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## **The effects of website design on purchase intention in online shopping: the mediating role of trust and the moderating role of culture**

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**Abstract:** Lack of trust in online transactions has been cited as the main reason for the abhorrence of online shopping. We have tested the mediating role of trust in online transactions to provide empirical evidence that trust in the online store represents the generic mechanism through which the focal independent variables of website design are able to positively influence purchase intention and reduce the perceived risk. We have further demonstrated the moderating effect of the individual's culture in e-commerce and thereby offered insights into the relative importance of website design factors contributing to trust for customers of different cultural values.

**Keywords:** trust; online purchase intention; perceived risk; online shopping; moderators; mediators; website design; culture; e-commerce; B2C e-commerce.

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## 1 Introduction

Over the years the evolution of the internet as a marketing medium has become a global phenomenon, leading to a rapid escalation of e-commerce in the past decade. The rise in the number of households possessing computers and the ease of internet access has led to this widespread acceptance of B2C e-commerce. According to Jupiter Corporation, e-commerce in the USA will reach \$144 billion by 2010. The penetration of e-commerce is also quite high in the developing economies of Asia. However e-commerce as a percentage of internet penetration continues to be very small. An I-Cube Report (2008)

shows that in 2008 the percentage of internet users who use the internet for e-commerce is only 7%. According to Tan and Guo (2005) the internet is viewed by customers as a world of chaos. Purchase is made only if the benefits are more than the risks. According to Grabner-Krauter and Kaluscha (2003) lack of trust is cited as the main reason for not shopping online. Hence, establishing trust in online shopping is one of the most crucial factors for success in online business environments. Academic researchers are eager to discover important website design factors that develop trust in online shopping. Past studies such as Cyr (2008) or Yoon (2002) provided empirical evidence on how various design factors build trust in the context of B2C ecommerce. However, there has been no consensus among researchers on the constituents for website design factors. In this study we have carried an extensive review of the literature on website design in order to determine a comprehensive model on website design and its influence on trust.

Culture has been defined in different ways by various scholars. It can be loosely defined as 'group psychographics'. From past studies (Marcus and Gould, 2000; Cyr, 2008), it has been noted that online companies are increasingly operating in multiple countries, each having a different cultural orientation. Past studies by Singh et al. (2005a, 2006) revealed that customers from different cultural backgrounds place different emphasis on various aspects of the website. We further note that none of the scholarly works have comprehensively studied the influence of culture on the website design, trust and the consequences of trust in online shopping. Although, this issue was partially addressed by Cyr (2008), even in her study country was used as a surrogate for culture. In the current study we discuss the limitations of using country as a surrogate for culture and advocate for measurement of the cultural values of the individual participants.

We further, conceptualise that trust is the generic mechanism through which the website design factors affect purchase intention and perceived risk. In this paper we propose that the website design factors affect trust and trust, in turn, increase purchase intention and reduce perceived risk. We note that none of the scholarly works have tested the mediating role of trust in relationship between design factors and purchase intention in online shopping, although Sultan et al. (2005) tested the mediating role of trust with some limited antecedent factors such as user and website characteristics.

The objectives of this study are as follows. Firstly, to review past literature and identify and empirically validate the website design factors that affect trust in the online store; secondly, to test the role of cultural variables in the relationship between website design factors and trust, and also between trust and its consequences; and thirdly, to test the role of trust in the relationship between the website design factors and purchase intention.

Our paper is divided into five parts. After the introductory Section 1, we review the relevant literature related to trust, website design, and culture in Section 2 and propose a model depicting the major website design factors as antecedents of online trust and also the consequences of online trust. Following the discussion, we propose a number of research hypotheses that hypothesise how the cultural values would affect the relationship between trust and website design factors and also between trust and its consequences. In Section 3, we discuss the methodology that has been used in the study. In Section 4, we present the results and findings from our study. In the final section we discuss the theoretical contributions, managerial implications of the empirical model and provide suggestions for future research.

## **2 Theoretical background and research model**

### *2.1 Website design*

The quality of website design is very important for any online store to attract customers. Cho and Park (2001) have found in their study that customer satisfaction in e-commerce is related to the quality of website design. According to Ranganathan and Grandon (2002), website design represents the way in which the content is arranged in the website. Wolfinbarger and Gilly (2003) argued that when customers interact with an online store they prefer to do so via a technical interface and not through any employee. Therefore the design of the website, which acts as the interface, would play an important role in influencing customer satisfaction. Lee and Lin (2005) had empirically found that website design positively influences overall customer satisfaction and perceived service quality. Besides, Ranganathan and Ganapathy (2002) have empirically established that website design positively affects purchase intention.

However, there has been little consensus among the scholars on the factors that constitute website design. In continuation of the above works, in this study, we investigate the nature of the website design factors. We believe that website design factors are too many and the development of the taxonomy of such factors would help us to better understand how it affects trust in B2C ecommerce. Kim and Lee (2002) suggested two perspectives for analysing design of a website: process and architecture. In the process perspective the market transactions are supposed to consist of a number of processes. The system is regarded as a sequence of processes. The architectural school of thought, on the other hand, considers the system as a collection of webpage documents.

In the architecture perspective the four components of design are content, structure, interaction and presentation. Content represents the information that is put up on the webpage. Structure represents that the way in which the information is arranged; for example, hierarchical, network etc. According to Park and Kim (2000) interaction represents the way the user can surf the web pages with maximum ease. The presentation aspect of the design represents the emotional appeal of the website, like the presence of visual aids etc.

In the present study we shall follow the architecture perspective as it deals with the system implementation details. In the online shopping context, Cyr (2008) had classified design factors as information design, navigation design and visual design. This is analogous to the architecture perspective of website design. Information design consists of content and structure of information. Navigation design is the interaction component and visual design is the presentation component of the website design.

### *2.2 Trust on the online store*

Trust has been defined in different ways by various authors. In our study we limit ourselves to the domain of B2C online shopping. Online Trust is a multi-dimensional construct. Authors such as Lee and Turban (2001) and Yoon (2002) had noted that there is no agreement among the authors on the definition of online trust. A detailed study on online trust, carried out by Tan and Sutherland (2004), had conceptualised online trust to be a multi-dimensional construct consisting of institutional trust, dispositional trust and interpersonal trust. Institutional trust comes from the internet and the concerns related to

the medium of online shopping. Dispositional trust deals with the individuals' openness, agreeableness, neuroticism, conscientiousness, and extroversion. Interpersonal trust deals with the trust between the two parties doing business. In the context of B2C online shopping the two participating parties in the business are the customer and the online vendor and would fall under the category of interpersonal trust. Interpersonal trust consists of predictability, integrity, credibility, and benevolence. Predictability is concerned with the vendors reputation of providing a good service, Integrity is the belief that the online vendor shall be honest and follow standards. We further believe that as predictability and integrity deals with honesty and consistency and they give rise to credibility of the online vendor. So, we conceptualise trust on the online store as the perceived credibility and benevolence of the online store in the eyes of consumer. Further, this definition has been used in the domain of online shopping by some authors like Stephens (2004) and Dash and Saji (2007). Credibility refers to the buyer's belief in the seller's expertise to do the job effectively, while benevolence is based on the buyer's belief in the positive intention of the seller (Ganesan, 1994).

In the next sub-section we discuss the role of culture in the relation between website design and trust.

### 2.3 *Culture*

Culture is a multi-dimensional construct. Various authors have defined culture in various ways. According to Kroeber and Kluckhohn (1952) "Culture consists of patterns, explicit and implicit, of and for behaviour acquired and transmitted by symbols, constituting the distinctive achievements of human groups, including their embodiments in artifacts". Kluckhohn and Kelly (1945) have said that "culture is historically created designs for living". To study the influence of cultural value, we turn to the seminal work of Hofstede (1980, 1991, 2001). Hofstede defines culture as the "collective programming of the mind which distinguishes the members of one group or category of people from those of another" (p.5, 1991). In the most exhaustive cross-cultural study to date, Hofstede (1980, 1991) established five dimensions of national culture. This development of a cultural dimensions typology is one of the major frameworks for understanding the influence culture on consumer behaviour in several marketing studies. Masculinity is the degree to which achievement, competition, assertiveness and performance are emphasised in a society. Uncertainty avoidance is the extent to which the members of a culture feel threatened by uncertain or ambiguous situations. Long term orientation refers to the time orientation of a culture; i.e., whether that culture tends to operate in a long-term or short-term context. Individualism refers to the ties between individuals. These ties tend to be relatively loose in individual cultures, and individual interests are emphasised over group interests. Collectivism, on the other hand, emphasises group welfare. Power distance refers to the extent to which the less powerful members of the society expect and accept that power is distributed unequally.

For more than 25 years researchers have relied on the work by Hofstede (1980) to make meaningful comparisons between national groups. Although there have been questions regarding the validity of using Hofstede's findings, the results of his work have been supported quantitatively and qualitatively by numerous studies in various disciplines (Sondergaard, 1990; Straub, 1994). Ford et al. conclude:

“In spite of criticisms from some quarters about the validity and generalisability of Hofstede’s results, papers published in leading journals have established its usefulness in theory development and testing and have found support for its contributions.” (Ford et al., 2003, p.10)

In keeping with the preceding endorsement, in this research Hofstede’s framework has been used for this study. Besides, Hofstede’s framework has been applied to investigate the influence of cultural value on consumer behaviour in the online context in several past studies in online settings such as Information, Visual, Navigation Design (Cyr, 2008), Privacy (Singh, 2002; Singh et al., 2005b; Singh and Matsuo, 2004), Security (Marcus and Gould, 2000).

In cross cultural studies, country has been used as a surrogate for culture by several past scholars such as Lee et al. (2007), Tan et al. (2007) and Cyr (2008). However, there is no consensus among authors on the issue as there are arguments for measuring cultural values at the individual levels. The notion of national culture construct is based on the postulate that there are larger cultural differences between countries than within countries. However, scholars such as Ng et al. (2007) argued that culture does not necessarily correspond to national boundaries, but often follows linguistic, ethnic, or religious divides. Yoo et al. (2001) had argued that members of a society need not have the same cultural values. Some individuals may develop ‘unique’ values that are different from the other members of the society. They argue that the learning opportunities of the individuals are ‘patchy’ and ‘constrained’ by the social structure. Besides, considering a nation-state as a surrogate for a culture raised problems because within-country heterogeneity may be greater than between-culture heterogeneity (Hofstede 1980; Samiee and Jeong, 1994). Srite and Karahanna (2006) argued that national culture is a macro-level phenomenon whereas acceptance of a technology such as online shopping is an individual level decision and, therefore, advocated the measuring of individuals’ cultural values by personality tests. Besides, McCoy et al. (2005) argued that it is inappropriate to use country scores on cultural dimensions because different individuals identify with the national culture in varying degrees. Besides, scholars like Srite and Karahanna (2006), Dash and Saji (2006), Dash et al. (2009) have done moderator analysis with the individuals’ cultural values and empirically established moderator effects of culture. Hofstede (2001) cautioned that his cultural metric is not valid for computing cultural scores for individuals. Realising these issues we did not focus on individual nation as a surrogate for culture. The cultural value identity of an individual person in this study were conceptualised at the individual level and not according to his or her national association.

In the next sub-sections we discuss the influence of these cultural values on the relationship between website design and trust and also between trust and its consequences.

## *2.4 Hypotheses development*

### *2.4.1 Trust in online store, its consequences and the influence of culture*

#### *Purchase intention*

From the literature the two most commonly identified consequences of trust were perceived risk and purchase intention. Purchase intention is concerned with the likelihood to purchase products online. In order to increase the acceptance of e-commerce it is

indispensable for the consumer to intend to use a retailer's website to obtain and provide information in order to complete a transaction by purchasing a product or service. Purchase intention is the final consequence of a number of cues for the e-commerce customer. Jarvenpaa and Tractinsky (1999) have argued that a customer's willingness to buy from the online store shall increase if the seller is able to evoke the customer's trust. Several studies (Gefen et al., 2003; Kim and Kim, 2005; Salam et al., 2005; Suh and Hun, 2003; Sultan et al., 2005) have empirically shown that increase in customer trust on the online vendor increases purchase intention.

Customers from high individualistic societies have a loosely knit social framework. According to Singh et al. (2003) personal freedom is valued more in individualistic cultures and individual decision making is emphasised. In collectivist societies the individual members form cohesive groups in which each individual expects the others in the group to look after his interest in exchange of unquestionable loyalty (Gong et al., 2007). Gong et al. (2007) further argued that in societies that are high on individualism, the individuals have a penchant to develop and try out new things. This is because individualistic societies favour more uniqueness and differentiation. Further, Yaveroglu and Donthu (2002) found that the individuals who are high on individualism are also high on innovativeness. So, customers high on individualism would require more trust from the online vendor in order to remain loyal and keep purchasing from him.

*H1a: Higher perception of customer trust in the online store results in higher purchase intention.*

*H1b: Collectivism negatively moderates the relationship between trust and purchase intention.*

#### *Perceived risk*

Perceived risk has been defined by Chellappa (2005) as the uncertainty that the customers face when they cannot foresee the consequences of their purchase decisions. As the internet is a virtual and global channel for buying and selling goods the seller cannot be physically felt it creates a perception of uncertainty in online transactions and, therefore, perceived risk in online shopping is high. Jarvenpaa and Tractinsky (1999) argued that there is no assurance that the customer will get what he sees on the internet. If there are technical problems during transactions, then the seller is not bound to bear the expenses. According to Yoon (2002), online trust is different from offline trust in three ways. First of all there is a huge distance between the buyer and seller; secondly, the absence of a sales person and thirdly there is no physical contact between the buyer and the product. So trust with the online vendor is indispensable for reducing perceived risk. Besides, it has been empirically shown by several studies (Jarvenpaa and Tractinsky, 1999; Pavlou, 2003; Harridge-March, 2006) that trust with the online vendor reduces perceived risk.

Customers from high uncertainty avoidance societies have less tolerance for uncertain and ambiguous situations. Tan and Guo (2005) noted that the internet is viewed as a world of chaos, so we believe that customers who are high on uncertainty avoidance have higher perceived risk from using the internet. Nath and Murthy (2004) found empirically that customers who are high on uncertainty avoidance are risk averse and are resistant to the use of the internet. Similarly, Lim et al. (2004) prescribed that those countries that are high on uncertainty avoidance need to stress on trust

in online stores to reduce the perceived risk associated with online transactions. So the online stores need to create higher trustworthiness in the minds of high uncertainty-avoidance-customers in order to overcome perceived risk. Thus, we propose the following

*H2a: Higher perception of customer trust in the online store results in lower perception of perceived risk in online shopping.*

*H2b: Uncertainty avoidance positively moderates the relationship between trust and perceived risk.*

#### *Perceived risk and purchase intention*

For online customers increased level of perceived risk is likely to reduce purchase intention. Consumers are reluctant to provide information on the internet because they fear their private information may be misused by some unauthorised person. Jarvenpaa and Tractinsky (1999) argued that a customer may be willing to buy from an online store if it is perceived to be of low risk even if he does not have a highly positive attitude towards the store. Choi and Lee (2003) and Jarvenpaa and Tractinsky (1999) have empirically shown that increased level of perceived risk reduces purchase intention. Thus, we propose the following.

*H3: Higher perception of perceived risk in online shopping results in lower purchase intention.*

#### *2.4.2 Trust in online store, website design factors as its antecedents and the influence of culture*

Website design is concerned with how information is put up on the website. It is primarily concerned with the information that is put up on the site, the aesthetic beauty of the website, the ease of navigation through the site and the time taken for navigation for improving usability. The relationship of the website design factors: information design, visual design, and navigation design with trust are discussed hereafter.

##### *Culture, information design and trust*

Information design deals with the information that is placed on the site and how the information is organised. Park and Stoel (2005) had argued that more information on the website leads to higher purchase intention. Kim and Eom (2002) had found that information about the firm, its products and services, promotions etc. positively affect customer satisfaction. Mithas et al. (2006) have found empirically that information content generates loyalty with online customers if the information is accurate, relevant and current. Further, Corritore et al. (2005) have argued that if the customer gets the relevant information in the website then the trustworthiness of the site increases. Furthermore, Cyr (2008) has provided empirical evidence that information design had strong positive effect on trust.

There have been a number of studies that have looked into the cultural values of customers and their impact on website acceptance. Tai and Chan (2001), in the domain of advertising, found empirically that customers high on masculinity give more preference to information cues for evaluating the quality and performance of products.

According to Singh et al. (2004), Japanese sites show masculine themes like online games and realism. Singh (2002) argued that masculine customers would emphasise sportiness and ambition. Further, there have to be decision making aids available on the site like explicit comparisons of products. It was pointed out by Newman and Nollen (1996) that masculine cultures have been viewed as “doing and acquiring rather than thinking and observing”. According to Ranganathan and Ganapathy (2002) information is more concerned with comparing alternatives, having more information about the firm, and having decision making aids on the site. These features are more concerned with ‘doing’ and ‘acquiring’ rather than ‘observing’. This is a masculine characteristic as per our discussion, so a customer from a masculine culture will pay more importance to information design. Further, since there is very little difference in Hofstede’s scores between Canada (52), India (56), and the USA (61) we believe that there will not be any significant difference in perception of information design between the Canadians, Indians and Americans. Thus, we propose the following

*H4a: Higher perception of information design in the website results in higher customer trust in the online store.*

*H4b: Masculinity positively moderates the relationship between information design and trust.*

#### *Culture, navigation design and trust*

Navigation Design of a website is concerned with the navigation of the website. Navigational schemes help the users to browse the site with ease. Cyr (2008) argued that even if detailed information is put on the site the customer may leave the site if he finds it difficult to search for the information he wants. Harridge-March (2006) had argued that proper navigation helps the customer to save time and overcome financial and performance risks and, therefore, leads to trust. Besides, Lim and Dubinsky (2004) had shown empirically that navigation properties of the website generate a favourable attitude towards the online store. Yoon (2002) has empirically shown that navigation design results in trust.

Singh (2002) had argued that guided navigation will reduce uncertainty for customers who are high on uncertainty avoidance. Marcus and Gould (2000), and Singh et al. (2005a) had argued that customers from high uncertainty avoidance cultures need to be given better navigational schemes so that they do not get lost in the website. Besides, Cyr (2008) found empirical evidence that customers who are high on uncertainty avoidance give more preference to navigational design for generating trust. Thus, we propose the following

*H5a: Higher perception of navigation design in the website results in higher customer trust in the online store.*

*H5b: Uncertainty avoidance positively moderates the relationship between navigational design and trust.*

#### *Culture, visual design and trust*

Visual design of the website deals with the aesthetic beauty and the emotional appeal of the website. It is concerned with the graphical aspects of the website. This includes the use of graphics, colours, photographs, and various font types to improve the look and feel of the site. Karvonen (2000) had shown that ‘aesthetic beauty’ of a

website positively affects trust. Cyr (2008) argued that visual design gives ‘overall enjoyment’ to the user because it beautifies the look and feel of the website. So, we believe that visual design is a key element that represents website usability. Thus, improving the visual design of a site should result in better usability of the website and this, in turn, would reduce ambiguities and increase the trustworthiness of the online vendor. Besides, Cyr (2008) also empirically established that the visual design of the website positively affects trust.

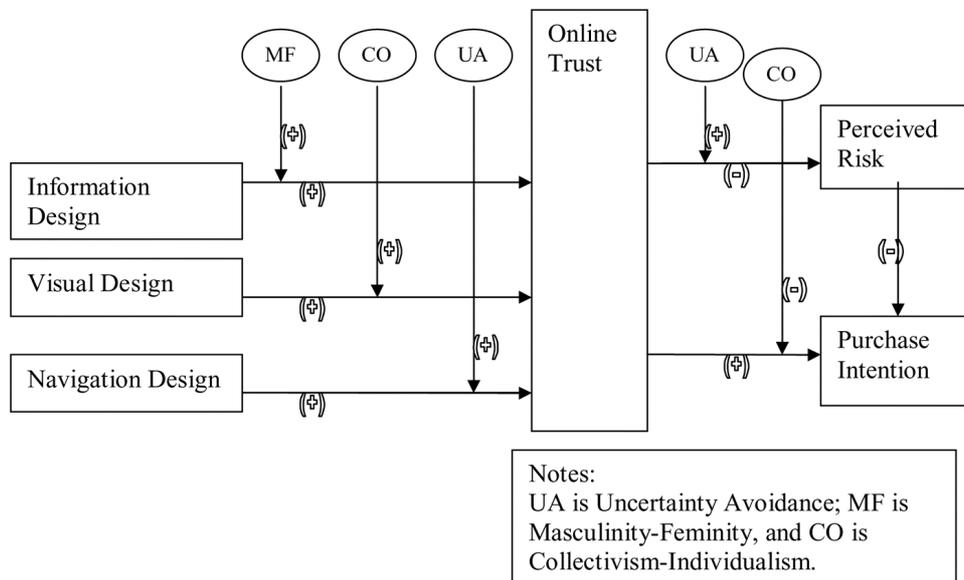
Sun (2001) argued that users from collectivist cultures such as China have a strong preference for visuals, whereas users who are more individualistic prefer a logical and structured page layout. Customers who are high on individualism avoid getting into groups and a more logical flow of information would allow them to perform the transaction on their own, without asking for any help from anybody. Besides, Cyr (2008) found empirically that visual design resulted in trust for users from China, which is high on collectivism, but not for users from Germany and Canada who are high on individualism. So, visual design as an antecedent to trust should be preferred more by collectivist customers. Hence, we hypothesise

*H6a: Higher perception of visual design in the website results in higher customer trust in the online store.*

*H6b: Collectivism positively moderates the relationship between Visual design and trust.*

We present the conceptual models derived from the above hypotheses in Figure 1.

**Figure 1** Customers’ cultural values and its moderating effects on the relation between the website design factors and trust, between trust and perceived risk and trust and purchase intention in online stores



### 2.4.3 *Trust as a mediator*

Some past studies provided empirical evidence that website design factors (Ranganathan and Ganapathy, 2002) develop purchase intention directly. However, there have been a plethora of papers (Yoon, 2002; Dash and Saji, 2006; Chen and Barns, 2007) that conceptualised and empirically verified that the antecedent factors generate trust, and trust, in turn, generates purchase intention. Baron and Kenny (1986) in their seminal paper defined that a mediator variable is a variable that represents the generic mechanism through which the focal independent variables are able to positively influence the outcome variable. Further, in the context of relationship marketing, Morgan and Hunt (1994) had suggested and empirically established that trust would mediate the relationship between commitment and its antecedents such as communication and opportunistic behaviour. Auh (2005), in the context of service marketing, had divided the attributes that generate loyalty into soft and hard attributes. Drawing inspiration from social exchange theory he argued that soft attributes involve more human interactions like social and relational attributes, whereas hard attributes are related to the core of the service such as competence, functionality, and reliability. Auh (2005) further established that trust is a mediator in the relationship between the soft attributes and service quality.

We also note that, in the context of online shopping, attributes like information design, visual design, navigation design are 'soft' attributes as they deal with social and relational attributes such as human contact, warmth, attentiveness, care etc. So we propose that these soft attributes would influence their outcome variable 'purchase intention' through the key mediating variable, trust. Therefore, in this study we hypothesise that trust represents the generic mechanism through which these focal independent variables are able to positively influence purchase intention. Furthermore, Sultan et al. (2005) had empirically established the mediating role of trust in online context. In their study trust was established as a mediator between the focal independent variables (e.g., website characteristics and consumer characteristics) and purchase intention. In a similar vein, we conceptualised the mediating role of trust in our model.

*H7: Trust in the online store mediates*

- (a) the positive effect of perceived information design on purchase intention.*
- (b) the positive effect of perceived visual design on purchase intention.*
- (c) the positive effect of perceived navigation design on purchase intention.*

Similarly we hypothesise that the website design factors are able to reduce perceived risk by developing trust toward online store. Therefore, we propose the following

*H8: Trust in the online store mediates:*

- (a) the negative effect of perceived information design on perceived risk.*
- (b) the negative effect of perceived visual design on perceived risk.*
- (c) the negative effect of perceived navigation design on perceived risk.*

### **3 Methodology**

#### *3.1 Context of study and sampling*

A questionnaire was designed to measure trust and website design. The sample consisted of students chosen randomly from various premier B-schools in India, USA and Canada. The countries were chosen because it has been established by Hofstede (1980) that India and western countries such as Canada and the USA differ significantly along a number of cultural dimensions. In order to comprehend the influence of culture on the website design factors that generate trust we focus on three of the dimensions used by Hofstede – collectivism, uncertainty avoidance and masculinity. From Hofstede's research it is clear that Indians are low on uncertainty avoidance, with an index score of 40 compared to the USA (46) and Canada (48). Similarly, the Americans and Canadians are high on individualism, with scores of 91 and 80, respectively, as compared to India, which has an index of 48. However, in masculinity there is not much difference between the countries as the Indians feature moderately high on masculinity with an index score of 56 and so do Canada (52) and the USA (62). We believe that by using the data from these countries it would be possible for us to determine whether country could be used as a surrogate for culture or whether cultural values operate at individual levels. Choi and Lee (2003), in their study on online shopping behaviour among Americans and Koreans, argued that a student sample is a very effective and easy way of achieving sample equivalence. Besides, researchers from Pew Internet and American Life Project (2008) have revealed that the online shoppers in the USA are primarily from younger age groups – 26% of online shoppers are in the age group 18–29 and a further 46% are in the age group 30–49. Similarly, in India most of the internet users and shoppers are from younger age groups – only 6% of the internet users are men in the age group 36–58 (I-Cube Report, 2008). Further, students are online shoppers from younger age groups and are heavy users of the internet. Besides, the students from the premier B-schools of India, USA and Canada have continuous internet access from their institutes and, hence, served our purpose.

The scales for the constructs were taken from existing literature in the domain of e-commerce. The scale for measuring Information design, Navigation design and Visual design were adapted from Cyr (2008). Trust was measured by the scales used by Chellappa (2005) and Suh and Han (2003). The scales for purchase intention was chosen from Suh and Han (2003) and that of perceived risk from Chan and Lu (2004). The cultural constructs masculinity-femininity, collectivism-individualism and uncertainty avoidance were measured by the scale developed by Yoo et al. (2001). This scale was empirically tested by several past studies related to culture such as Yoo and Donthu (2002), Donthu and Yoo (1998), Yoo and Donthu (2001) and Dash et al. (2009). The scales have been presented in tabular form in Appendix 1. All variables were measured on a 5-point Likert scale from “strongly disagree (1) to strongly agree (5)”. Data collection was carried out in two phases. In the first phase the participants were asked whether they do online shopping and whether they wanted to participate in the survey. In the next phase, the responses from the affirmative students were considered for the survey. For collecting data from the Indian, Canadian and American respondents, an online questionnaire was created and links to the survey were sent randomly to the students. The questionnaire was distributed to 1200 Indian students randomly chosen from the affirmative list of students, out of which 305 responses were received. After

eliminating unfilled and partially filled responses the final sample size was 290. Similarly, the questionnaire was distributed randomly among the students from B-schools in Canada and the USA who had consented to participate in the survey. The survey was distributed to 900 B-school students in Canada and 300 B-school students from the USA. 337 responses were received. After eliminating unfilled and partially filled responses the final sample size was 292. The sample characteristics are shown in Table 1.

**Table 1** The sample characteristics

<i>Sample</i>	<i>Indian</i>	<i>Western</i>	<i>Pooled</i>
Size	290	292	582
Male	240	136	376
Female	50	156	206
Years of internet experience	8.38	9.81	9
Average age	27	21	23.95
Average number of transactions with the portal in the last year	11	5.89	8.37

There was not much variation in the underlying demographics across the two samples except for gender, where the western sample had a much higher proportion of women than the Indian one. However, we believe that the psychographic orientations of the respondents are more important than simply the gender differences. Since the cultural values of all the respondents were measured at the individual level the 'gender effect' was taken care of.

## 4 Results and data analysis

### 4.1 The measurement model

Before using the inferential statistical analysis we assessed the validity and reliability of the constructs. Confirmatory Factor Analysis (CFA) was used to test discriminant and convergent validity and reliability of the questionnaire items and the constructs. The results of CFA are presented in Tables 2 and 3.

The fit of the six factor measurement model consisting of online shopping constructs on a correlation matrix of 19 measures was acceptable:  $\chi^2(137) = 422.099$  ( $p < 0.001$ ); CFI = 0.94; IFI = 0.94; RMSEA = 0.06. Although the  $\chi^2$  statistics is significant ( $p < 0.001$ ), other goodness-of-fit indices indicated a good fit. The CFI and IFI of 0.93 satisfied the recommended cut-off criterion. The RMSEA for the model is below the cut-off criterion of 0.08. Convergent validity is achieved if the loading of each of the individual items on a construct is greater than 0.5. With the exception of 1 item each from trust and purchase intention, all other items displayed high convergent validity with factor loading greater than 0.5. Hence, convergent validity was achieved. In a similar vein, for the four cultural variables (constructs) the goodness of fit measures such as  $\chi^2(87) = 182.748$  ( $p < 0.001$ ); CFI = 0.93; IFI = 0.93; RMSEA = 0.06 were acceptable. Even here, the  $\chi^2$  statistics was significant ( $p < 0.001$ ), but other goodness-of-fit indices indicated a good fit.

**Table 2** The factor loadings and reliability for the predictor and criteria variables (Indian and Western sample)

Variable	Items	Indian sample			Western sample		
		Loadings	Mean (SD)	CR	Loadings	Mean (SD)	CR
Information design	ID1	0.698	3.97 (0.806)	0.75	0.726	3.94 (0.859)	0.73
	ID2	0.852	3.88 (0.831)		0.789	4.00 (0.823)	
Visual design	VD1	0.810	3.96 (0.847)	0.69	0.817	4.16 (0.814)	0.77
	VD2	0.633	3.82 (0.819)		0.770	3.98 (0.859)	
Navigation design	ND1	0.824	3.97 (0.907)	0.81	0.828	4.10 (0.905)	0.74
	ND2	0.769	3.97 (0.753)		0.723	4.12 (0.866)	
	ND3	0.716	3.83 (0.846)		0.541	3.84 (0.815)	
Trust	T1	0.647	3.78 (0.844)	0.83	0.707	3.76 (0.816)	0.84
	T2	0.722	3.81 (0.823)		0.733	3.79 (0.879)	
	T3	0.633	3.58 (0.924)		0.620	3.59 (0.855)	
	T4	0.523	3.69 (0.772)		0.610	3.77 (0.756)	
	T5*	0.692	3.79 (0.741)		0.484	3.45 (0.713)	
	T6	0.696	3.60 (0.810)		0.675	3.59 (0.792)	
	T7	0.795	3.89 (0.770)		0.778	3.84 (0.782)	
Perceived risk	PR1	0.596	2.60 (1.02)	0.75	0.671	2.68 (0.990)	0.81
	PR2	0.619	2.41 (0.970)		0.781	2.55 (0.916)	
	PR3	0.652	2.09 (0.885)		0.686	2.27 (0.811)	
	PR4	0.733	2.20 (0.923)		0.733	2.34 (0.886)	
Purchase intention	PI1	0.731	4.13 (0.840)	0.74	0.800	3.91 (0.843)	0.77
	PI2	0.795	4.08 (799)		0.790	3.85 (0.860)	
	PI3*	0.482	3.97 (1.11)		0.608	3.66 (1.06)	

\*Items with factor loadings less than 0.5 were dropped not considered for computation of CR.

**Table 3** The factor loadings and reliability for the cultural variables (Indian and Western sample)

Variable	Items	Indian sample			Western sample		
		Loadings	Mean (SD)	CR	Loadings	Mean (SD)	CR
Masculinity-femininity	MF1	0.541	2.41 (1.2)	0.73	0.652	2.22 (1.27)	0.77
	MF2	0.637	2.83 (1.1)		0.727	2.79 (1.15)	
	MF3	0.822	2.59 (1.107)		0.757	2.61 (1.09)	
	MF4	0.514	3.17 (1.12)		0.539	3.05 (1.24)	
Collectivism-individualism	CI1	0.579	3.37 (0.922)	0.83	0.653	3.08 (0.958)	0.80
	CI2	0.619	3.74 (0.785)		0.581	3.51 (0.843)	
	CI3	0.854	3.52 (0.893)		0.646	3.31 (0.920)	
	CI4	0.775	3.58 (0.866)		0.729	3.24 (0.936)	
	CI5	0.630	3.41 (0.861)		0.611	3.09 (0.978)	
	CI6	0.500	3.14 (0.880)		0.577	2.98 (0.930)	

**Table 3** The factor loadings and reliability for the cultural variables (Indian and Western sample) (continued)

<i>Variable</i>	<i>Items</i>	<i>Indian sample</i>			<i>Western sample</i>		
		<i>Loadings</i>	<i>Mean (SD)</i>	<i>CR</i>	<i>Loadings</i>	<i>Mean (SD)</i>	<i>CR</i>
Uncertainty avoidance	UA1	0.500	3.40 (0.940)	0.78	0.531	3.52 (0.891)	0.79
	UA2	0.584	3.64 (0.824)		0.780	3.78 (0.791)	
	UA3	0.745	3.74 (0.830)		0.695	3.74 (0.733)	
	UA4	0.719	3.76 (0.747)		0.565	3.72 (0.724)	
	UA5	0.678	3.78 (0.736)		0.671	3.87 (0.722)	

The assessment of discriminant validity was conducted for all the correlated constructs. The correlation matrices for the latent variables presented in Table 4 show that the correlation coefficient between any two constructs was significantly below unity, which supports the discriminant validity of the model. However, a stringent criterion for testing discriminant validity, suggested by Bagozzi and Phillips (1982) is to fix the correlation between two constructs as 1.0 and then employ a  $\chi^2$  difference test for the constrained and unconstrained models. A significantly lower  $\chi^2$  value for the model in which construct correlations are not constrained to unity would indicate that the constructs are not perfectly correlated and discriminant validity is achieved. Our results indicated that with an additional degree of freedom there was an increase in  $\chi^2$  value ranging from 92 (with navigation design and visual design constrained) to 818 (with trust and perceived risk constrained). So our model demonstrated improved model fits when the constructs were separated and, hence, discriminant validity was achieved.

**Table 4** The correlation between the various constructs in the model

	<i>Information design</i>	<i>Visual design</i>	<i>Navigation design</i>	<i>Trust</i>	<i>Perceived risk</i>	<i>Purchase intention</i>
Information design	1.00					
Visual design	0.567	1.00				
Navigation design	0.583	0.690	1.00			
Trust	0.436	0.366	0.365	1.00		
Perceived risk	-0.313	-0.236	-0.228	-0.746	1.00	
Purchase intention	0.464	0.359	0.338	0.684	-0.515	1.00

In assessing measurement reliability, Fornell and Larcker (1981) stressed the importance of reliability of each measure (individual item), and the internal consistency of the composite reliability of each construct. Composite reliability is calculated as the squared sum of the individual item loadings divided by the squared sum of loadings plus the sum of error variances for the measures. The composite reliability of each construct should be more than 0.6 for measurement reliability. The results in Tables 2 and 3 indicate that reliability of the measurement scales for the criteria and predictor variables and cultural variables respectively was achieved.

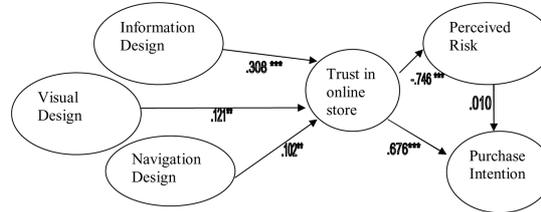
#### 4.2 Measurement invariance

In any cross national study instruments can be compared when cross national measurement equivalence is achieved. In this study we restricted ourselves to metric invariance i.e., invariance of factor loadings, which indicates that the respondents from different countries interpret and respond to the measures in an identical manner (Bagozzi and Yi, 1988; Steenkamp and Baumgartner, 1998). Measurement invariance was tested by using a hierarchical ordering of two nested models. The first model tested whether the pattern of salient and non-salient factor loadings was equal across countries. This is called configural invariance. Our results indicate that our data fit well with the a-priori hypothesised model:  $\chi^2(274) = 616.224$  ( $p < 0.001$ ), CFI = 0.932, RMSEA = 0.046. In the second model we tested whether the factor loadings were equal across the countries or not. This is known as metric invariance. Our results indicate that our data fit well with the a-priori hypothesised model:  $\chi^2(287) = 640.343$  ( $p < 0.001$ ), CFI = 0.93, RMSEA = 0.046. The increase in  $\chi^2(13) = 24.119$  is insignificant at  $p = 0.001$  level. Further, there were no changes in the IFI, CFI and RMSEA values, indicating that metric invariance had been achieved. Similarly, measurement invariance was tested for the cultural variables. Our results indicate that our data fit well with the a-priori hypothesised model:  $\chi^2(174) = 419.220$  ( $p < 0.001$ ), CFI = 0.90, RMSEA = 0.049. In the second model we tested metric invariance, i.e., whether the factor loadings were equal across the countries or not. Our results indicate that our data fit well with the a-priori hypothesised model:  $\chi^2(186) = 449.938$  ( $p < 0.001$ ), CFI = 0.89, RMSEA = 0.049. The increase in  $\chi^2(12) = 30.718$  is significant at  $p = 0.001$  level. However, there were no changes in the CFI and RMSEA values, indicating that metric invariance had been achieved.

#### 4.3 Results of research hypotheses

After achieving a satisfactory fit in the measurement model, the structural model based on a path analysis was then estimated. Path analysis using AMOS 4.0 was performed with trust, perceived risk and purchase intention as the dependent variables and information design, visual design and navigation design as the independent variables. The goodness of fit indices were then evaluated to determine if the model could be considered reliable in testing the hypotheses. The path model ( $\chi^2(6) = 43.58$  ( $p < 0.001$ ); IFI = 0.98, CFI = 0.98, RMSEA = 0.05), yielded a reasonable fit to the data. Although the  $\chi^2$  statistics are significant ( $p < 0.001$ ), the other goodness-of-fit indices also indicated a good fit. The Comparative Fit Index (CFI) and Incremental Fit Index (IFI) were above the guideline of 0.90. The RMSEA was also below 0.08. Therefore, the model was considered fit enough to proceed with further analysis.

The results from the path analysis shown in Table 5 and Figure 2 indicate that information design ( $\beta = 0.308$ ,  $p < 0.01$ ), visual design ( $\beta = 0.121$ ,  $p < 0.05$ ) and navigation design ( $\beta = 0.102$ ,  $p < 0.05$ ) are significant predictors of trust in online stores. Information design of the website was considered to be the most important factor for generating trust, followed by visual design and navigation design. However, the relationship between visual design, navigation design and trust were found to be insignificant for the Indian sample. As indicated in Table 5, trust was also found to be a significant predictor of purchase intention ( $\beta = 0.676$ ,  $p < 0.001$ ) and perceived risk ( $\beta = -0.746$ ,  $p < 0.001$ ). Thus, the hypotheses H1a, H2a, H4a, H5a and H6a were supported, whereas H3a was rejected.

**Figure 2** The structural path model

\* $P < 0.05$ ; \*\* $P < 0.01$ ; \*\*\* $P < 0.001$ .

#### 4.4 Test for moderator effects of culture

Next, the significant predictor variables of trust (and also of perceived risk and purchase intention) were taken into analysis and the moderator effects of culture were verified. To test the moderator effect of the cultural variables, moderator regression analysis was performed, as prescribed by Sharma et al. (1981). Stepwise linear regression analysis was carried out. First, the independent variables were entered. Second, moderators were entered and the change in  $R^2$  was noted. In each of the subsequent steps, the interaction of the independent variables and moderators were entered and the change in  $R^2$  value noted. The results of the moderator regression analysis with cultural variables as moderators are presented in Tables 5–7. The proposed moderators masculinity ( $\beta = -0.106$ ,  $p < 0.01$ ) collectivism ( $\beta = 0.069$ ,  $p < 0.1$ ) and uncertainty avoidance ( $\beta = 0.100$ ,  $p < 0.05$ ) were found to be significant predictors of trust. The moderator regression analysis results show that the interaction terms of masculinity and information design ( $\beta = 0.463$ ,  $p < 0.05$ ), and navigation design and uncertainty avoidance ( $\beta = 0.656$ ,  $p < 0.05$ ), were found to be significant predictors of trust, indicating that masculinity is a quasi moderator in the relationship between information design and trust, whereas uncertainty avoidance is a quasi moderator between navigation design and trust. Similarly, uncertainty avoidance was a significant predictor of purchase intention ( $\beta = 0.088$ ,  $p < 0.01$ ). Our results indicate that the interaction of trust and collectivism is significant with a negative effect ( $\beta = -0.588$ ,  $p < 0.01$ ) on purchase intention. Collectivism negatively moderates the relationship between trust and purchase intention. Thus, the hypotheses H1b, H4b, and H5b were supported and H2b, H6b were rejected.

**Table 5** Moderator regression analysis between website design and trust with culture as moderator

Independent variable	$R^2$	$R^2$ change	Standardised coefficient
Information design, visual design, navigation design	0.215	–	0.308***, 0.121**, 0.102**
Masculinity	0.240	0.025	-0.106***
Collectivism			0.069*
Uncertainty avoidance			0.100**
Information design $\times$ Masculinity	0.245	0.005	0.463**
Visual design $\times$ Collectivism	0.245	0.000	-0.048
Navigation design $\times$ Uncertainty avoidance	0.250	0.005	0.656**

\* $P < 0.05$ ; \*\* $P < 0.01$ ; \*\*\* $P < 0.001$ .

**Table 6** Moderator regression analysis between trust and perceived risk with culture as moderator

<i>Independent variable</i>	<i>R<sup>2</sup></i>	<i>R<sup>2</sup> change</i>	<i>Standardised coefficient</i>
Trust	0.557	–	–0.746***
Uncertainty avoidance	0.558	0.001	0.014
Trust × Uncertainty avoidance	0.558	0.000	0.294

\* $P < 0.05$ ; \*\* $P < 0.01$ ; \*\*\* $P < 0.001$ .

**Table 7** Moderator regression analysis between trust and purchase intention with culture as moderator

<i>Independent variable</i>	<i>R<sup>2</sup></i>	<i>R<sup>2</sup> change</i>	<i>Standardised coefficient</i>
Trust	0.467	–	0.684***
Collectivism	0.468	0.001	0.033
Trust × Collectivism	0.476	0.008	–0.580**

\* $P < 0.05$ ; \*\* $P < 0.01$ ; \*\*\* $P < 0.001$ .

We checked for country level variations of cultural values and summarised the results in Table 8. Table 8 shows that, except for collectivism, there is no significant difference in the cultural values between the Indian and the Western samples. The mean score for collectivism among the Indians was 3.46 and that for the western sample was 3.2. This suggests that cultural variations exist at the individual level although at the country level the cultural variations may be less. This result is in agreement with the findings of McSweeney (2002) who stated that

“If a national culture were common to all national individuals then there would not have been significant intra-country differences in individuals’ responses. But the IBM survey responses within each country were characterised by radical differences.”

This result shows that country should not be used as a surrogate for culture.

**Table 8** The cultural scores of Indian and Western samples

<i>Cultural measure</i>	<i>India</i>	<i>Canada and USA</i>	<i>T value</i>
Uncertainty avoidance	3.66	3.73	–1.27
Collectivism	3.46	3.20	4.88***
Masculinity	2.75	2.67	1.14

\*\*\*Indicates significance at  $p < 0.001$  level.

To determine whether country can be used as a surrogate for culture we carried out path analysis for each sample. As the western sample had a greater proportion of women than the Indian sample we wanted to ensure that the results of the country level analysis is not skewed by gender effects. So, we investigated the path coefficients for each gender. Our results showed that there is no difference in path coefficients between the two genders. Our results in Table 9 show that the westerners gave more importance to trust to develop purchase intention ( $\beta = 0.793$ ,  $p < 0.01$ ) compared to the Indians ( $\beta = 0.518$ ,

$p < 0.01$ ). However, we found that the westerners gave less importance to trust to reduce perceived risk ( $\beta = -0.742$ ,  $p < 0.01$ ) compared to the Indians ( $\beta = -0.758$ ,  $p < 0.01$ ). Our results indicate that the Indian customers give more emphasis to information design to generate trust ( $\beta = 0.401$ ,  $p < 0.01$ ) compared to the westerners ( $\beta = 0.180$ ,  $p < 0.1$ ). Similarly, westerners gave more importance to navigation design as an antecedent of trust ( $\beta = 0.146$ ,  $p < 0.1$ ) compared to the Indians ( $\beta = 0.069$ , ns). Further, we found the westerners gave more importance to visual design as an antecedent of trust ( $\beta = 0.224$ ,  $p < 0.05$ ) compared to the Indians ( $\beta = 0.045$ , ns).

**Table 9** Effect of the website design factors on trust

<i>Path</i>	<i>Path coefficient (Indian)</i>	<i>Path coefficient (Western)</i>	<i>Path coefficient (Pooled)</i>
Information design → Trust	0.401***	0.180*	0.308***
Visual design → Trust	0.045	0.224**	0.121**
Navigation design → Trust	0.069	0.146*	0.102**
Trust → Perceived risk	-0.758***	-0.742***	-0.746***
Trust → Purchase intention	0.518***	0.793***	0.676***
Perceived Risk → Purchase intention	-0.027	0.151**	-0.010

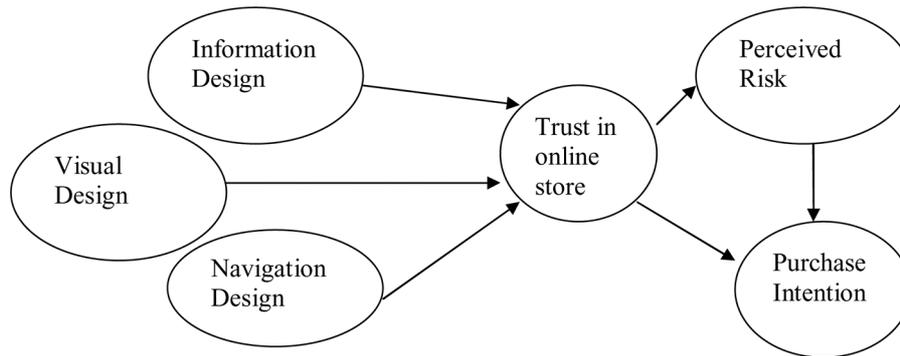
\* $P < 0.05$ ; \*\* $P < 0.01$ ; \*\*\* $P < 0.001$ .

#### 4.5 Test for mediator effect of trust

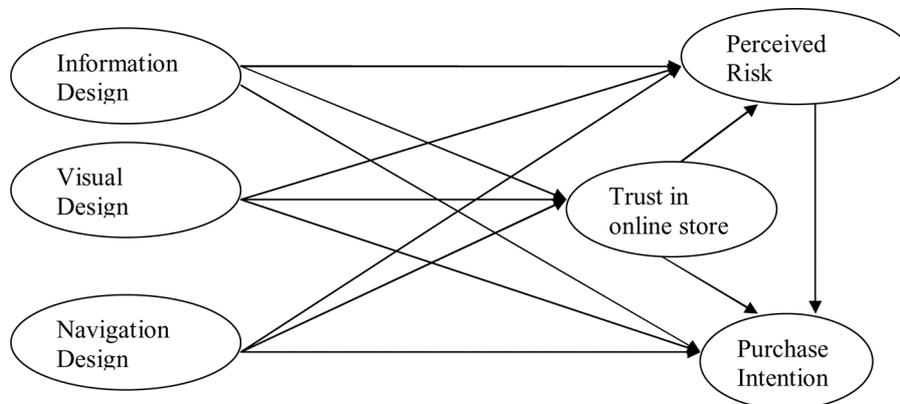
In the next step we tested the mediator effect of trust on the relationship between the website factors and purchase intention/perceived risk. We compared the Direct Effect Model (D-E-M) when trust and purchase intention /Perceived risk are constrained (i.e., trust not linked to purchase intention to transact/Perceived risk) with the free model when the mediating path from trust to intention/Perceived risk was not constrained. The Direct Effects model (Shown in Figure 4) included the additional direct path from website factors to intention to transact/ Perceived risk, in addition to the mediating paths from trust to purchase intention/perceived risk, as shown in Figure 3. The comparison of the proposed constrained D-E-M model with the free D-E-M model allowed us to test whether trust fully or partially mediates the effect of the website factors on purchase intention/perceived risk. To fulfil the condition of full/partial mediation, the effect of the antecedent variables on the dependent variables (purchase intention and perceived risk) should be significant in the constrained model and the previous significant effect should not be significantly/insignificantly reduced in the free model. This procedure of testing the mediating effect is consistent with the one suggested by Baron and Kenny (1986). Our review of the conditions for mediation (Baron and Kenny, 1986) suggested that the mediating effects of trust were indeed present between the website factors (information design, visual design and navigation design) on purchase intention. First the F-M-M showed that some of the antecedent variables information design ( $\beta = 0.308$ ,  $p < 0.001$ ), visual design ( $\beta = 0.121$ ,  $p < 0.05$ ), and navigation design ( $\beta = 0.102$ ,  $p < 0.05$ ) had a significant direct effect on trust. When the mediating path, through trust, to purchase intention was constrained (i.e., trust was not linked to purchase intention) the direct effects of information design ( $\beta = 0.31$ ,  $p < 0.001$ ), visual design ( $\beta = 0.27$ ,  $p < 0.001$ ) and navigation design ( $\beta = 0.23$ ,  $p < 0.001$ ) on purchase intention was significant. Fourth,

the previously direct effects of information design ( $\beta = 0.20, p < 0.001$ ), visual design ( $\beta = 0.16, p < 0.05$ ) and navigation design ( $\beta = 0.10, p < 0.05$ ) were significantly reduced when the mediating path from trust to purchase transaction was opened (see Table 10). From this result we can conclude that trust partially mediates the relationship between information design, visual design, navigation design and purchase transaction. Therefore H7a, H7b and H7c are partially supported.

**Figure 3** The mediator effect model with website design factors as antecedents and perceived risk and purchase intention as consequences of trust in online stores



**Figure 4** The direct effect model with website design factors as antecedents and purchase intention (and perceived risk) as consequences of trust in online stores



In order to test H8 which predicted that trust mediates the negative effect of the website design factors on perceived risk, we followed the same procedure as outlined above. First, the F-M-M showed that the antecedent variables information design, visual design and navigation design had a significant effect on trust. Second, the F-M-M also noted that trust had a significant negative effect on perceived risk. Third, when the mediating path through trust to perceived risk is constrained (i.e., not linked to perceived risk) the direct effects of information design ( $\beta = -0.31, p < 0.001$ ), visual design ( $\beta = -0.24, p < 0.001$ ) and navigation design ( $\beta = -0.23, p < 0.001$ ) were significant. Fourth, the previously direct effect of information design ( $\beta = 0.02$ ), visual design ( $\beta = 0.4$ ) and navigation design ( $\beta = -0.05$ ) were not significant when the mediating path from trust to perceived risk was opened (See Table 11). From this result we can conclude that trust fully

mediates the relationship between information design, visual design, navigation design and perceived risk.

To test the mediator role of trust we used the mediator analysis prescribed by Baron and Kenny (1986). Our results in Tables 10 and 11 show that trust fully mediates the relationship between the all website design factors and perceived risk and partially mediates the relationship between the all website design factors and purchase intention. Therefore hypothesis H7 is partially supported and H8 is fully supported.

We discuss the possible implications of the support and counter support for the hypotheses in the next section.

**Table 10** The mediating effect of trust between website design factors and purchase intention

<i>Path</i>	<i>Path via trust</i>	<i>Path coefficient</i>	$\chi^2$ (DF)	<i>GFI</i>	<i>IFI</i>	<i>CFI</i>	<i>RMSEA</i>
Visual design → Purchase intention	Not constrained	0.16*	19.42 (5)	0.99	0.99	0.99	0.04
	Constrained	0.27**	119.37(6)	0.94	0.93	0.93	0.15
Navigation design → Purchase intention	Not constrained	0.10*	30.72 (5)	0.98	0.98	0.98	0.06
	Constrained	0.23**	135.63 (6)	0.92	0.92	0.92	0.17
Information design → Purchase intention	Not constrained	0.20**	8.54 (5)	0.99	0.99	0.99	0.00
	Constrained	0.31**	100.24 (6)	0.95	0.94	0.94	0.14

\* $P < 0.05$ ; \*\* $P < 0.001$ .

**Table 11** The mediating effect of trust between website design factors and perceived risk

<i>Path</i>	<i>Path via trust</i>	<i>Path coefficient</i>	$\chi^2$ (DF)	<i>GFI</i>	<i>IFI</i>	<i>CFI</i>	<i>RMSEA</i>
Visual design → Perceived risk	Not constrained	0.4	37.06 (5)	0.98	0.98	0.98	0.08
	Constrained	-0.24*	518.51 (6)	0.83	0.68	0.68	0.36
Navigation design → Perceived risk	Not constrained	0.05	36.26 (5)	0.98	0.98	0.98	0.07
	Constrained	-0.23*	520.58 (6)	0.83	0.68	0.68	0.36
Information design → Perceived Risk	Not constrained	0.02	38.75 (5)	0.98	0.98	0.98	0.08
	Constrained	-0.31*	491.86 (6)	0.83	0.69	0.69	0.35

\* $P < 0.001$ .

## 5 Theoretical contributions, managerial implications and future directions

We identified that trust in online stores is one of the key obstacles of online transactions. In order to operate a successful e-business, an online company requires a deep understanding of how trust is developed and how it affects purchase intention in online stores. In this study we empirically demonstrated that website design factors, which constitute the drivers of trust, eventually contribute to online purchase decision. Online stores should use effective implementation of website design factors such as information design, visual design and navigation design as marketing tools by which trust in the website can be created and subsequently, purchase intention can be enhanced. This is in accord with the work of Sultan et al. (2005) and Dash and Saji (2006) who pointed out that trust mediates the relation between website design elements and purchase intention. In summary, we have empirically found that specific website design factors generate trust

in online shopping. We comprehensively tested the mediator role of trust in online shopping and our results corroborate the results of Sultan et al. (2005) who tested the mediator role of trust in the relation between website design, customer characteristics, and purchase intention.

Besides, we believe that the emphasis attached to each website design factor would vary depending on the cultural values of the customer. According to Yoo et al. (2001), culture has been measured mainly using two approaches: culture-centred and personality-centred. Culture-centred approaches are qualitative methods of culture assessment, whereas the personality-centred approaches are based on quantitative measures. These approaches have been widely used in business studies using proxies and values inference (Yoo et al., 2001). There are two types of value inferences: direct values inference which uses primary data and indirect values inference which uses secondary data (Lenartowicz and Roth, 1999). One major drawback of the use of proxies is that they can only provide nominal measures. The indirect values inference, on the other hand, may result in measurement errors. So, the method of direct values inference is the most important for personality-centred ways to measure culture. Therefore, in our study we used the scale developed by Yoo et al. (2001) to measure culture at the individual level. To the best of our knowledge no past study has used moderator regression analysis, with culture as a moderator in the relation between website design and trust in the context of B2C online shopping. Our results illuminate that culture acts as moderator in the relationship between website design factors and trust, and also between trust and purchase intention. As such, our work provides a framework for online customer segmentation based on cultural values of customers. Using our model, consumer segmentation can be made at the individual level i.e., culture-centric segmentation across cultures and countries. This is a meaningful framework for global product management strategies because there may be equivalent market segments across countries based on consumer groupings instead of the country-level segmentation. In this case, a similar marketing programme may be applied to equivalent market segments in different countries under the assumption that the segments' responses would be similar across countries. For example, an online company may develop an online product/service that may be targeted at very highly masculine, individualistic, and low uncertainty avoiding consumers. Instead of identifying a few countries that meet this profile the online store can identify customer segments within each country.

Our results have shown that culture at the individual level acts as a moderator in the relationship between website design factors and trust and also between trust and purchase intention. Alternately, there were cases when culture did not moderate the relation between two variables at the individual level, but at the country level there were differences. For example, it was believed that collectivism would result in difference across the two samples with respect to visual design as a predictor of trust. But we found no moderator effect of collectivism, although visual design was a significant predictor of trust in USA and Canada, but not in India. This suggests that culture operates at the individual level rather than at the country level. Western customers were found to place more stress on visual design than Indian customers. This could be because of the fact that out of the Rs. 9210 crore e-commerce market in India, online travel related purchases account for Rs. 7000 crore. We believe that for purchasing tickets, or any intangible goods, one does not require better visual design. However, better visual design implies use of applets and more add-ons that make the webpage download even slower and make

the online shopping process more time consuming. Therefore, the Indians give less importance to visual design.

From our study we found that customers who are high on masculinity lay more emphasis on information design. This means that online stores selling products to masculine customers should present information logically so as to help them in assertive and quick decision making. This is in agreement with the conceptual works by Singh (2002) where he stated that masculine customers would like to have features that would help in assertiveness. Although, we did not find any significant difference in masculinity scores between India, Canada and the USA we found that Indian customers gave more importance to Information Design. This has an important implication, as it corroborates further that there could be cultural variations at the individual level and country should not be used as a surrogate for culture. The Indians use online shopping primarily for convenience and this could be the reason for the excessive importance given to information design.

Similarly, customers who are high on uncertainty avoidance were found to pay more importance to navigation design to generate trust. So, online stores selling products to such customers need to place greater emphasis on navigation features of the website. Our results give empirical support to the arguments of Marcus and Gould (2000) who had pointed out that the customers who are high on uncertainty avoidance would need more guided navigation. Further, we found that western customers gave more importance to navigation design than Indians, although there was no significant difference between Indians and the westerners for uncertainty avoidance scores. This further suggests that there could be other issues that influence the importance attached to navigation design factors.

From our hypotheses we found that collectivism negatively moderates the relation between trust and purchase intention and that western customers place more emphasis on trust to generate purchase intention. However, we found no moderator effect of uncertainty avoidance in the relationship between trust and perceived risk. Further, trust was given more importance by Indians (compared to the Canadians and Americans) to reduce perceived risk. This could be because Indian e-commerce is in a nascent stage compared to the USA and Canada. According to internet world stats report, the penetration of the internet in India was less than 1% prior to 2002. This, in turn, means that Indian customers have not been using the internet for long and the institutional trust is low. So, Indians emphasise trust more with the online vendor as means to reduce perceived risk.

One drawback of this study is that we have only used website design factors as antecedents of trust. Jarvenpaa and Tractinsky (1999) had conceptualised that there are other factors such as vendor repute and vendor size that affect purchase intention. Tan et al. (2007) had shown empirically that external and internal norms affect purchase intention. We believe that future studies should include the effect of other antecedents of trust such as vendor repute, subjective norms etc on trust in online stores. This would be a possible extension for future research. Further, only the moderator effect of culture has been tested in the study. There could be moderator effects of product type, customers' personal values like demographics and psychographics which we have not tested in this study.

Finally, this study constitutes an early effort to empirically test the effect of website design factors on online trust and intention in online context. Consequently, it raises more questions than it answers. As e-commerce become more and more global in its strategic

thinking, it behoves managers and researchers to grapple with the complex interplay between website design and cultural values. To ignore the fact that culture influences website design is synonymous with overlooking the reality that advertising influences consumer choices or lower prices typically lead to higher sales, or higher trust typically leads to more purchase intention. The challenge is apparent-culture is a factor that both researchers and managers must become cognisant of in trying to develop website design over the long term.

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**Appendix 1**

**Table 1** The Questionnaire along with the measurement scales for the variables used in the study

<i>Construct</i>	<i>Items</i>	<i>Questions</i>	<i>Source</i>
Information Design	ID1	In my online store, I find the information to be logically presented	Cyr (2008)
	ID2	In my online store, I find the information on this site to be well organised	
Visual Design	VD1	The website of my online store looks professionally designed and well presented	Cyr (2008)
	VD2	The screen design on the website (i.e., colours, boxes, menus, navigation tools etc.) of my online store is harmonious and well presented	
Navigation Design	ND1	I can easily navigate the website of my online store	Cyr (2008)
	ND2	I find the website of my online store easy to use	
	ND3	The site of my online store provides good navigation facilities to search the information content	
Trust	T1	Based on my past experience I do believe that the transaction through my online store is always safe	Chellappa (2005)
	T2	Based on my past experience I do believe that the transaction through my online store is always reliable	
	T3	Based on my past experience I do not think that things may go wrong with my transaction through my online store	
	T4	Based on my past experience I am confident that my online store will promptly inform me if at all any problem occur with any of my transactions	
	T5	Based on my past experience I am confident that my transaction through my online store will always be transparent	Suh and Han (2003)
	T6	Based on my past experience I do believe that my online store always protects my best interest	
	T7	Based on my past experience, I can say that my online store is trustworthy	

**Table 1** The Questionnaire along with the measurement scales for the variables used in the study (continued)

<i>Construct</i>	<i>Items</i>	<i>Questions</i>	<i>Source</i>
Perceived Risk	PR1*	I do not perceive any risk by sharing my personal information concerning my transaction with the online store	Chan and Lu (2004)
	PR2*	I am confident that others can not tamper with information concerning my transaction with the online store	
	PR3*	I believe that advanced technology can provide the desired security for my transaction with the online store	
	PR4*	I do not think that my money will get stolen whenever I transact through my online store	
Purchase Intention	PI1	I intend to continue using my online store for purchasing a product or service in future	Chen and Barns (2007)
	PI2	I would strongly recommend others to use my online store	Suh and Han (2003)
	PI3*	I shall not transact with my online store in the near future	Chen and Barns (2007)

\*Indicates that the items are coded in reverse.