

# Has Culture an Impact on the Importance of UX Aspects?

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## Summary

We investigate if the cultural background of a person has an influence on the subjective importance of UX aspects for several common product categories. To clarify this, we replicate an already published study with German students (Winter et al., 2017) in Indonesia. Results show significant differences concerning the rated importance of UX aspects for many product categories. Especially hedonic quality aspects are rated higher concerning their importance in the Indonesian sample. However, if we just look at the order of the importance ratings, then both samples show a quite high agreement.

## 1 Introduction

Many modern products or Web Sites are designed for an international market. Therefore, it is important to consider culture specific expectations in the design to achieve a broad user acceptance in different cultures (see, for example, Heimgärtner, 2017 or Marcus & Gould, 2001).

In a previous study (Santoso et al., 2017) German and Indonesian participants evaluated Amazon and Skype with an extension of the User Experience Questionnaire (short UEQ). Results showed differences in the UEQ scale means and in addition concerning the perceived importance of the UX aspects represented by the UEQ scales. However, the UEQ contains only 6 scales and it is thus unclear if the findings can be generalized to other UX aspects. We replicate a study by Winter et al. (2017) with Indonesian participants to get a more detailed picture on the influence of culture for the subjective importance of different UX aspects.

## 2 UX Aspects

We investigate the influence of culture on the importance of UX aspects for different product categories. As a basis we use a list of UX aspects described by Winter et al. (2017).

- **Content Quality (CQ):** The information provided by the product are actual and of good quality.
- **Customization (CU):** I can adapt the product to my personal preferences or personal work style.
- **Perspicuity (PE):** It is easy to understand and learn how to use the product.
- **Efficiency (EF):** I can achieve my goals with minimal time and minimal physical effort. The product responds quickly to my input.
- **Immersion (IM):** When I deal with the product, I forget the time. I completely sink into the interaction with the product.
- **Intuitive Usage (IN):** I can use the product directly without any learning or help of other people.
- **Usefulness (US):** Using the product brings me advantages. It saves me time and effort and makes me more productive.
- **Novelty (NO):** The design of the product is interesting and unusual. The design catches my attention.
- **Beauty (BE):** The product is beautiful and attractive.
- **Identity (ID):** The product helps me to make contacts and to present myself positively.
- **Controllability (CO):** The product always reacts predictably and consistently to my input. I have full control over the interaction.
- **Stimulation (ST):** I find the product stimulating and exciting. It's fun to deal with the product.
- **Clarity (CL):** I find the user interface of the product looks tidy and clear.
- **Loyalty (LO):** Even if there are other equivalent products for the same tasks, I would not change the product.
- **Trust (TR):** My given data is in safe hands. The data will not be misused to harm me.
- **Value (VA):** I find the product makes a high-quality and professional impression.

*Customization, Perspicuity, Efficiency, Intuitive Usage, Usefulness, and Controllability* are pragmatic quality aspects, while *Immersion, Novelty, Beauty, Identity, Value* and *Stimulation* are hedonic quality aspects (Hassenzahl, 2001). The other four UX aspects cannot clearly be assigned to one of these categories.

How important such an UX aspect is depends on the type of product (Winter et al., 2017). Knowledge about the relative importance of such UX aspects can be quite important in the design phase of a product to decide on conflicting requirements. If, for example, a planned feature has a positive impact on efficiency and a negative impact on perspicuity and intuitive

usage, then it is important to know which aspects are more important for the users, to draw a decision if this feature should be realized or not.

### 3 Replication study

We tried to be as close as possible to the experimental procedure used in Winter et al. (2017). So mainly the textual information was translated from German to Indonesian.

The participants should judge the importance of the UX aspects described in the previous section for several product categories. The categories were described by a category name and several examples. Some of the examples from the German study are unknown in Indonesia and had to be replaced. The following product categories were used in the study (if the example is only used in one of the two versions it is followed by a (G) for the German version or an (I) for the Indonesian version):

- **Word Processing:** Word, MS PowerPoint, Latex, Writer (OpenOffice)
- **Spreadsheet:** Excel, Calc (OpenOffice)
- **Messenger:** WhatsApp, Facebook Messenger, Snapchat
- **Social Network:** Facebook, Xing, LinkedIn
- **Video Conferencing:** Skype, Facebook Video Call (G), Google hangout (I)
- **Web Shops:** Amazon (G), Conrad (G), Redcoon (G), ebay (G), Tokopedia (I), Bukalapak (I), Shopee (I)
- **News Portals:** Spiegel.de (G), Zeit.de (G), Sueddeutsche.de (G), detik.com (I), liputan6.com (I)
- **Booking Systems:** Bahn.de (G), Lufthansa.de (G), booking.com (G), hrs.de (G), Traveloka (I), Trivago (I)
- **Info web pages:** Club web-site (G), web-site of home town (G), <http://www.ui.ac.id> (I), <http://smartcity.jakarta.go.id/> (I)
- **Learning platforms:** Moodle (G), openelms (G), Udemy (I), Udacity (I)
- **Programming tools:** VisualStudio, Eclipse
- **Image processing:** Photoshop, gimp, CorelDraw (I)
- **Online banking:** Online portal of own bank (G), Starmoney (G), m-BCA (I), mandiri mobile (I), jenius (I)
- **Video portals:** Youtube, Netflix, Amazon Prime (G)
- **Games:** WOW (G), Minecraft (G), DoTA2 (I), Mobile Legend (I)

114 undergraduate students of the Faculty of Computer Science, Universitas Indonesia (64 males, 50 females, average age 21.34 years) participated in the study. The data set from the German version is a bit smaller and contains only 58 participants (see Winter et al., 2017).

An MS Excel list containing the UX dimensions as rows and the product categories as column headers was sent to the participants per mail. Participants had one week to fill out the Excel

and send it back. The same instructional text as in Winter et al. (2017) was used. The importance of each UX aspect for a product category could be rated on a 7-point Likert-Scale. With 16 UX dimensions and 15 product categories the participants had thus to fill 240 cells, i.e. had to make 240 decisions.

The mean importance ratings per product category and UX aspect are shown in Table 1. If the difference between the German (G) and Indonesian (I) sample is significant (t-test, two sided) on the .05 level, the values are formatted in bold font. The last column shows the rank correlation between the importance ratings of the German and Indonesian samples.

		PE	EF	CO	IN	US	CU	CL	NO	BE	ID	ST	IM	VA	LO	TR	CQ	
Word Proc.	G	<b>5,91</b>	6,31	<b>6,60</b>	5,60	6,45	5,07	6,00	<b>2,46</b>	<b>3,33</b>	<b>1,52</b>	<b>3,24</b>	<b>2,37</b>	<b>4,84</b>	<b>3,84</b>	5,26	<b>4,10</b>	.91
	I	<b>6,62</b>	6,48	<b>6,03</b>	5,91	6,55	5,24	6,27	<b>4,22</b>	<b>4,35</b>	<b>4,02</b>	<b>4,42</b>	<b>3,75</b>	<b>5,98</b>	<b>5,30</b>	5,75	<b>5,64</b>	
Spreadsheet	G	<b>6,00</b>	6,33	<b>6,53</b>	5,29	6,53	4,91	5,98	<b>2,39</b>	<b>3,19</b>	<b>1,48</b>	<b>3,24</b>	<b>2,25</b>	<b>4,88</b>	<b>3,84</b>	5,23	<b>3,95</b>	.94
	I	<b>6,51</b>	6,54	<b>6,02</b>	5,75	6,58	5,12	6,27	<b>4,21</b>	<b>4,28</b>	<b>3,95</b>	<b>4,39</b>	<b>3,87</b>	<b>5,96</b>	<b>5,15</b>	5,80	<b>5,67</b>	
Dev. Tools	G	<b>5,83</b>	6,41	<b>6,69</b>	<b>5,00</b>	<b>6,52</b>	<b>6,38</b>	5,86	<b>2,91</b>	<b>3,74</b>	<b>1,89</b>	<b>4,38</b>	4,35	<b>5,21</b>	<b>4,50</b>	5,31	<b>5,11</b>	.90
	I	<b>6,34</b>	6,23	<b>6,14</b>	<b>5,66</b>	<b>6,25</b>	<b>5,82</b>	6,02	<b>4,79</b>	<b>4,58</b>	<b>4,15</b>	<b>5,13</b>	<b>4,65</b>	<b>5,99</b>	<b>5,04</b>	5,44	<b>5,70</b>	
Image Proc.	G	5,79	6,22	<b>6,43</b>	5,14	6,34	6,00	5,88	<b>3,11</b>	<b>4,31</b>	<b>1,78</b>	4,70	4,41	<b>5,33</b>	<b>4,63</b>	5,02	<b>4,36</b>	.85
	I	5,96	5,98	<b>5,93</b>	5,46	6,03	5,72	6,06	<b>5,06</b>	<b>5,19</b>	<b>4,09</b>	5,14	4,79	<b>5,79</b>	<b>5,19</b>	5,12	<b>5,45</b>	
Booking system	G	<b>5,97</b>	<b>6,14</b>	<b>6,47</b>	<b>5,74</b>	<b>5,55</b>	<b>3,76</b>	6,03	<b>3,00</b>	<b>3,93</b>	<b>1,56</b>	<b>3,22</b>	<b>2,38</b>	5,71	<b>3,40</b>	<b>6,70</b>	6,44	.89
	I	<b>6,35</b>	<b>6,51</b>	<b>6,06</b>	<b>6,13</b>	<b>6,12</b>	<b>4,67</b>	<b>6,33</b>	<b>5,61</b>	<b>5,84</b>	<b>4,33</b>	<b>5,06</b>	<b>4,28</b>	6,04	<b>5,75</b>	<b>6,40</b>	6,53	
Online banking	G	<b>5,79</b>	<b>5,84</b>	<b>6,83</b>	5,83	<b>5,59</b>	3,14	6,02	<b>2,29</b>	<b>3,21</b>	<b>1,38</b>	<b>2,39</b>	<b>1,98</b>	6,10	<b>4,00</b>	<b>6,98</b>	<b>6,68</b>	.76
	I	<b>6,36</b>	<b>6,38</b>	<b>5,98</b>	6,03	<b>6,38</b>	<b>3,93</b>	6,03	<b>4,50</b>	<b>4,61</b>	<b>4,26</b>	<b>4,36</b>	<b>3,87</b>	6,22	<b>4,88</b>	<b>6,65</b>	<b>6,24</b>	
Web-Shop	G	5,97	5,47	6,17	5,93	<b>4,96</b>	<b>3,31</b>	<b>6,07</b>	<b>4,60</b>	<b>5,59</b>	<b>2,00</b>	<b>4,70</b>	4,40	5,98	<b>4,45</b>	6,62	6,42	.86
	I	6,24	<b>6,29</b>	5,82	5,92	<b>5,86</b>	<b>4,47</b>	<b>6,44</b>	<b>5,72</b>	<b>5,94</b>	<b>4,50</b>	<b>5,33</b>	4,86	6,00	<b>5,56</b>	6,46	6,36	
Messenger	G	5,95	5,98	6,09	6,28	<b>4,60</b>	<b>4,03</b>	<b>5,45</b>	<b>3,98</b>	<b>4,50</b>	<b>5,75</b>	<b>4,51</b>	<b>3,35</b>	<b>4,60</b>	<b>4,58</b>	6,67	<b>4,93</b>	.71
	I	6,22	6,25	5,98	6,19	<b>5,88</b>	<b>4,77</b>	<b>6,37</b>	<b>5,71</b>	<b>5,38</b>	<b>5,46</b>	<b>5,26</b>	<b>5,51</b>	<b>5,61</b>	6,58	<b>5,67</b>	6,44	
Social Netw.	G	<b>5,55</b>	<b>5,00</b>	5,91	5,66	<b>3,73</b>	<b>4,69</b>	<b>5,26</b>	<b>4,84</b>	<b>5,31</b>	<b>6,39</b>	5,65	<b>4,58</b>	<b>4,90</b>	5,19	<b>6,66</b>	5,67	.59
	I	<b>6,14</b>	<b>5,83</b>	5,89	5,95	<b>5,39</b>	<b>5,38</b>	<b>6,28</b>	<b>5,91</b>	<b>5,98</b>	<b>5,78</b>	5,77	<b>5,57</b>	<b>5,61</b>	5,48	<b>6,39</b>	5,84	
Video Conf.	G	5,48	5,86	<b>6,07</b>	5,67	5,64	<b>4,16</b>	<b>5,36</b>	<b>3,22</b>	<b>3,95</b>	5,04	<b>3,86</b>	<b>3,24</b>	<b>4,66</b>	<b>3,87</b>	6,24	5,05	.81
	I	5,83	6,12	<b>5,68</b>	5,74	5,91	<b>4,65</b>	<b>6,06</b>	<b>5,03</b>	<b>5,10</b>	4,92	<b>5,19</b>	<b>4,88</b>	<b>5,50</b>	<b>5,11</b>	6,19	5,44	
Learning Platf.	G	<b>5,95</b>	5,78	<b>5,53</b>	5,55	<b>6,05</b>	5,05	5,97	<b>4,38</b>	4,90	<b>4,08</b>	5,43	4,70	<b>5,36</b>	<b>3,96</b>	5,56	6,53	.93
	I	<b>6,35</b>	6,12	<b>5,91</b>	5,89	<b>6,44</b>	5,12	6,26	<b>5,13</b>	5,25	<b>4,99</b>	5,39	4,86	<b>6,04</b>	<b>4,90</b>	5,91	6,56	
Video Portals	G	<b>5,00</b>	<b>4,65</b>	<b>4,72</b>	5,28	<b>3,57</b>	<b>3,67</b>	<b>5,16</b>	<b>4,53</b>	<b>4,93</b>	<b>3,67</b>	<b>5,14</b>	<b>5,22</b>	<b>4,50</b>	<b>4,02</b>	<b>5,07</b>	<b>5,12</b>	.83
	I	<b>5,57</b>	<b>5,46</b>	<b>5,54</b>	5,47	<b>5,22</b>	<b>4,63</b>	<b>6,11</b>	<b>5,50</b>	<b>5,54</b>	<b>4,99</b>	<b>5,92</b>	<b>5,74</b>	<b>5,38</b>	<b>5,33</b>	<b>5,68</b>	<b>5,75</b>	
News Portal	G	4,98	<b>4,66</b>	<b>4,43</b>	5,23	<b>4,30</b>	3,54	5,50	<b>4,12</b>	<b>4,66</b>	<b>2,15</b>	4,42	4,27	5,14	<b>3,93</b>	<b>4,39</b>	<b>6,88</b>	.85
	I	5,26	<b>5,26</b>	<b>5,09</b>	5,51	<b>5,14</b>	3,78	5,90	<b>5,29</b>	<b>5,39</b>	<b>3,99</b>	4,85	4,74	<b>5,68</b>	<b>4,76</b>	<b>5,38</b>	<b>6,53</b>	
Web Pages	G	<b>4,97</b>	4,79	<b>4,41</b>	<b>4,86</b>	<b>4,56</b>	<b>2,67</b>	5,60	<b>3,93</b>	<b>4,64</b>	<b>2,63</b>	<b>4,11</b>	3,64	<b>4,60</b>	<b>3,25</b>	<b>4,35</b>	6,41	.84
	I	<b>5,57</b>	5,26	<b>5,15</b>	<b>5,45</b>	<b>5,50</b>	<b>3,92</b>	5,96	<b>5,23</b>	<b>5,31</b>	<b>4,12</b>	<b>4,61</b>	4,08	<b>5,71</b>	<b>4,31</b>	<b>5,61</b>	6,45	
Games	G	5,53	5,02	5,82	5,48	<b>2,06</b>	<b>4,47</b>	<b>4,81</b>	<b>6,33</b>	6,38	4,50	<b>6,84</b>	<b>6,84</b>	4,67	5,06	4,56	<b>4,04</b>	.82
	I	5,64	5,14	5,96	5,67	<b>4,22</b>	<b>5,17</b>	<b>5,95</b>	<b>6,03</b>	6,22	4,70	<b>6,03</b>	<b>5,92</b>	5,15	5,30	5,08	<b>5,15</b>	
Av.	G	<b>5,64</b>	<b>5,63</b>	<b>5,91</b>	<b>5,50</b>	<b>5,10</b>	<b>4,32</b>	<b>5,66</b>	<b>3,74</b>	<b>4,44</b>	<b>3,05</b>	<b>4,39</b>	<b>3,87</b>	<b>5,10</b>	<b>4,17</b>	<b>5,64</b>	<b>5,45</b>	.93
	I	<b>6,06</b>	<b>5,99</b>	<b>5,81</b>	<b>5,78</b>	<b>5,83</b>	<b>4,83</b>	<b>6,15</b>	<b>5,20</b>	<b>5,29</b>	<b>4,55</b>	<b>5,14</b>	<b>4,74</b>	<b>5,77</b>	<b>5,18</b>	<b>5,90</b>	<b>5,93</b>	

Table 1: Means of the importance ratings for Perspicuity (PE), Efficiency (EF), Controllability (CO), Intuitive Use (IN), Usefulness (US), Customization (CU), Clarity (CL), Novelty (NO), Beauty (BE), Identity (ID), Stimulation (ST), Immersion (IM), Value (VA), Loyalty (LO), Trust (TR), and Content Quality (CQ). Scale ranges from 1 to 7.

We can see directly that each product category has a specific pattern of importance ratings. Related product categories (for example, *Word Processing* and *Spread Sheet*, *Programming Tools* and *Image Processing* or *Messenger* and *Video Conferencing*) show in both samples quite similar patterns.

If we look on the average ratings of the dimensions over all product categories we see that the six highest differences between our two samples are found for *Identity*, *Novelty*, *Loyalty*, *Immersion*, *Beauty* and *Stimulation*. These are, except for *Loyalty*, all hedonic UX aspects.

Thus, hedonic UX aspects are relatively more important for Indonesian students than for German students. Especially for products that are mainly used for work or administrative personal tasks (*Word Processing, Spread-Sheet, Programming Tools, Image Processing, Booking System, Online Banking*) there is a clear discrepancy between both samples. For the German sample the hedonic qualities show very low ratings compared to the pragmatic quality aspects. The hedonic aspects are also rated lower than the pragmatic aspects in the Indonesian sample, but the difference in the ratings is much lower here.

But if we look only on the order of importance we see that there is a high agreement between both samples. The rank correlations between the importance ratings are extremely high. Thus, concerning the question which are the most relevant UX aspects for a given product category participants from both cultures show a quite high agreement. The type of the product seems to have a much bigger impact on the importance of UX aspects than any cultural variables.

## 4 Summary

We have investigated the importance of various UX aspects on various product categories for German and Indonesian students. One finding was that the relative importance of hedonic quality aspects is higher in the Indonesian sample than in the German sample. However, the order of importance of the different UX aspects is surprisingly similar.

If a planned feature in a product has a positive impact on one UX aspect and a negative on another aspect, then it is important to know which of these aspects is more important to draw a decision. Since the order of importance is quite similar in the German and Indonesian sample it is quite likely that such concrete design decisions based on the importance of UX aspects will be valid in both cultures. However, this is true only for decisions based on the somewhat abstract UX aspects. Concerning concrete design elements there can still be big differences depending on specific cultural aspects. For example, Marcus and Gould (2001) describe differences concerning the usage of pictures of persons on web pages between cultures that differ in the acceptance of an unequal power in a society (power distance, Hofstede, 2001).

A good explanation for the differences of the two samples concerning the relative importance of hedonic and pragmatic quality aspects is currently missing. Such an explanation must be based on a model of cultural differences, see for example Hofstede (2001). But such models of culture describe learned traits, which influence the behaviour of people inside the society, i.e. the way people interact with other people. How people interact with products is not really in focus of existing cultural models, so there is a need to do some further work here.

Of course, as a limitation we must mention that we have only data from studies in two countries and it is of course possible that results from other cultural environments will show different results. Thus, before more general conclusions on the impact of culture on the importance of UX aspects can be drawn much more data need to be collected.

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