Affective Design of E-Commerce User Interfaces: How to Maximise Perceived Trustworthiness

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Abstract
Successful e-commerce user experience design depends on a large number of factors. This paper focuses on consumers' acceptance of and trust in an e-commerce system, based on the transaction's value and perceived risk. The model of trust for e-commerce (MoTEC) by Egger (2000) provides a framework making explicit factors likely to affect customer trust. For each model component, design principles are provided, along with more concrete guidelines. It will be shown that the user interface is only one element of the customer experience. Designing for trust therefore requires user experience strategists to look beyond the mere design of the web site and pay attention to more general management and marketing issues.

Keywords Human-computer interaction, e-commerce, user experience, trust

1. Introduction

As increasingly more products and services are sold over the Internet, it becomes all the more important to build up knowledge in e-commerce-specific user interface (UI) and user experience (UX) design. Whether a web site is an extension of a familiar off-line company, or whether it is the only touch point with an unknown company, consumers must be confident that they have significantly more to gain than to lose when entering a transaction. Losses can take the form of frustration, deception, dissemination of confidential information, as well as wasted time and money. The entire user experience must therefore be designed to induce a positive affective state by strategically addressing consumers' concerns.

1.1 Consumer Trust

The main UX concept examined in this paper is consumer trust, as it encapsulates the notions of uncertainty, vulnerability and risk, characteristic of transactional relationships (Deutsch, 1960; Doney & Cannon, 1997). Trust is defined as a type of belief superior to faith and inferior to confidence. The Faith-Trust-Confidence continuum, as defined by Arion *et al* (1984), refers to the amount of available knowledge and cues on which to base one's belief. Thus, trust acts as a mental mechanism, based on incomplete information, that helps reduce complexity to allow for decision making under uncertainty (Luhmann, 1988; Kahneman *et al*, 1982).
Trust is seen as a highly valuable element of business relationships, as it fosters risk taking in economic transactions (Luhmann, 1988). Two types of trust must be distinguished. The first type, initial trust, refers to a new situation where, say, a prospective customer assesses the trustworthiness of a merchant based on third-party information and surface cues. The second type, trust based on direct experience, presupposes an initial transaction, followed by an evaluation of the outcome. As such, it affects the long-term orientation of the relationship. In this paper, the stress will be on designing for initial trust.

1.2 Research Objectives

Given the importance of trust in commercial relationships, there is a clear need for substantive and methodological knowledge about consumer trust in e-commerce.
Previous UX research on trust has focused on graphic design (Kim & Moon, 1998), surface cues (Cheskin Research & Studio Archetype, 1999) and user experience design (Nielsen Norman Group, 2000). While these studies all contribute to our knowledge about trust design, none of them has attempted to start from an in-depth theoretical account of trust to derive trust-specific design principles.
In addition, existing design guidelines have paid little attention to the wider business and marketing issues necessary to design not only a web interface but the entire buyer-seller interaction.

The initial phase of the author's research dealt with substantive knowledge and the development of a model of trust for e-commerce (MoTEC; see 2.2 below). Readers interested in the theory underlying the development of the model are referred to Egger (2001). The objective of this paper is to show how the descriptive model can systematically be used to derive design principles that maximise consumers' initial trust in an online vendor.

2. Method
The approach adopted in this research project was to start with a model that identifies all the factors, be they on- or offline, likely to have an effect on consumers' perception of a vendor's trustworthiness. The general issue of trust was first analysed from a psychological (Rempel *et al*, 1985) and marketing (Doney & Cannon, 1997) viewpoint, which led to the identification of a number of crucial factors for the development and maintenance of trust. These factors were then integrated as components in an analytical model. This model has been iteratively tested and refined by means of user tests where over 60 subjects were tested on sites for online grocery shopping, travel booking, private banking, as well as online marketing services (Egger & de Groot, 2000). Since its formulation in Egger (1998), the model has continuously been refined with new research findings by the author and other sources. An overview of the MoTEC model is presented below (Fig. 1).
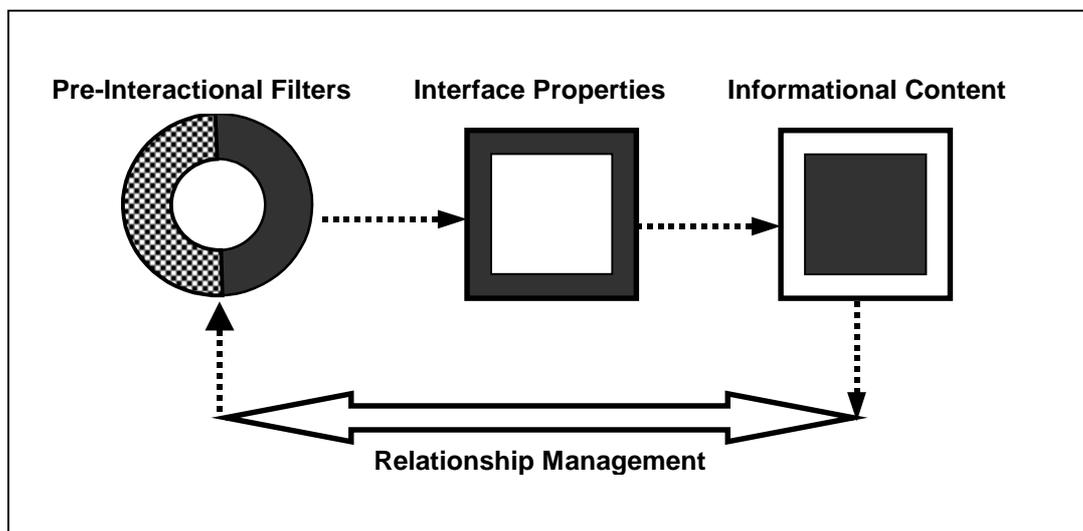

Figure 1 – Overview of the Model of Trust for Electronic Commerce (MoTEC)

The model is based on the metaphor that people's predisposition to trust and pre-knowledge determine an initial trust value even before a merchant web site is accessed. As one explores a new site for the first time, the first impression made by a system, in terms of graphic design and usability, will lead to a re-assessment of that trust value. As one examines cognitively more demanding factors, such as the company's competence or the risk of a transaction, one's trust value is bound to change once again. The fourth dimension, relationship management, refers to the handling of inquires or orders over time. Whether communication happens before or after ordering, the responsiveness and the quality of the help may also affect one's level of trust. This model shows that trust can be affected by both emotion and cognition, in both implicit and explicit ways. One should add that the evaluation of interface properties does not necessarily precede the evaluation of informational content; however, the former, *qua* means, is often required for the latter.

Sections 3 to 6 will present the model's four dimensions in greater detail. The descriptions will be followed by implications for design, in the form of design principles and more concrete guidelines.

3. MoTEC: Pre-interactional Filters

The first model dimension consist of pre-interactional filters. That is, factors that can affect consumers' trust in an online business before any online interaction has taken place.

3.1. User Psychology

Research has shown that individuals differ a lot in terms of their readiness to trust another party. (Deutsch, 1960). Cultural factors have also been reported to shape people's trust attitudes and behaviours (Jarvenpaa & Tractinsky, 1999). For instance, it has been found that Americans and Japanese trust more readily than Chinese and French (Fukuyama, 1995). Another predisposition is people's trust in information technology (IT) and, specifically, in the Internet. Generally, one's expertise in the underlying technology affects the extent to which the medium is perceived to be reliable and trustworthy. Another psychological filter is the person's general attitude towards e-commerce. Although a third of the population forms the "early adopters of almost anything" (Keen, 1999), two-thirds will need good arguments and the benefit of others' experiences to feel confident enough to transact online.

Know the customers:
- Identify the customer segments targeted by the company's marketing strategy.
- Establish a profile for each group: pay particular attention to age, gender, cultural and socio-economic background, as well as to likely personality traits (Early adopters? Risk averse?).
- Determine their levels of proficiency with IT, the Internet and e-commerce.

3.2 Pre-purchase Knowledge

This sub-component refers to facts or preconceptions about a particular industry and/or a particular company. For instance, some people may have a rather negative perception of direct marketing companies or second-hand car dealers. This entails that these people will approach online systems of such companies with a negatively biased trust value. Prior knowledge might also include an individual's offline experience with a specific company. This experience can be both indirect and direct. Indirect experience is mostly related to brand awareness, i.e. knowing that a particular company exist and what it offers. Direct experience, on the other hand, implies that one has actively interacted with a particular business, be it physically or through other media like phone, fax or mail order.

Examine attitudes towards the industry:
- Analyse consumers' familiarity with and perception of the industry.
- Determine the objective risks characteristic of the industry.
- Determine the perceived risks associated with the industry.
- Identify ways others have addressed those risks and concerns, both off- and online.

Analyse the company's brand equity:
- Determine the company's brand position with respect to its competitors.
- Determine consumers' perception of the brand: reputation, quality of experiences, expectations.
- Identify any associations and values connected to the brand.
- Define a clear online user experience strategy.

3.3 Transference

In addition to one's own experience with a company, one can also rely on the advice of trusted sources of information. The author's research has found that people rely a lot on word-of-mouth, a form of viral marketing. Experiences, good and bad, spread rapidly among the web of trust consisting of close friends, family or colleagues. Other trusted sources in the offline world are traditional media like newspapers or television programs. Online, people can also be influenced by what they read on trusted web sites, e-zines, newsgroups, bulletin boards or mailing lists. In addition, a site's presence and ranking in directories or search results can also affect the perception of its trustworthiness.

Take advantage of trusted sources of information:
- Identify and use traditional sources of information trusted by the target population.
- Identify and use online channels trusted by the target population.
- Use on- and offline viral marketing techniques to raise awareness of the web site.

4. MoTEC: Interface Properties

Interface properties refer to the surface cues that make or brake the first impression made by a web site. Given people's confirmation bias, first-time visitors will unconsciously seek to confirm their first impression rather than falsify it. The two factors under consideration here are branding and usability.

4.1 Branding

When accessing a site for the first time, the first response is likely to be an emotional one. The appeal of the interface, in terms of graphic design and layout, can directly affect the acceptability and usage of the system. More specific attributes of branding are the easy identification of the company and its activity sector, e.g. by means of a prominent logo and slogan. Another element likely to have a significant influence at this stage is how prominently the company presents its main selling points. This can arouse people's curiosity and motivate them to explore the site further. Since the first contact is all about presentation, professionalism is also a key factor. For instance, outdated content, broken links and typographical errors have all been reported to decrease a site's credibility and trustworthiness (Nielsen Norman Group, 2000; Fogg *et al*, 2001). Generally, the more a company is perceived to have invested in its web site, the less likely it is perceived to act opportunistically by betraying customers' trust, as it would have more to lose than to gain.

Take advantage of a familiar brand experience (traditional companies)**:**
- Transpose trusted offline brand attributes to the web site (colour scheme, style guide, etc.).
- Ensure that the different channels all convey the same image.
- Integrate offline marketing campaigns into the design of the web site.

Create an interactive brand experience (dotcoms)**:**
- Take advantage of people's familiarity with related on- and offline companies.
- Meet or exceed people's expectations about the look-and-feel and functionality of the web site.
- Take advantage of the medium's interactivity for efficient experience branding.
- Complement online with offline branding channels to facilitate the transfer of trust to the web site.

Convey a professional image:
- Invest considerable resources for brand positioning, UX strategy and implementation.
- Allude to the company's investment in its operations and the size of its customer base.
- Pay attention to details, be they graphic, textual or navigational.
- Have a domain name consistent with the brand or company name.

4.2 Usability

When prospective customers start exploring a web site, the ease and the efficiency with which they can access relevant information can affect how much they feel in control of the site. Factors that come into play are the architecture of the information, the familiarity of metaphors and the transparency of terminology. Any feature that lets visitors familiarise themselves with the system or that guides them through the shopping process can also facilitate the human-computer interaction. Specifically, confirmations of actions, process feedback and constructive error messages all help visitors feel in control of the system. An aspect related to usability is the reliability of the system, which can be affected by factors both inside and outside the merchant's control. Generally, ease-of-use is perceived as a sign that the company understands, cares for and respects its customers.
Please note that we will not expand on general principles for web design (cf. Nielsen, 1999).

Provide easy access:
- Design for cross-platform and cross-browser compatibility.
- Avoid the need for plug-ins and downloads on the homepage.
- Only use plug-ins if they add value to the content.

Be customer-centric:
- Structure the site in accordance with customers' domain model and expectations.
- Present information in a way relevant to the customer: e.g. thoroughly test localised systems.
- Minimise click stream for greater efficiency and satisfaction.
- Learn and anticipate customers' preferences: e.g. personalisation over time.

Let the customer be in control:
- Support the browsing behaviours of both novice and expert users.
- Inform customers about the procedures required to transact: e.g. overview of steps.
- Provide clear feedback to user actions: allow for easy error management.
- Allow for customisation: e.g. content, language or measurement units.

5. MoTEC: Informational Content

When exploring a site further, customers will start assessing the information they encounter. This phase can be split into two main processes. The first is an evaluation of the company's competence, while the second is an evaluation of the risk associated with a potential transaction.

5. 1 Competence

5.1.1 Products & Services
Whether people have a precise goal in mind or simply browse through a site, detailed descriptions of the available products and services help them make informed decisions about their purchases. The credibility of the information has also been observed to be very important as unreasonable or misleading claims can say a lot about a company's ethical standards and trustworthiness. Features that reduce user costs, such as comparisons with competitive products, may also be perceived as a sign of honesty and competence. In addition, the provision of related content, if relevant, can also be interpreted as the company truly understanding its customers' needs. Evaluating financial costs also comes into the picture at this stage, as it feeds into the prospective customer's cost-benefit analysis.

Create value:
- Create added value that may motivate and justify risk taking.
- Meet or exceed customers' expectations about the quality of descriptions: e.g. multimedia features.
- Support the decision-making process: e.g. by offering comparisons or alternatives.

Be credible:
- Back up objective content with data and references: e.g. external links.
- Provide credentials and affiliations of reviewers.
- Acknowledge any content that is sponsored by or affiliated to another party.

Be transparent:
- Display all costs prominently and early in the process.
- Provide explanations as to unusually high or low prices.
- Be clear as to any implicit costs: e.g. cost of ownership.

5.1.2 Company
When selecting merchants, prospective customers will try to infer a party's trustworthiness from its past behaviour and performance. It is therefore important that people be able to clearly identify the party (or parties) that will be involved in the transaction. Contact details and photographs of people behind the company also help convey a real-world feeling (Fogg *et al*, 2001). Given the moral dimension of trust, people will be receptive to cues conveying a company's philosophy and values. In addition, little known e-commerce sites that have created strategic alliances with high-profile and trusted companies are likely to benefit from those partnerships in terms of added credibility.

Present the company:
- Provide complete contact details: e.g. physical address, phone and fax numbers, etc.
- Provide information about the company's legal status, associations and partnerships.
- Show that there are real people behind the company: e.g. provide key names and photographs.

Describe the company's achievements:
- Provide company background: e.g. history and development.
- Provide a portfolio of high-profile customers.
- Provide investors information: e.g. stock price and annual reports.

Communicate the company's values:
- Stress moral values in the company's philosophy.
- Mention sponsoring and charity activities the company is involved in.

5.2 Risk

5.2.1 Security
Assuming a prospective customer is interested in a given product, the next step will be to assess the security of an online transaction. Cues that help this process are an explicit security policy, the use of encryption on order forms, as well as the involvement of trusted third parties.

Address security concerns up-front:
▪ List the measures taken to ensure that data is transferred, processed and stored securely.
▪ Provide prominent links to the security policy.
▪ Mention what hardware and software solutions are used: provide external links to providers.
▪ Complement browser feedback with text to inform users that they are on a secure page.
▪ Provide several payment options.

Provide reassurance in case of fraud:
▪ Be clear about consumers' liability: e.g. policies of credit card companies.
▪ Provide consumer redress mechanisms and financial compensation.

5.2.2 Privacy
In addition to security issues, people may also want to investigate information provided about the company's privacy policy. Typically, a privacy policy makes explicit the use and dissemination of any personal information collected on the site. When registration is required, the type of personal information required in registration forms can be quite determinant, as details judged to be irrelevant for the transaction are usually not given or made up. Once a personal profile has been created on a web site, the ease with which details can be accessed and modified also contributes to a feeling of control.

Provide a privacy policy:
▪ Communicate the company's commitment to the privacy of its customers.
▪ Provide prominent links to the privacy policy.
▪ Be audited by and display the seals of an independent trusted third party.

Let customers be in control of their data:
▪ Delay the need for registration as long as possible.
▪ Give customers a complete overview of the information required in registration forms.
▪ Justify the inclusion of seemingly irrelevant details.
▪ Provide easy means to access and modify data.

5.2.3 Contractual terms
Every commercial transaction comes with its own set of terms and conditions. Consumers judge the competence and the professionalism of a company by the presumed quality and validity of any warrantees, return policies or customer service. Unexpected and unreasonable obligations on the part of the customer once a product or a service is purchased are also likely to affect customers' trust.

Be transparent about the fine print:
▪ Strive to produce legal documents that are easily understandable.
▪ Check that terms and conditions are compatible with the legislations of the target countries.

6. MoTEC: Relationship Management

Relationship management reflects the facilitating effect of timely, relevant and personalised vendor-buyer interactions on trust development (pre-purchase) and maintenance (post-purchase).

6.1 Pre-purchase
In the case a prospective customer has a question, it should be easy to get in touch with the company. Different means of contact will cater to different needs. Facilitating contacts can also be perceived as an indication that the company really cares for its customers. It also helps overcome the lack of face-to-face interaction. Once contact has been initiated by the customer, it is important that the company's response be prompt and informative. Indeed, if a visitor never gets an answer to his transaction-critical question, he is not very likely to buy from that vendor. Immediate feedback that the customer's enquiry is queued for processing can help communicate responsiveness. In addition to the promptness of the

reply, its quality in terms of relevance and completeness is also of paramount importance. Customers value a personal touch, e.g. that they are addressed by their name or that the message is written by an identifiable individual.

Provide different means of contact:
▪ Provide traditional means of contact: e.g. postal address, phone and fax numbers.
▪ Provide online means of contact: e.g. e-mail addresses or instant messaging.

Handle customer inquiries efficiently:
▪ Provide feedback that inquiries are queued for processing.
▪ Reply to e-mail inquires within 24 hours.
▪ Provide complete and personalised responses.

6.2 Post-purchase
Once an order has been placed, customers generally value a confirmation of their order. Some vendors propose a tracking facility that lets customers check the progress of their order. This contributes to the transparency of the process and puts the customer in control of the situation. Fulfilment is an importance part of the customer experience. It includes the physical delivery of an order to the customer, its condition, presentation, packaging, as well as the correctness and completeness of the order. Should something be wrong with the order or should help be required, the ease with which customer service can be notified is crucial to the maintenance of trust. Besides, the amount actually charged by the company should be identical as the amount authorised through the online payment system. The way problems are solved all put consumers' trust in a vendor to the test.

Provide feedback about the order:
▪ Send a confirmation message immediately after a customer has placed an order.
▪ Allow customers to track orders in real time.
▪ Make it easy for customers to modify and cancels orders.

Choose trustworthy commercial partners:
▪ Choose reliable partners for the web site: e.g. hardware, software, hosting, etc.
▪ Choose reliable partners for the logistics: e.g. for warehousing, packaging, delivery, etc.

Provide an effective after-sales service:
▪ Make it easy to return products and get refunds.
▪ Bear in mind that it is cheaper to retain satisfied customers than to acquire new ones!

7. Discussion

It is noteworthy that the design principles presented in this paper partly overlap with the findings made by Cheskin Research & Studio Archetype (1999) and the Nielsen Norman Group (2000). The novelty of the present approach lies in the scope of the knowledge it produces. As was mentioned in Section 2, the first phase of this research dealt with the development of the MoTEC model. The model is based on a variety of theoretical accounts of trust, as well as on numerous empirical studies. The iterative development of the model, by means of several applications and evaluations cycles, ensures that the model elements are coherent and complete. The stress of this paper was to show how descriptive knowledge about the trustworthiness evaluation process could be translated into methodological knowledge for trust design.

The wide scope of the model is reflected in the three types of design principles that were produced:
1. Trustworthiness can be communicated *before* customers have accessed the web site (branding);
2. Trustworthiness can be communicated *during* the online interaction (UI and UX design);
3. Trustworthiness can be communicated *after* the online interaction (customer service, fulfilment).

The affective design of e-commerce user interfaces must therefore be placed in the wider context of customer experience strategy. It follows that the traditional scope of Human-Computer Interaction (HCI), viz. "a user interacting with a system", must be extended to "a customer interacting with a company" if one wants to communicate trustworthiness effectively. This redefines the role of UX designers, as they will have to collaborate very closely with management and marketers to develop a common and consistent strategy.

7.1 Limitations

One should note that keeping the design principles too high-level comes at a price. Indeed, it sacrifices the direct applicability of the principles by UX strategists and designers. Although each principle was illustrated by concrete guidelines, it was felt that one needs high-level design principles to gain a general understanding of the trust issues in business-to-consumer (B2C) e-commerce. These general design principles can then be adapted to different industries and business models. Indeed, systems for healthcare services, online banking or online gambling all come with their own set of trust issues. In other words, these services would attach different weights to the different model components.

7.2 Further Research

The author's research will concentrate on the iterative development of the MoTEC model and its applications. In addition to the design principles, three further methodological tools will be developed: a questionnaire that measures consumer trust, a checklist for expert reviews, as well as a more structured trust-specific design method. These tools will be validated by means of case studies in different industries. For research updates, please refer to: http://www.ecommuse.com.

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