

Influencing Joy-of-Use in sales-oriented Websites

A validated design framework¹

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Abstract. In the field of User Experience, various established theories exist however they lack practical guidelines in the design for positive emotions. This study (conducted end of 2005) postulated an integrative design framework for influence factors in respect to Joy-of-Use. It was successfully applied to an existing eCommerce-website and in this form validated empirically.

Keywords: Joy-of-Use, User Experience, Emotion, eCommerce, Web

Starting Point

The importance of the factors fun and joy in context with a product plays an increasingly significant role in marketing. For example German car manufacturer BMW markets its cars with slogans like „Prinzip Freude“ (translated “Principle of Joy”) or „Aus Freude am Fahren“ (translated “The Joy of Driving”). Rather than just highlighting functionality and quality, the company tries to position itself through the unique pleasure of using the respective car.

The same can be observed in the field of highly interactive products like software, where the recently coined term User Experience seems to become the buzzword of this decade. Since most traditional usability criteria are adhered these days in the software design process, new differentiators are needed for the users to assess interfaces. The key hereby lies within experiencing a positive integrative experience: Both

¹ This article is part of a study, conducted end of 2005. It highlights the most important steps and omits several in-depth research. More information can be found at <http://joy-of-use.com>.

functional and personal requirements of the user have to be satisfied during the complete product usage.

As such the field of interest, Joy-of-Use, covers a variety of potential areas of evaluation criteria like positive emotions, visual attractiveness, user-friendliness and functionality. They all contribute to the generation of the experienced pleasure of using the respective product. Leading the individual user to a subjective criteria catalogue sets the particular focus, which makes it hard for designers to find appealing solutions for mass audiences without a guideline or a framework.

Methodology

In this study, various aspects of Joy-of-Use, which contribute to an added value for users were evaluated with regard to their special significance to eCommerce.

The topic was approached from two sides (Figure 1):

- Understanding how emotions are triggered led to theories of human needs (omitted in this article). These are represented by a set of context-relevant factors, which can support positive emotions.
- Existing expert theories were evaluated with regard to potential common areas and to their practical feasibility (omitted in this article).

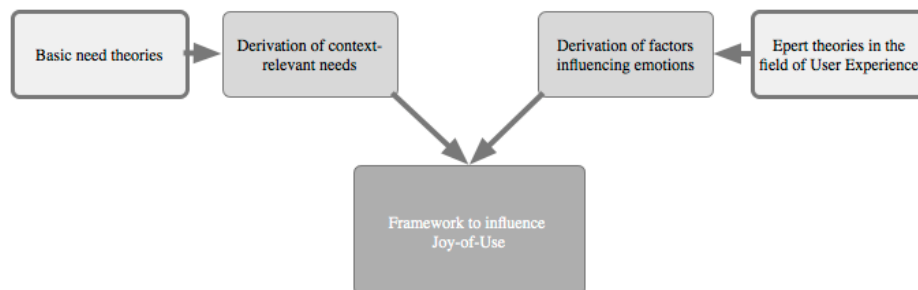


Fig. 1. Process to postulate a Joy-of-Use framework

The result of this procedure was the postulation of a framework for positively influencing Joy-of-Use in the field of eCommerce. A popular eCommerce website was then taken as a test subject for an empirical user evaluation to validate the applicability of the framework.

Theoretical Background

Need Theories

To find a pragmatic approach to influence Joy-of-Use, the common basic human needs of potential users build the foundation. The satisfaction of those basic needs is the primary motivation for all actions, therefore humans judge each action or situation if those needs are matched, supported or even prevented. This evaluation is usually done subconsciously, however the results become transparent in designated emotions. So if a user experiences positive emotions during the usage of a product its concluding judgment will also be a positive one.

Since the satisfaction of the basic needs leads to positive emotions, the premise could be made that a supporting user interface can provoke positive evaluations in a large scale of user groups.

It is important in this regard to differentiate between two types of goals:

- The direct goal of action, which is more of a functional nature
- The indirect goal of action, which is the satisfaction of basic human needs

Since the user rates both types, each has to be carefully considered in the design process.

The next step drew upon the theories of Maslow [1], Herzberg [2], Reiss [3] and Csikszentmihalyi [4] (Figure 2). Their various definitions of human needs and motives were evaluated with regard to their practical feasibility in the context of interactive products (omitted in this article).

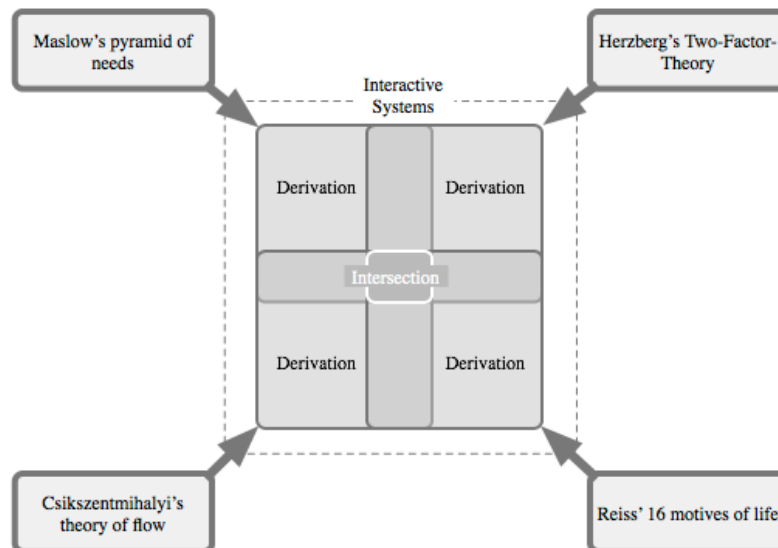


Fig. 2. Derived factors based on theories of basic needs

The result of comparing and aggregation was a set of eight main human needs whose satisfaction potentially leads to positive experience.

Table 1. Context-Relevant needs

Need	Definition
Knowledge and Education	Striving for knowledge, education and the desire to fulfill one's potential
Power and Influence	Striving for control and influence as well as freedom to shape one's environment
Success	Striving for success
Autonomy	Striving for autonomy and personal responsibility
Communication	Striving for communication with other people
Structure	Striving for order, clarity and organization
Wealthiness	Striving for money and tangible goods
Image	Striving for public recognition and status

Expert Theories

Besides the derivation of needs, practical factors of accepted expert theories (Donald Norman [5], Marc Hassenzahl [6], McCarthy and Wright [7], Kees Overbeeke [8], Patrick W. Jordan [9] and Pieter Desmet [10]) were evaluated with regard to applicability and the derived needs.

In these theories, usually two types of emotions can be distinguished:

- Affective emotions emerge superficially before the effective use of the product. A quick spontaneous assessment by the user happens in affect when he perceives the product for the first time.
- Cognitive emotions however are the result of a cognitive assessment of an incident. The science of cognitive psychology defines emotions as the consequence of judging an incident in respect to the convenience of achieving a specific goal.

Furthermore, most of the expert theories describe a designated process how the user perceives a product. Hereby the product experience already starts before the first actual contact: The user generates concrete expectations and wishes for the product based on personal or shared experiences with others leading to a first assessment.

By mapping the two types of emotions to the process of perception the premise could be made that the first contact and interaction with a product significantly influences the manifestation of emotions.

Based on the expert theories several feasible factors for applying those theories could be articulated and aggregated into the following set.

Table 2. Derived factors for influencing emotions

Factor	Definition
First contact with product	
Product Image	Striving for identification, public recognition and status
Product Promises	Making promises and opening possibilities
Connection	Creating a positive connection between user and product
Visual Appeal	Complying with standard design guidelines
During interaction with product	
Functionality	Existence of functionality to achieve the primary goals
Serviceability	Usability Criteria
Efficiency and Effectiveness	Usability Criteria
Potential for interaction	Possibilities for influencing the process of maintenance
Concept of interaction	Logical structure and stringent concept of interaction
Stimulation	Creating challenges for users to allow development
Image of product	Striving for identification, public recognition and status
Personalization	Opening possibilities for users to tell own stories or to reflect personal experiences and attitudes

Framework

Since an absolute generation of Joy-of-Use is not possible, a sensible acquaintance with the user is needed. Besides understanding the different emotions themselves, they have to be mapped to the various steps of the experience process:

- In the pre-experience, certain emotions are developed as well as a first assessment. However since no direct contact with the product has been made yet, a practical influence on the Joy-of-Use cannot be established.
- In the contact-experience, the visual design plays the most crucial role. This does not primarily mean that certain principles have to be applied consistently but rather that the visual design strongly promises the satisfaction of the user's needs.
- The interaction-experience is shaped by the user-friendliness of a product and the achievement of direct and indirect goals.
- The post-experience reflects the judgment of the experience by the user in respect to his original expectations.

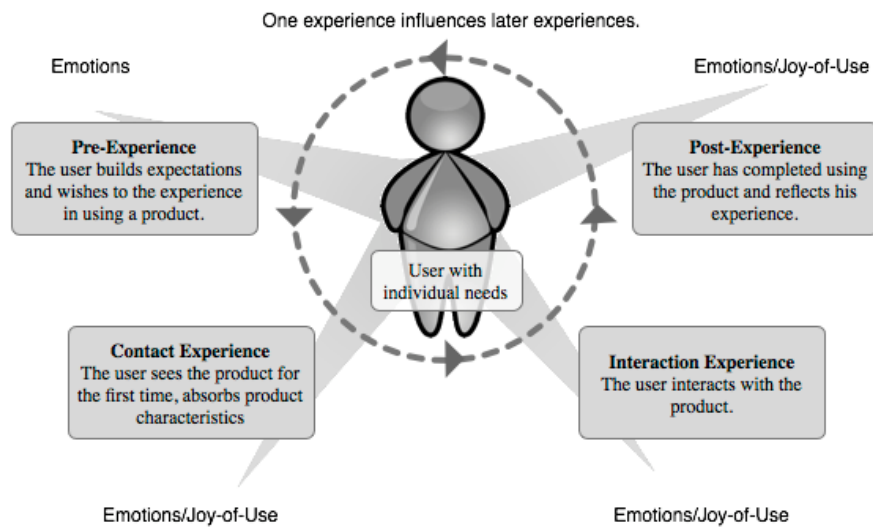


Fig. 3. The experience process in context of the generation of Joy-of-Use

Application approaches of the derived influence factors

To design the various phases of experience in the most positive way, the previously derived influence factors had to become manifest in potential guidelines. This affects primarily the contact and interaction experiences since those are capable of being influenced by designers and developers. Therefore, the pre-experience is out of scope.

Table 3. Potential application of influence factors

Influence Factors	Approaches for Application
Contact-Experience	
Product Image Striving for identification, public recognition and status	<ul style="list-style-type: none"> • Consider cultural norms and values of the target audience in the visual presentation. • Each product represents the user; therefore the image has to reflect his attitude and wishes.
Product Promises Making promises and opening possibilities	<ul style="list-style-type: none"> • Transport that the product fulfills the user's needs and requirements. • Show the user the available functionality of the product during the first contact. • Show the user that he can drive decisions on his own within the available effective degrees of freedom.
Connection Creating a positive connection between user and product	<ul style="list-style-type: none"> • Get and keep the user interested. • Transport that the product fulfills the user's needs and requirements.

Visual Appeal Complying with standard design guidelines	<ul style="list-style-type: none"> • Comply with the standard design guidelines.
<hr/>	
Interaction-Experience	
Functionality Existence of functionality to achieve the primary goals	<ul style="list-style-type: none"> • The product has to have the functionality needed to achieve the direct goal. • The functionality of the product has to be transparent.
Serviceability Usability-Criteria	<ul style="list-style-type: none"> • Design a system with a clear logical structure
Efficiency and Effectiveness Usability-Criteria	<ul style="list-style-type: none"> • Functionality, structure and interaction should be optimized for effective and efficient workflows.
Interaction Potential Possibilities for influencing the process of maintenance	<ul style="list-style-type: none"> • Offer multiple ways to complete certain tasks, access to information or solving dedicated problems.
Interaction Concept Logical structure and stringent concept of interaction	<ul style="list-style-type: none"> • The interaction concept has to be applied consistently and transparently throughout the complete application. • Offer clear points of orientation for the user.
Stimulation Creating challenges for users to allow development	<ul style="list-style-type: none"> • Challenge and surprise the user, appeal to all his senses (if feasible) but do not overburden him. • Offer optional detailed information and documentation.
Product Image Striving for identification, public recognition and status	<ul style="list-style-type: none"> • Be considerate of the users norms, values and expectations. • Make intensive research to fit the image to the target group.
Personalization Opening possibilities for users to reflect personal experiences and attitudes	<ul style="list-style-type: none"> • Allow groups and the sense of belonging. • Offer possibilities for individualization. • Allow the user to transport the experience to other (future) users. • Allow the user to contribute to the system.

Validation

Setup

The postulated framework and its practical influence were validated empirically in September 2005. An existing website of a large European car rental company was examined and a selected scenario was redesigned following the derived guidelines.

The test consisted of 24 participants in the range of 18 to 32 years of age. One half was first confronted with the original version of the website and afterwards with the version which has been optimized based on the framework. The other half first received the optimized and then the original version.

To evaluate the successful application of the optimized aspects, two separate control-questionnaires were used: one covered the influence factors in the contact experi-

ence; the other covered the same in the interaction experience. Both questionnaires consisted of statements, which had to be rated using Likert-scale.

An additional third questionnaire asked for the situational emotions and feelings to check if perceivable applications of the framework did contribute to a positive influence of Joy-of-Use. It covered polar expressions of feelings, rated via the semantic differential.

Table 4. Polar expressions of feelings for evaluation of situational emotions

Comfortable (German: "Angenehm")	Uncomfortable (German: "Unangenehm")
Is fun (German: "Macht Spass")	No fun (German: "Macht keinen Spass")
Provides confidence (German: "Weckt Vertrauen")	Does not provide confidence (German: "Weckt kein Vertrauen")
Optimistic (German: "Optimistisch")	Pessimistic (German: "Pessimistisch")
Calm (German "Ruhig")	Agitated (German: "Unruhig")
Excited (German "Aufgeregt")	Bored (German: "Gelangweilt")
Impressed (German "Beeindruckt")	Unimpressed (German: "Unbeeindruckt")
Confident (German "Zufrieden")	Disappointed (German: "Enttäuscht")

Process

To survey the contact experience test participants were confronted with the respective version of the website for 30 seconds without interaction. After this period the particular control questionnaire for the contact experience had to be filled out.

Thereupon the participant was free to navigate and interact as much as the (high-fidelity) prototype allowed for. The given task was to select and configure a car reflecting the individual needs of the participant leaving the way to achieve this goal completely open. After accessing the second step in the reservation process, the observation was stopped to fill out the second control questionnaire covering the interaction experience along with the third "situational emotions" questionnaire.

Concluding the first version of the website, the same procedure was applied to the second version.

Results

Contact-Experience

The answers for the contact experience were mapped with numeric values starting from 2 for “strongly agree” (German: “stimme ich voll zu”) to -2 for “strongly disagree” (German: “Stimme ich überhaupt nicht zu”).

The average value for the optimized version is \bar{x} 0,81 opposed to the original version, which was generated an average value of \bar{x} 0,56. Therefore the optimization of the homepage can be regarded as successful, however a specific quality classification cannot be made.

Table 5. Aggregated Results Contact-Experience

	Valid Cases	Average	Standard Error	Standard Deviation
Optimized Website	24	0,81	0,09	0,42
Original Website	24	0,56	0,09	0,46

Interaction-Experience

The same applies to the interaction-experience: Here the optimized website was perceived better in average (\bar{x} 0,97) than the original one (\bar{x} 0,63).

Table 6. Aggregated Results Interaction Experience

	Valid Cases	Average	Standard Error	Standard Deviation
Optimized Website	24	0,97	0,09	0,45
Original Website	24	0,63	0,13	0,66

Situational Emotions

In this case the answers were mapped into a scale of numeric values from 3 to -3. Also an average increase in positive perception of the optimized website (\bar{x} 1,28) is recognizable opposed to the original website (\bar{x} 0,58).

Table 7. Aggregated Results for Situational Emotions

	Valid Cases	Average	Standard Error	Standard Deviation
Optimized Website	24	1,28	0,16	0,8
Original Website	24	0,58	0,23	1,11

Especially the factor “Is fun” (German: “Macht Spass“) could be increased from an average of 0,04 to 1,46 through the optimization based on the framework.

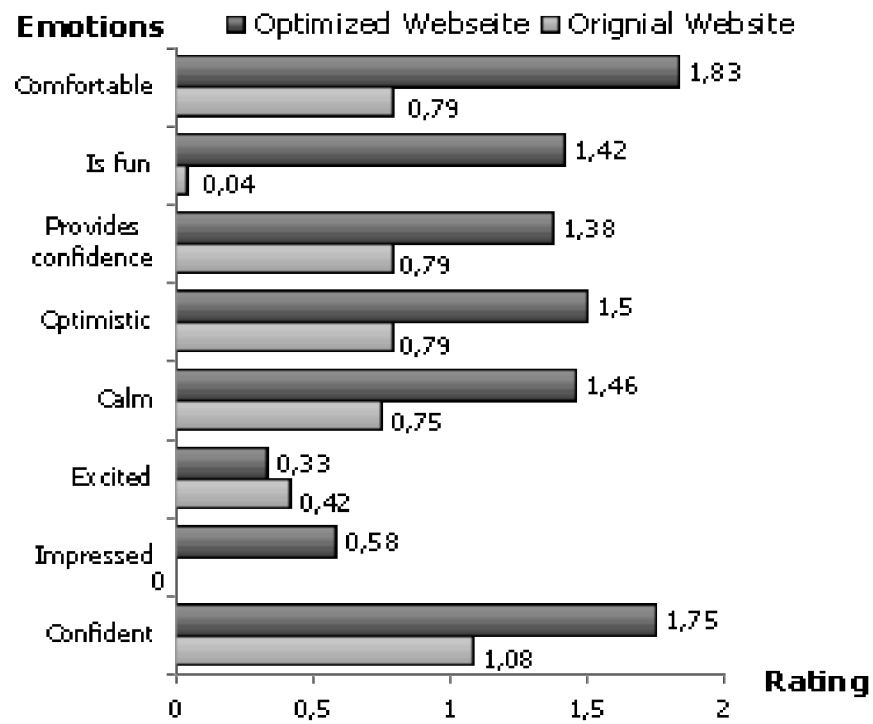


Fig. 4. Single results for all emotions

Summary

This first evaluation of the framework confirms the positive impact of optimized derived factors on the perceived Joy-of-Use.

A statistical interference analysis supports the findings regarding the contact-experience as a trend, regarding the interaction experience significantly and regarding the situational emotions highly significant.

Conclusions

Limitations

The result of the validation has to be taken with certain limitations:

- The testing was conducted primarily in the field of students.
- The questionnaires as such were not evaluated with regard to which extent they represent the derived influence factors.
- The increase in the positive perception cannot be broken down (yet) to single factors, since the experience as a complete package was examined.

Applicability

The postulated framework can be regarded as a first approach to influence the Joy-of-Use of eCommerce websites. The conducted testing just represents a first step for validation with a distinct need for further research.

It offers practical levers and new points of view to achieve positive emotions through interface design and explains which dependencies lead to this effect.

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