses on specific properties of interactive systems and its users and investigates the relationship between them. “Experience as Meaning” concept is used to realize this. This concept is three-fold. First, a user’s actions and a system’s perceived feedback set up the base for creating a meaning. Second, the three system affordances (appearance, interaction, function) help the communication between the user and the system. And third, the user uses four aspects (aesthetics, emotional, cognitive and practical) to manipulate this communication and to construct a precise meaning of the experience. The following figure represents an interaction-centered view to understand user’s experience with an interactive system.



We argue that the APEC framework could be used for all types of interactive systems. It makes use of (i.e. respects) all the human capabilities and supports different interaction styles. The arrows between action and feedback show different coupling possibilities. Here, user’s action and system’s perceived feedback are coupled via three types of closely-related affordances (appearance, interaction and function) that represent the system from the user’s point of view. These affordances are further coupled via four aspects of user experience (aesthetic, emotional,

cognitive and practical) that may affect the communication of these affordances and help the user construct an overall experience. The important issue here is that the meaning that is communicated by action and feedback could be improved by sensibly utilizing these different coupling mechanisms. The APEC framework includes tangible properties of an interactive system in terms of function, interaction and appearance and intangible properties of user experience in terms of aesthetics, cognitive, emotional and practical aspects by which the user actually *constructs* an experience. Secondly, a designer has control over the tangible parts of this framework, which he can easily manipulate for design and analyses purpose. This framework challenges designers to explore the changes in the intangible parts by manipulating the tangible parts.

3. APEC in Use

A pilot study¹ is under development to use the APEC framework as an “Analysis Tool” to understand experience. The main focus of this analysis tool is to understand how and what coupling mechanisms are utilized for designing an interactive system. We intend to use some formalized questions to understand these couplings. Following are some fragmented questions² that will be used in the study.

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|---|
| <p>Appearance ↔ Cognitive</p> <ul style="list-style-type: none">• Only from its appearance, what do you think you will be able to do with this system?• Please describe what expectations did you have based on your previous experiences?• What did you expect the interface to be like? Describe, how different this interface is from the one you were expecting?• Has someone else told you about this system? Please describe what,• Does this interface remind you of any of your past experiences? Please describe• Only from its appearance, what parts of the system do you think are ambiguous?• |
| <p>Interaction ↔ Emotional</p> <ul style="list-style-type: none">• Please describe your feelings while you were operating the system.• Did you realize any ambiguity in the system interaction? What emotions did you elicit on that moment?• |
| <p>Function ↔ Practical</p> <ul style="list-style-type: none">• Please describe how useful the functionality was for attaining your actual goal• In what ways (modality / channels / senses) does the system allow you to realize the function? Please describe how easy or difficult it was.• Did the function performed the way you had intended to?• |

[1] We may be able to present the detailed description about this study and its results at the time of this workshop.

[2] This question list is only for illustration purpose and is based on only 3 types of coupling mechanisms (out of the total of 12).

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Definitions:

Aesthetic Aspect: Aesthetic aspect is concerned with the immediate reactions initiated by the sensory information (e.g. look and feel) of the product. This aspect helps appreciate only the ‘skin deep’ beauty of the system and it does not involve any cognitive support. Both the user and his environment contribute towards the process of eliciting aesthetic appreciations.

Cognitive Aspect: Cognitive aspect is related to involving human cognition (i.e. cognitive processing skills). This aspect helps the user comprehend a product’s narrative structure, action possibility, explanation of actions and expected results. It also helps the user reflect on his previous situations (or events) and evaluate the current situation. The ‘actual beauty’ could be judged from this aspect since people can analyze the system from cultural, social, political and historical perspectives.

Emotional Aspect: Emotional aspect is related to different emotions (e.g. joy, anger, disappointment, disgust, etc.) elicited by an interactive product. Emotions evaluate and judge the user state based on each events of user’s interaction with the system. Evoked emotions belong to the user only but they depend on different events and interactions the user is going through with the system.

Practical Aspect: A user uses the system in order to access its functions (these can be pragmatic or hedonistic) and if the system doesn’t fulfill them, it means nothing to the user even if the system is beautiful or attractive. The practical aspect is related to the actual ‘use’ of the system. It makes the user realize usability and functionality of the given system.