

# Web-based annual reports at first contact: corporate image and aesthetics

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## **Abstract**

*Purpose:* Enterprises aim for a favorable corporate image and use their corporate annual reports to impart it. The annual report is a formal document that fulfills the mandatory disclosure requirements and serves as an organization's mass communication medium to inform shareholders, investors, employees, customers, suppliers and the press, as well as the general public. In particular, large enterprises provide an additional online version of their report. We investigated user engagement at first contact with such web-based annual reports and the influence of main report characteristics – content, usability, and aesthetics – on corporate image and overall impressions.

*Method:* In a web-based study, 155 participants read one of eight online corporate annual reports from German companies. Corporate image was assessed before and after browsing the report, overall impression afterwards. The report characteristics content, usability, and aesthetics were measured with established and validated questionnaires.

*Results:* Findings were in line with our hypotheses: Corporate image significantly improved from before to after reading a web-based annual report, even as reading time was short, demonstrating a mere exposure effect. The report characteristics content, usability, and aesthetics explained 20.5% of the variation in this increase and 66.0% of the overall impression of the reports; the best predictor was visual aesthetics.

*Conclusion:* Content features of corporate reports are often limited by legal requirements, and usability of online reports is mainly driven by users' demands. However, organizations can positively influence their public perception in particular by improving the visual design of their annual reports online.

## **Keywords**

annual reports online, corporate image, content, usability, aesthetics

## **Practitioner's Takeaway**

- A mere exposure effect was found positively influencing evaluations of corporate image; visual aesthetics of web-based annual reports could partly explain this effect
- Perceptions of the three main report design characteristics content, usability and aesthetics constitute the overall impression of an online annual business report, aesthetics has the strongest impact
- Design aesthetics is a report characteristic that can be shaped relatively easily and potentially has strong effects in attracting attention. Reports should display a pleasantly varied, dynamic and creative layout that uses an attractive color scheme
- Recommendations for testing annual reports in terms of content, usability, and aesthetics are given

# Web-based annual reports at first contact: corporate image and aesthetics

## 1. INTRODUCTION AND LITERATURE REVIEW

A favorable corporate image is seen as one of an enterprise's most valuable assets due to its benefits relating to various target groups such as customers and employees. Thus, enterprises are highly interested in a positive public perception of themselves. One place where enterprises communicate in a comprehensive way to a broad audience and impart their corporate image is the annual report. In it, enterprises publish their financial year. In addition to the print version of the report, large enterprises publish an online version, often as a stand-alone website. Consequently, the effects of readers' engagement with online corporate annual reports on corporate image and relevant report characteristics such as content, usability, and aesthetics are of great interest. The present study investigates these aspects with respect to corporate reports on the Internet.

### *1.1 Corporate image*

The significance of corporate image has been widely noted, and corporate image is seen as one of a corporation's most critical and strategic intangible assets (Bernstein, 1986; Brown *et al.*, 2006; Rhee and Valdez, 2009). A positive image can provide both differentiation and competitive advantage (Dowling, 1993; Gray and Balmer, 1998), which guarantees better long-run returns for better-perceived companies (Fombrun, 1996). Corporate image is one of the assets most appreciated by consumers (De Ruyter and Wetzels, 2000; Johnson and Wilson, 1993; Storey and Easingwood, 1998), and organizations with a good image are able to attract more and better job applicants (Collins and Han, 2004; Turban and Cable, 2003).

However, a single common and coherent definition of corporate image is lacking (e.g., Chun, 2005; Walker, 2010). One point of confusion is the interchangeable use of related terms, such as corporate reputation (Barnett *et al.*, 2006). In general, both image and reputation represent complex sets of organizational expressions and assessments (King and Whetten, 2008). Moreover, organizational image and reputation are closely related and interdependent (Markwick and Fill, 1997), perhaps even the same or at least part of the same construct (Gotsi and Wilson, 2001). A good reputation can lower firm costs (Deephouse, 2000; Fombrun, 1996); enable firms to charge premium prices (Deephouse, 2000; Fombrun and Shanley, 1990; Fombrun, 1996; Rindova *et al.*, 2005); attract job applicants (Fombrun, 1996; Turban and Greening, 1997), investors (Srivastava *et al.*, 1997) and customers (Fombrun, 1996); increase profitability (Roberts and Dowling, 2002); create competitive barriers (Deephouse, 2000; Fombrun, 1996; Milgrom and Roberts, 1982); and increase the likelihood that shareholders will contract with a firm (Deephouse, 2000; Rhee and Haunschild, 2006).

In the present study, corporate image is defined as the summary of actual perceptions by externals toward an organization (see Bromley, 1993; Chun, 2005; Davies and Miles, 1998). Corporate image can be influenced by short-term cues and can change more quickly than reputation (Balmer and Greyser, 2003; Gray and Balmer, 1998).

### *1.2 Corporate annual reports*

One place where organizations seek to impart corporate image is the annual business report (Bekey, 1990; Bonnell II, 1982; Neu *et al.*, 1998). Essentially, the annual report is a formal document that fulfills the mandatory disclosure requirements to inform shareholders, investors, employees, customers, suppliers and the press, as well as the general public, about a

company's past, present and future financial situation (see Piwinger, 2014). Its contents are the entire annual accounts, including an income statement, the management report, the supervisory board report and resolutions for the appropriation of earnings. Annual reports of large companies (as focused in the present study) have to fulfill several national and international legal requirements; the 'International Financial Reporting Standards' (see <http://www.ifrs.org>) can be used as an orientation. For example, in Germany, information such as annual accounts including profits and losses, management report, report of the supervisory board, a proposal on the appropriation of profits, and an audit certificate are mandatory; marked-listed companies have to publish an additional English version of their annual reports (Piwinger, 2014).

However, it has been widely recognized that the report's purpose goes beyond fulfilling legal commitments. The annual report is the most comprehensive document available to the public, and, thus, the main disclosure vehicle (Marston and Shrives, 1991). Parker (1982) highlighted the annual report as an organization's mass communication medium. It is a key communication vehicle between a firm's management and stakeholders and a primary source of financial and operating information about the firm (Needles *et al.*, 1999). Following Sikes (1986), executives use the report as a calling card, salesmen as a credential and personnel departments as a recruiting tool. In the design and advertising literature, annual reports are referred to as highly sophisticated marketing tools (e.g., Subramanian *et al.*, 1993; Anderson and Imperia, 1992), which communicate an organization's image (e.g., Bekey, 1990; Bonnell II, 1982).

Like all corporate communications, corporate annual reports perform marketing functions in enhancing the understanding of, association with, and attitude and predisposition toward a product, service or corporation (Adcock *et al.*, 1995). Consequently, the annual report should improve the perception of the company. However, specific empirical evidence of fulfilling this goal seems lacking (see Stanton and Stanton, 2002). Research suggests that mere exposure to information is central to an individual's perception of corporate image (Gatewood *et al.*, 1993; Olson and Mathias Thjømøe, 2003). Thus, one would expect typical attitudinal effects, such as mere exposure effects (Zajonc, 1968), to be caused by engagement with an annual corporate report. The first aim of our study is to investigate such a mere exposure effect.

### *1.3 Characteristics of corporate annual reports online*

Because there are no official regulatory requirements for the design format of a corporate annual report, there are huge differences among companies. All large enterprises create a print version of the corporate annual report; many enterprises also publish an online version. One approach is to solely provide the print version as a PDF document on a company's website. However, some enterprises put great effort into creating additional online corporate annual reports, which are separate and sophisticated websites including quantitative information, narratives, photographs, graphs, and sometimes external links, audio and video elements. Responsive designs are used increasingly and modern web-based business reports can contain animations, interactive elements (such as comparisons of key performance indicators) and information graphics or personalized features. Thus, an online annual report can be implemented separately from the existing corporate website as a multimedia website, in its presentation quite different from the classical printed annual report (or its PDF version). The objects of the present study were such web-based annual reports by German enterprises. In 2013, a separate online corporate annual report was provided by 70.0% of DAX30 enterprises (DAX, 'Deutscher Aktienindex', German stock index, a stock market index consisting of the 30 major German companies trading on the Frankfurt Stock Exchange).

As such online annual reports are implemented as stand-alone websites, core facets of the user web experience become of interest. User perceptions of websites are mainly driven by three characteristics: web content, usability, and aesthetics (e.g., Cober *et al.*, 2003; Tarasewich *et al.*, 2001; Thielsch *et al.*, 2014).

Content is primary for websites and is defined by the International Organization for Standardization in ISO standard 9241-151 (ISO, 2006) as ‘a set of content objects’ on a web user interface. A content object is an ‘interactive or non-interactive object containing information represented by text, image, video, sound or other types of media’ (ISO, 2006, p. 3). Subjective perceptions of web content are essential in business settings (Huizingh, 2000; Palmer, 2002) and influence a broad variety of general user reactions, such as overall attitudes and satisfaction, perceived service quality, purchase intentions, website preference, commitment, loyalty, and the intention to revisit or recommend a website (for an overview see Thielsch and Hirschfeld, in press). However, the content of online corporate annual reports is often determined by the specific context of an enterprise and legal specifications. Thus, enterprises are obliged to optimize the content of annual reports in relation to such requirements.

Usability of a website is often defined based on ISO 9241-11 as the ‘extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use’ (ISO, 1998, p. 2). Thus, usability is best optimized so that a user of an annual online report experiences no problems and the report meets the users’ demands. Again, the subjective viewpoint of users is important: While a web-based corporate report may present itself as objectively usable (e.g., based on fast loading speed and good search function), it can still be experienced as unusable from a subjective user’s point of view (e.g., caused by misunderstandings or missing functions; see Hornbæk, 2006).

Beyond usability, impressions of a website’s aesthetics are of great interest because, among others, aesthetic evaluations influence satisfaction, preferences, trust, motivation, customer loyalty, impulse purchases and intention to revisit a website (see Moshagen and Thielsch, 2010, p. 691). There is no common definition available; however, aesthetics is often described as an immediate pleasurable subjective experience (Leder *et al.*, 2004; Moshagen and Thielsch, 2010; Reber *et al.*, 2004). As there are no legal specifications, design aesthetics allows for more degrees of freedom in presentation formats of annual corporate reports. Additionally, aesthetic responses occur immediately at first sight, and thus, the visual aesthetics of a website is very quickly processed, often within a split second (e.g., Lindgaard *et al.*, 2006; Thielsch and Hirschfeld, 2012; Tractinsky *et al.*, 2006; Tuch *et al.*, 2012).

In respect to the interplay of website content, usability, and aesthetics Thielsch and colleagues (2014) found that aesthetics has the highest impact on first and overall impressions. Yet, all three constructs significantly influence the overall impressions of website user, effect sizes for content were medium and those for usability low (Thielsch *et al.*, 2014). Thus, the second aim of our study is to investigate those three web-based report characteristics and especially the role aesthetics is playing in users’ appraisal of annual corporate reports online.

#### *1.4 Research approach and hypotheses*

The mere exposure to information has a strong effect on an individual’s perception of corporate image (Gatewood *et al.*, 1993; Olson and Mathias Thjømmøe, 2003). We aim to replicate this effect with respect to web-based annual reports. Thus, our first hypothesis is that the exposure and engagement of an user with an online business report will increase his or her evaluation of the corporate image.

As there is currently no empirical study available on the issue it is unclear how content, usability, and aesthetics perceptions affect users’ evaluations of web-based corporate

reports. Yet, findings from general research on website perception suggest that especially aesthetics might positively influence users' appraisal of online annual reports at first contact. Thus, the second aim of the study is to analyze to what extent the proposed mere exposure effect is associated with report characteristics such as content, usability, and aesthetics. Based on prior research demonstrating the importance of aesthetics for first impressions (e.g., Lindgaard *et al.*, 2006; Thielsch and Hirschfeld, 2012; Tractinsky *et al.*, 2006; Tuch *et al.*, 2012) our second hypothesis is that aesthetics will have a significant impact in explaining the expected mere exposure effect.

Third, we relate the overall impression of a given report to the three report characteristics content, usability, and aesthetics to investigate their relevance to the general perception of an annual report. Following the results of Thielsch and colleagues (2014) we expect in our third hypothesis that all three constructs – content, usability, and aesthetics – will contribute to the overall impression of an online business report with aesthetics showing the highest impact.

## 2. METHOD

### 2.1 Sample

Participants were recruited via social media, email or face-to-face contacts. A total of 160 volunteers anonymously completed the study. Data from two participants were excluded from analyses due to missing consent for the use of their data; an additional two participants had to be excluded due to unrealistic data given about their demographics. With respect to the definition of corporate image, one participant was excluded due to being employed at the allocated stimulus enterprise. Thus, a total of 155 participants (55.5% female), with ages ranging from 21 to 82 years ( $M = 33.0$ ;  $SD = 12.63$ ), were included in the following analyses. The education level of 77.4% of the participants was Abitur (German university entrance qualification) or higher. Of the participants 65.2% stated that they had never seen any annual report before. The others varied from 1 to 200 ( $M = 15.64$ ;  $SD = 32.15$ ) read annual reports before this study. However, this experience factor is not significantly correlated to the given dependent measures and means of all measures were quite comparable (see appendix A.1). Thus, all of the participants were jointly analyzed.

### 2.2 Materials

Eight online annual reports from German companies listed in the DAX30 served as stimulus materials and were selected based on interviews with an expert in corporate communication specialized in corporate annual reports. To reduce possible bias effects caused by testing stimuli from different lines of businesses, reports were selected with a focus on industrial production enterprises. Consequently, reports from DAX30 companies in the financial or insurance branches were not considered. The URLs of the selected online reports and the respective companies can be found in the appendix (Table A.2). In the reports, companies reported their business year 2013 or 2012/2013. The reports were presented as separate websites and were freely available on the Internet.

### 2.3 Measures

Several measures were applied in the present study; a full list of the questionnaires used is provided in the appendix, Tables A.3-A.6. The survey was performed in German.

*Corporate image.* Corporate image was measured twice: before (t1) and after (t2) the participants read the online corporate annual report. The image questionnaire contained nine Likert-type items based on the criteria used in *Fortune* magazine's survey of the World's Most Admired Companies (<http://fortune.com/worlds-most-admired-companies/>; assessed 01

September 2014). A sample item is 'Effectiveness in doing business globally' (1 = 'bad', 7 = 'excellent'). This measure shows good internal consistency (see Table 1); examples of previous work using *Fortune* magazine's criteria can be found at Gatewood *et al.* (1993) and Allen *et al.* (2007).

*Overall impression.* The overall impression of the reports was measured with a single item displaying a very common school mark from the German education system. The Item was: 'Which overall grade you give this annual report?' anchored with 1 ('very good'), 2 ('good'), 3 ('satisfactory'), 4 ('adequate'), 5 ('poor'), and 6 ('unsatisfactory').

*Online report characteristics.* The following website evaluation questionnaires were slightly adapted in wording to better fit annual online business reports. Terms such as 'website' within the items were replaced by 'report'. The participants were asked to indicate their level of agreement with each item on a 7-point Likert scale (1='strongly disagree', 7='strongly agree').

*Perception of content.* The Web-CLIC questionnaire was used (Thielsch and Hirschfeld, in press). This measure consists of twelve items on the four subscales 'clarity', 'likeability', 'informativeness', and 'credibility' representing a general factor 'subjective perception of content'. The authors provide evidence for high reliability and stability, as well as convergent, divergent, discriminative, concurrent, experimental and predictive validity (see Thielsch and Hirschfeld, in press).

*Perceived website usability.* The scale measuring perceived website usability (Flavián *et al.*, 2006) was used in its German version (see Thielsch, 2008 and Thielsch *et al.*, 2015). This scale is a seven-item measure assessing perceived ease of use, ease of understanding and speed of information retrieval. The adapted German scale showed high internal consistency and factorial validity (Thielsch, 2008).

*Perception of aesthetics.* The visual aesthetics of websites inventory was used ('VisAWI', Moshagen and Thielsch, 2010). This questionnaire consists of 18 items on the four subscales 'simplicity', 'diversity', 'colorfulness' and 'craftsmanship' representing a general factor 'visual aesthetics'. The items measuring simplicity ask to evaluate how clearly and structured the layout of a website is perceived; diversity is directed to the inventiveness and dynamic of the layout; colorfulness comprises aspects of color choice, placement, and combination; and craftsmanship items refers to the topicality, sophistication and perceived professionalism of the design. The authors provide evidence of high reliability and convergent, divergent, discriminative, concurrent, and experimental validity (see Moshagen and Thielsch, 2010).

## 2.4 Procedure

We used the software EFS Survey 10.2 (by QuestBack) to conduct the web-based study. The participants were recruited via social media (using platforms such as Facebook), email or face-to-face contacts and did not receive any compensation for partaking. They were asked to support research and to participate in a study about annual reports of German companies. Using a link on their personal computers, participants were directed to the web-based questionnaire. On the welcome page they were informed about involved researcher, anonymity, voluntariness and duration of the present study. After providing demographical background information (e.g., age, gender, level of education) and answering a mood scale (which served as a control variable and did not reveal any effects on measures), the participants were randomly referred to one of the eight online annual reports. Before the report was presented to the participant, corporate image of the particular company was assessed using the *Fortune* magazine's criteria as described above (t1). Afterward, the company's online annual report was presented via a hyperlink in its current form as fully functional website. The participants were instructed to explore the report carefully to be able to answer questionnaires about it (the median browsing time was 2.33 min). Then the

questionnaires assessing a report’s content, usability, aesthetics, and overall impression were given in randomized order, as were the items within each questionnaire. After that, corporate image was assessed again (t2). Finally, the participants were thanked and given the option to comment on the study or to have their data excluded from analysis. Completing this study took approximately 15 minutes.

### 3. RESULTS

Table 1 shows descriptive statistics and correlations among the study variables; with respect to content and aesthetics, the general factor was analyzed. For further analysis, one additional variable  $\Delta$ corporate image was defined describing the absolute difference in the corporate image evaluation from the first to the second measure ( $\Delta$ corporate image = corporate image<sub>t2</sub> - corporate image<sub>t1</sub>). Values of overall impression were reversed for the following calculations.

Table 1  
*Descriptive statistics, internal consistencies (Cronbach’s alpha) and correlations among variables*

Variable	M	SD	$\alpha$	1	2	3	4	5	6
1. Corporate image (t1)	4.56	.88	.86	-					
2. Corporate image (t2)	5.00	.96	.91	.67**	-				
3. $\Delta$ corporate image	0.44	.75	-	-.31**	.50**	-			
4. Content	4.43	1.00	.92	.45**	.70**	.38**	-		
5. Usability	4.72	1.41	.96	.28**	.48**	.29**	.64**	-	
6. Aesthetics	4.89	.96	.93	.38**	.65**	.40**	.72**	.59**	-
7. Overall impression	4.55	.82	-	.31**	.58**	.39**	.68**	.63**	.78**

*Note.*  $N = 155$ . Corporate image rated on a seven-point Likert scale ranging from ‘bad’ to ‘excellent’; Content, usability, and aesthetics rated on a seven-point Likert scale ranging from ‘totally disagree’ to ‘totally agree’; Overall impression rated as school mark from 1=‘very good’ to 6=‘insufficient’ (values were reversed in calculations).

\*\* $p < .01$ .

First, the changes in corporate image from before reading the annual reports to after were analyzed. Corporate image increased significantly from the first to the second measure ( $t(154) = 7.16, p < .001$ ). The standardized effect size for the found increase in organizational image was  $d = 0.47$ , which is close to a medium effect. According to the guidelines proposed by Cohen (1988), the standardized mean differences of  $d = 0.2, 0.5$  and  $0.8$  are considered small, medium, and large effects, respectively. Thus, we could confirm our first hypothesis that the exposure of an user with an online business report will increase evaluations of the corporate image.

Second, predictors of the found increase in corporate image ratings were examined. A hierarchical regression model was conducted with  $\Delta$ corporate image as dependent variable and the three report characteristics of content, usability, and aesthetics as independent variables. After the exclusion of three outliers, all the requirements (e.g., collinearity, independent and normally distributed errors, homogeneity of variance and linearity) were met to calculate a hierarchical regression model.

Therefore, a three-stage hierarchical multiple regression was conducted to determine whether content, usability and aesthetics predicted the increases in corporate image. Content was the first variable entered, followed by usability and aesthetics, according to the subjective



importance of those variables as shown in prior research (see Thielsch et al., 2014); the regression statistics can be found in Table 2.

Table 2

*Summary of hierarchical regression analysis for variables predicting  $\Delta$ corporate image*

Variable	B	SE(B)	$\beta$	R <sup>2</sup>	$\Delta$ R <sup>2</sup>	$\Delta$ F	df
Step 1				.17	.17	30.70***	1, 153
Content		.27	.05	.41***			
Step 2				.17	.00	.30	1, 152
Content		.25	.06	.38**			
Usability	.03	.05	.05				
Step 3				.21	.03	6.25*	1, 151
Content		.14	.08	.22			
Usability	.00	.05	-.01				
Aesthetics	.19	.08	.27*				

Note. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

The hierarchical multiple regression revealed that at stage one, content contributed significantly to the regression model and accounted for 17.0% of the variation in  $\Delta$ corporate image. Introducing usability explained no additional variance in  $\Delta$ corporate image. However, the addition of aesthetics to the regression model significantly explained an additional 3.4% of the variation in  $\Delta$ corporate image. When all three independent predictors were included in stage three in the regression model neither content nor usability were significant; the only significant predictor of  $\Delta$ corporate image was aesthetics ( $\beta = .27, p < .05$ , see Table 2). This is in line with our second hypothesis that aesthetics will have a significant impact in explaining the found mere exposure effect. Together the three independent variables accounted for 20.5% of the variation in  $\Delta$ corporate image.

A more in-depth analysis was conducted to determine the variation explained by each of the four facets of aesthetics measured with the VisAWI (i.e., simplicity, diversity, colorfulness, and craftsmanship; Moshagen and Thielsch, 2010). The regression model with  $\Delta$ corporate image as dependent variable and the four VisAWI subscales as independent variables revealed that subjectively experienced visual diversity was the best predictor ( $\beta = .37, p < .01$ , explaining 6.1% of the variance). Craftsmanship ( $\beta = .11, p = .36$ ), colorfulness ( $\beta = .06, p = .56$ ), and simplicity ( $\beta = -.03, p = .81$ ) did not emerge as significant predictors. Together the four independent variables accounted for 19.5% of the variation in  $\Delta$ corporate image.

Finally, predictors of overall impression of an online annual report were examined. Again, a hierarchical regression model was conducted with overall impression as dependent variable and the three report characteristics content, usability, and aesthetics as independent variables. No outlier occurred, and all the statistical requirements for calculating hierarchical regression (e.g., collinearity, independent and normally distributed errors, homogeneity of variance and linearity) were met. Again, a three-stage hierarchical multiple regression was conducted to determine to what extent content, usability and aesthetics predicted overall impression. As above, content was the first variable entered, followed by usability and aesthetics; the regression statistics are shown in Table 3.

Table 3

*Summary of hierarchical regression analysis for variables predicting overall impression*

Variable	B	SE(B)	$\beta$	R <sup>2</sup>	$\Delta R^2$	$\Delta F$	df
Step 1				.46	.46	132.69***	1, 153
Content	.56	.05	.68***				
Step 2				.53	.06	20.24***	1, 152
Content	.39	.06	.47***				
Usability	.19	.04	.33***				
Step 3				.66	.13	58.91***	1, 151
Content	.13	.06	.15*				
Usability	.12	.04	.21**				
Aesthetics	.47	.06	.54***				

Note. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

The hierarchical multiple regression revealed that at stage one, content contributed significantly to the regression model and accounted for 46.4% of the variation in overall impression. Introducing usability significantly explained an additional 6.3% of the variation in overall impression. Finally, the addition of aesthetics to the regression model significantly explained an additional 13.3% of the variation in overall impression. When all three independent predictors were included in stage three in the regression model, all were significant. The best predictor was aesthetics ( $\beta = .54, p < .001$ , see Table 3), and together the three independent variables accounted for 66.0% of the variation in overall impression. Those results confirm our third hypothesis.

#### 4. DISCUSSION

First, this study demonstrated that users' engagement with web-based annual reports can positively influence corporate image confirming our first hypothesis. Even a relatively short amount of time spent at first contact with an online business report leads to attitude changes with mediocre effect size ( $d = 0.47$ ). This finding is in line with the theory of Zajonc (1968) and prior research demonstrating that mere exposure to information is central to an individual's perception of corporate image (Gatewood *et al.*, 1993; Olson and Mathias Thjømøe, 2003). The present results fit nicely with the claims that, beyond fulfilling legal commitments, enterprises should use the corporate annual report to impart corporate image (Bekey, 1990; Bonnell II, 1982; Neu *et al.*, 1998) and to reach out to a broad audience with this medium (Marston and Shrivs, 1991; Needles *et al.*, 1999; Parker, 1982).

Second, report characteristics predicting improvements in corporate image were investigated. The results revealed that report aesthetics was the best predictor of these improvements ( $\beta = .27$ ); content ( $\beta = .22$ ) and usability ( $\beta = -.01$ ) were not significant predictors of the attitude changes in the current study. This finding is in line with our second hypothesis based on the empirically found high importance of aesthetics for users' attitudes and reactions (Moshagen and Thielsch, 2010), especially regarding first impressions (e.g., Lindgaard *et al.*, 2006; Thielsch and Hirschfeld, 2012; Tractinsky *et al.*, 2006; Tuch *et al.*, 2012). In particular, the aesthetics facet diversity was important for improvement in image perception. Thus, users in the current study especially valued how interesting, inventive, dynamic, and pleasantly varied the design of an online business report was. However, one might argue that the design characteristics explained only approximately one-fifth of the variance in image chance. Still, given the high value of corporate image and the numerous consequences of its perception, even slight changes become highly important. Our findings on

effects of aesthetics on corporate image corresponded well with comparable results in recruiting research (e.g., Cober *et al.*, 2003; Uggerslev *et al.*, 2012) or user experience and brand perceptions (e.g., De Angeli *et al.*, 2009; Garzotto *et al.*, 2010).

Third, report characteristics predicting the overall impressions of the reports were analyzed. In line with the findings on improvements in corporate image, report aesthetics was the best predictor of overall impressions ( $\beta = .54$ ). This finding again confirms the empirically found high importance of aesthetics for users' attitudes and overall appraisal (Moshagen and Thielsch, 2010; Thielsch *et al.*, 2014). In contrast to the findings on the attitude change, both content ( $\beta = .15$ ) and usability ( $\beta = .21$ ) showed significant effects on the overall perception of online reports in a regression analysis – which is in line with prior research findings on overall website impression (Thielsch *et al.*, 2014) and our third hypothesis.

Nevertheless, some readers of these results are maybe wondering why aesthetics has the strongest impact at first contact with a web-based annual report and not content – especially in the light of high variance explained by content if it is the only variable in the regression analysis. Yet, it is important to keep in mind that content, usability and aesthetics evaluations are correlated (see table 1). Especially aesthetics is known to potentially produce halo-effects and to influence the perception of other constructs (e.g., Lindgaard *et al.*, 2006; Thielsch *et al.*, 2015), possibly due to its early onset in visual processing (see Thielsch and Hirschfeld, 2012). Analyzing only content would not incorporate such effects leading to a possible overestimation of the importance of content.

#### *4.1 Practical implications*

This study demonstrates a positive attitude change with respect to corporate image after readers spent a relatively short amount of time with an online report. This finding illustrates that even well-known brands, such as those tested in the present study, can profit from readers' engagement with their annual reports on the Internet. Thus, companies and organizations should put effort into reaching out to potential readers. However, contents of web-based annual reports are often determined by context and legal specifications, and usability must generally be maximized for an optimal user experience. In contrast, aesthetics is a report characteristic that can be shaped relatively easily and potentially has strong effects in attracting attention. Thus, from an organizational viewpoint, especially the design aesthetics of an online business report creates various possibilities and can serve as a unique selling point in competition with other companies. Enterprises can positively influence their public perception by improving visual design features of their online reports and, thus, ensure their reports are aesthetic. In particular, designers of online annual reports might focus on a pleasantly varied, dynamic and creative layout that uses an attractive color scheme in a sophisticated manner. Information graphics should be designed in an informative and aesthetic way, while interactive elements must be intuitive to use. Furthermore, modern web-based reports are combined with compelling multimedia elements.

Newly created, prototypes or even first draft versions of web-based annual reports can benefit from a structured analysis of users perceptions and preferences – especially, as for many companies a web-based annual report is still kind of an uncharted territory and user requirements are vague. Content perception could be assessed by applying an information quality measure such as the AIMQ (Lee *et al.*, 2002) or a web content questionnaire such as the Web-CLIC (Thielsch and Hirschfeld, in press). Usability can be tested by adapting a classical usability questionnaire: For example the System Usability Scale (SUS; Brooke, 1996) or, more specific to the web, the usability scale of Flavián *et al.* (2006) used in the present study. For assessing aesthetics, the VisAWI (Moshagen and Thielsch, 2010) seems to

be a sound instrument; the present study implies that the facet diversity might be particularly interesting to investigate. Alternatively, if there is little time for testing and only the general aesthetic impression is of interest, a more economical short-version, the VisAWI-S, is available (see Moshagen and Thielsch, 2013).

#### 4.2 Limitations and future research

This study has some limitations that should be kept in mind while interpreting the results. In addition, these limitations suggest directions for future research.

First, in respect to the found mere exposure effect, the statistical model could explain 20.5% of the variation in improvements in corporate image. This finding suggests that further variables – probably in addition to online reports’ design characteristics – influence user evaluations. Potentially, besides the report itself the simple engagement with the enterprise is a critical factor in improving the receptors’ evaluation of the enterprise. Future research should identify remaining predictors and further examine interaction characteristics explaining the found variation.

Second, the effect on corporate image was analyzed by using the existing online versions of corporate annual reports. Future research should investigate to what extent the found effects can be transferred to different media, especially print, which is the most common format of corporate annual reports. Furthermore, future studies on web-based business reports can benefit from experimentally varying relevant report characteristics as identified in the present study.

Third, we targeted our study to a broad audience of potential readers of annual reports. Some participants were highly experienced with such reports while others were novices. Yet, we found no significant correlation between this experience factor and our main variables. Only one small significant difference for the usability ratings occurred at the mean level, this might be caused by a higher expertise of experienced readers in using annual reports. Nevertheless, a more detailed comparison between experts and laypeople or different target groups of annual reports might be promising for future research.

Fourth, the free exploration task used in our study led sometimes to a quite short amount of time participants spend with an annual report. Other tasks (e.g., search or memory tasks) might work better in provoking a deep examination of a given report. Some research in Human Computer-Interaction would suggest a vanishing importance of aesthetics over time (e.g., Sonderegger *et al.*, 2012) and the importance of content and usability might grow in a continued use scenario. Yet, this is a question for future research on web-based annual reports.

Fifth, we used a single item (an overall grade) as a general, holistic marker of business report quality. In further research, this way of measuring participants’ overall impression of annual reports could be validated with additional measures and especially behavioral markers (e.g., using paired comparison tasks or ranking data; see Hirschfeld & Thielsch, 2015).

Sixth, all of the tested participants and presented online reports shared the same cultural background. Possible differences in design perceptions driven by culture are discussed in several studies (e.g., Cyr *et al.*, 2010; Marcus and Gould, 2000; Robbins and Stylianou, 2003). Consequently, the extent to which found results are prone to cultural differences should be analyzed by a cross-cultural approach. This could be done by rerunning the present study in different cultural contexts (e.g., Cyr *et al.*, 2010; Tractinsky, 1997)

In summary, the present study found positive effects of users' engagement with online annual reports on corporate image, i.e. a mere exposure effect. In terms of report characteristics this effect was mainly driven by perceptions of aesthetic design features, which was also the most important predictor of the overall impression of a web-based report at first contact. However, content and usability evaluations accounted for substantial variance in the overall appraisal of an online report. These findings open promising perspectives in future research on companies' communication via annual reports on the World Wide Web.

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## Appendix

Table A.1

*Differences between participants with and without prior experience with annual corporate reports*

	Corporate image (t1)		Corporate image (t2)		Content		Usability		Aesthetics		Overall impression	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
No experience (n = 101)	4.59	0.81	4.96	0.94	4.32	0.99	4.56	1.43	4.89	0.94	4.55	0.85
Experience (n = 54)	4.52	1.00	5.06	1.01	4.64	1.00	5.03	1.33	4.90	1.01	4.56	0.77
Significance of difference	$F_{(1, 153)} = 0.23, p = .63, d = 0.08$		$F_{(1, 153)} = 0.40, p = .53, d = -0.10$		$F_{(1, 153)} = 3.58, p = .06, d = -0.32$		$F_{(1, 153)} = 3.93, p = .05, d = -0.34$		$F_{(1, 153)} < 0.01, p = .96, d = -0.01$		$F_{(1, 153)} < 0.01, p = .99, d = 0.00$	

Note. Standardized mean difference effect size were calculated using Cohen's *d*; according to the guidelines provided by Cohen (1988), *d* values of 0.2, 0.5 and 0.8 are considered small, medium, and large effects, respectively

Table A.2

*List of online annual report stimuli (Name of company and URL of report; assessed 01 September 2014)*

Company	URL
BASF AG	<a href="http://bericht.basf.com/2013/de/serviceseiten/willkommen.html">http://bericht.basf.com/2013/de/serviceseiten/willkommen.html</a>
Bayer AG	<a href="http://www.geschaeftsbericht2013.bayer.de/">http://www.geschaeftsbericht2013.bayer.de/</a>
Continental AG	<a href="http://report.conti-online.com/index_de.html">http://report.conti-online.com/index_de.html</a>
Deutsche Telekom AG	<a href="http://www.geschaeftsbericht.telekom.com/site0413/de/start.php">http://www.geschaeftsbericht.telekom.com/site0413/de/start.php</a>
SAP AG	<a href="http://www.sapintegratedreport.com/2013/de/">http://www.sapintegratedreport.com/2013/de/</a>
Siemens AG	<a href="http://www.siemens.com/annual/13/de/index/">http://www.siemens.com/annual/13/de/index/</a>
ThyssenKrupp AG	<a href="http://www.thyssenkrupp.com/financial-reports/12_13/de/">http://www.thyssenkrupp.com/financial-reports/12_13/de/</a>
Volkswagen AG	<a href="http://geschaeftsbericht2013.volkswagenag.com/serviceseiten/willkommen.html">http://geschaeftsbericht2013.volkswagenag.com/serviceseiten/willkommen.html</a>

Table A.3

*List of items measuring corporate image (based on Fortune's World's Most Admired Companies criteria (<http://fortune.com/worlds-most-admired-companies/>; assessed 01 September 2014)*

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1. Ability to attract and retain talented people
  2. Quality of management
  3. Social responsibility to the community and the environment
  4. Innovativeness
  5. Quality of products or services
  6. Wise use of corporate assets
  7. Financial soundness
  8. Long-term investment value
  9. Effectiveness in doing business globally
- 

*Note.* Rated on a seven-point Likert scale ranging from 'bad' to 'excellent'; in the present study,  $\alpha = .86$  (t1) and  $.91$  (t2)

Table A.4

*List of items measuring online annual report content on the four scales (based on the Web-CLIC, see Thielsch and Hirschfeld, in press)*

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Scale: Clarity ( $\alpha = .73$ )

1. I find the contents of the report to be clearly presented.
2. The texts provide me information in a clear and concise manner.
3. I find the language used in the texts to be current and easy to understand.

Scale: Likeability ( $\alpha = .89$ )

4. The report piques my interest.
5. The contents of the report are exciting.
6. I enjoy reading the report.

Scale: Informativeness ( $\alpha = .80$ )

7. The information is of great value.
8. I find the information in the report to be useful.
9. The report is informative.

Scale: Credibility ( $\alpha = .89$ )

10. I find the information provided in the report to be authentic.
  11. The information provided in the report is reliable.
  12. I can trust the information in the report.
- 

*Note.* Rated on a seven-point Likert scale ranging from 'totally disagree' to 'totally agree';  $\alpha$  in the present study is directly indicated at the scales

Table A.5

*List of items measuring online annual report usability (based on a scale adapted from Flavian et al., 2006; for details see Thielsch et al., 2015)*

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1. I think this report is easy to understand.
  2. This report is simple to use, even when using it for the first time.
  3. It is easy for me to find the information I seek.
  4. I can easily understand the structure of this report.
  5. It is easy to navigate within this report.
  6. Contents are organized in a way that I know where I am at any time.
  7. I am able to find the information I need quickly.
- 

*Note.* Rated on a seven-point Likert scale ranging from ‘totally disagree’ to ‘totally agree’; in the present study  $\alpha = .96$

Table A.6

*List of items measuring online annual report aesthetics on the four scales (based on the VisAWI, see Moshagen and Thielsch, 2010)*

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Scale: Simplicity ( $\alpha = .79$ )

1. The layout appears too dense. (r)
2. The layout is easy to grasp.
3. The layout appears well structured.
4. The report appears patchy. (r)
5. Everything goes together in this report.

Scale: Diversity ( $\alpha = .87$ )

6. The design is uninteresting. (r)
7. The layout is inventive.
8. The design appears uninspired. (r)
9. The layout appears dynamic.
10. The layout is pleasantly varied.

Scale: Colorfulness ( $\alpha = .87$ )

11. The color composition is attractive.
12. The colors do not match. (r)
13. The choice of color is botched. (r)
14. The colors are appealing.

Scale: Craftsmanship ( $\alpha = .81$ )

15. The layout appears professionally designed.
  16. The layout is not up-to-date. (r)
  17. The report is designed with care.
  18. The design of the report lacks a concept. (r)
- 

*Note.* Rated on a seven-point Likert scale ranging from ‘totally disagree’ to ‘totally agree’; negatively-keyed items are indicated by (r) and are reverse-scored;  $\alpha$  in the present study is directly indicated at the scales