

# Globalisation vs. localisation in e-commerce: Cultural-aware interaction design

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## ABSTRACT

Online shopping is the product of consumer assessment of the technological medium and the e-vendor. Previous research has evinced a number of interface features which are believed to be associated with trust building in e-commerce. In this paper we address issues of cross-cultural validity of these 'trust attributes' by comparing the relative importance given to them in two European nations (UK and Cyprus) which are characterized by different cultural values such as uncertainty avoidance (the way cultures deal with risk) and individualism/collectivism (the relative importance given to groups vs. individuals). A large-scale survey study suggested a strong cultural bias in the evaluation of trust attributes. The implications of these findings for interface design and localization are discussed.

## Categories and Subject Descriptors

H.5.2 [Information Interfaces and Presentation]: User Interfaces – evaluation/methodology, user-centred design.

## General Terms

Design, Experimentation, Human Factors

## Keywords

Trust, culture, on-line shopping.

## 1. INTRODUCTION

Trust has long been regarded as a critical antecedent of e-commerce adoption, as it originates in contexts of uncertainty, risks and dependence [3]. Many previous studies have attempted to find appropriate ways of building trust within web interfaces [1, 6]. For retailing sites, some attention has been given to the trust-building role of usability, the aesthetic of the interface, presence of third party seals of approval, amount of information about the products, privacy policy, and contact address. Overall, these studies posit that some interface features act as risk relievers, or trust attributes, affecting customers' intentions and behaviour. Unfortunately, empirical evidences on the predictive values of

these attributes are still contradictory. There are many open questions as to how customers actually use such attributes and whether consumer judgments based on them are valid, consistent and objective [8].

In this paper, we explore issues of cross-cultural validity of a selected set of trust attributes, by comparing the relative importance given to them in two European nations, the UK and Cyprus. These nations differ along two important cultural dimensions reflecting how society deals with unknown situations (uncertainty avoidance) and the relative importance given to groups in the society (collectivism vs. individualism). The paper contributes to the foundation of a cultural-aware design approach.

## 2. CULTURE

Culture is the cumulative deposit of knowledge, beliefs, values and attitudes, which rules people's behaviour in a society and distinguishes the members of one group from another. Culture is shared, learned behaviour, which is transmitted from one generation to another. It is pervasive, yet invisible, as it consists of unwritten rules and habits shaping people's interaction with their physical and social environment. Hofstede [7] proposes five value dimensions, which have a significant impact on behaviour in all cultures and differentiate between different cultures.

- *Power distance (PDI)*: the extent to which the weaker members of a society accept inequality in power distribution.
- *Individualism vs. collectivism (IDV)*: the relative importance given to individuals or groups within a society.
- *Masculinity vs. femininity (MAS)*: Masculinity refers to societies where gender roles are clearly distinct; femininity stands for a society where gender roles overlap.
- *Uncertainty avoidance (UAI)*: the extent to which a society feels vulnerable in unknown situation.
- *Long-term vs. short-term orientation (LTO)*: Long-term orientation encourages virtues oriented towards future rewards; short-term orientation promotes virtues related to immediate rewards.

In recent years, there has been an upsurge of interest in the role of culture within the HCI community. Culture is regarded as a powerful variable affecting users' expectations and behaviour, thus determining people's response to the interface design, including misuse or no use at all. It is acknowledged that design elements that are appropriate for one culture may not be appropriate for another, because of different cultural preferences and biases of the user population (e.g., spatial orientation of information, colour semantics, and cultural metaphors). For instance, Chinese languages (written top to bottom) suit vertical

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menus, whereas western languages (left to right) suit horizontal ones [5]. American users favour alphanumeric labels, while Chinese users favour pictorial icons [2]. Cultural values also affect e-commerce metaphors: bargaining suits countries which negotiate prices in real life, such as Turkey [9].

In his plenary lecture at AVI 2002, Aaron Marcus advocated the mapping of Hofstede's culture dimensions to user interface components, such as metaphors, mental models, navigation, interaction and appearance [10]. For instance, combining uncertainty avoidance (UA) and navigation, Marcus suggested that high UA countries prefer limited options and simple controls, whereas low UA countries prefer multiple options and complex control. Combining power distance (PD) and interaction, the author suggested that high PD cultures prefer severe error messages, whereas low power-distance cultures prefer supportive messages. Marcus's approach mainly relies on designers' insights and cultural stereotypes. As such, it may be prone to ethnocentrism, the tendency to evaluate other people and cultures according to assumptions and ideas originating in one's own culture.

Our research effort in cultural design follows a bottom-up approach grounded on empirical research to collect user requirements in different cultures [4]. We believe that this phase is instrumental in developing a robust theory of cultural design. Empirical research clarifies the relationships between cultural dimensions and users' behaviour, providing insights for the generation of design ideas beyond stereotypes and common knowledge. The advantage of such an approach was demonstrated in an ethnographic study to investigate ATMs' adoption in urban India [4]. It showed that Hofstede's theory [7] was useful as a framework to summarise and understand user attitudes, beliefs, and behaviours but it was not sufficient to anticipate which factors affected adoption and usage in very different cultural contexts. Hofstede's cultural descriptions are too high-level to inform design of technology directly. Furthermore, the bulk of Hofstede's research date back to the mid '70s and most of the stereotypes described in its classification may have changed because of the current globalisation tendency induced by the Internet.

### 3. METHOS

The study compared attitudes, opinions and beliefs of British University students with those of Greek Cypriots. These two countries are at different stages of e-commerce adoption. In 2003, 33% of British Internet users (48% of the population) bought on-line, whereas only 8% of the Cypriots who had access to the Internet (46% of the population) did so<sup>1</sup>. We believe that one of the reasons of this difference may on different values in the two societies, requiring a different approach to interaction-design.

According to Hofstede [7], UK and Greece differ on uncertainty avoidance (higher in Greece) and individualism vs. collectivism (Greeks give more importance to groups than British people do; Table 1). As no data were available to characterize Cyprus at the time of the study, the scores of Greece were assumed to apply to Cyprus too, as Greek Cypriots have common history, language, religion with Greeks. This assumption is shared with other cultural studies.

**Table 1. Cultural value dimensions in the UK and Greece**

	<i>PDI</i>	<i>IDV</i>	<i>MAS</i>	<i>UAI</i>	<i>LTO</i>
UK	35	89	66	35	25
Greece	60	35	57	112	N/A

We hypothesized that these cultural differences would affect e-commerce adoption in Cyprus and the relative importance given to trust attributes. In particular, we expected that Cypriot participants would be more anxious about on-line shopping than the British. People in high UA countries worry more and, consequently, would attribute more importance to graphical attributes which are immediately visible such as brand, security, and interface aesthetics. Furthermore, as Cypriots are more likely to be affected by social influence, recommendation by friends or other customers' feedback will assume greater importance than in the UK.

The on-line study combined self-reports on perceived importance of trust attributes with more objective measurements based on an experimental economics paradigm. Participants were given a set of interface screen-shots, which could or could not contain specific trust attributes, and asked to estimate their willingness to buy from that specific web-site. The value of this two-pronged approach to collect reliable information on on-line behaviour is discussed in [8].

### 3.1 Procedure

The questionnaire was translated in Greek and English and piloted in both languages. It was posted on [www.freeonlinesurveys.com](http://www.freeonlinesurveys.com) and advertised to students and staff at the University of Manchester and Cyprus. The study was open from the 26<sup>th</sup> of June to the 26<sup>th</sup> of July 2005. The home page reported instructions in English and Greek and the two national flags linking to the translated versions. The study aimed at students from the two countries, but the survey was open to everybody willing to participate.

The questionnaire consisted of three sections. In Section 1, participants had to estimate the importance of 5 trust attributes on their decision to buy or not to buy on-line on a 7-point Likert scale. These statements addressed recommendation by friends, presence of a well-known brand, presence of a security icon, interface aesthetics, and customer feedback. A final statement collected their level of anxiety when buying on-line. The second part of the questionnaire included the 8 items addressing IDV and UA in the Values Survey Modules 1994 (VSM 94) adapted to University students (Hofstede, personal communication). The final section proposed a number of scenarios, comparing couples of interface screen-shots in which selected trust attributes were manipulated. The final section collected personal data, including gender, native language, country of origin and residence, ethnicity, occupation, age, whether they used the Internet to shop on-line and how long.

### 3.2 Results

Results are reported in four sections: sample description, social influence, graphical trust attributes and localization issues.

#### 3.2.1 Sample

Responses were obtained from 595 participants, including 261 people from the UK, 115 from Cyprus and 59 from Greece. The

<sup>1</sup> Data for Cyprus were taken from the EC e-Minder project; data for the UK from the Eurostat report 2003.

remaining respondents were from different countries and were discarded from the analyses. The analysis of the VSM 94 scores highlighted very similar profiles for the Greek and Cypriot participants. Hence, they were merged in the same sample, labelled Greek Cypriots in the rest of the paper. People from the UK displayed a much lower value on uncertainty avoidance and were found to be more orientated towards individualism than the Greek Cypriots.

**Table 2. PDI and UAI values for Cyprus, Greek and UK**

	<i>Cyprus</i>	<i>Greek</i>	<i>UK</i>
IDV	65	71	90
UAI	53	53	9.7

Our findings on the Greek Cypriots sample significantly diverged from Hofstede's values. In particular, we found a difference of 33 points in IDV and 59 in UAI. The difference can reflect a general evolution occurred in the last 30 years within the Greek culture, which is strengthened in our sample, as the respondents were mostly young university students (77% of the sample).

The sample was evenly distributed among males (43%) and females (48%; 9% did not state their gender). Overall, the Greek Cypriot sample contained more males (63%), and the British sample more females (61%). The difference is significant,  $\chi^2 = 24.35$ ,  $p = .001$ . Some 64% of the Cypriots had a computing background, versus 13% of the British. A difference also emerged as regards to e-commerce adoption ( $\chi^2 = 38.45$ ,  $p = .001$ ). Some 19% of the Greek sample declared not using e-commerce (vs. 2% in the UK sample); 64% declared using it a few times a year or less (67% in the UK) and 17% declared using it at least monthly (31% in the UK). A Mann-Whitney U test showed that British respondents had used e-commerce longer than Cypriots  $U = 16958.5$  ( $N = 434$ )  $p < .001$ .

### 3.2.2 Social influence

A questionnaire item aimed to determine whether participants were influenced by their friends in their decision to shop-from an e-commerce web-site. Greek Cypriots obtained an average of 4.1 on a 7-point scale (1 = very unimportant; 7 = very important). This value was significantly higher than the average British answer (mean= 3.8),  $t_{(432)} = 2.74$ ,  $p < .01$ . Similarly, customers' recommendation was more important for the Cypriots (mean= 5.46, standard error= .11) than for the British (mean= 4.85, standard error= .09),  $t_{(432)} = 4.35$ ,  $p < .001$ .

In order to ensure that these differences were caused by cultural differences and not by e-commerce experience, the influence of this variable was removed by co varying it out. A multivariate analysis of co-variance (MANCOVA) was run using the two items (recommendation by friends and customers' feedback) as dependent variables, country (2) as the between-subjects factor and e-commerce experience as the covariate. The multivariate effect of country was significant  $F_{(2,428)} = 14.10$ ,  $p < .01$ , showing that people in these two countries attributed different importance to friends and other customer recommendation independent of their e-shopping experience.

### 3.2.3 Graphical trust attributes

The questionnaire asked participants to report how much they worried when using e-commerce and to estimate the relative importance given to the following graphical trust attributes: brand, security icons and interface aesthetic. Following the approach

previously described, scores to these 4 items were entered as dependent variables in a MANCOVA with country (2) as between-subjects factor and e-commerce experience as covariate. The multivariate effect of country was highly significant  $F_{(2,426)} = 15.83$ ,  $p < .01$ , showing that people in the two countries attributed different importance to these elements. Table 3 reports descriptive statistics for each item and probability values of the univariate tests. Greek Cypriots attributed more importance to all trust attributes with the exception of the presence of security icons, which was evaluated as more important by the British.

**Table 3. Trust attributes evaluation**

	<i>Cyprus</i>		<i>UK</i>		p
	Mean	Std Er	Mean	Std Er	
Worry	4.54	.12	3.36	.09	.001
Security	5.77	.12	6.11	.08	.05
Interface	5.24	.09	4.80	.08	.001
Brand	5.65	.12	5.12	.09	.01

The scenario-based section of the questionnaire further addressed issues of security. It reported two screen-shots of the same customer's shopping cart, just a step before proceeding to buy the product. One interface represented a secure web site: a small security padlock icon was displayed in the browser status-bar and the website address began with the *https* prefix. The other screen-shot represented a non-secure web site, displaying a fake third-party seals and none of the standard security indicators. For each scenario, participants had to indicate how likely they would have been to proceed with the transaction.

Participants' answers were analysed by a mixed model analysis of covariance with security (2) as within-subjects factor and country (2) as between-subjects factor. E-shopping experience was used as covariate. Results indicated a significant interaction between security and country  $F_{(1,424)} = 12.98$ ,  $p < .001$  and a main effect of country  $F_{(1,424)} = 4.78$ ,  $p < .05$ . British people were more accurate in appreciating the real level of security of the two web-sites. They declared preferring to buy from the most secure one (mean= 3.87) than from the less secure one (mean= 3.25). Conversely, Cypriots slightly favoured the web-site showing the fake trust seal (mean= 3.45) without realizing that it missed other more important, although less apparent, indicators.

### 3.2.4 Localisation issues

The questionnaire also addressed issues of localization. Responses from Greek people were not used in these analyses. The first scenario showed two versions of the same e-shop localized with photos of people and shop windows taken in the UK or in Cyprus. For each interface, the user had to report their intention to buy. These scores were entered as dependent variables in a mixed model analysis of variance with e-shop (2) as the within-subjects factor and country (2) as the between-subjects one. The analysis returned a significant effect for e-shop, as in general participants favoured the interface displaying the pictures from Cyprus  $F_{(1,429)} = 8.46$ ,  $p < .01$ .

Another scenario compared the willingness to buy from the two major national airlines in the UK and Cyprus. Participants were shown two screen shots of the life web-sites and asked which one they preferred on a 5 point scale (1= Cyprus Airways; 5 = British

Airline). The price was identical in both scenarios. Result of a Mann-Whitney U test showed a significant difference between Cypriots and the British  $U = 6836$  ( $N = 375$ )  $p < .001$ . On the average, people from both countries declared preferring to travel with their local airlines. People from Cyprus tended to be extreme on their choice. Some 10% of them declared that they would only travel with their local carrier, whereas only 2% of the British sample declared that they would only travel with BA.

Different results emerged when participants had to choose which one of two e-mail addresses (www.shopping-online.co.uk and www.shopping-online.com.cy) they would prefer to buy from. A cross-tabulation analysis showed that 53% of the Cypriot sample preferred the .co.uk address and 47% the .com.cy address. Conversely, 98% of the participants from the UK reported preferring the .co.uk address.

#### 4. CONCLUSIONS

E-commerce offers the opportunity to expand markets beyond temporal and spatial borders, reaching out to a very diverse range of potential customers. So far, the prevailing approach to e-commerce has implied a globalisation of trading activities, with little attention to habits, needs and requirements of potential customers. Nevertheless, this study demonstrates important differences between people's perception of web-sites even within the boundaries of the EC. Greek Cypriots were more anxious about using e-commerce than British people, probably due to their higher level of UA. Consequently, Cypriots attributed more importance to graphical trust attributes of the interface, such as brand and aesthetics, but they tended not to attribute enough importance to security aspects of the transaction and were easily misled by false cues. They also attributed more importance to recommendation from their friends, and other customers' feedback probably due to the collectivist nature of their society.

The study also showed that people tend to favour national brands independent of their culture, but it highlights the difficulty of designing web-sites which are perceived as reflecting one's own culture. Foreigner web-sites are used in new markets but not in established ones: most of the Cypriots declared trusting more a British web-site than a Cypriot one; whereas almost nobody in the UK did so. According to the e-Minder report, the trend in Cyprus is due to the perception that foreigner sites offer better prices and better services, but also to a lack of local alternatives.

Both the higher UA and the collectivist nature of the Cypriot society may be responsible for the slower uptake of e-commerce in Cyprus as compared to the UK. In general, people in higher UA countries are less open to changes and innovation. Furthermore, people living in a collectivist society prefer to follow the habits of other people like them. As e-commerce in Cyprus is still at an early stage, the number of adopters is small and cannot influence the majority of non-users. There is no social pressure to adopt it and there is a greater fear of doing so. This context deserves special attention, not the simple translation of interaction paradigm designed to suit different cultures.

The study stressed the value of user research to set the foundation of cultural-aware design [4]. For example, the discrepancies about the relative importance attributed to security as compared to other graphical trust attributes (e.g., brand and aesthetics) is counterintuitive and could not have been predicted by a pure theoretical approach. Furthermore, the study showed an important evolution of cultural values within the young generation as compared to Hofstede's data [7]. Young Cypriots and Greeks are becoming more individualist and willing to undertake risk-taking activities. Communication media, and in particular the Internet with its strong American flavour, can be deemed responsible for this change.

A major challenge for e-commerce designer is to build trust in an environment that lacks the interpersonal dimension typical of commercial activities. Trust can be build only by 'talking the language of customers' – this language will differ according to their frame of mind., or their culture.

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