

Introducing Need Items – A Basis for Understanding User Experience Centered Product Requirements for Web Products

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Abstract. This paper presents a study to understand which psychological needs require to be fulfilled to elicit positive experiences with web products. We therefore conducted in-depth interviews with website users to understand which needs are to be fulfilled with five of the most frequently used websites in Germany. The interviews helped to inductively extract 56 need items. These need items were related to established need categories according to [8] and therefore help to specify relevant psychological needs in the area of web products. Results aim to provide a basis for practitioners to understand product requirements as part of user experience centered software engineering.

Keywords: Need items, user experience, product requirements, user experience engineering, human centered product development.

1 Introduction

In academia and business the importance to develop human centered products that enhance human well-being is becoming more and more central. Within this context, User eXperience (UX) is nowadays an established component of product quality. However, the transformation of the UX concept into practical software engineering is still in early stages [see e.g. 1 and 2]. Therefore, the present work aims to provide a basis for understanding human-centered product requirements based on specified psychological needs for the area of web products.

2 User Experience (UX)

A common understanding of UX provides the norm DIN EN ISO 9241-210 by defining UX as "*a person's perceptions and responses that result from the use and/or anticipated use of a product, system or service*" [3]. This definition describes the concept of UX phenomenologically, however, it is considered too abstract for practical product development. The question in product development is to understand how to develop for UX.

Looking at developing for UX deeper requires investigating desired product quality. However, different existing approaches to user centered product quality of interactive products appear difficult to apply [4-6]. Saying that, they do not provide a relation between perceived product quality and underlying human motives in order to understand the drivers that constitute positively perceived product quality and, correspondingly, a positive user experience. In order to understand underlying human motives, [7] suggest referring to psychological needs as they are assumed to be particular qualities of experiences that all people require to drive [8].

3 UX Framework

To connect both worlds – product quality and psychological needs – for understanding their influence on perceived product quality, we proposed an early UX framework. The framework included the needs for *autonomy – independence, competence – effectance, relatedness – belongingness, security – control, pleasure – stimulation and influence – popularity* [9 and 10] as well as the product qualities usability and attractiveness as they were shared by all product quality approaches within the context of user experience.

The next logical step was to make the framework applicable. Therefore, the abstract psychological needs require to be specified according to the product context.

An evaluation of the framework with the mobile social media service *LiveShare* by *Cooliris* has shown that the process to specify needs was only marginally applicable in practical software engineering as a result of its time- and resource consuming procedure. The framework itself was considered to be useful [10].

Based on the study results, we draw the conclusion that applicable support to develop for UX requires a pre-specified framework for a specific product area.

That said, the goal of this work was to understand *which psychological needs lead to satisfying experiences in web product usage* by identifying specified needs for the area of web products. We subsume these specified needs under *need items*.

4 Study Approach

To answer the research question, a qualitative approach was chosen in order to understand underlying concepts of meaning. This is, to *inductively improve the early UX framework* by identifying psychological needs that are central for eliciting positive experiences as well as to *deductively prove the existence of the proposed psychological needs by [8] within the area of web products*. Therefore, we conducted problem-centered semi-structured episodic interviews according to [11] with 31 individual website users of about 45 minutes for each interview. During the interviews, we asked funnel questions from general (open) to specific (closed) for assuring induction and deduction. We furthermore emphasized to think aloud and followed a question style as proposed in the Valence Method by [12].

Study objects were the five websites *Facebook.de, Ebay.de, Amazon.de, Google.de* and *Spiegel Online*. The selection is based on the 20 most frequently used websites in

Germany according to Nielsen/Statista 2012. A broad selection aims at understanding psychological needs in different fields of web (desktop) products. The selected websites cover Social Network, eCommerce, Search, Email and News/Information. Each interviewee used two of these websites during the interview.

Study participants were selected according to thematical sampling [13, p.402]. Of the 31 participants, 13 were female and 18 male, they used the Internet for at least 5-15 hours a week, knew all evaluated websites and had strong experience in usage of at least two of the five study object websites. The sampling helped to collect at least 10 interviews for each website and to exclude invalid interviews.

5 Results – Revised Framework

The research was successful in inductively deriving 56 *need items* from user statements that specify relevant psychological needs in the area of web products. We classified these need items into 24 more general *need categories*. Mapping these 24 need categories with the top-ten *psychological needs by* [8] has shown that the psychologists need concept is appropriate in the area of web products and, more influential on the previous work, that the *need for self-esteem – self-respect adds to the earlier proposed framework* in [10]. Figure 1 displays the revised framework for the area of web products.

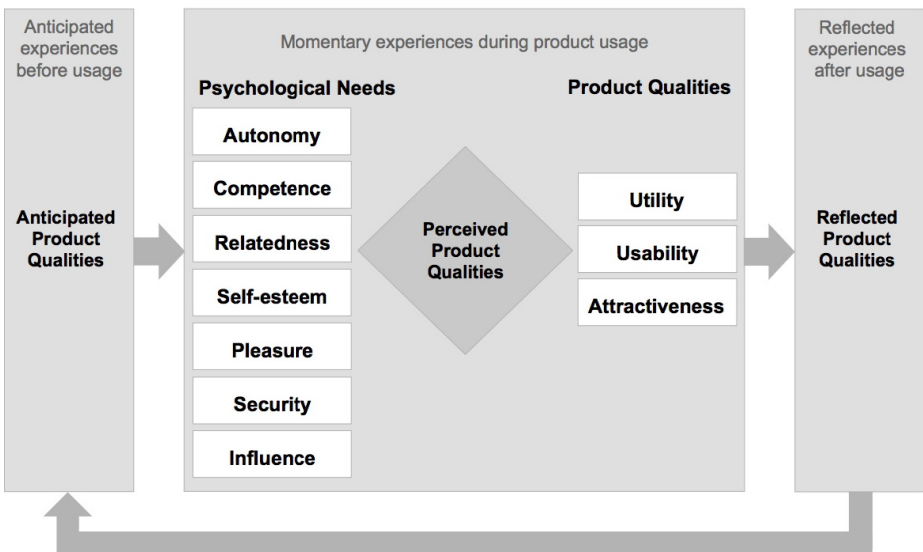


Fig. 1. UX Framework in the Area of Web Products

6 Results – Need Items

Table 1 shows the 56 need items and 24 need categories, related to the model of psychological needs from [8].

Table 1. Need Categories and Need Items in the Area of Web Products

Psychological Need [12]	Need Category	Need Item (To be...)	
Autonomy – Independence	Freedom of Choice	• Self-dependent	• Self-determined
	Freedom of Opinion	• Honest • Profound	• Informative
	Independency	• Uncommitted	• Unrestricted
Competence – Effectance	Success	• Successful • Capable	• Effective
	Planning	• Tactical	• Prepared
	Knowledge	• Educated • Experienced	• Informed • Up-to-date
Relatedness – Belongingness	Exchange	• Involved	• Available
	Altruism	• Inspiring • Selfless	• Generous • Helpful
	Participation	• Participating	• Existent
Self-esteem – Self-respect	Approval	• Approved • Accepted	• Appreciated • Respected
	Individuality	• Individual	
Pleasure – Stimulation	Excitement	• Playful	• Excited
	Curiosity	• Gawping • Curious	• Attentive
	Inspiration	• Explorative	• Inspired
	Creativity	• Imaginative	• Artistic
	Distraction	• Entertained • Amused	• Relaxed
	Surprise	• Surprised	
Security – Control	Overview	• Structured	• Oriented
	Self-control	• Self-controlled	• Prudent
	Certainty	• Safe • Certain	• Protected
	Ease	• Assured	• Carefree
	Trust	• Confident	• Trusting
Influence – Popularity	Reputation	• Influential	• Exemplary
	Presence	• Regarded	

7 Summary and Conclusion

The paper presented a study that aimed to understand which psychological needs require to be fulfilled to elicit positive experiences in web products. A qualitative research design was chosen to inductively answer this research question and to deductively prove an earlier proposed UX framework which relates psychological needs as put forward by [8] with product qualities.

The study was successful in extracting 56 need items and defining 24 overall need categories that specify relevant psychological needs in the area of web products. Results aim to support practitioners in engineering human-centered web products.

However, there are still many more steps to go to make this research topic more valuable in practical software engineering. These first research results open up a spectrum of future research, such as:

- Reproducing the findings by conducting, *firstly*, other qualitative studies to derive need categories or, *secondly*, applying a quantitative research design that aims at proving the resulting 24 need categories within the area of web products.
- Understanding the prioritization of presented need categories for different product contexts, different life areas, and if applicable, for the different life stages of humans.

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