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# **Emotion-Centred Design**

A Human Factors Approach in Affective Web Design

A Thesis for Fulfilment of a  
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# *Abstract*

This thesis hypothesised that a major factor in the failure of many e-Commerce ventures was the lack of emotion imparted into the design, with trust barriers still being to the fore, and a lack of affective human factors like fun, pleasure and joy in the user experience. The human brain often acts emotionally before rationally and this affects initial reactions to experiences and the propensity to purchase online. A key to understanding human-computer communication is that form should follow emotion (as well as function).

A wide range of design concepts and theories are analysed for linkages to human emotion due to the exploratory nature of this thesis. Aspects of New Media design such as video, sound, images, colour and virtual reality are covered along with previous research into affective human factors; transferability of emotional elements from other products; and the importance of trust and prevention of negative emotions. Case examples are provided throughout via screenshots and commentary, including a special section on the way that the Nike site has met many emotional design criteria.

Research into the opinions of designers and users is undertaken via questionnaires to verify literary findings and measure views on emotional appeal within Websites. It was found that there are misunderstandings of human-computer communication – with designers not meeting user expectations in some areas, even though many designers agree that emotional design is important. In particular, there needs to be a better understanding of how to integrate fun, social contact, colour, trust and sound into designs.

Emotion is core to human function, and evolution has seen the emotional parts of the brain grow long before rational areas arose. Given the importance of emotion it is only natural that an emphasis should be placed on it in design philosophies. Whilst some designers are realising the importance of this in consumer products this concept needs to be further emphasised in the world of e-Commerce. Designers surveyed in this thesis were nearly all following a form follows function or a subjective/intuitive design philosophy. However, it was found that there was a good level of support (70%) for emotional design. A gap was established from this fact because only 45% believe they are currently using a high level of emotional design in practice. Chi-square tests showed that there were a number of significant relationships between the level of education and other questionnaire variables such as the importance of colour and recontextualising from car and game design.

Establishing trust helps to overcome the core human emotion of fear. Branding, seals of approval and high quality navigation are amongst the elements that can assist in bridging human-computer distrust. Predispositions and previous experiences can also affect initial trust values. Questionnaire results found that designers still believe that lack of trust is a major psychological barrier to purchasing online. Major

trust dimensions from previous empirical research were all deemed important. It was also found that users and designers rated trust near the top of emotional themes to concentrate on in Web design.

Negative emotions (anger and frustration) can also arise if the design is not inherently usable. Usability was the top-rating design theme amongst designers. There has to be a good balance between the rational and emotional sides. Further negative emotions can be evoked if the site is slow or if there are delays. Speed of loading was amongst the top emotional design elements for both users and designers. It is a difficult line for designers to tread – on one hand using speed to prevent negative emotions, but on the other hand balancing the need for other design elements that generate positive emotions through fun and pleasure characteristics (that might slow things down).

Designers involved in this study were very much in agreement with the importance of choosing colours to match the emotions they wanted to evoke in visitors (based on understandings of colour-emotion stereotypes and ‘temperatures’). Colour can achieve harmonious interactions or cause rejection by the human brain depending on its application. The survey of users revealed that almost half of the respondents counted colour in their top 5 emotional themes, whereas designers did not think it was as important as other emotive dimensions.

Different cultures may respond differently to metaphorical images, colours, and dimensions such as power-distance and masculinity. Nearly all designers believed that empathising with target users (a part of emotional intelligence) was very important, as was involving users in the design process (user-centred design). Only 50% of users felt that designers were respecting their demographics and culture, so there is still a large number of people who feel they could be more satisfied in this sense. It is proposed that more user testing be carried out in conjunction with frameworks that rate cultural dimensions based on target audiences.

The use of video and streaming media was portrayed to be a proposition requiring careful consideration and application by previous non-empirical references. Streaming video can connect with people on an emotional level, bringing in a degree of surprise and variation, and fully highlight the appealing characteristics of the product(s) trying to be sold online. Other New Media technologies such as virtual reality (VR) and 3D have been around for quite awhile (in computer games and scientific applications) but are yet to achieve widespread usage in Website e-Commerce. Some literature is against the use of VR and 3D on the Web but several companies have been receiving accolades in this area because of the ability to bridge an emotional gap between brands and consumers. Questionnaire results showed that most design respondents did not think streaming media, 3D and VR were important in order to gain emotional connections. However, higher bandwidth speeds that will facilitate more use of streaming media and 3D are deemed favourable by designers in terms of increasing emotional appeal.

The need for social contact, familiarity and recognition of expressions and gestures led to the proposition of using virtual shop assistants and agents. Contact in the form of live text chat can also fulfil some social needs and plays a big part in portraying trustworthiness since a real person is being interacted with. Designers surveyed in this study were reasonably evenly distributed amongst those in favour, unsure and in disagreement with the use of agents. Surprisingly, given that users would not have had much exposure to virtual agents and characters online, they actually deemed them amongst the highest rating emotional design elements – creating a gap between user expectations and designer actions.

Resources revealed that sound can account for a large part of an overall experience. Sound creates mood and atmosphere, and is present in the physical retail environment. Although literature stresses the importance of sound to Web design, designers in this study were of quite the opposite view. Sound was not deemed to be an important experience (near the bottom of ranked emotional dimensions). Users, however, rated sound amongst the middle group of emotional elements. More use of sound is an opportunity for the future.

Two broad product ranges – automobiles and computer games – were investigated to see what made them such emotion-centred items. Cars and games evoke feelings of pleasure, fun, flow and fantasy because of their design. Designers favoured interactivity, colour use and fun as gaming elements best applied to Web design. More than half of designer respondents believed that the design of cars and games can be recontextualised into Web design, and most users were definitely in favour of seeing emotional elements they like about cars and games placed into Websites.

Dimensions and potential mechanisms for measuring or assessing the emotional intelligence of Websites are proposed, and these include the use of semantic maps to position and compare Websites based on their performance against dimensions such as fun, warmth, trustworthiness, use of colour and the ability to engage users on a social level. The capability of building emotion into a Website is then balanced with the need for high-quality navigation, functionality and usability – as poor efforts in these ‘rational’ areas can lead to negative emotions and distrust. The design also has to keep in line with the demands of the company wanting the Website built.

This study was exploratory – with the aim of bringing out into the open some aspects of New Media e-Commerce design that could be better utilised in order to match the emotions and feelings of customers – potentially leading to higher degrees of sales success. This thesis is therefore hoped to be a catalyst for further study in this area.

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As a professional in the Information Technology (IT) industry one must learn to live with change and constantly be open to new ideas and ways of thinking. Given my initial interest in IT, design and psychology, the concept of applying emotional design to e-Commerce and Websites was an endeavour that changed the way I think about software design in a lot of respects. Research in this area is relatively challenging and new, and so I was delighted to obtain help and support from a large number of people, without whom this thesis would not have been possible.

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