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The cultural adaptation of web design to local industry styles: A comparative study

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This article looks to the tendency of a country's crafts and industries to produce in a particular industry style. Industry styles are value-expressive, often established through implicit design features that companies apply undeliberately. Two studies are carried out on the web design of small and medium sized ICT companies in Germany and Spain. The first study shows how industry styles can be understood and designed as expressive of a country's value orientation. It thus provides a method for design according to a local industry style. The second study demonstrates the effectiveness of cultural adaptation to an industry style. It shows that users in Germany and Spain find web pages with industry styles adapted to local culture more trustworthy and appealing.

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The homepage of carmaker SEAT is slightly different in Germany than it is in Spain (SEAT Germany, 2009; SEAT Spain, 2009). The German homepage contains extra information, and shows this more directly than the Spanish homepage. Some of its non-product visuals are also different from those used in Spain. The German homepage features a picture of car mechanics standing in a field under a blue sky, while the Spanish homepage features a picture of a street full of cars and people, most of them women. These differences might reflect on the way the SEAT brand positions itself in Germany and Spain against its competitors, and be part of a different brand style for the two countries. However, the secondary nature of these differences makes it likely that they were created without such an explicit goal, based on an implicit idea of what the German and Spanish offices thought was appropriate for German or Spanish users. Indeed, a further inspection of the homepages in automotive industry suggests that to some extent such differences are industry wide, in that the German and Spanish homepages of other brands show differences that are vaguely similar to those found for SEAT.

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Such cross-cultural, industry-wide differences in web pages point to the existence of local industry styles in web design. In the past, researchers who have investigated cross-cultural differences in web pages have stressed the importance of adapting to local customs, because this would enhance user trust and appreciation of the website. These researchers have given a prominent role to web design in achieving this. However, they have not laid out how web designers can achieve the adaptation of web pages to local industry styles, nor have they effectively tested the effect of adapting such styles on user evaluations. In this article, we will first look to the role of local industry styles in design, using insights from traditionally dispersed literatures. In Section 1, we will introduce the concept of industry style (drawing from the literature on product and graphic design, art and architecture) and the potential benefits for firms to adapt their styles to local markets (drawing from the literature on marketing). Section 2 then looks to earlier studies on the cultural adaptation of design, which have been carried out almost exclusively in the field of web design. This discussion leads to the position that local industry styles reflect on the values shared by companies and users in a local market, often in a highly implicit manner. The cultural adaptation of the design of one local industry style to another then becomes a matter of comparing the stylistic differences between industries from different countries, and of interpreting these differences, based on the diverging value orientations in those countries.

Next, two studies will be presented on the cultural adaptation of web design. In these studies, we will compare the local industry styles of homepages of small and medium sized ICT companies in Germany and Spain. In Study 1, we will ask the question how to understand and create differences in the industry styles of companies from those countries, based on the values that they express. To this purpose, the websites of local ICT companies in Germany and Spain were analysed from a cultural values perspective. Based on this analysis, two designs were made for the homepage of an ICT company, one in a German and the other in a Spanish industry style. These designs were tested against German and Spanish homepages, and it is shown that both are successfully recognised as belonging to their respective German and Spanish 'families' of homepages. Thus, Study 1 provides a method for the analysis and simulation of industry styles, based on a cross-cultural comparison and a focus on the implicit design features that make up an industry style. Study 2 addresses the question of whether culturally adapted websites are more acceptable to users in a local setting, in terms of their initial trust and attitude. This study shows that homepage adaptation to a local (German or Spanish) industry style has a positive influence on local users' trust and attitude.

1 Value-expressive industry styles that incite familiarity, trust, and positive attitudes

In the past, some nationalist states and their institutions have expressed their values by actively creating a national style for their favoured industries (for

examples, see Woodham, 1997, 2010). However, in most cases the expression of local values through design can be regarded as the natural result of a country's crafts and industries producing in a particular style. Here, industry styles are defined as arising up and above the individual brand styles of the companies that make up a local industry. Cleveland (2010) gives the example of the brand style (or 'house' style) of the life style magazine Vogue, whose graphic layout creates a visual identity for the brand Vogue. In a historical analysis, Cleveland (2010: p. 9) also speaks of period styles, where local magazines like Vogue and Cosmopolitan have 'their own stylistic attributions which make up the visual grammar of the day.' To the extent that such period styles are particular to a local industry, and within a given time period, we can speak of a local industry style (e.g., of today's American life style magazines such as American Vogue, Cosmopolitan, etc.).

The literature on the design of industry styles is sparse, so as a starting point we turn to the literature on brand styles. One stream of work, on 'visual brand identity,' has focused on how product design is able to express brand values (Karjalainen, 2004; 2007; Karjalainen & Snelders, 2010; Karjalainen & Warell, 2005). The studies in this area have followed up on the general idea of design as a form of communication, capable of expressing certain ideas, either by companies or society as a whole (for example, see Crilly, Good, Matravers & Clarkson, 2008; Forty, 1986; Monö, 1997). Specifically, these studies have looked at how companies transform the brand values promoted by them into design features, thus creating a particular style for the brand that can be repeated over the different products of a brand.

Another stream of research on brand styles has focused on 'shape grammars,' i.e., reoccurring combinations of design features in a group of products. A shape grammar analysis based on reoccurring features can help to synthesize new designs that can be recognized by users as belonging to a particular brand (Agarwal & Cagan, 1998; McCormack, Cagan, & Vogel, 2004; Pugliese & Cagan, 2002; Shih-Wen & Chen, 1997). The shape grammar approach has its roots in architecture, where it was originally regarded as a way of simulating architectural styles (Knight, 1983; Stiny, 1980). Recently, Chan (2000) has elaborated on this idea that shape grammars can be conceived of as styles. He followed the art historian Ackerman's (1962) definition of style as a reoccurring solution to an artist's problem of expression, leading to certain qualities that are identifiable in the artefacts produced by the artist, or by groups of artists of a specific school, period, or region. It is this definition of style that we depart from in this article (see Person & Snelders, 2010, for a more elaborate discussion of this definition of style in design). In general, a style in design can be seen as being based on an expressive way of designing by (groups of) designers, who, in the case of brand styles, work for a brand, or, in the case of industry styles, work in a local industry.

The studies on visual brand identity and shape grammars can be seen as demonstrations of how design styles can be identified through an analysis of the structural aspects of design, and of the value-expressive character of these aspects. However, a number of issues pertaining to industry styles remain untouched by this literature. First, these studies have analysed and studied design styles, often (and preferably so) through comparisons across different brands within an industry. Industry styles, however, are attributed to the designs of a local industry, which itself comprises of several companies that have their own brand styles. Therefore, for industry styles the basis of comparison becomes cross-cultural, over industries in different countries working within the same domain. Such comparisons should point to forms of value expression through design that are less tied to the market differentiation efforts of individual brands within countries, and more to differences between industries as a whole.

Second, Ackerman's definition of style focuses on the outcome of a process that might come about undeliberately, and that can reveal itself in various ways, and also through the work of various designers working in the same context. For brand styles, this context is created by the directions of corporate, brand, and R&D management that aim to express the competitive advantage of the company (Ravasi & Lojcono, 2005). However, if industry styles exist up and above the differentiation efforts of individual companies, the context in which they arise is likely to be found more broadly, in the value orientations that designers share with companies operating in a local industry. This has also been argued by Razzaghi, Ramirez, and Zehner (2009), who studied cross-cultural differences between Iran and Australia for student-generated concepts for telecommunication devices. These authors looked to within-country similarities and cross-country differences in the designs of the students from both countries, and their interpretation of the divergent design styles of Iranian and Australian students was guided by the different value orientations in these countries, as established earlier by Hofstede (2001). This insight is particularly relevant for industry styles, since these denote similarities in the work of a varied set of companies, and each of these is likely to deviate from the other in terms of a heavily promoted, and more explicit brand style. Thus, compared to brand styles, industry styles are likely to be less formalized, less connected to, and less explained by the marketing communication efforts of individual companies. Therefore, a priori knowledge of local values (such as provided by Hofstede) might help to understand what local industry styles are expressing, and through what stylistic means they are achieving their implicit communication of value.

Third, from a users' perspective, the assumption in the brand style literature has been that users will appreciate design styles that express certain (brand) values. However, to our knowledge this assumption is not much tested. For industry styles, a test of user evaluations has the complication that users will

not easily notice the design features of a local industry style, because it exists as a relatively constant factor over a number of products that vary conspicuously in their brand style. Given the implicit character of industry styles, the evaluation by users is likely to become more implicit as well. As an implicit measure for the design according to a local industry style, we will use a measure of 'family resemblance.' This measure is comparable to the procedures used by Razzaghi et al. (2009) who studied the within-country similarities of conceptual designs of Iranian and Australian students. Originally a criterion put forward by Wittgenstein (1958), and later formalized as a measure by Barsalou (1985), family resemblance expresses the degree in which an object is similar to other objects of the same family, on the basis of consciously or unconsciously perceived similarities between those objects. The assumption is that these similarities are based on reoccurring features in the objects, and thus point to the existence of a style in these objects. But style attribution is implicit here, because the features that form the basis of the style need not be consciously perceived, and thus for the user only exist by implication.

Furthermore, we expect that the evaluation of a local industry style by local users will be based on their acceptance of designs that express a particular value orientation, and the inherent trust that such design incites. This expectation is based on a theory in marketing of shared values (Morgan & Hunt, 1994: p. 25), which elaborates on the relation between familiarity, trust, and attitude formation. Shared values refer to 'the extent to which partners have beliefs in common about what behaviours, goals, and policies are important or unimportant, appropriate or inappropriate, and right or wrong.' Applied to design, this theory thus refers to the degree in which the design of a product reflects shared values between companies and users. Shared values are a direct precursor of a desire to maintain a valued relationship and to rely on a trusted exchange partner. In order to successfully accommodate their design style to the values of local users, companies should become aware of the values upheld by local users, and make their designs expressive of those values. The theory of shared values predicts that successful accommodation leads users to reward the companies' sensitivity to their values with their trust and patronage.

To summarise, given the implicit character of industry styles and the fact that they are shared by companies in a local industry, the best way to investigate the effect of industry styles on user evaluation is comparatively, based on an analysis of how industries from different countries operate on the basis of different value orientations. The criterion for culturally adapted design would be an implicit measure of family resemblance: does the new design appear to be similar to other designs from a particular industry? Study 1 will address the question of how to adapt a design to a local industry style. It does so by providing a method for adapting design to a local industry style, based on a cross-cultural comparison and a focus on the implicit design features that make up an industry style. If the cultural adaptation of a design to a local industry style

has been successful, a second question is whether the impression of users is such that they would trust and appreciate culturally adapted designs. This question has for the most part been addressed in the area of web design, which is discussed in the next section.

2 Cross-cultural comparisons in the design styles of websites

Web design is the most studied application area for cross-cultural differences in design. In this section we will briefly discuss this literature, focussing on international comparisons in the design styles of websites. Before doing so, we should note that this literature has not explicitly addressed the notion of industry styles. In addition, web design is but one of the design disciplines through which companies express themselves to their users, next to other disciplines such as industrial design, architecture, fashion, etc.² Yet, it has been noted that the cross-cultural differences in web design tend to be industry specific (Barber & Badre, 1998), which points to the existence of industry styles in this domain.³ Furthermore, web design is a large and dynamic area of design practice, with many local efforts by smaller companies, but the resulting designs can be very accessible to users from different countries.

In the literature on internet marketing, the issue of trust has come up as a central concern. This is because of the finding that users refrain from online interactions with a company mainly because they do not trust the company's website enough (Fogg et al., 2001; Hoffman, Novak, & Peralta, 1999; Schlosser, White, & Lloyd, 2006). In line with this literature, this article defines trust as the believability of an object, a person, or a piece of information. This definition is close to later conceptualizations of 'exchange trust,' 'ability,' and 'integrity' of websites, which are found to be important dimensions of trust (see Chong, Yang, & Wong, 2003; Gefen, 2002; Kiryanova, 2003 for a reviews of the literature on dimensions of online trust).

Previous studies on web-based trust have acknowledged the importance of design for creating trustworthy websites: The look and feel of a website is paramount in first attracting the attention of a user and signalling the trustworthiness of the site' (Briggs, Burford, De Angeli, & Lynch, 2002: p. 330). Fogg et al. (2003) further emphasize the importance of an appropriate design style in relation to web-based trust; in a survey study they find that nearly half of the users base their degree of trust in a website on the overall visual impression of the site. Finally, Schlosser et al. (2006: p. 135) have shown that investments in the web design of e-commerce sites lead to stronger trust beliefs in the general competences of the company, and also to stronger online purchase intentions. In particular, these authors stress that it is the 'front-end (design) elements of a website' that play a role in this, because 'people will

likely generalize their trust in a firm's ability in one area (design) to other related areas (e.g., order fulfilment)' (parentheses in the original).

Both the literatures on internet marketing and on computer–human interaction have looked to cultural differences in web design. In these literatures, the conclusion is that web design guidelines for enhancing user trust and attitude need to be country-specific. The analysis of cultural differences in web design clearly shows systematic differences between countries. This search is guided by insights on cultural differences – in particular Hofstede's cultural dimensions of collectivism, uncertainty avoidance, power distance and masculinity (for an extensive review of these dimensions see Hofstede, 2001). Studies by Singh et al. (Singh & Baack, 2004; Singh & Matsuo, 2004; Singh, Zhao, & Hu, 2005) show that many aspects of a website's general build-up and content reflect differences in the value orientation of countries, as profiled by the Hofstede value-dimensions. An application of this approach to web design is the work by Barber and Badre (1998) and Cyr and Trevor-Smith (2004) on cultural markers in local websites. Barber et al. (1998: p. 2) define cultural markers as 'interface design elements that are prevalent, and possibly preferred, within a particular group. Such markers signify a cultural affiliation.' Colour, spatial organisation, fonts, shapes, icons, communication style, sounds, flags, and the use of animation are examples of cultural markers.

The mere existence of large and interpretable cross-cultural differences between existing websites has led many authors to suggest that adaptation to local industry standards is the advised practice for cross-cultural web design (see Cyr & Trevor-Smith, 2004; Gefen & Heart, 2006; Marcus & Gould, 2000; Singh, 2003; Singh & Baack, 2004; Singh & Matsuo, 2004; Singh et al., 2005). Some authors have also looked more closely to the particular benefits of cultural adaptation for practice. In general, these authors depart from the idea of compatibility (Winn & Beck, 2002: p. 20), which is in line with the theory of shared values discussed above: 'compatibility can be established by using a unified voice that expresses the customer's values: web design that creates a community culture fosters a sense of belonging.' The idea that trust and familiarity are linked is also expressed in the view that trust is based on the confirmation of expectations developed from previous encounters with websites (Kim, Ferrin, & Rao, 2003; Zhang & Zhang, 2005). With respect to this, Kee and Knox (1970) state that familiar situations are more trusted because they are perceived as less complex and less risky. Applied to web design, it is believed that adapted websites with more familiar designs would be trusted better (Gefen, 2000; Grabner-Kraeuter, Kaluscha, & Fladnitzer, 2006).

Although this literature provides a clear conclusion, there is limited direct evidence supporting the claim that the cultural adaptation of the design of websites leads to more trusted and better liked websites among users. The methodological approach that characterizes most studies is one of finding

and describing differences, but not testing user evaluations of these differences. As Taylor, Miracle, and Wilson (1997) note, it is unsound from a methodological perspective to draw conclusions about the applicability or effectiveness of web design on the basis of descriptive data, as most studies in this field have done. There have been a limited number of comparative studies to examine the effects of cultural adaptation of websites on user evaluations (Luna, Peracchio, & De Juan, 2003; Singh, Furrer, & Ostinelli, 2004; Steenkamp & Geyskens, 2006), although in none of them did the design style of the website play a pervasive role. Taken together, these studies show that, under some conditions, users like websites when they are culturally adapted. Note, however, that these studies employed limited forms of cultural adaptation (e.g., the studies compared websites with adapted country extensions in their URL, or standard websites against translated sites in a single cultural setting), and comparisons were made on attitude, and not on trust. Thus, the question remains unanswered how the design of a web page can be successfully adapted to a local industry style, and whether the adaptation to a local industry style leads to higher levels of positive attitudes and trust. Study 2 addresses this question, and it will show that homepage adaptation to a local industry style has a positive influence on local users' trust and attitude.

3 Study 1

Study 1 demonstrates a method, based on the theories about industry styles described in Section 1. Following Section 2, the study focuses on the efforts of an industry in the field of web design. However, since the theoretical foundations are about industry styles in general, it should be possible to apply its results to other design disciplines through which industry styles might arise (such as industrial design, graphic design, etc.).

The purpose of the method is to design web pages that are reflective of a local industry style. This method is demonstrated by applying it to the design of an adapted homepage for Germany and Spain for an existing European (non-German, non-Spanish) small-sized ICT company. The choice of Germany and Spain was based on the fact that these countries were important for the company, and because there are marked differences in the value orientation of these countries, based on the scores on the Hofstede dimensions: Germans score higher on masculinity (66 vs. 42) and individualism (67 vs. 51), whereas Spain scores higher on power distance (57 vs. 35) and uncertainty avoidance (86 vs. 65). Small and medium sized companies were chosen to ensure that the companies were sufficiently local and 'home-grown,' and ICT is an industry that harbours large numbers of such companies in both countries. The method comprised of three steps, each connected to the particular character of industry styles discussed in the previous sections:

1. Cross-cultural comparison of industry styles
2. Guidelines and design according to a local industry style
3. Assessing the family resemblance of the adapted design

3.1 *Cross-cultural comparison of industry styles*

As a starting point, the existing literature on the relation between cultural dimensions and cultural markers (Barber & Badre, 1998; De Mooij, 1998; Marcus & Gould, 2000; Singh & Baack, 2004; Singh & Matsuo, 2004) was scanned for indications of how cross-cultural differences in web design relate to the differing scores of Germany and Spain on the Hofstede dimensions. As noted above, Barber & Badre, 1998 have already noted how such cultural markers are industry specific. For this reason, we checked in what specific way the cross-cultural differences predicted by the literature can be found back in the homepages of German and Spanish ICT companies. For this purpose, 27 existing German and 23 existing Spanish websites of local small and medium sized ICT companies were examined (all software developers and consultants for business-to-business markets, with specialisation in financial, customer relations, or organisational management, among others). To prevent inclusion of homepages that are internationally rather than locally oriented, the search was done through German and Spanish search terms and on German and Spanish domains (.de and .es). In addition, through the contact details on the homepages the origin of each company was established as either truly German or Spanish.

The result of step 1 is a list of cross-cultural differences found between existing web designs from two countries that can be interpreted from a cultural values perspective. The list consisted of nine major differences between the ICT industries in Germany and Spain, each relatable to one of the four value dimensions of Hofstede. The following excerpt is an example of the result of this first step, for one of the found differences:

‘Countries with a high level of uncertainty avoidance tend to have simpler web pages with restricted amounts of data and more structured websites than countries with low levels of uncertainty avoidance (Marcus & Gould, 2000; Singh & Matsuo, 2004; Tsai, Chang, Chuang, & Wang, 2008). In addition, in countries with a high level of uncertainty avoidance, navigation through the website is facilitated by using buttons that are easily identified as links. In countries with low levels of uncertainty avoidance, links are more often words in the text that are underlined (Singh & Matsuo, 2004). These differences were also observed in the German and Spanish homepages of ICT-SMEs. German homepages tended to be longer, used scroll bars, and predominantly used text-links. Spanish homepages were shorter and reserved most information for dedicated pages of the website. Button-links were used predominantly on Spanish homepages, often in a similar design as that of the banner and text frames, resulting in altogether more neatly arranged homepages.’

3.2 *Guidelines and design according to a local industry style*

Based on the nine major differences in cultural markers between German and Spanish ICT homepages found in Step 1, a list of design style criteria can be

made for creating adapted German and Spanish homepages within a particular industry. These guidelines pertain to those aspects in the differences from Step 1 that could be designed and become part of a value-expressive industry style. For a large part these were aspects of graphic/web design, themes in the applied text and visuals, and the way in which the homepage addresses users. Table 1 lists the most important guidelines used for the design of homepages adapted to a German or Spanish industry style.

Based on the design guidelines two concept-homepages were created by the third author (then a final year design student specialized in the design of products and their commercial interfaces), in close cooperation with the web designers of the company. One concept-homepage was adapted to a German industry style, the other adapted to a Spanish industry style. In a later stage we could thus test both styles against the homepages of existing companies in an industry, with one style being adapted, and the other unadapted to the local industry style. For this reason, the German and Spanish styled homepages were both translated into the German and Spanish from an original version in the English language. This led to two adapted and two unadapted homepages. For the adapted homepages, one was in the German language and with a German design style, and one was designed in the Spanish language and with a Spanish design style. The other two homepages were unadapted in their design style: the one for the German market was in the German language but with a Spanish design style, and the other for the Spanish market was in the Spanish language but with a German design style.

To arrive at equivalent translations for the homepages, the original English texts were translated and back-translated by two German and two Spanish native speakers whose English was excellent. Specific attention was given to banner texts and headlines, which were translated based on a procedure of 'decentering' (after Brislin, 1980; Werner & Campbell, 1970). This procedure

Table 1 Criteria for the design of homepages in a German and Spanish industry style

<i>German industry style</i>	<i>Spanish industry style</i>
Textual focus	Visual focus
Pictures of products and outside office environments	Pictures of teams of customers/employees
More pictures of men	More pictures of women
Small banner	Big banner
No animation	Animation
Page can have scroll bar	Page fits to the screen
Links as text	Links as buttons
A lot of information on one page	Little information on one page
Focus on product	Focus on status symbols
Focus on technical product information	Focus on price
Focus on individual	Focus on collective
Communicate 'winning' and 'success'	Entertain with art and fashion
Opinion of experts	Business partners

consists of iteratively searching for the most equivalent short paraphrases in English, German and Spanish. Decentering was not chosen for the larger texts because it can lead to fragmented translations when applied to larger texts, and because larger texts can provide their own context for interpretation (Harkness & Schoua-Glusberg, 1998). Finally, words on homepage buttons and links were simply translated with the most commonly used words for such buttons in both countries (these include a few English words such as 'Home' and 'Go'). Appendix A presents the adapted homepages for Germany and Spain in the local industry style and language.

3.3 *Assessing the family resemblance of the adapted design*

The degree of family resemblance of the adapted and unadapted homepages was assessed by its most direct and objective measure (this measure is also known as 'central tendency,' and was originally devised by Barsalou, 1985). This measure is based on the pairwise comparisons between a number of objects, based on their subjectively rated similarity. With n objects, the number of pairwise comparisons equals $n(n - 1)/2$. A measure of family resemblance can then be calculated on the basis of these pairwise comparisons, as the average similarity score of one object with all other objects. In this way, this measure expresses the degree in which each object of a certain family of objects resembles the other objects in that family, based on a subjective, non-analytical perception of similarity.

To arrive at an estimate of the family resemblance of the German and Spanish adapted and unadapted homepages, the homepages have to be compared to existing homepages from local small and medium sized ICT companies in Germany and Spain. For this purpose, eight additional German and eight additional Spanish homepages were included in the study (these homepages were randomly selected from 40 newly searched homepages in Germany and Spain). In this way, two sets of ten homepages were created, one German, the other Spanish, each containing two created homepages and eight existing ones (see Appendix B). With ten homepages in a set, 45 pairwise comparisons can be made between the homepages. However, a small pretest with three students revealed that the pairwise comparison between the adapted and unadapted homepage was problematic, because students noticed that the two homepages were by the same company, and this made them more aware of these homepages and also overrate the difference between them. For this reason this comparison was taken out, leaving 44 pairwise comparisons to be rated on similarity.

Next, 20 European (non-German/non-Spanish) students rated the degree of perceptual similarity between the 44 pairs of German homepages; another 20 students rated the 44 pairs of Spanish homepages. Participants sat in front of two computer screens placed next to each other. Each screen showed an open Internet Explorer window with the Favourites menu opened in the left part of the window. The Favourites menu contained links to each of the ten homepages in the form of a designated letter. Participants also received

a booklet with each of the 44 pairs of homepages depicted as little (5 by 4 cm) screenshots and with each homepage coded by the same designated letter as in the Favourites menu. Participants then opened each pair of homepages on the computer screens, following the examples depicted in the booklet. After participants checked that they had opened the correct homepages, they rated the overall similarity between each pair on a 7-point rating scale (ranging from 'no resemblance at all' to 'very high resemblance'). Participants rated 22 pairs in this way, had a short break, and then rated the remaining 22 pairs.

Based on these pairwise comparisons, the family resemblance of each homepage of the set can be calculated as each homepage's average similarity to the other homepages in the set. For the ten German homepages, the measure of family resemblance ranged from 3.00 to 3.97. For the eight existing German homepages, the average family resemblance equalled 3.56. The family resemblance of the adapted homepage was high, but it did not differ significantly from this average score ($M = 3.93$; $t(19) = 1.13$, $p = .271$). However, the family resemblance of the adapted homepage differed significantly from that of the unadapted homepage ($M = 3.00$; $t(19) = 6.16$, $p < .001$). The family resemblance measures of the ten Spanish homepages ranged from 4.14 to 2.69. The average family resemblance of the eight existing homepages equalled 3.52. Again, as intended, the family resemblance of the adapted homepage was high but did not differ significantly from the average family resemblance ($M = 3.69$; $t(19) = .691$, $p = .498$). Again, the family resemblance of the adapted homepage differed significantly from that of the unadapted homepage ($M = 3.19$; $t(19) = 2.83$, $p < .05$).

3.4 Conclusion Study 1

Study 1 shows that the website manipulations successfully led to the creation of adapted German and Spanish homepages that resembled typical German and Spanish industry styles in web design, and led to unadapted homepages that were significantly less typical of German and Spanish web design. This result has been achieved by following a method for adapting designs to a local industry style, in the form of a set of procedures that help designers to translate a particular value orientation of a local industry into a set of directions for designing culturally adapted products. Having established this, the article now turns to testing the effect that the adapted homepages might have on user attitude and trust.

4 Study 2

Study 2 addresses the question of whether a better understanding of industry styles will help create culturally adapted homepages that are acceptable to users in a local setting in terms of their initial attitude and trust. With regard to the effects of adapted versus unadapted homepages, the theory of shared values (Morgan & Hunt, 1994) predicts that trust will be higher and attitudes will be more positive for adapted homepages than for unadapted ones, and therefore we will test:

H1: Homepages that are culturally adapted to a local industry style will be perceived as more trustworthy than unadapted homepages.

H2: Homepages that are culturally adapted to a local industry style will generate a more positive attitude than unadapted homepages.

4.1 Method Study 2

Study 2 was an experiment that compared four different groups, based on two independent variables that were crossed in a (2×2 between subjects) factorial design:

- Adaptation of industry style, with two conditions: adapted, unadapted
- Target country, with two conditions: Germany, Spain

The 97 participants that took part in the study were 55 German business students in Germany from the University of Dortmund and 42 Spanish business students from the ESADE business school in Barcelona. All participants were of German/Spanish nationality, and had practically always lived in Germany/Spain. Business students were chosen because company purchasers of the product advertised by the homepage in the study typically have a business background and often are junior trainees. Within each country, participants were randomly assigned to either the adapted or the unadapted homepage condition. In Germany, 31 participants viewed the adapted homepage and 24 participants viewed the unadapted homepage. In Spain, 24 participants viewed the adapted homepage and 18 participants viewed the unadapted homepage.

As an introduction to the study, participants were told that they were taking part in a company test of different versions of a new homepage. They then read a scenario that asked them to imagine that they were employees of a mid-sized company that was responsible for purchasing the type of software product offered on the homepage. Each participant then viewed the (adapted or unadapted) homepage at their own pace, and filled in a short questionnaire. The questionnaire contained statements on which participants could agree or disagree on a seven-point scale ranging from -3 (does not apply) to $+3$ (applies). The first statements were about the trust in, and attitude towards the homepage, based on previous work by [Fogg et al. \(2001\)](#), [McKnight and Chervany \(2001\)](#), and [Schlosser et al. \(2006\)](#). Homepage trust was assessed by three statements. The first two measured trustworthiness: 'I have trust in the homepage'; and 'The homepage comes across as credible to me.' The third statement measured the expertise, or ability component of trust: 'The homepage comes across as professional to me.' Respondents' attitude towards the homepage was measured with the statement: 'Personally, I find the homepage appealing'.

The questionnaire further included a number of statements that were derived from a small qualitative pilot study with 10 student participants from the

University of Hamburg, who were asked to compare the adapted and unadapted homepage (both in the German language). These interviews revealed higher levels of trust and a strong preference of German participants for the adapted, German styled homepage, and they provided a number of reasons for this. These reasons are related to the differences created between the German and Spanish industry styles, and can be seen as indicators of cultural markers that represent the various aspects of an industry style, as noted by users. As such, they can underlie the hypothesised effects, and mediate in the relation between homepage adaptation on one hand, and trust and attitude towards the homepage on the other. On the basis of this pilot study, four indicators of cultural markers were included in the questionnaire, each measured by one statement: (1) 'The ratio of visual to textual elements appeals to me;' (2) 'The visuals for this type of website appeal to me;' (3) 'The design of the homepage suits a business software product well;' and (4) 'On the basis of the homepage, I expect that it will be easy to find information on the website.' All statements were measured with 7-point scales, The questionnaire items and scenario text were made in a German and Spanish version, created by following the same procedure of translation and back-translation as described in Study 1.

4.2 Results and discussion Study 2

First, homepage trust was established as a composite variable, based on the average of the three trust statements (Cronbach alpha was .77 and .74 for the German and Spanish sample respectively). This means that the joint effects of adaptation of industry style and target country on homepage trust could be investigated by a single ANOVA. A second ANOVA was carried out to assess the effects of adaptation of industry style and target country on attitude towards the homepage (as measured by a single statement). These two ANOVAs were carried out again, but now with gender and age included as covariates, to find potential complications in the hypothesised effects. There were no significant gender or age effects, so these variables are not discussed further. Unless otherwise specified, in all reported ANOVAs $df = 1, 93$.

Hypothesis 1 states that adapted homepages will be perceived as more trustworthy than unadapted homepages. This is exactly what happened: both in Germany and Spain the homepage that was adapted to the local industry style was trusted the most (see Figure 1 left). This is confirmed by the ANOVA on trust, which yielded a significant interaction effect of adaptation to industry style by target country ($F = 16.59, p < .001$). As predicted, the German style homepage was trusted more in Germany, and the Spanish style homepage was trusted more in Spain. Separate directional t -tests in both countries confirm this (Germany: $M_{\text{adapted}} = 1.82$ vs. $M_{\text{unadapted}} = 1.42$; $t(53) = -1.71, p < .05$; Spain: $M_{\text{adapted}} = 1.85$ vs. $M_{\text{unadapted}} = .94$; $t(40) = 4.51, p < .001$). No significant main effects were found, so across the two countries, and across the two industry styles no differences were found in the general level of trust.

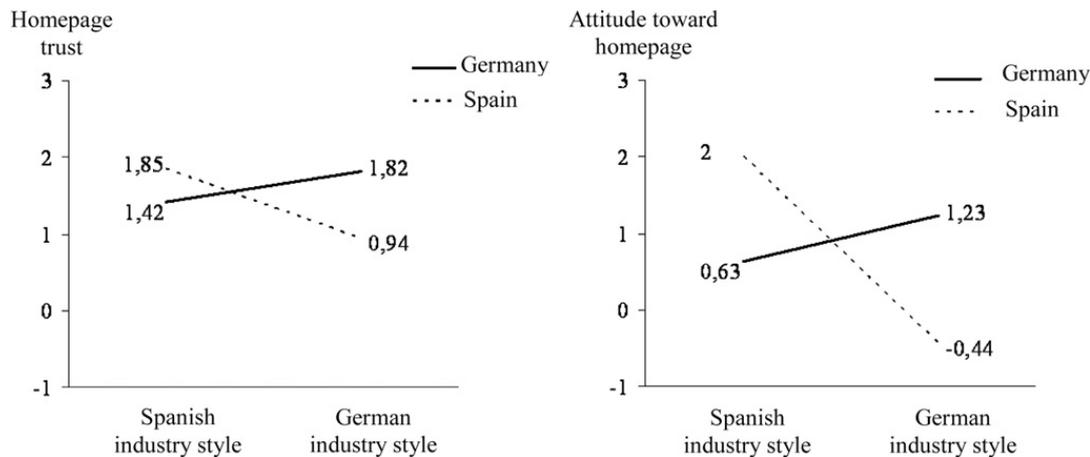


Figure 1 Cultural adaptation to industry style \times target country interaction effects on homepage trust and attitude towards the homepage in Study 2

Hypothesis 2 states that adapted homepages will generate a more positive attitude than unadapted homepages. The results also confirmed this hypothesis: in Germany and Spain the homepage that was adapted to local industry style generated the most positive attitude (see Figure 1 right). The ANOVA on attitude towards the homepage also yielded a significant interaction effect of adaptation to industry style by target country ($F = 38.32, p < .001$). As predicted, the German style homepage was liked best in Germany, and the Spanish style homepage was liked best in Spain). Again, separate directional t -tests in both countries confirm this (Germany: $M_{\text{adapted}} = 1.23$ vs. $M_{\text{unadapted}} = 0.63$; $t(53) = -1.60, p < .05$; Spain: $M_{\text{adapted}} = 2$ vs. $M_{\text{unadapted}} = -0.44$; $t(40) = 8.99, p < .001$). In addition to the hypothesised interaction effect the ANOVA also showed a significant main effect of adaptation of industry style ($F = 14.05, p < .001$). Calculated over both countries, the homepage that was adapted to the Spanish industry style ($M = 1.31$) was more positively evaluated than the one that was adapted to the German industry style ($M = .39$).

The effects of cultural adaptation on the indicators of cultural markers are shown in Table 2. These effects are similar to the effects reported on trust and attitude towards the homepage: the culturally adapted homepages scored higher on all four cultural markers, both in Germany and Spain. This also implies that the German preferences for the four cultural markers were the reverse of that in Spain, because the adapted style in each country was the same as the unadapted style in the other. Four separate ANOVAs were carried out and these confirmed the interaction effect between industry style and target country on the indicators of cultural markers. Thus, in both countries the ratio between visual and textual elements was best liked for the homepage that was adapted for their country ($F = 19.16, p < .001$). This was also true for visuals appeal ($F = 57.18, p < .001$) and homepage suitability ($F = 27.10, p < .001$).

Table 2 Mean values for the indicators of cultural markers in the adapted and unadapted conditions in Germany and Spain in Study 2 ($n = 97$)

Cultural Marker	Germany		Spain	
	Adapted ^a	Unadapted ^b	Adapted ^c	Unadapted ^d
Ratio visual/textual elements	1.45	1.00	1.29	-.39
Appeal visuals	1.42	.88	1.83	-.78
Homepage suits a business software product	2.07	1.58	1.54	-.06
Easy to find information	1.84	1.58	1.88	1.28

^a German language, German industry style.

^b German language, Spanish industry style.

^c Spanish language, Spanish industry style.

^d Spanish language, German industry style.

For the ease of finding information the mean scores showed the same pattern, but only a marginally significant interaction effect was found ($F = 3.29$, $p < .08$).⁴

4.3 Conclusion Study 2

Homepage adaptation had a clear and positive effect on the trustworthiness for users (Hypothesis 1) and on user attitudes towards the homepage (Hypothesis 2). In addition, German as well as Spanish participants believed that: (1) *their* adapted homepage had a more appealing ratio between visual and textual elements; (2) the visuals on *their* adapted homepage were more appealing; (3) *their* adapted homepage suited a business software product best; and (4) it would be easier to find information on *their* adapted website.

5 General discussion

This paper started with the observation that the best way to investigate the value-expressive character of industry styles is comparatively, based on an analysis of how industries from different countries operate, based on different value orientations. The procedure for this analysis can be regarded as a method for designing artefacts within a particular industry style, and the criterion for the success of this method is that of family resemblance: is the new design perceived as similar to other designs from a local industry?

Study 1 presents a stepwise procedure that can be followed to design according to a local industry style. The study focuses on web design, but given its more general theoretical underpinning it should be applicable to other design disciplines as well. The procedure laid out in Study 1 departs from the particular value orientation of a country in question, and knowledge of how different value orientations of countries are expressed in the design of the web pages in those countries. Based on these two sources of information and an analysis of existing websites of a particular local industry, a set of cultural markers can

be identified that denote the industry style. Study 1 also shows that the procedure of adapting web pages to a local industry style is successful in that it leads to designs of new web pages that resemble existing web pages of a diverse range of companies within a particular local industry. Given the implicit nature of many of such cultural markers, the design effort was strongly supported by the comparative character of the analysis and its interpretation of differences between countries in terms of the underlying values they express. This provided an understanding of the reasons behind the design guidelines and helped in the design of the homepages from a local perspective, while avoiding to just copy from local example.

In the development of the culturally adapted homepages in Study 1, we did not make a strict distinction between the form and content in the design of the homepages. This might seem strange if one were to define style as art and design historians have done in a distant past, namely as the formal aspects of design (the 'how'), distinct from functional or content aspects of design (the 'what'). However, later definitions of style, such as the one provided by [Ackerman \(1962\)](#), describe style as the outcome of a process, which can be retraced both in an artefact's structural (form) and functional (content) characteristics. In practice as well, and especially when departing from the value-expressive cultural markers described in Study 1, it turned out to be an impossibility to design the structural qualities of the homepage without changing the functionality or content at the same time. The stronger textual focus, smaller banners, and use of scroll bars in the German industry style are intrinsically linked to the (value-expressive) need to be comprehensive and put all information on a single, impressive page. Likewise, the stronger visual focus, larger banners, and simpler graphic layout in the Spanish industry style are linked to the (value-expressive) need to appear well-connected and fashionable, while still being affordable.

Study 2 shows that the cultural adaptation of web design to local industry styles is the advised practice: cultural adaptation had a clear and positive effect on the level of trust and the attitude of users. Furthermore, both German and Spanish participants find the homepage that is adapted to their culture better in terms of its ratio between textual and visual elements, its visual appeal, its suitability for a business software product, and the ease of finding information on it. However, the adapted homepages for the two countries differ widely on these criteria. For example, the preferred homepage in Germany contains *a lot of* text and *few* visuals, whereas the preferred homepage in Spain contains *little* text and *many* visuals.

Given these diametrically opposed judgements of the indicators of cultural markers in Germany and Spain, the question arises to what extent differences in the value orientation between the countries also leads to differences in the perception of a website. For larger cultural differences, such as those

between western and Asian cultures, previous research has shown marked differences in the perception of visual material. For example, Chinese, Japanese and Korean people were found to perceive visual material holistically (paying attention over a more dispersed area of a picture), while Americans of European descent perceived this material analytically (paying attention to a few focal areas in the picture) (Ji, Peng, & Nisbett, 2000). A recent study on cultural differences in website perception between South Korea, China, and the United States has corroborated these findings with eye tracking data, with Koreans and Chinese having a more holistic viewing pattern over a website than Americans (Dong & Lee, 2008). If such differences of perception also exist between countries as near to each other as Germany and Spain, then this would allow for a more precise interpretation for the effects that we found.

On a wider scale, there might be a contribution of this work to the literature on style, both in art and design. This literature has for the most part focused on competitive motives for style production. Artists, designers, and the companies they work for are thought to produce styles that, according to Baxandall (1980: p. 121), tend to be 'showily skilful' in order to distinguish themselves from competitors in the market through other means than a low price, or exclusively held connections or information. However, for many, often smaller companies in industries such as the one studied in this article, industry styles have arisen more or less spontaneously, up and above the competitive brand styles of the individual companies that make up the industry. In our case of the different styles of local ICT industries, it is more likely that the basis for local style production was communal, rather than competitive. According to a recent book of McCloskey on the virtues of capitalist societies (2006: p. xiii), companies thrive in 'ethical soil.' Her argument is that companies in successful industries do not only base their efforts on notions of competition and survival, but also on notions of collegiality, trust, and optimism. A local industry style might thus reflecting the more communal values that are shared by companies in a local industry, as expressed by a shared set of practices and style of design.

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Appendix A

Design style elements used to construct country-specific homepages in Study 1

Con sus colegas

Large banner with Spanish design style included little text about collective effort – but with animation and three pictures.

MS Outlook Features mit Mitarbeitern teilen
Ihr Erfolg ist unser Antrieb: Unsere Lösungen machen Unternehmen nachweislich erfolgreicher.

Small banner with German design style included no animation, substantial text about individual success, and one picture.

TeamLink
Inicio Productos Tienda Soporte Contacto

For Spanish design style business partners were mentioned here (undisclosed)

For German design style opinions of expert magazines were mentioned here (undisclosed)

General webpage's body and navigation structure and commercial options were common to both versions.

TeamLink
Independiente de la plataforma
Desde **349,00 EUR**
COMPRAR AHORA DOWNLOAD MAS DETALLES

Spanish design style product description included visual elements (e.g., product logo, graphical buttons for links, collectivist background) and included little product information.

TeamLink Pro

TeamLink Pro umfasst einen auf Windows basierten E-Mail Server, Antivirus, Antispam und eine Outlook Teilungsmöglichkeit: Wenn Sie bereits mit Outlook arbeiten, bietet Ihnen TeamLink Pro die Möglichkeit um Agenda, E-Mail, Kontaktpersonen und Aufgaben zu teilen. Windows based Mailserver mit webbased interface, Verwaltungsmöglichkeiten und viele andere features Norman Virus Control für Emailscan auf dem Server und Antispam Scan.

- Shared Calendar, Mail, Contacts, Tasks
- Public Folders
- Configurable Access Rights
- Palm and PocketPC handhelds synchronisation
- Off-line availability
- E-mail server
- Norman Mailserver Antivirus
- Webmail

Jetzt Kaufen--> Download--> Mehr Info-->

German design style product description included few visual elements, product name was in regular font, links were through text elements, and extensive product information was provided. A slider was included in the German style design in order to scroll through all of the information content.

Appendix B

Homepages of the German and Spanish ICT-SMEs used in Study 1 and their family resemblance scores

Germany

(J is adapted, C is unadapted, German homepages B, D and I have modest animation in small window on the right side of the page)

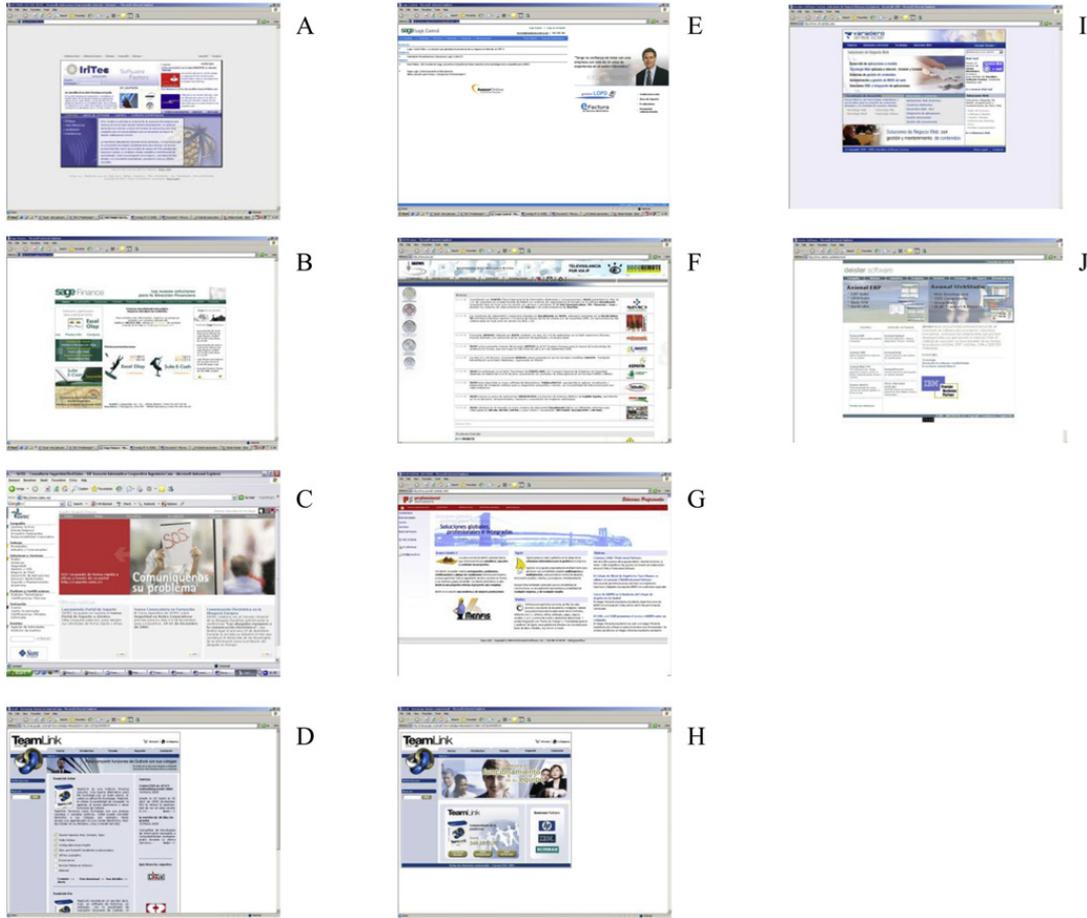


Family resemblance scores

I	3.97
J (adapted)	3.93
D	3.89
G	3.62
F	3.52
A	3.42
E	3.35
B	3.13
H	3.04
C (unadapted)	3.00

Spain

(H is adapted, D is unadapted, Spanish homepages A, C and F have dominant animation in the banner, F has additional modest animation on the right side of the page, B has dominant animation on the left side of the page)



Family resemblance scores

I	4.14
J	3.81
B	3.72
H (adapted)	3.69
C	3.61
G	3.54
A	3.32
E	3.21
D (unadapted)	3.19
F	2.69

Notes

1. Present address: Department of Industrial Design, Eindhoven University of Technology, Den Dolech 2, 5612 AZ, Eindhoven, The Netherlands. Tel.: +31 40 2473601.
2. It could be argued that industry styles find their expression in a concerted effort of different design disciplines (such as web design, product design, graphic design), similar to how some authors have stressed that brand styles are expressed over different design disciplines (Schmitt, Simonson, & Marcus, 1995). However, as we argued in Section 1, industry styles are different from brand styles, and it is unlikely that designers from different disciplines coordinate their efforts to create synergistic effects in the expression of an industry style. On the other hand, with any given product, the design effort in one discipline often represents or refers to a design effort in another discipline. For instance, the physical product is often portrayed on the website and package, a manual can schematically draw out what can be seen on an interface, etc. This can induce designers to create some connections between design disciplines in the expression of an industry style. However, it is a matter of debate how loose these relations are, and whether the style of websites in an industry is separate from the styles of products, packaging, interfaces, and manuals in that industry.
3. Web design is two-dimensional, and shares this with graphic design and some forms of art. The two-dimensional character of Web design may allow more easily for formal comparisons of designs in terms of their underlying style. At the same time, it might endanger the correspondence with the literature on styles of three-dimensional objects, such as in product design and architecture, discussed in the previous section. However, we note that previous work on industry styles, even if applied to three-dimensional objects, has typically been two-dimensional in nature. Cross (2007) noted how much of the work on shape grammars in architecture has focussed on formalising two-dimensional representations of buildings, and a scan of the work on visual brand identity and shape grammars in product design shows that, here too, the majority of studies have investigated the two-dimensional, 'graphic' representation of products from a single (side or frontal) viewpoint.
4. Because the pattern of significant effects on the four cultural markers was similar to that found on homepage trust and attitude towards the homepage, additional tests were carried out to test whether the cultural markers mediate – and thus are responsible for – the positive influence of adaptation to local industry style on local users' trust and attitude. Following a three-step mediation testing procedure outlined in Baron and Kenny (1986), it appeared that the positive influence of adapting a web page to a local industry style on user trust is fully explained by an improvement to the ration of visual/textual elements, and by enhancing the impression for local users that the homepage suits a business software product. For attitude towards the homepage, the positive influence of adapting a web page to a local industry style is for the largest part explained by an improvement to the ratio of visual to textual elements, and by enhancing the visual appeal of the homepage to local users. Thus, the positive influence of adaptation to a local industry style on local users' trust and attitude can be seen as indirect; the influence is brought about via these indicators of the cultural markers.

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