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A New Method To Evaluate Good Design For Brand Recognition In The Digital World

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Abstract: Visual aesthetics has become a crucial element in strengthening brand experience. In the digital era, however, designers need to approach aesthetics from a holistic standpoint where both traditional and more modern factors are taken into consideration. In this paper we present digital BrandUX, a new method to improve brand consistency through the evaluation of aesthetic features. It builds on the Design Format Analysis (DFA) of Warell (2001) with the addition of a structured step-by-step approach. To test the method we analysed two web sites using both DFA and digital BrandUX. The results showed that digital BrandUX is a promising advance in aesthetic evaluation, assisting designers in identifying a greater number of visual aesthetic features. Moreover, the method ensured that the designers explored and identified all types of factors, with the exception of language. Future lines include the development of a handbook to improve ease of use of the method.

Keywords: aesthetic evaluation, brand experience, website, consistency

1. Introduction

Visual aesthetics has become a central competitive factor in the digital world (Karjalainen, 2007). Companies must develop digital products that not only appear attractive and easy to interact with, but also carry distinctive references to the 'character' of the brand.

Visual aesthetics play an important role in the transmission of ideas and brand messages. Research shows that people associate the visual design of a product with certain attributes (Du and McDonald, 2018). For example, Reid et al (2010) showed that people associate certain forms of cars with the perception that the car is 'respectful of the environment'. According to that study, cars with smooth shapes are classified as more 'environmentally friendly'. Thus, products convey abstract messages through aesthetic features which carry references to the character of the brand and communicate the core brand value to customers (Warell, 2001; McCormack et al., 2004; Dell'Era and Verganti, 2007; Ranscombe et al., 2012; Karjalainen 2007).

By managing the visual aesthetic strategically and consistently, companies can substantially impact the visual recognition of brand and brand experience (Warell, 2001; Pugliese and Cagan, 2002; McCormack and Cagan, 2004; Karjalainen, 2004). Aesthetics can, therefore be used strategically to

foster favorable brand identity and to strengthen the aesthetic brand consistency (Schmitt and Simonson, 1997; Stompff, 2003; de Mozota, 2004).

Studies in Human Computer Interaction (HCI) have traditionally focused on the effectiveness and the efficiency of the interaction. However, it has been well recognized that the needs of users go beyond usability and utility, and that visual aesthetics is a strong determinant of user experience. Design for brand experience and visual recognition is an emerging topic still in its infancy. Consequently, there is a need to construct tools and processes that help organizations to make the brand tangible in a consistent way (Väänänen-Vainio-Mattila et al.,2008).

This study presents digital BrandUX, a model that evaluates the visual aesthetic consistency of a brand on web sites. The method addresses the recognition of brand design features and analyses the extent to which those features are embedded in the web. Building on the Design Format Analysis of Warell (2001), digital BrandUX strengthens brand experiences. To do so, it introduces a structured step-by-step approach that guides the designer through the analysis of brand features.

2. Semantic transformation for brand experience

The process of transforming the brand from abstract and intangible ideas into touchpoints is called Semantic Transformation. The process of decoding the design into specific messages, ideas and meanings is called Semantic Attribution. The difference between the message the company wants to communicate and the customer perception of that message is called the Brand Gap (Neumeir , 2003; Gonzalez, 2017) (Figure 1).
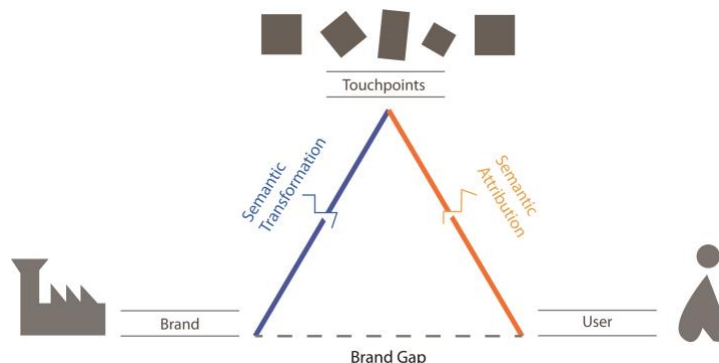

Figure 1.Triadic semiotics perspective (Karjalainen 2004, Motta Filho 2017)

Since experience cannot be designed, but only the settings that support it (Vargo & Lusch, 2008, Vargo et al., 2008; Kimbell, 2011a; Sangiorgi, 2012), the Semantic Transformation process tends to come up with activable design guidelines that are later used to design touchpoints (Karjalainen, 2003,2007; Neumeier 2005; Roscam 2010; Clatworthy, 2012; Newbery and Farnham 2013; Roto et al 2015; Motta Filho 2017).

In ideal situations, every interaction designed under the setting of the Semantic Transformation process functions as the manifestation of brand identity, evoking certain associations that are aligned to strategically defined brand messages (Karjalainen, 2004). However, distortions occur during the Semantic Transformation process that leads to visual aesthetic inconsistencies in interactions. These inconsistencies increase the Brand Gap and weaken the brand experience (Gonzalez et al., 2016). They might be due to, for instance, misinterpreted design descriptions, lack of

knowledge to transform the setting into different type of touchpoints, departments divided into watertight and independent silos or unstructured processes.

A new visual aesthetic evaluation model is required to address the complexity of transforming the brand idea into tangible interaction. Analyzing aesthetic design features and exploring the extent to which they are embedded leads to visually well-orchestrated brand interactions, an increase in aesthetic consistency, thereby reducing the brand gap (Roscam, 2010).

3. Visual aesthetic evaluation

There are two measurement approaches to studying aesthetics. The first approach considers specific interface features such as structure and color factors (Kim et al., 2003; Tuch et al., 2010; Altaboli and Lin, 2011). Such object based evaluation assesses how 'beauty' has been transformed into visual aesthetic features and requires the expertise and knowledge of designers.

The second approach focuses on the user perception of aesthetics (Lavie and Tractinsky, 2004; Mosehgen and Thiershe , 2010; Jiang et al., 2016). This subject centered approach analyses the experience and comments of users to evaluate how visual aesthetic features are perceived as 'beautiful' (Tan el al., 2009).

In recent decades, a lot of effort has been made to consider user perception during the design process. Proof of this is the large number of tools which have been developed based on the evaluation of user experience (Engage, 2006 Lasa et al., 2015).). However, designers frequently fail to recognize the importance of object based evaluation. Although user evaluation is essential, it can have certain limitations. The process is time consuming and it can be difficult to recruit users. Hence, before applying any user evaluation method we need to be sure that the aesthetic is consistent throughout the web site. The subsequent user evaluation can therefore identify problems and inconsistencies that have gone unnoticed in the design process.

4. Digital BrandUX

Digital BrandUX is a new method to evaluate the visual aesthetic features of web sites. It follows the object based evaluation approach and uses heuristic [1] measurement. To do so, the method builds on the DFA baseline, with the addition of a structured step-by-step approach which aims to improve the effectiveness of the aesthetic evaluation, and collect relevant and meaningful data (Roto et al., 2009).

Digital BrandUX guides the designers in the aesthetic visual evaluation process through 25 items. (Table 1). These items were created by combining the specific parts of each construct (general, visual, navigable, text and details) with moderns and traditional aesthetic factors (architecture, color, movement and language).

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[1] Heuristic or heuristic technique is a mental shortcut that eases the cognitive load of making a decision.

Table 1: Constructs, factor and items of digital BrandUX Method

Construct	factors	items
General	Architecture Color Movement	Layout and position of content and the space taken in the page. Reading order. Position, dimension and color of logo. Predominant colors at background and foreground. Transition of pages.
Visual	Architecture Color Movement Language	Layout and composition of pictures, photos and graphics. Tone, illumination, contrast and saturation. Transition of pictures. Change of forms, size, color and position when interacting with visuals. Tone of voice.
Navigable	Architecture Color Movement Language	Hierarchy of navigable. Position shape and size of navigable. Color, illumination, contrast and saturation. Movement and change of forms, size, color and position when interacting with navigable. Tone of voice.
Text	Architecture Color Movement Language	Typography , spacing and justified Tone, illumination, contrast and saturation. Movement and changes of forms, size, color and position when interacting with text. Tone of voice. Language.
Details	Architecture Color Movement Language	Layout and position of content and the space taken in the page. Reading order. Tone, illumination, contrast and saturation. Movement and changes of form, size, color and position when interacting with details. Tone of voice.

The following is a more detailed explanation of digital BrandUX. Firstly a measurement approach is discussed; secondly the aesthetic factors are explained, then web site parts are described and finally, the DFA method is presented.

4.1 Object based evaluation approach

Object based measurements rely on global aesthetic rules derived from empirical studies (Tractinsky et al., 2006; Zhang et al., 2009; Altaboli and Lin, 2011; Mõttus et al.,2013). These rules can be measured using two approaches. The first approach uses quantitative metrics (Ngo et al.,2000; Michailidou et al., 2008).These types of evaluations are commonly developed through mathematical formulas or software that (semi) automatically computes the aesthetic rues (Zain et al., 2011). The second approach uses heuristic techniques, which are based on the aesthetic judgement of experts against a set of criteria. These criteria tend to assess the attractiveness of interfaces in terms of design guidelines (Sutcliffe 2002).

Beyond universal aesthetic rules brands need to develop their own. Simply focusing on general and universal aesthetic rules adds limited value and differentiation. For this reason, the authors have selected the heuristic technique. It presents a significant advantage in terms of time and resources needed. In addition, it can easily deal with quantitative as well as qualitative aesthetic criteria (Karjalainen et al., 2011).

4.2 Aesthetic factor

Traditional vs modern factors.

Object based aesthetic evaluation research carried out in the field of Semantic Transformation has focused on features related to layout and color aspects (Schwarzfischer, 2011). Such traditional features respond mostly to physical products.

However, with the advent of the digital era new aesthetic language has emerged (Benyon, et al., 2005; Lundgren.; 2011. Cooperet al., 2014). Recent studies have supported the relevance of movement and gestural features representing the aesthetic interaction of products (Lenz et al.,2017; Cooper et al., 2014; Saffer, 2009;Lim et al., 2007). Moreover, linguistics can also carry distinctive reference to the brand character (Ozok and Salvendy, 2000; 2001). For instance, features such as tone of voice, verbal time and sentence structure can be used to evoke different brand values.

Taking traditional and more modern factors into consideration, digital BrandUX guides the designer through 4 aesthetic factors: architecture, color, movement and, finally language.

Specific vs abstract factors.

Objective based method takes into consideration typically 'specific' type of features. However, a web site can be also be defined by 'abstract' types of features.

Specific features are related to measurable and quantifiable features such as color code, height, speed or time. Moreover, they usually refer to one aesthetic factor. Through the repetition of these features, familiarity and recognition is established among similar product or element. However, repetition not always is possible. For instance, a partial shape utilized in one web site element might not be applicable in another. In such cases the combination of specific and abstract features is desirable.

Abstract features refer to more perceptual aspects like hot or aggressive color. They are centered in the description of emotions and experiences the visual aesthetic evokes (Löwgren, 2009, Petersen, 2004). That is, they define the reasons that make the interaction meaningful for people (Diefenbach et al., 2013; Lenz et al., 2017). In addition, they might combine more than one construct making them easily transferable to other web site elements.

To effectively evaluate aesthetic features in a holistic manner the Digital Brand UX incorporate both.

4.3 Web site constructs

A web site can be broken down into elements and sub elements. To analyse a web site our approach proposed the next 5 constructs: general, visual, navigable, text and details.

General elements take into account the features related to layout such as header, body, footer and logo, and also page transition and content positioning. They determine the basic structure of the site page. Visual elements refer to pictures, photos, videos, graphics and icons. They draw the eye and help direct readers to specific parts of the page. The elements that the user can interact with such as links, buttons, and menus are define as navigable. Most webpages are not stand-alone they are part of a larger structure. So, navigation plays a crucial role in keeping customers on the site.

Web sites do not exist solely to be looked at but rather to communicate. The internet began as a method of sharing information and it evolved into the World Wide Web, it became rich in all kinds of

media. Finally, details take into consideration aspects that might not be included in the rest of the construct such as questionnaires, telephone number and so on.

4.4 Design Format Analysis

Design Format Analysis (DFA) (Warell, 2001) is recognized as an optimum method to analyses aesthetic consistency throughout a specific experience. This heuristic approach pays special attention to brand visual recognition by exploring the occurrence of selected design features. To do so, features that are deemed as being the most important or relevant for visual recognition are selected from initial analysis products. Then, the extent to which these features are presented throughout different touchpoints and interactions is checked.

An important drawback of DFA is the lack of structure for aesthetic feature exploration and identification. As a consequence, identification and selection of visual brand aesthetics is highly dependent on the experience and ability of each expert applying the methodology. This leads to variation in the results which can occur in three ways. Traditional and modern aesthetic features, abstract and specific aesthetic features and web site construction elements. To increase consistency , digital BrandUX was developed using a step by step structure.

5. Preliminary evaluation of digital BrandUX method

To validate digital BrandUX two experiments were carried out. The first experiment explored the visual aesthetic features using the DFA method, while in the second experiment digital BrandUX was applied. The aim of the experiments was to compare the results and to validate the following hypotheses:

H1: Digital BrandUX assists the designer in identifying a greater number of visual aesthetic features than the DFA

- H1.1 Digital BrandUX assists the designer in identifying a greater number of abstract features than DFA.
- H1.2 Digital BrandUX assists the designer in identifying a greater number of specific features than DFA.
- H1.3 Digital BrandUX assists the designer in identifying a greater number of architecture features than DFA.
- H1.4 Digital BrandUX assists the designer in identifying a greater number of color features than DFA.
- H1.5 Digital BrandUX assists the designer in identifying a greater number of movement features than DFA.
- H1.6 Digital BrandUX assists the designer in identifying a greater number of language features than DFA.

H2: Digital BrandUX assures that all designers explore and identify all type of factor.

- H2.1 Digital BrandUX assures that all designers explore and identify abstract features.
- H2.2 Digital BrandUX assures that all designers explore and identify specific features.
- H2.3 Digital BrandUX assures that all designers explore and identify architecture features.
- H2.4 Digital BrandUX assures that all designers explore and identify color features.

- H2.5The digital BrandUX assures that all designers explore and identify movement features.
- H2.6 The digital BrandUX assures that all designers explore and identify language features.

H3: Digital BrandUX adjusts better than DFA to the characteristics that
define Väänänen-Vainio-Mattila et al., (2008) as a requirement to integrate an evaluation tool into business activity.

- H4.1 Digital BrandUX is easier to use than DFA.
- H4.2 Digital BrandUX is quicker than DFA.
- H4.3 Digital BrandUX is more useful than DFA.
- H4.4 Using Digital BrandUX designer feel more Confident than using DFA.
- H4.5 The Knowledge Needed for digital BrandUX is less than for DFA.
- H4.6 The results from digital BrandUX are more comparable than results from DFA.
- H4.7 The digital BrandUX is more Advisable than DFA.

Method.

Two existing commercial web sites were evaluated for this study. Both pages were from cycling companies and their core products were road, city and mountain bicycles. The first site (Site A) was considered to have a higher average of visual aesthetic brand features than the second site (Site B).

Participants.

A total of 38 design students from 4th year bachelor and 1st year master courses participated in this study. The first group (Group 1) consisted of 22 bachelor design students from 4th year and the second group (Group 2) consisted of 16 first year strategic design master students. In both groups 50% were females and 50% males.

Procedure.

Both experiments were carried out in a laboratory context. The procedure involved freely exploring the web site and identifying the visual aesthetic brand features. To do so, Group 1 used the DFA method while Group 2 used the digital BrandUX method.

Both experiments were divided into 4 phases: In the first phase (1) a theoretical approach about the importance of visual aesthetic features and brand experience was explained. In the second phase (2) each group was given an explanation of the method to be uses. In the third phase (3) participants explored and identified the visual aesthetic features based on the assigned method. Finally, in the last phase (4), participants completed a questionnaire about effectiveness of the aesthetic evaluation (Väänänen-Vainio-Mattila, 2008).

6. Results

The visual aesthetic features that each participant identified were filtered and classified. Firstly, features that did not describe visual aesthetic features were deleted. Secondly, features which described the same or similar aspects were grouped. Thirdly, aesthetic descriptions that defined more than one visual aesthetic feature were broken down into individual features. Finally, the features were classified according to type feature which being abstract, specific, architecture, color, movement and finally language. Furthermore the time that each participant needed to develop each experiment was also recorded.

After identification of the features was completed, participants were invited to fill in a questionnaire. The questionnaire was based on Väänänen-Vainio-Mattila ., 2008 about the requirement. The specific questionnaires collect data about: Ease to Use, Quickness, Utility, Security, Knowledge Needed, Comparability and Advisability.

6.1 Type of features

Experiment 1: DFA

The participants of Group 1 identified between 5 and 12 visual aesthetic features at Site A, and between 2 and 7 at Site B. Regardless of the quantity, such features can be classified as abstract or specific, and can refer to architecture, color, movement or language features. Table 2 shows the percentages of participants that mentioned abstract, specific, architecture, color, movement and language features. In the case of Site A, 81.8 % of participants recognized abstract features and 95.4% of participants mentioned specific features. In addition, structure was identified by almost 90.9%, color by 50%, movement by 40.9% and language by 9% of participants. Results from Site B showed that 63.6 % participants identified abstract features and %81.8 specific features. Moreover, structure was identified by 77.2% people, color by 72.7% movement by 27.2 %and language by 9%.

Table 2. Percentage of participants that identified the aesthetic factors using DFA.

	Abstract	Specific	Architecture	Color	Movement	language
Site A	81.8%	95.4%	90.9%	50%	40.9%	9%
Site B	63.6%	81.8%	77.2%	72.7%	27.2%	9%

In Site A the average number of total features was identified as 6.45, of which around 50% were abstract features and 50% were specific (Table 3). Regarding the four aesthetic factors, architecture and color had the highest average of 2.41 and 2 respectively, followed by movement with 0.55 and language with 0.09. No reference was made to any other aesthetic factor. Analysing the standard deviation, the highest deviation of 2.36 was related to abstract features, followed by total (1.81), specific (1.6) architecture (1.62) and color (1.15). The features with a lowest deviation were movement with 0.74 and language with 0.29.

Table 3. Average numbers of feature and standard deviation using DFA.

		Total	Abstract	Specific	Architecture	Color	Movement	Language
Site A	Average	6.45	3.14	3.32	2.41	2	0.55	0.09
	Dev	1.6	2.36	1.81	1.62	1.15	0.74	0.29
Site B	Average	4	1.59	2.82	1.82	1.23	0.27	0.09
	Dev	1	1.74	1.97	1.33	1.02	0.46	0.29

Site B followed a similar pattern but with lower averages. The average number of total features was 4, of which approximately 40% were abstract and 60% specific (Table 3). With regard to the four aesthetic factors, architecture and color had the highest average of 1.82 and 1.23 respectively, followed by movement (0.27) and language (0.09). No reference was made to any other aesthetic factor. In respect to standard deviation showed the highest deviation in Site B was related to specific

features (1.97), followed closely by abstract (1.74), architecture (1.33) color (1.02) and total features (1). Factors with the lowest deviation were movement and language with 0.46 and 0.29.

Experiment 2: digital BrandUX

The participants of Group 2 identified between 20 and 34 visual aesthetic features on Site A, and between 11 and 29 on Site B (Table 4). 100% of participants recognized abstract as well as specific features. The results for Site A showed that 100% of participants mentioned architecture, color and movements features while 81.25 % identified features related to language. In Site B architecture was mentioned by 100% of participants, color by 87.5%, and movement by 93.7% and language by 68.75%).

Table 4.Percentages of participants that identified the aesthetic factors using digital BrandUX.

	Abstract	Specific	Architecture	Color	Movement	Language
Site A	100%	100%	100%	100%	100%	81.25%
Site B	100%	100%	100%%	87.5%	93.7%	68.75%

The average number of total features on Site A was 26.3, of which around 40% were abstract and 60% were specific features (Table 5). In regard to the four aesthetic factors, architecture presented the highest average of 7.3, followed by image (4), color (3), movement (3) and language (2). Standard deviation results revealed that the highest deviation was related to total features (4.3), followed by abstract and specific, both with 2.7. Finally, the factors with the lowest deviation were architecture (1.6) , movement (1.3) and language (1.3).

Table 5. Average numbers of feature and standard deviation using DFA.

		Total	Abstract	Specific	Architecture	Color	Movement	Language
Site A	Average	26.3	10.3	15.9	7.3	4	3.3	2
	Dev	4.33	2.7	2.7	1.8	1.6	1.3	1.3
Site B	Average	18.9	8.4	10.5	6	2.5	1.8	1.3
	Dev	5.9	2.7	4.1	2.6	1.5	1	1.1

In the case of Site B, the average number of total features was 18.94, of which 44% were abstract and 56 % were specific features (Table 5). Architecture recorded the highest average of 6, followed by color (2.05), movement (1.8) and language (1.3). Standard deviation results showed that the highest deviation was related to total features with 5.9, followed by specific features (4.1) , abstract (2.7), structures (2.6), color (1.59), language (1.13) and movement (1.04).

6.2 Questionnaire

The questionnaire was based on the Likert scale with seven ordered response levels. When responding to a Likert item participants specified their level of agreement or disagreement. The scale was numerical ranging from 1 (Strongly Disagree) to 7 (Strongly Agree).

Table 6. Results of questionnaire for DFA and digital BrandUX.

	Ease of use	Quickness	Utility	Confidence	Knowledge Needed	Comparability	Advisable	Min /Site
DFA	5.7	4.6	5.4	4.4	4.6	5	5.7	19
Digital Brandux	4.1	4.1	5.4	4.1	5	5	5.2	14

The average results of the questionnaire showed that over overall, participants scored the DFA between Slightly Agree and Moderately Agree. As Table 6 summarizes, the average score of Ease of Use was (5.7), Quickness (4.6), Utility (5.4), Confidence (4.4), Knowledge Needed (4.6), Comparability (5) and Advisable (5.7).

The participants of Group 2 scored the digital BrandUX method with lower level of agreement. The average score was between Neither Agree Nor Disagree and Moderately Agree: Ease of use (4.1), Quickness (4.1), Utility (5.4), Confidence (4.1), Knowledge Needed (5.5), Comparability (5) and Advisable (5.2).

The time needed by the designer to apply both methods was also asked the. The average time per method was 19 minutes in the case of DFA and 140 minutes in the case of digital BrandUX.

7. Discussion of results

Digital BrandUX guides designers through a more structured step by step process than DFA. Consequently, those designers that used BrandUX explored aesthetic features with much more precision and detail. This significantly increased the quantity of visual aesthetic features identified by each participant (Table 7).

Participants that used DFA on average gathered a total amount of 5.22 features, while those that used BrandUX defined 22.6 features. This increase was reported against all factors. Hence, in the case of abstract features, the average increased from 2.3 to 9.35, specific features from 3 to 13.2, architecture increased from 2.11 to 6.65, color from 1.6 to 3.25 , movement from 0.41 to 2.55 and language from 0.09 to 1,65. It can therefore be concluded that the first Hypothesis (H1) and sub hypotheses (H1.1, H1.2, H1.3, H1.4, H1.5 and H1.6) are validated.

Table 7. Average numbers of feature and standard deviation (site A and Site B) using DFA.

	Total	Abstract	Specific	Architecture	Color	Movement	Language
DFA	5.225	2.365	3.07	2.115	1.615	0.41	0.09
Digital BranUX	22. 6	9.35	13.2	6.65	3.25	2.55	1.65

The extent to which all the aesthetic factors were identified by the participants increased when using digital BrandUX method (Table 8). For instance, the results obtained from DFA showed that abstract features were mentioned by 72.7% of participants, specific by 88.4 %, architecture by 84%, color by 61%, and movement by 34.05% and finally, language by 9%. In the experiment carried out with the

digital BrandUX, those percentages increased reaching a 100% of participants in the cases of abstract, specific and architecture factors. Color and movement were mentioned by almost all the participants reaching 93.3 % and 96.85% respectively. Finally, language related features were identified by 75% of participants. This means that sub-hypotheses H2.1, H2.2, H2.3 are validated and the sub-hypothesis H2.6 is rejected. H2.4 and H2.5 can also be considered validated. In these latter two cases, although color and movement were not identified by 100% of participants the results were close. This deviation might be related to lack of attention and/or motivation, especially considering a 100% results was obtained in Site A (Table 8). As a consequence the H2 is partially validated.

Table 8. Percentages of participants (average of site A and SiteB) that identified the aesthetic factors using digital BrandUX.

	Total	Abstract	Specific	Architecture	Color	Movement	Language
DFA	72.7%	88.4%	84.05%	61.35%	34.05%	9%	72.7%
Digital BranUX	100%	100%	100%	93.75%	96.85%	75%	100%

Finally, regarding the effectiveness of the method (Table 6) the results show that BrandUX scored slightly lower than DFA. An interesting result is that ease of use scored 1.6 points below the DFA method. One possible explanation might be that the 25 items where not sufficiently explained or clarified. This would hinder the understanding and application of the digital BrandUX method. It is true that some participants were confused by apparent overlaps between certain items. An alternative explanation might be that digital BrandUX could be considered laborious and demanding, which might affect the motivation and interest of designers.

8. Conclusions and further research

Despite the awareness of visual aesthetics as a means of strengthening the brand experience, our study suggests that designers still approach aesthetics from a partial viewpoint. When designers were invited to freely explore a web site, they tended to focus on traditional features. The approach to digital products needs to move towards a more holistic approach where both traditional and more modern factors are taken into account. In addition, the designers in our study were inclined to consider the web site as a single unit, without breaking it down into its component parts. Thus, the different element and sub elements of the analysed site were frequently disregarded in the evaluation process.

Digital BrandUX addresses the requirement of the digital age, bringing together aesthetic factors that describe specific, abstract, traditional and modern features. This method strengthens the brand experience by guiding the designer through every aesthetic factor of each web site element and sub element. It not only considers the web site as a whole, but also facilitates the exploration of its component elements.

Digital BrandUX is a promising advance in aesthetic evaluation; however, there are aspects that require further attention. Firstly, the method as it stands does not limit the depth to which any item can be explored. This fact was reflected in the standard deviation. Secondly, the statements that described the 25 items seemed not to be sufficiently clear, affecting the perception of Ease of Use, Quickness and Confidence when applying the method. It is the intention of the authors to further

improve understanding by (i) creating more descriptive statements that clarify meaning and content and (ii) developing a handbook with examples and frequently asked questions that supports the description of items.

Furthermore, the results are context dependent since the model was tested under controlled conditions. This study should therefore, be considered as an initial evaluation of the method, requiring further development and verification.

References

Altaboli, A., & Lin, Y. (2011). Investigating effects of screen layout elements on interface and screen design aesthetics. *Advances in Human-Computer Interaction,* 2011, 5.

Bhandari, U., Neben, T., Chang, K., & Chua, W. Y. (2017). Effects of interface design factors on affective responses and quality evaluations in mobile applications. *Computers in Human Behavior*, 72, 525-534.

Clatworthy, S. (2013*). Design support at the front end of the New Service Development (NSD) process: The role of touch-points and service personality in supporting team work and innovation processes.* The Oslo School of Architecture and Design.

Dell'Era, C., & Verganti, R. (2007). Strategies of innovation and imitation of product languages. *Journal of Product Innovation Management*, 24(6), 580-599. doi: 10.1111/j.1540-5885.2007.00273.x

Diefenbach, S., Lenz, E., & Hassenzahl, M. (2013). An interaction vocabulary. describing the how of interaction. *In CHI'13 Extended Abstracts on Human Factors in Computing Systems* (pp. 607-612). ACM.doi: 10.1145/2468356.2468463

Du, P., & MacDonald, E. F. (2018). A Test of the Rapid Formation of Design Cues for Product Body Shapes and Features. *Journal of Mechanical Design*, 140(7), 071102..

Engage (2006*). Report on the evaluation of generative tools and methods for "emotional design"*. Deliverable D15.3. EU project Engage 520998

Fogg, B. J., Lee, E., & Marshall, J. (2002). *Interactive technology and persuasion.* The Handbook of Persuasion: Theory and Practice. Thousand Oaks, CA: Sage.

Gonzalez, I., Val, E., Justel, D., & Iriarte, I. (2016). Closing the brand gap through innovation and design. *Procedia CIRP*, 50, 112-116. 10.1016/j.procir.2016.05.100

Gonzalez, I., Val, E., Justel, D., & Iriarte, I. (2017). A Framework For Product Design Based On Semantic Attribution Process. *The Design Journal*, 20(sup1), S16-S27.doi: g/10.1080/14606925.2017.1352983

Hassenzahl, M. (2004). The interplay of beauty, goodness, and usability in interactive products. *Human-computer interaction*, 19(4), 319-349

Jiang, Z., Wang, W., Tan, B. C., & Yu, J. (2016). The determinants and impacts of aesthetics in users' first interaction with web sites. *Journal of Management Information Systems*, 33(1), 229-259.

Karjalainen, T. M. (2003). Strategic brand identity and symbolic design cues. *In 6th Asian design conference* (pp. 1-13).

Karjalainen (2004). *Semantic Transformation in Design*. University of Art and Design Helsinki

Karjalainen, T. M. (2007). It looks like a Toyota: Educational approaches to designing for visual brand recognition. *International Journal of design*, 1(1).

Karjalainen, T.-M., & Snelders, D. (2010). Designing visual recognition for brand. *Journal of Product Innovation Management,* 27,6e22.

Karjalainen, T. M., & Snelders, D. (2010). Designing visual recognition for the brand. *Journal of Product Innovation Management,* 27(1), 6-22. doi: 10.1111/j.1540-5885.2009.00696.x

Kimbell, L. (2009). *The turn to service design. Design and creativity*: Policy, management and practice, 157-173.

Kong, Q., & Guo, Q. (2018, July). Comprehensive Evaluation Method of Interface Elements Layout Aesthetics Based on Improved AHP*. In International Conference on Applied Human Factors and Ergonomics* (pp. 509-520). Springer, Cham.

Lasa, G., Justel, D., & Retegi, A. (2015). Eyeface: A new multimethod tool to evaluate the perception of conceptual user experiences. *Computers in Human Behavior*, *52*, 359-363.

Lavie, T., & Tractinsky, N. (2004). Assessing dimensions of perceived visual aesthetics of web sites. *International journal of human-computer studies*, 60(3), 269-298.

Lenz, E., Diefenbach, S., & Hassenzahl, M. (2014, October). Aesthetics of interaction: a literature synthesis. *In Proceedings of the 8th Nordic Conference on Human-Computer Interaction: Fun, Fast, Foundational* (pp. 628-637). ACM. Doi:10.1145/2639189.2639198

Lenz, E., Hassenzahl, M., & Diefenbach, S. (2017). Aesthetic interaction as fit between interaction attributes and experiential qualities. *New Ideas in Psychology*, *47*, 80-90.

Lim, Y. K., Stolterman, E., Jung, H., & Donaldson, J. (2007, August). Interaction gestalt and the design of aesthetic interactions. In *Proceedings of the 2007 conference on Designing pleasurable products and interfaces* (pp. 239-254). ACM.

Lundgren, S. Interaction-Related Properties of Interactive Artifacts. C*onference Proceedings of Ambience'11,* (2011), 112–121.

Löwgren, J. (2009). Toward an articulation of interaction aesthetics. *New Review of Hypermedia and Multimedia*, 15(2), 129-146.

McCormack, J. P., Cagan, J., &Vogel, C. M. (2004). Speaking the Buick language: capturing, understanding, and exploring brand identity with shape grammars*. Design studies*, 25(1), 1-29.

Michailidou, E., Harper, S., & Bechhofer, S. (2008). Visual complexity and aesthetic perception of web pages. *In Proceedings of the 26th annual ACM international conference on Design of communication* (pp. 215–224), ACM. doi:10.1145/ 1456536.1456581.

Moshagen, M., & Thielsch, M. T. (2010). Facets of visual aesthetics. *International journal of human-computer studies*, 68(10), 689-709.

Motta Filho, M. A. *Designing for Brand Experience*.

Petersen, M., Iversen, O., Gall Krogh, P., & Ludvigsen, M. Aesthetic Interaction: a pragmatist's aesthetics of interactive systems*. Proceedings of the 5th conference on Designing interactive systems: processes, practices, methods, and techniques*, (2004), 269–276.

Neumeier M (2003) *The brand gap.* New Riders, Indianapolis.

Ngo, D. C. L., & Byrne, J. G. (2001). Application of an aesthetic evaluation model to data entry screens. *Computers in Human Behavior*, 17(2), 149-185.

Newbery, P., & Farnham K (2013) *Experience design: a framework for integrating brand, experience and value.* John Wiley & Sons New Jersey

Nysveen, H., Pedersen, P. E., & Skard, S. (2013). Brand experiences in service organizations: Exploring the individual effects of brand experience dimensions. *Journal of Brand Management*, 20(5), 404-423.

Ozok, A. A., & Salvendy, G. (2000). Measuring consistency of web page design and its effects on performance and satisfaction. *Ergonomic*s, 43(4), 443-460.

Ozok, A. A., & Salvendy, G. (2001). How consistent is your web design*?. Behaviour & Information Technology,* 20(6), 433-447.

Petersen, M., Iversen, O., Gall Krogh, P., &Ludvigsen, M. Aesthetic Interaction: a pragmatist's aesthetics of interactive systems. *Proceedings of the 5th conference on Designing interactive systems: processes, practices, methods, and techniques -DIS '04, ACM* Press, (2004), 269–276.

Pugliese, M. J., & Cagan, J. (2002).Capturing a rebel:modeling the Harley-Davidson brand through a motorcycle shape grammar. *Research in Engineering Design*,13(3), 139-156. doi: 10.1007/s00163-002-0013-1

Ranscombe, C., Hicks, B., & Mullineux, G. (2012). A method for exploring similarities and visual references to brand in the appearance of mature mass-market products. *Design Studies*, 33(5), 496-520.

Reid, T. N., Gonzalez, R. D., & Papalambros, P. Y. (2010). Quantification of perceived environmental friendliness for vehicle silhouette design. *Journal of mechanical design*, 132(10), 101010.

Abbing, E. R. (2010). *Brand driven innovation: strategies for development and design* (Vol. 21). Ava Publishing.

Roto, V., Obrist, M., & Väänänen-Vainio-Mattila, K. (2009, August). User experience evaluation methods in academic and industrial contexts. *In Proceedings of the Workshop UXEM* (Vol. 9).

Saffer, D. (2008). *Designing gestural interfaces: touchscreens and interactive device*s. " O'Reilly Media, Inc.".

Schwarzfischer, K. (2011). The Aestetic Meaning of Syntactic, Semantic and Pragmatic Gestalt Integrations in Integrative Aesthetics. *Gestalt Theory*, *33*(3), 345.

Seckler, M., Opwis, K., & Tuch, A. N. (2015). Linking objective design factors with subjective aesthetics: An experimental study on how structure and color of web sites affect the facets of users' visual aesthetic perception. *Computers in Human Behavior*, 49, 375-389.

Shneiderman, B. (1997). *Designing the user interface: Strategies for effective human-computer interaction* (3rd ed.). Boston: Addison-Wesley.doi: 10.1002/j.1538-7305.1949.tb00928.x

Simonson, A., & Schmitt, B. H. (1997). *Marketing aesthetics: The strategic management of brands, identity, and image.*

Stompff, G. (2003). The forgotten bond: Brand identity and product design. *Design Management Journal* (Former Series), 14(1), 26-32.

Sutcliffe, A. (2002, January). Assessing the reliability of heuristic evaluation for Web site attractiveness and usability. *In System Sciences, 2002. HICSS. Proceedings of the 35th Annual Hawaii International Conference on* (pp. 1838-1847). IEEE.

Tractinsky, N., Katz, A.S., & Ikar, D.: What is beautiful is usable. *Interacting with Computers* 13(2), 127–145 (2000).

Tractinsky, N., Cokhavi, A., Kirschenbaum, M., & Sharfi, T. (2006). Evaluating the consistency of immediate aesthetic perceptions of web pages. *International journal of human-computer studies*, 64(11), 1071-1083.

Tuch, A. N., Roth, S. P., HornbæK, K., Opwis, K., & Bargas-Avila, J. A. (2012). Is beautiful really usable? Toward understanding the relation between usability, aesthetics, and affect in HCI. *Computers in Human Behavior*, 28(5), 1596-1607.

Väänänen-Vainio-Mattila, K., Roto, V., & Hassenzahl, M. (2008). Towards practical user experience evaluation methods. *Meaningful measures: Valid useful user experience measurement (VUUM)*, 19-22.

Vargo, S. L., & Lusch, R. F. (2008). Service-dominant logic: continuing the evolution. *Journal of the Academy of marketing Science,* 36(1), 1-10.

Vargo, S. L., & Lusch, R. F. (2008). From goods to service (s): Divergences and convergences of logics. *Industrial marketing management*, 37(3), 254-259.

Vargo, S. L., Maglio, P. P., & Akaka, M. A. (2008). On value and value co-creation: A service systems and service logic perspective. *European management journa*l, 26(3), 145-152.

Warell, A. (2001). *Design syntactics: a functional approach to visual product form theory, models, and methods.* Chalmers University of Technology.

Wetter-Edman, K., Sangiorgi, D., Edvardsson, B., Holmlid, S., Grönroos, C., & Mattelmäki, T. (2014). Design for value co-creation: Exploring synergies between design for service and service logic. *Service Science*, 6(2), 106-121.

Zain, N. H. M., Razak, F. H. A., Jaafar, A., & Zulkipli, M. F. (2011, November). Eye tracking in educational games environment: evaluating user interface design through eye tracking patterns. *In International Visual Informatics Conference* (pp. 64-73). Springer, Berlin, Heidelberg.

Zhang, Q., Kang, W., Zhao, C., & Ming, X. (2009, May). Aesthetic coloring for complex layout using genetic algorithm. *In Global Congress on Intelligent Systems* (pp. 406-410). IEEE.