Establishing Trust in E-Commerce Through Website Design Elements:
The Moderating Role of Gender

Abubaker A. Shaouf, University of Zintan, Libya*
Kevin Lu, Brunel University London, UK

ABSTRACT

It is expected that website design can lead to online trust, although research that systematically examines such a relationship is little. In addition, far too little attention has been paid to understand the effect of website design on e-trust across gender. In this study, therefore, three elements of website design (visual design, information design, and navigation design) are examined for their effect on consumer trust in e-commerce. Using data collected from 532 online shoppers, the overall model was first tested using structural equation modeling (SEM) analysis. The research model was then tested for each gender group separately. The results of the study indicated that website design is an important factor in establishing trust in e-commerce. The results further revealed that website information design is more important to males than females in forming e-trust, while website navigation design is more important to females than males in forming e-trust. However, website visual design was found to be a key driver of e-trust for both males and females.

KEYWORDS

E-Trust, Gender Difference, Information Design, Navigation Design, Visual Design, Website Design

1. INTRODUCTION

In October 2020, there were around 4.67 billion internet users worldwide, encompassing 59 percept of the global population (Statista, 2020a). Of these internet users, 50.4 percent were males and 49.6 percent were females (Statisa, 2020b). Online vendors are always interested in capturing internet users; they do so by creating positive shopping experiences that encourage them to form trust in online transactions (Masele & Matama, 2020; Pengnate & Sarathy, 2017). There is a business case for this purpose. According to Chou, Chen, and Lin (2015), "When trust is formed, people are more likely to purchase or repeat their purchase of an item from a website" (p. 544).

It is expected that website design can lead to online trust, although research that systematically examines such a relationship is little (Hussein, Chauhan, Dalmer, Rudzicz, & Boger, 2020). In addition, far too little attention has been paid to understand the effect of website design elements on e-trust across gender (Mukherjee, 2020; Sohaib, Kang & Nuvunnabi, 2019). This has presented a significant gap in the literature. This study, therefore, aims to contribute to the existing body of knowledge by offering much insight into the influence of three elements of website design (visual design, information design, and navigation design) on consumer trust in e-commerce. This study

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also focuses on an important, but largely ignored, issue in previous research: ***The moderating role of gender in the context of e-commerce***.

While gender differences have been an important research topic in various fields, until quite recently, there has been little discussion about this topic in e-shopping literature. As indicated by Cyr and Head (2013): "The moderating effect of gender has been studied in a variety of Information Technology (IT) settings, but has rarely been examined in an e-shopping setting." (p. 1359). More recently, Lin, Featherman, Brooks, and Hajli, (2019,p 1187) have argued that "gender effects remains poorly understood in the E-commerce settings".

Gender has long been considered to play a key role in moderating the effect of design features on consumers' evaluative judgements (Holbrook, 1986). Previous studies have found prominent differences between men and women in terms of online trust (Mukherjee, 2020), confidence in privacy protection on the internet (Park, 2015), IT usage (Assaker, 2019; Shaouf & Altaqqi, 2018), motivations to use social networking sites (Mouakket, 2018; Noguti, Singh, & Waller, 20219), website design perceptions (Cyr & Bonanni, 2005; Moss, Gunn, & Heller, 2006), visual attention to online shopping information (Hwang & Lee, 2018), and decision-making processes (Gonzalez, Meyer & Toldos, 2021).

Recently, empirical research has suggested that such differences may moderate the way through which online users respond to online stimuli (Aboobucker, 2019; Jain, Gajjar, & Shah, 2020; Kim, Kim, Yoo, & Park, 2020; Santo & Trigo, 2020; Sohaib et al., 2019; Tan & Ooi, 2018). As such, the success of this study could offer prolific insights for IT managers, website designers, and e-marketers into the way through which website design influences users' responses across the respective genders.

Because of its identifiability and accessibility, gender has also been found and continues to be, a useful demographic factor used to segment market, consumer and user groups, including in online shopping and in the way it is associated with website design (Cyr, 2014a; Melnyk, Van Osselaer, & Bijmolt, 2009). Gender is also considered to be a variable that can be easily combined into information management and communication systems (Hwang, 2010). Thus, investigating gender differences in this context could also provide website designers and e-marketers with much insight into how to develop online communication strategies among men and women.

Against this background, this study seeks to answer the following research questions:

Research question 1: What role does website design play in forming consumer trust in e-commerce?
Research question 2: How dose gender influence the relationship between website design elements and e-trust?

2. THEORETICAL FOUNDATION AND HYPOTHESES DEVELOPMENT

2.1 Online Trust (OTR)

Trust is a term frequently used in the literature, but to date there is no consensus about its definitions because of its complexity (Ponte, Trujillo, & Rodriguez, 2015). Therefore, a single definition of trust is impossible, and the literature gives various definitions of trust. For example, Mayer, Davis, and Schoorman (1995, p.712) defined trust as "the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party". Čater and Čater (2009, p. 1154) also give a short and basic definition of trust as "a belief that one relationship partner will act in the best interests of the other partner". This definition is consistent with Rufin and Molina's (2015) view, who define trust as "the belief that the other party will act, as expected, in a socially responsible way and will thus meet the expectations of the party who trusted …" (p. 23).

Fimberg and Sousa (2020) argue that the uniqueness of online environments can put pressure on Internet marketers to create a trust that is much stronger and more persistent than what is normally

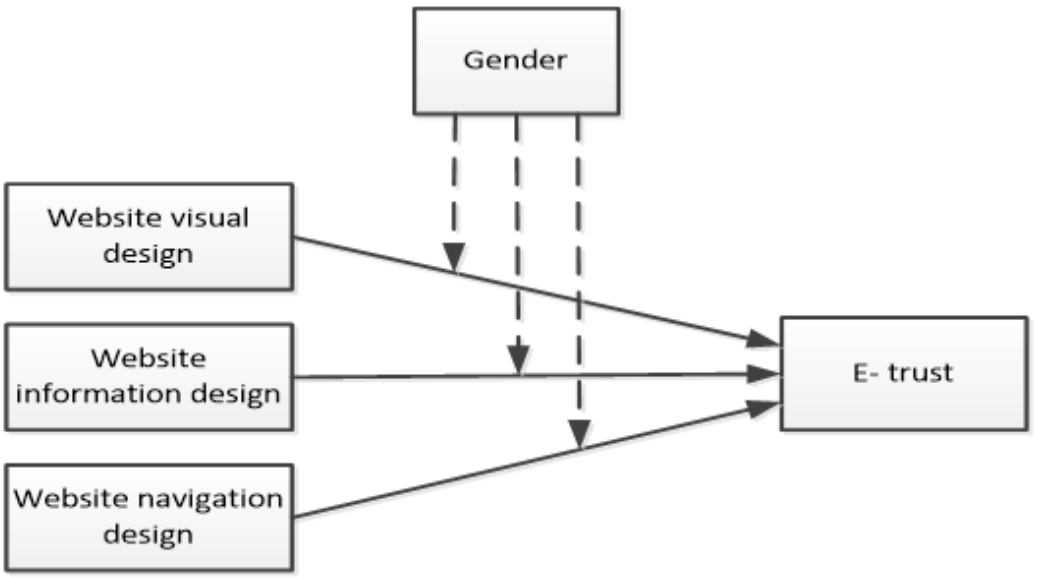
demanded offline. Also, Chen and Dhillon (2002, p.1) stated: "Since transactions [on the internet] occur without personal contact, consumers are generally concerned with legitimacy of the vendor and authenticity of products or services".

All that has been presented so far suggests that in order to ensure that online transactions are completed; e-shoppers must be confident and trusting in e-vendors. In alignment with this view, Ang and Lee (2000. p, 3) conclude that: "If the website does not lead the consumer to believe that the merchant is trustworthy, no purchase decision will result".

In this field, researchers have developed a number of articles on factors leading to trust in e-vendors. Some suggested findings showing the positive relationships between website quality (e.g., website usability, product information quality, and customer service) and consumer trust in e-commerce (Amaro & Duarte, 2015; Fang et al., 2014; Hong, 2015; Jiang, Rashid, & Wang, 2019; Lü, Fan, & Zhou, 2016; Ponte et al., 2015; Santo & Trigo, 2020). However, variables, such as website visual design, information design, and navigation design have not been adequately examined related to e-trust formation (Hussein et al., 2020). In addition, the relationship of website design elements to e-trust has not previously been investigated across genders (Mukherjee, 2020; Sohaib et al., 2019). Therefore, this study aims to shine new light on this research area through an examination of the impact of website design elements (visual design, information design, and navigation design) on consumer trust in e-commerce. Additionally, this study seeks to take a first step in testing these relationships across gender.

Our theoretical research model is presented in Fig. 1. The model was developed based on theories in the human-computer interaction and information systems fields (Davis, 1989; Meyers-Levy, 1989; Pengnate & Sarathy, 2017; Santo & Trigo, 2020).

Figure 1. Research model



2.2 Website Design

Website design refers to the manner in which the content of the website is made accessible to web users (Ozdemir & Kilic, 2011). In the context of the internet, several studies (e.g., Hussein et al., 2020;

Li, Peng, Jiang, & Law, 2017; Pengnate & Sarathy, 2017; Shao, Zhang, Li & Guo, 2019; Shaouf & Altaqqi, 2018) have stressed the importance of design elements of site stimuli in enhancing shopper behaviors and outcomes. This may be because of the competitive nature of online environments, where consumers spend on average only 6.4 seconds on each search engine's results page (Hotchkiss, 2006), and they usually decide to stay or leave the website within the first two minutes (Dahal, 2011). Thus, to encourage website's visitors to stay on the website for longer and explore different links, website designers and e-marketers must devote all their efforts to develop websites that are visually attractive and easy to access information content (Cyr, 2014a; Hasan, 2016).

In the context of the current research, a number of researchers have developed different scales for website evaluations (e.g., Aladwani & Palvia, 2002; Loureiro, 2014). Some of these studies present the concept of *web atmospherics*, which has been defined as "a group of Web site interface characteristics, such as navigation cues, information cues, graphic design, and general layout" (Chen & Dibb, 2010, p. 325). Shin, Chung, Oh, and Lee (2013) grouped dimensions of website quality into six categories, namely: shopping convenience, website design, information usefulness, transaction security, payment system, and customer communication. Kim and Lennon (2013) also conceptualised website quality as a composite of the four dimensions of website design, fulfilment, customer service, and security and privacy.

Because the focus of this study is on the website design, it focuses on three dimensions of website design (visual design, information design, and navigation design). It is anticipated that these categories of design enable a website visitor to access information associated with online products or services (Chen & Dibb, 2010; Hasan, 2016). Cyr (2014a) analysed previous literature on website design and argued that visual, information, and navigation are the broadest dimensions on which a Business to Consumer (B2C) website's design is evaluated. Each of these elements is discussed in the following subsections.

2.2.1 Website Visual Design (VD)

Website visual design deals with the beauty of the website. This includes the use of graphics, colors, images, animation, shapes, size, font style, and entertainment (Cyr, 2008). In recent years, researchers have shown an increased interest in studying visual appeal in store environments, as attractiveness affects consumer behavior (e.g., Chou et al., 2015; Hernandez-Mendez & Munoz-Leiva, 2015; Shaouf, 2020; Shaouf, Lü, & Li, 2016). Among many theories that aim to explain the effectiveness of visual design factors, the theory of Visual Rhetoric (Scott, 1994) is a widely accepted one. According to this theory, visual elements, such as images, color, and animation can easily convey commercial meaning in marketing messages and, in turn influence a target audience. Since its appearance 26 years ago (Scott, 1994), the theory of Visual Rhetoric has become one of the most frequently referenced and powerful theories for the prediction of online consumer behavior (Flores, Chen, & Ross, 2014; Shaouf, 2020). In this study, we are interested in exploring whether and how visual cues of websites (e.g., background color, images, and flash design) influence visitors' trust in the website.

In this context, a number of researchers have sought to determine the effects of the visual design of online stimuli on consumers' reactions. Casey and Poropat (2014), for example, analysed the responses of online users to a web survey and they found that visual aesthetics of the online survey exert a huge influence on users' trust in the online survey. Shaouf et al. (2016) also evaluated the effect of visual elements of an online stimulus on visitors' cognitive aspects, with positive and significant results.

Considering a specific visual element, Pelet and Papadopoulou (2011) suggested that Business to Consumer (B2C) websites' color schemes may influence consumers' perceptions of – and beliefs about – e-sellers. A positive relationship was also suggested between increased color appeal and the level of consumers' trust in a website (Cyr, Head, & Larios, 2010). In their recent investigation, Jiang et al. (2019) also argue that human images placed on websites may increase consumers' trust in the website. Masele and Matama (2020) and Shaouf (2020) suggested that a well-designed website in terms of visual dimensions can build trust and confidence. Of particular relevance to the current

study, Wang and Emurian (2005, p. 114) reported "…, online consumers still require protection from deceptive websites, and effective design might be anticipated to contribute to that outcome." Accordingly, this study offers the following hypothesis:

Hypothesis 1: *Website visual design (VD) has a positive impact on consumer trust in the website.*

2.2.2 Information Design (ID)

Website information design refers to the organisation and logical representation of information on the website (Marcus & Gould, 2000). Research studying the characteristics of online vendors often highlights the significance of information design and quality related to products or services (Cyr, 2013; Ponte et al., 2015). As indicated by Cox and Dale (2002): "As well as stating what the Web site offers, the information should be clearly and logically organized: if customers have to take time to find the information they are looking for, they are unlikely to stay on the Web site" (p. 863).

Despite the growing importance of the topic, a review of the literature does not identify much research that systematically investigates shoppers' perceptions of website information design, and how such perceptions can help form trust in e-commerce (Cyr, 2014b; Ganguly, Dash, Cyr, & Head, 2010, Masele & Matama, 2020). This study, therefore, seeks to add to the literature in this regard by suggesting a positive association between consumers' perceptions of website information design and their trust in the website. In this regard, Cyr (2014a, p. 3) argues that "website design has the potential to impact behavioral responses of users often related to user trust, satisfaction, and loyalty". Furthermore, Hsieh, Lo, Hu, and Chang (2015) state that users' perceptions of website information design may influence their cognitive states, such as beliefs about the website. Therefore, this study advances the following hypothesis:

Hypothesis 2: *Website information design (ID) has a positive impact on consumer trust in the website.*

2.2.3 Navigation Design (ND)

Website navigation design refers to patterns employed to help website visitors move through the pages of the website and obtaining the related information for completion of the shopping task (Garrett, 2010). This includes, for instance, the number of drop-down menus and the number of sub-menus in the site pages. Recently, website navigation design has become a major area of interest within the field of e-commerce (Castilla et al., 2016; Cyr, 2013). "If a website is not usable – if its features or design irritates, confuses, or frustrates users in their quest to perform desired operations – many users will simply access another site that better meets their needs because their perceptions towards the website will get worse" (Vila & Kuster, 2012, p.120). McKinney, Yoon, and Zahedi (2002, p. 308) also point out: "No matter how thorough the information content of a site is, a customer who has difficulty in searching and getting the needed information is likely to leave the site". This suggests that a website must be well-structured and well-designed to be navigable, which then enhances users' responses.

As previously mentioned, many studies have determined the factors increasing consumers' trust in e-commerce (Amaro & Duarte, 2015; Fimberg & Sousa, 2020; Hong, 2015; Hussein et al., 2020; Lü et al., 2016; Ponte et al., 2015). What seems to be lacking in the literature, however, is a clear explanation of how e-trust can be influenced by website navigation design (Hussein et al., 2020). This study, therefore, attempts to extend previous research by proposing a relationship between navigation issues of the website and e-trust formed in consumers' minds while interacting with a website.

According to the Technology Acceptance Model (TAM) (Davis, 1989), perceived ease of use (PEOU) and perceived usefulness (PU) are key antecedents of users' judgements of – and beliefs about – a new information technology. Building on TAM, a number of authors have demonstrated that PEOU can build online trust and confidence (Assaker, 2020; Casey & Poropat, 2014; Cox & Dale, 2002; Elwalda, Lü, & Ali, 2016). The findings of Masele and Matama (2020) study also revealed that

trust leading to website loyalty increases when the user perceives that the website is usable. Moreover, Ganguly et al. (2010) have suggested that navigation issues of the website may play a significant role in decreasing perceived risk related to online transactions, which may lead to an increase in consumers' trust and their behavioral intentions. Along similar lines, Vila and Kuster (2012) conclude that "if a website is considered easy to use and fast, the levels of perceived risk decrease" (p.120). Of particular relevance to this study, Cyr (2008) reported findings showing that a well-designed website in terms of its navigation elements can lead to high levels of trust and satisfaction with the website. Interface design was also found to support consumers' feelings of trust in online content (Hussein et al., 2020). These results suggest that there is an association between perceived navigation design of the website and the level of trust in the website. Therefore, the following hypothesis is offered:

Hypothesis 3: *Website navigation design (ND) has a positive impact on consumer trust in the website.*

2.3 The Moderating Role of Gender

As previously mentioned, men and women are different in their patterns of thinking and behaving. These differences may moderate the extent of their participation in online activities (Aboobucker, 2019; Jain et al., 2020; Kim et al., 2020; Mukherjee, 2020; Santo & Trigo, 2020; Sohaib et al., 2019). In this study, we expect the effects of website design elements (of visual design, information design, and navigation design) on e-trust to be different between genders. As indicated by Cyr and Bonanni, (2005, p. 566) "the design of a website may have an impact on user preferences, which in turn may produce different reactions between men and women."

According to the Selectivity Hypothesis (Meyers-Levy, 1989), men are considered to be selective processors and they focus on the overall message. However, women are viewed as comprehensive processors and they like to engage in a detailed elaboration of the message content. By applying this view, it might be convincingly argued that male users will give more attention to whatever is attractive and interesting on websites than women, and therefore men are more likely to judge websites based on peripheral cues such as images, colors, and animation. In line with this view, Park (2015) found that the visual design in web advertisements has a more powerful influence on males than on females, who tend to click on advertisements for further details. The same conclusion has been reported by Shaouf et al. (2016) who state significant differences between the sexes in the effect of web advertisements' visual design on consumers' responses.

It has long been assumed and supported, that female users read more carefully online than male users do (Leong & Hawamdeh, 1999). The same study also revealed that males prefer images, animation, and colors more than females. Furthermore, Wolin and Korgaonkar (2003) revealed that male users often surf websites for pleasure reasons, while female users surf websites for shopping reasons. Cyr (2014a) also concluded that men are more influenced by peripheral cues (e.g. color and animation techniques) than women who rely on detailed information. A similar conclusion was also reported by the study of Tuch, Bargas-Avila, and Opwis (2010), who found that the opinions of male users about a website are more affected than female users by the website organisation of information and aesthetic aspects, such as colors, as well as font size and styles. Also, women were motivated by the ability to gain social information, while men were motivated by the ability to gain general information (Krasnova, Veltri, Eling, & Buxmann, 2017). Gender differences also moderate the relationship between social support and the adoption of shopping habits (Adaji, Oyibo, & Vassileva, 2018)

Likewise, Goodrich (2014) conducted an experimental study and revealed that women focus more strongly on the text on the website, and men focus more strongly on the images. Moreover, the level of consumer involvement was found to be higher in female user than in male user (Lee & Kim, 2018).

Thus, specific to online environments, where shoppers suffer from a lack of personal contact, females' beliefs about a website (e.g. the extent to which the website is trustworthy) may not be easily formed by low task-relevant cues on websites. However, the reverse may be true for males (Meyers-

Levy & Loken, 2015). Also, female users have been found to show less trust online than males and to perceive a higher level of risk in online transactions (Rodgers & Harris, 2003). Thus, provided that a website is viewed as a reliable and enjoyable place, peripheral design elements (e.g. visual and information design) may not be strong determinants of women's judgements of the website. This view is more consistent with Rodgers and Harris' (2003) view who suggest that the lack of face-to-face interaction provided by online environments may make women less trusting and emotional with online offers than men.

Drawn from the Selectivity Hypothesis, by contrast, other researchers (e.g. Richard, Chebat, Yang, & Putrevu, 2010) showed that women, in comparison to men, had a higher level of involvement with online messages and paid more attention to detailed information on the internet. Richard et al. (2010) also suggested that males may respond more positively than females to well-organised websites. The results Sohaib et al. (2019) have showed that men and women have different perceptions of what is important to be provided by an online store to make a positive shopping experience.

According to the Technology Acceptance Model (TAM), perceived ease of use is a key antecedent of users' responses toward new information technology. TAM was used extensively to explain the effects of perceived ease of use on consumer trust and behavioral intention on Business to Consumer (B2C) websites (e.g. Elwalda et al., 2016). In the context of the United Kingdom (UK), perceived usefulness (PU) was the strongest determinant of online outcomes for males, but it failed to be significant among females. Perceived ease of use (PEOU) was the strongest determination of females, but it was non-significant for males (Assaker, 2019).

In this context, Davis (1989) defined perceived ease of use as "the degree to which a person believes that using a particular system would be free of effort" (p.320). By applying this definition to our case, perceived ease of navigation and obtaining information has been defined as the degree to which a user believes that navigating a website and obtaining the required information from it would be free of effort (Assaker, 2020). Interestingly, perceived ease of use, which navigation design is a part of, was found to be more important and influential on females' responses than males (Amin, Rezaei, & Tavana, 2015). Lin and Hsieh (2016) have recently investigated gender differences in the design principles of website interfaces. The authors found that the usability principle is one of the most important criteria in designing websites for females, whereas other criteria (e.g. flexibility) were rated as the most important principles for males. As a result, it might be convincingly argued that an increase in perceived ease of website use and navigation will have a stronger impact on women's judgements of the site than those of men, who generally rely on the overall message design (Tsichla et al., 2014).

In a study well-aligned with the current study, Cyr and Head (2013) ran a multicultural experiment in which 432 male users and 523 female users were questioned. In general, the authors found that gender has a great potential to moderate the relationship between website design and its consequences, such as consumer satisfaction.

Based on the above discussion, this study advances the following relationships between the website design elements (of visual design, information design, and navigation design) and e-trust among males and females:

Hypothesis 4: *The effect of website visual design (VD) on consumer trust will be higher for males than for females.*

Hypothesis 5: *The effect of information design (ID) on consumer trust will be higher for males than for females.*

Hypothesis 6: *The effect of navigation design (ND) on consumer trust will be higher for females than for males.*

3 METHODOLOGY

3.1 Survey Development, Pre-testing and Pilot Study

In order to test the proposed hypotheses, this study uses a survey questionnaire that includes groups of questions based on the research model. The survey questionnaire consists of four constructs, namely: website visual design, website information design, website navigation design, and e-trust. Moreover, some demographic questions (e.g. gender, age, and education level) and online behavior questions (e.g. internet experience, internet use per week, and online shopping use per month) were asked.

The questionnaire includes measurement scales adapted from previous studies to fit in with the context of the current study. Website visual design was measured by six items adopted from those of Chen and Dibb (2010) and Cyr (2013). The measurement scales for website information design (four items) and website navigation design (four items) were adopted from Cyr (2008) and Cyr (2013). Online trust was assessed by six scales adopted from those of Ponte et al. (2015) and Vila and Kuster (2011). All the measurement scales in this study were measured on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Table 1 provides a summary of all the measurement scales used in this study and the supporting literature for each construct.

Considering the nature of this study, the survey instrument was first pre-tested with ten subjects who had a good level of internet experience and had frequently purchased online. Once the pre-testing had been completed, the survey was then piloted with 70 potential participants in this study. Cronbach's alpha was adopted to assess the reliability of the study constructs. All the proposed constructs met the criteria of having a high reliability, as all the Cronbach's alpha values were higher than .70 (Hunnally & Bernstein, 1994). Based on the feedback obtained from the pre-testing and the pilot study, the final version of the questionnaire was accepted.

Table 1. Construct measurements

Construct	Item	Supporting literature
Visual design (VD)	• The website has an attractive screen background and pattern (VD1). • The color use on the website is attractive overall (VD2). • This website has eye-catching images and titles on the home page (VD3). • The graphics and pictures used on this site fit well with the content (VD4). • The brightness of screens/pages on this website is adequate (VD5). • The website animations are meaningful (VD6).	Chen and Dibb (2010) and Cyr (2013)
Information design (ND)	• I find the information on this website logically presented (ID1). • I find the information on this website to be well organised (ID2). • All product options, product attributes and product information are well presented (ID3). • The information on this website is arranged in a way that makes sense to me (ID4).	Cyr (2008) and Cyr (2013)
Navigation design (ND)	• I can easily navigate this website (ND1). • I find this website easy to use (ND2). • This website provides good navigation facilities to information content (ND3). • The structure of the website is convenient (ND4).	Cyr (2008) and Cyr (2013)

Table 1 continued on next page

Table 1 continued

Construct	Item	Supporting literature
Online trust (OTR)	• I can trust this website (OTR1). • I believe that this website is honest and true (OTR2). • This website seems to be sincere in its promises (OTR3). • This website deserves a lot of respect (OTR4). • I believe that this website honestly provides correct information (OTR5). • I believe that this website has integrity (OTR6).	Ponte et al. (2015) and Vila and Kuster (2011)

3.2 Sample and Data Gathering

To empirically test the research model, two public universities in the UK (Brunel University London and Sheffield Hallam University), with a population of around 40,000 students, were selected based on easy access to the subjects as well as cost and time considerations.

Because the present study has used non-probability sampling, the minimum sample size was determined based on rules of thumb (Cooper and Schindler, 2014). According to Saunders et al. (2016), most business and management researchers work at the level of 95 percent of confidence and 5 percent of margin of error.

By using convenience and purposive sampling techniques, the researchers were able to collect 532 usable questionnaires, which considered to perfectly represent the features of the study population (Saunders et al., 2016, p. 281).

Of the 532 participants, 288 (54.1%) were males and 244 (45.9%) were females. The largest percentage of the participants (73.7%) was aged 18-27, followed by those aged 28-37 (25.5%). Of 532 participants, 55.6% were undergraduate students and 44.4% were postgraduate students. The vast majority of the participants (94.9%) had at least four years' experience with the internet, and almost 60% of the subjects spent more than 20 hours a week surfing the internet.

Prior studies have suggested that choosing samples from university students could be a good representative of online shoppers, as most online consumers tend to be younger and more educated than the general public (Faraoni, Rialti, Zollo, & Pellicelli, 2018; Noguti et al., 2019).

For this study, the data collection task took six weeks, in which 532 questionnaires were deemed usable. In each session of the data collection, each participant was allocated individually to a personal computer, and they received instructions to complete the experimental task. The task of data collection in this study was divided into three stages. In the first stage, the participants were informed about the purpose of the study, and then they were asked to complete the first section of the questionnaire, which included demographic characteristics and online behavior questions. Then, the participants were instructed to visit the home page of the Olympus website and simulate the purchase of a digital camera from this site. Immediately, the participants were asked to complete the rest of the questionnaire based on their experiences with this website. This approach is similar to the method used by previous studies (e.g. Chou et al., 2015; Cyr, 2013; Cyr et al., 2010; Hasan, 2016; Tsichla et al., 2014; Zahedi & Song, 2009). Consistent with this study, previous studies (e.g. Cyr, 2013; Cyr et al., 2010) have used a single vendor website (e.g. SonyStyle or Dell) to assess the relationship between design elements of the website and their consequences. In this context, Hasan (2016) also employed a real Business to Consumer (B2C) website exploring the effects of users' perceptions of website designs (of visual, information, and navigation) on users' responses.

The Olympus website was chosen for this study after a comprehensive search for an unfamiliar website. In the context of our study, trust in an e-vendor has been found to be highly influenced by the familiarity with the website (Pengnate & Sarathy, 2017). If a website is already trusted by a consumer, design elements of the website may not be important in terms of determining his/her beliefs (Chen & Dibb, 2010). As indicated by Sirkeemaa (2019, p, 343) "Trust is not an issue if seller and buyer know each other, and have an existing business relationship. However, when there are no earlier experiences, when the customer is not familiar with the vendor or the products and services are new- trust can be challenging.

According to Gefen, Karahanna, and Straub (2003), familiarity with a website can be assessed by a consumer's previous visits to the site. As Komiak and Benbasat (2006, p. 946) indicated: "Familiarity is one's understanding of an entity, often based on previous interactions, experience, and learning".

Following these principles, a large number of potential participants were first questioned to assess their familiarity with Olympus.com. The results indicated that the vast majority of the participants had not previously visited this website and they had no previous practice with it, providing a solid ground for this study (Chen & Dibb, 2010; Gefen et al., 2003). These results were also confirmed by the pilot test with 70 subjects.

In recent years, the digital camera has become one of the most popular consumer electronic products in the UK, and the digital camera market is expected to grow annually by 1.4% (Statista, 2020c).

4 DATA ANALYSIS AND RESULTS

4.1 Reliability and Validity Analysis

In this study, Cronbach's alpha was used to estimate the reliability of the measurement scales. As presented in Table 2, the Cronbach's alpha value of each construct exceeded the required level of .70, supporting the internal consistency and high reliability of the proposed constructs (Nunnally & Bernstein, 1994). In order to establish the reliability of each item adopted in the study, exploratory factor analysis (EFA) using principal component analysis with Varimax rotation was performed. As can be seen from the data in Table 2, only four components were derived from principal component analysis, explaining a total of 72.913% in variance. As a result of exploratory factor analysis (EFA), one item for information design (ID4) was excluded because its factor loading was lower than the absolute value of .4 (Hair, Black, Babin, & Anderson, 2014). The factor loadings of the remaining items (19 items) ranged from 0.608 to 0.853, and each item also showed a loading only on its related factor, providing evidence for items reliability (Hair et al., 2014).

Table 2. Results of reliability and factor analysis

Items	Factors				Alpha
	1	**2**	**3**	**4**	.857
VD1	**0.728**	0.004	0.091	0.084	
VD2	**0.774**	0.007	0.046	-0.045	
VD3	**0.738**	0.006	0.077	0.162	
VD4	**0.608**	0.078	0.063	0.235	
VD5	**0.703**	0.245	0.073	0.237	
VD6	**0.681**	0.310	0.147	0.179	

Table 2 continued on next page

Table 2 continued

Items	Factors				Alpha
ID1	0.092	**0.773**	0.112	0.237	.836
ID2	0.204	**0.664**	0.368	0.213	
ID3	0.228	**0.720**	0.345	0.046	
ND1	0.122	0.147	**0.842**	0.180	.893
ND2	0.173	0.113	**0.853**	0.191	
ND3	0.010	0.122	**0.801**	0.268	
ND4	0.097	0.241	**0.696**	0.308	
OTR1	0.094	0.025	0.303	**0.784**	.908
OTR2	0.058	0.171	0.190	**0.814**	
OTR3	0.137	0.158	0.249	**0.769**	
OTR4	0.275	0.102	0.115	**0.652**	
OTR5	0.214	0.093	0.207	**0.710**	
OTR6	0.323	0.070	0.094	**0.635**	

Note: VD = visual design, ID = information design, ND = navigation design, and OTR = online trust

To assess the convergent validity of the measurement scales, a confirmatory factor analysis (CFA) was then performed. Before assessing the convergent validity using factor loading of the items, the average variance extracted (AVE), and the composite reliability (CR), the goodness of fit was evaluated. As suggested by Hair et al. *(*2014), the following indices were checked for the goodness of fit: chi-square ($x2^{)}$ statistics, goodness of fit index (GFI); adjusted goodness of fit index (AGFI); normed fit index (NFI); increased fit index (IFI); comparative fit index (CFI); root mean square residual (RMR), and root mean square error of approximation (RMSEA). The results indicated that all model fit indices are satisfactory, as $x2/^{d}f = 1.4$, GFI = .983, AGFI = .939, NFI = .997, IFI = .916, CFI = .916, RMR = .031, and RMSEA = .058, indicating that the measurement scales can be evaluated (Hair et al., 2014).

As a rule of thumb, a standardised regression weight (factor loading) of each item should be equal to, or above the level of .6 (Hair et al., 2014; Nunnally & Bernstein, 1994). The average variance extracted (AVE) values, which refer to the explained average variance of an item's loading, should achieve the level of .50 or more. The composite reliability (CR) values, which are concerned with the internal consistency reliability of the measures, should achieve at least the level of .70 (Hair et al., 2014; Nunnally & Bernstein, 1994).

The results obtained from the exploratory factor analysis (CFA) are summarised in Table 3. The standardised regression weights of all items were greater than the required level of .6, suggesting a high convergent validity of the collected data (Hair et al., 2014). All the values of the composite reliability (CR) also exceeded the required level of .70, confirming the internal consistency and reliability of the measurement scales (Nunnally & Bernstein, 1994). The values of the average variance extracted (AVE) also achieved the required level of .50 (Hair et al., 2014).

Table 3. Results of validity tests

Construct	Items	Factor loadings	CR	AVE
Visual design	VD1 VD2 VD3 VD4 VD5 VD6	.71 .73 .73 .61 .74 .73	.858	.503
Information design	ID1 ID2 ID3	.65 .86 .76	.806	.584
Navigation design	ND1 ND2 ND3 ND4	.85 .86 .80 .79	.895	.682
Online trust	OTR1 OTR2 OTR3 OTR4 OTR5 OTR6	.81 .85 .86 .76 .76 .70	.909	.625

Note: VD = visual design, ID = information design, ND = navigation design, OTR = online trust, CR = composite reliability, and AVE = average variance extracted

Finally, discriminant validity was evaluated by comparing the square roots of the average variance extracted (AVE) with the shared correlation between a construct and the other constructs. It can be seen from Table 4, the square roots of the AVE (in bold) were higher than the correlation between a variable and any other variables in the model, suggesting differences between the study's constructs, and thus discriminant validity is established (Fornell & Larcker, 1981).

Table 4. A factor correlation matrix with the square root of the AVE

Construct	VD	ID	ND	OTR
VD	**0.709**			
ID	0.543	**0.764**		
ND	0.369	0.653	**0.826**	
OTR	0.516	0.569	0.589	**0.791**

Note: VD = visual design, ID = information design, ND = navigation design, and OTR = online trust.

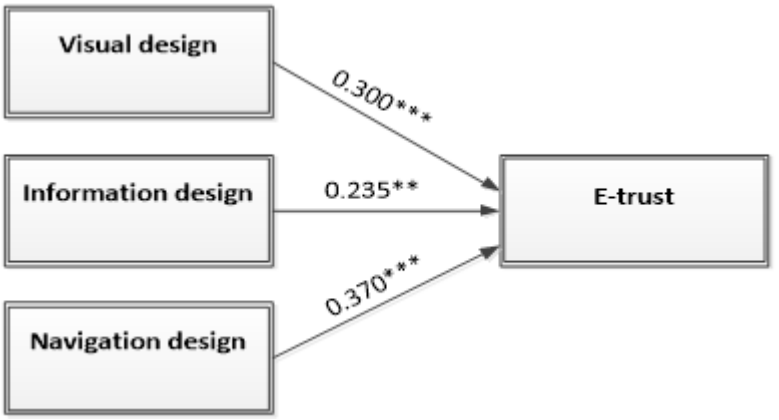
4.2 Hypotheses Testing

To test the proposed hypotheses, a structural equation modeling (SEM) technique was used via Analysis of Moment Structures (AMOS25). According to Hair et al. (2014), a relationship between two factors is significant if p-value is $< .05$ and C.R (critical ratio) ^{3} 1.96. Following these rules, the developed hypotheses in this study were evaluated.

In H1, website visual design was expected to have a positive and significant relationship with consumers' trust in website. The statistical analysis supported this hypothesis (visual design ® online

trust: β-value = .300, p-value < .001, C.R. = 4.767), suggesting that a consumer's trust in e-commerce is highly affected by website visual design. The results also gave support to H2 in which website information design (ID) has a positive effect on consumer trust (Information design (ID) ® online trust (OTR): β-value = .235, p-value < .01, C.R. = 3.214). In H3, consumer trust in e-vendors was assumed to be positively and significantly influenced by website navigation design. The statistical analysis showed results to support the relationship between website navigation design and e-trust (navigation design (ND) ® online trust (OTR): β-value = .370, p-value < .001, C.R. = 6.716), meaning that navigation design of websites is positively and significantly associated with shoppers' trust in the website. A summary of hypotheses testing is presented in Fig. 2.

Figure 2. SEM analysis for overall model (n = 532)



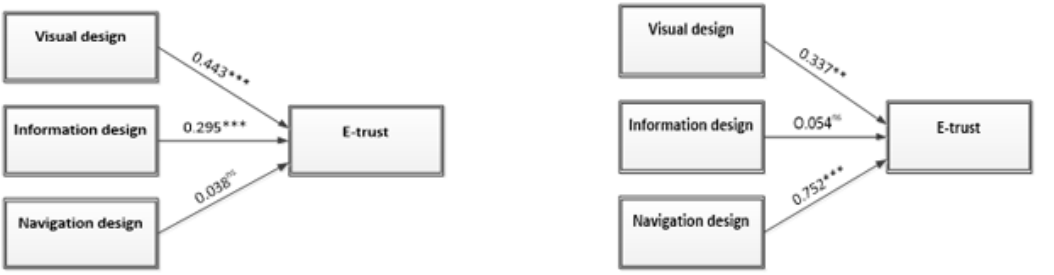
In H4, H5 and H6, this study expects that the effect of website design elements (of visual design, information design, and navigation design) on e-trust would vary across gender. Following Keil et al. (2000), the moderating impact of gender was assessed by using a two-group SEM analysis; one for males (N = 288) and one for females (N = 244). The overall goodness-of-fit was excellent for both male ($x2/df = 1.4$, CFI = .94, RMSEA = .06) and female models ($x2/df = 1.3$, CFI = .97, RMSEA = .05).

The results of this study indicated that website visual design had a significant effect on online trust for both the male group (β-value = .443, p-value < .001, C.R. = 5.488) and the female group (β-value = .337, p-value < .01, C.R. = 2.977), indicating that gender did not play a moderating role in the effect of website visual design on e-trust. In other words, the association between website visual design and shoppers' trust in e-vendors is not different between male shoppers and female shoppers. Thus, H4 is not supported.

However, the results showed that website information design had a positive significant effect on online trust for the male group (β-value = .295, p-value < .001, C.R. = 3.809), but an insignificant impact for the female group (β-value = .054, p-value > 0.05, C.R. = .392). This means that the relationship between website design of information and e-trust differs between the two sexes. Thus, H5 is supported.

Furthermore, the association between website navigation design and online trust was insignificant for the male group (β-value = .038, p-value > .05, C.R. = .535), but the same relationship was significant for the female group (β-value = .752, p-value < .001, C.R. = 8.150), supporting H6. Fig. 3. provides a summary of the results of the structural models for male and females groups.

Figure 3. (a) SEM analysis for males (n = 288), (b) SEM analysis for females (n = 244)



5 DISCUSSION

Because of the competitive nature of e-commerce environments, design elements of a website are considered to have the same importance as its content for the viewers' interaction. The current study was designed to provide a better understanding of the impact of three components of website design (visual design, information design, and navigation design) on consumers' trust in e-commerce. Importantly, this study investigated the role of gender as a moderator in our model.

The proposed model was tested in a controlled setting with 532 online shoppers through the use of Olympus.com. This study proposes three hypotheses explaining the direct relationships between the three elements of website design and e-trust. Other three hypotheses explaining the moderating role of gender were also assumed.

The results of this study are different from prior studies that dealt primarily with familiar websites (Masele & Matama, 2020). This study first revealed that website design elements (of visual design, information design, and navigation design) have direct and significant impacts on consumers' trust in an unfamiliar website. In this context, previous studies have found that elements of website quality (e.g. speed of download, and security and privacy) have a direct relationship with consumers' trust in e-vendors (Alcantara-Pilar, Blanco-Encomienda, Armenaski, & Barrio-Garcia, 2018; Chen & Dibb, 2010; Peng et al., 2017; Shaouf, 2020). Nevertheless, the current study extends the knowledge in that online trust can be directly and significantly affected by website visual, information, and navigation design. Such results provide further support to the view that visual elements (e.g. images, animation and color) have a significant impact on viewers' responses in online environments, where consumers do not have personal contact with the e-vendors (Cyr et al., 2010; Jiang et al., 2019; Shaouf et al., 2016). Furthermore, this study's results support previous research into this area which suggests that perceived ease of use (PEOU) is a key determinant of online consumers' responses (Assaker, 2020; Elwalda et al., 2016).

The findings of the current study are also consistent with those of Zahedi and Song (2009), who found that website design plays a significant role in forming consumers' beliefs about e-commerce. The results of this study also match those observed in earlier studies by Chou et al. (2015), Cyr (2008), and Ganguly et al. (2010), who note that website design has an influence on shoppers' cognitive reactions, such as beliefs. The important study of Hsieh et al. (2015) explained the impact of website information design on shoppers' cognitive reactions in general. However, the current study replicates and suggests that when online shoppers perceive a website to be well-designed in terms of its information, navigation and visual elements, their levels of trust in an online vendor increases.

Another major theoretical outcome of the current investigation is the moderating effect of gender in an e-commerce context. In particular, this study assumes that the effect of website design elements on online trust is different among males and females. To the best of our knowledge, no previous work has been conducted to explain the moderating role of gender in the relationships between website design elements and consumer trust. This research fills this gap in the literature by explaining how gender

moderates the relationships between three elements of website design (visual design, information design, and navigation design), and their consequences of consumer trust in e-vendors.

While Ganguly et al. (2010) found that the relationship between website design and online trust is moderated by culture, the results of the present study extend our knowledge in this area, and establish the role of gender in the effect of website design on online trust.

Drawn from the Selectivity Hypothesis (Meyers-Levy, 1989), this study assumes that the effect of the visual design and information design of B2C websites would have more influence on men's responses than those of women. By contrast, it was hypothesised that website design elements of navigation would exert a higher impact on women's responses compared to men's responses. Surprisingly, the results show that elements of website visual design (e.g. images, animation and color) positively and significantly affect consumer trust for both males and females. This finding was unexpected and suggests that visual characteristics placed on websites have the same importance for male and female shoppers.

Previous gender-related investigations, such as those carried out by Adaji et al., (2018), Goodrich (2014), and Shaouf et al. (2016), have reported a moderating effect of gender in the impact of the visual design of site stimuli (e.g. advertisements) on shoppers' cognitive aspects (e.g. attitude). Since the moderating effect of gender in this relationship has not been examined previously, the reason for our result is not clear, but it may be explained by the fact that visual appeal in online environments plays a significant role in enhancing males and females' judgements (Rodgers & Harris, 2003). Due to the lack of personal contact with the product in an online setting, the website visual appeal is the only way a consumer makes judgements of the websites.

As predicted, however, the results showed that website information design has a positive and significant effect on online trust for males, but an insignificant impact for females. This result suggests that website information design is more important for male shoppers than female shoppers in terms of guiding online behaviors.

As anticipated, e-trust was found to be positively and significantly affected by website navigation design for females, whereas e-trust was insignificantly associated with website navigation design for males. This indicates that a Business to Consumer (B2C) website with effective navigation elements has a higher ability to influence and attract female shoppers than male. These results support the assumption of the Selectivity Hypothesis (Meyers-Levy, 1989), which considers men as selective processors and women as comprehensive processors engaging in a detailed elaboration of message content. Moreover, these results lend support to previous studies concerning gender differences in this context (Goodrich, 2014; Shaouf et al., 2016; Tsichla et al., 2014).

The study of Santo and Trigo (2020) shows that electronic Word of Mouth (e-WOM) quality and subjective norms may influence online trust differently across gender. Also, Shao et al. (2019) established results showing that the role of mobility and reputation in building trust differ across gender. More recently, Koens et al. (2020) have presented that the influence of online stimuli on information seeking behavior can be different across gender.

The results of the current study, therefore, extend this knowledge and highlight the role of gender in the effect of three elements of website design (visual, information, and navigation) on the level of e-trust formed in consumers' mind while interacting with the website. Finally, the results obtained from the current investigation further support the assumption that individual factors may moderate the effect of external stimuli on users' reactions (Ha & Lennon, 2010).

6 THEORETICAL IMPLICATIONS

The empirical findings of this study make a number of theoretical contributions that extend upon the existing literature in several ways.

First, this study reviews and links work on three components of website design (visual design, information design, and navigation design) and e-trust, leading to the proposed model.

Second, this work enhances our knowledge regarding the effect of three elements of website design on consumer trust in e-commerce. Specifically, this study delineates more detailed relationships between website design and shoppers' trust in e-vendors.

Third, this study focuses on an important but largely ignored issue in previous research: *the moderating role of gender in the context of e-shopping* (Cyr & Head, 2013; Lin et al., 2019; Meyers-Levy & Loken, 2015; Mouakket, 2018). Specifically, the results of this study indicate that enhancing online experiences through effective website design elements can generate high levels of e-trust for both male and female shoppers.

Finally, the results of this study extend the work of Meyers-Levy (1989) by highlighting the significance of the Selectivity Hypothesis for the explanation of sex differences in the context of e-commerce.

7 MANAGERIAL IMPLICATIONS

Besides the theoretical implications, the findings of this study also offer several implications that are highly beneficial for website designers and e-marketers in terms of designing and managing effective communication strategies, which can positively enhance consumers' responses.

For example, the current study empirically demonstrated that design elements of websites (visual design, information design, and navigation design) play a significant role in increasing the levels of consumers' trust in e-vendors. These findings suggest that websites should be well-designed in order to alleviate feelings of anxiety and provide a sense of confidence while shopping online.

Another managerial implication, suggested by the findinc gs of this study, is that e-marketers should pay closer attention to the individual characteristics of the shoppers (e.g. gender). In fact, our results provide guidelines for designing and managing websites among male and female users. For instance, website designers and e-marketers may be able to boost online trust for males by providing interesting information and visual designs, possibly through the use of vivid colors, pleasant images and animations; whereas females may be targeted most effectively by well-designed features of navigation through the website.

8 LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

The study extends the knowledge of the effects of website design on consumer trust in e-commerce. It also provides much insight into the manner through which three elements of website design (visual design, information design and navigation design) affect e-trust across gender. However, the study has a few limitations that need to be addressed in future research.

First, the sample of this study was well-educated with approximately 74% of participants in the age bracket of 18–27 years. Thus, future research can expand this study by testing the proposed model with a variety in age and educational backgrounds.

Second, the study focuses on the role of website design in forming e-trust, as it is considered to be the most important factor in adopting e-commerce (Chou et al., 2015; Hajli, Sims, Zadeh, & Richard, 2017). However, other responses, such as emotions are considered to play an important role as well. Thus, the addition of such factors to our model is important for future research.

Third, the proposed model was tested based on a British sample. However, culture is considered to be an important factor affecting consumer behavior in online environments. Therefore, it would be interesting to test the proposed model in different cultures with different shopping lifestyles.

Finally, this study focuses on the key role played by gender in the relationships between website design elements and e-trust. However, other demographic features, such as age and education level, may play an important role in the process, and future investigations could explore such issues.

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APPENDIX A - SAMPLE OF SHOT SCREENS

Figure 4. Sample screenshot 1

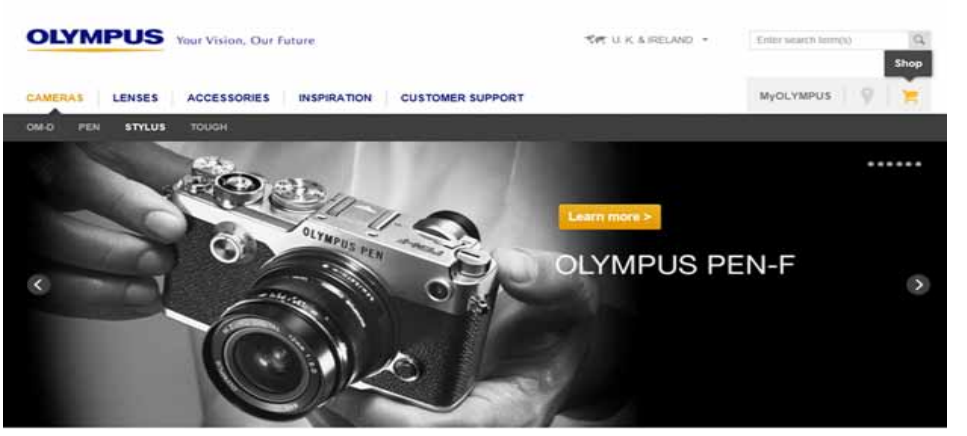
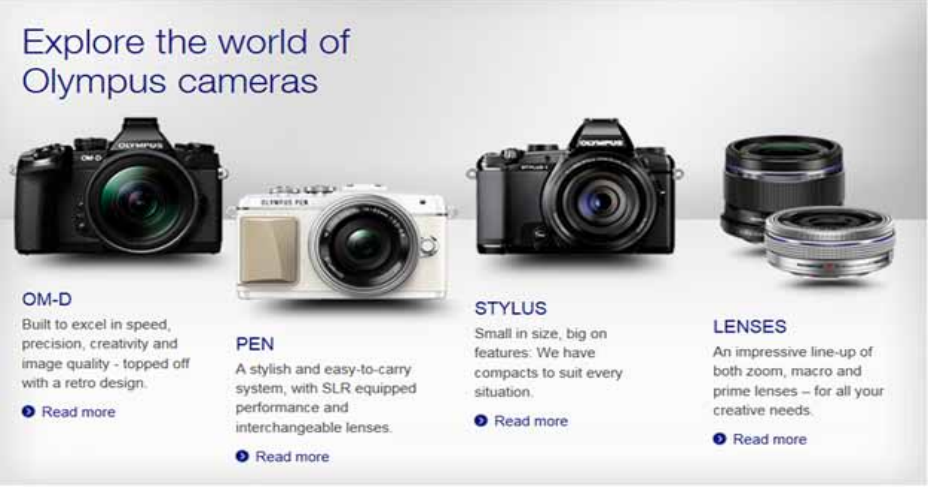


Figure 5. Sample screenshot 2



Abubaker Shaouf is an assistant professor in the department of Business Management, University of Zintan, Libya. He is the Business incubator manager at University of Zintan, Libya. He is also the director of Entrepreneurship and Innovation Center. He received his PhD in digital market and information technology from Brunel University London in 2017. His work has been published in different international journals, including Computers in Human Behavior, International Journal of Online Marketing, International Journal of Marketing Studies, International Journal of Management and Applied Science. His research interests are consumer behaviour, digital marketing, and IT.

Kevin Lü, Associate Professor, Brunel Business School, Brunel University, UK. His research interests include customer behavior, analytical marketing, and business analytics. His research work has been supported by Research Councils, EU and KTP. Previously, he has also held academic posts at Heriot Watt University, UK. Prior to joining academia, he worked in industry in the USA.