

User Success Rate to Measure Usability in Responsive Website Layout Changes (Case Study: Indonesian Newspaper Website)

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ABSTRACT Online Newspapers can be accessed through many varied devices such as personal computer (PC), Tablet and mobile phone, people usually called this kind of online newspaper by responsive website. Responsive website have elastic and flexible layout, so it can be changed easily based on size of devices monitor. On Newspaper, front page is very important because it contains headline news, popular news, menus and other information. The changes on its layout can affect position of news and menus. Therefore usability measurement is needed in order to get the user success rate. Methodology for this research is Quantitative and using ANOVA to find the significance of usability through the success rate when accessing website by different devices (PC, Tablet, Mobile Phone), case study in Indonesia Newspaper. The results of the test that was conducted on Headline News, other News, and front page menu stated that all respondents are prefer to use PC monitor because more simple and easy to access newspaper website. For that reason the changes layout is significantly affect users when they access website through different devices.

Keywords : *Usability, responsive website, newspaper, layout, online newspaper*

INTRODUCTION

News can be read in physical printed newspaper however because of the development of technology currently news also can be read on website newspaper. Website Newspaper can be access and read by varied devices such as Personal Computer (PC), Tablet, and Mobile Phone. Because it also can be access through variety of devices, this kind of website called responsive website. Responsive website have elastic and flexible layout (Frain, 2012) so it can be changed following the size of monitor when website accessed (Baturay & Birtane, 2013). If it accessed through PC monitor website will be seen bigger but if it accessed using tablet or mobile phone, naturally the size of website will changed. This changes of screen size have also had an effect in the changed of website layout, including website newspaper.

Printed newspaper and online version (website) basically are similar because it contains news, picture and advertisement (Detreville, 1978). The News provides the latest trending topic which coming from national and International issues. Likewise in newspaper website, on their first page also put the newest headline issues that happened in national and international. However when website accessed from different devices, the change of its layout will happen because naturally layout will follow the monitor size on devices which is used. That kind of matter became a problem because many important menus disorganized. The layout changes indeed affect headline news and other menus. In a research study, giving assessment to website including the layout,

user only need a very short time i.e. 50ms (Lindgaard, Fernandes, Dudek, & Brown, 2006).

The level of convenience when user used website including newspaper website associated with usability. Usability according to Shackel defined as the ability of object when it used by human easily and effectively (Galitz, 2007; Shackel & Richardson, 1991). Measuring usability to the success rate is when layout is change.

LITERATURE REVIEWS

Newspaper, e-Newspaper, and Newspaper Website

Newspapers developed when the printing press discovered by Johann Gutenberg (Elvinaro, 2015). By development of times, newspaper which previously in printing form change into electronic newspaper and online newspaper. Printing newspaper and electronic newspaper do not have much differences, because it has similar from design and layout side. In different case with online newspaper (newspaper website), newspaper and newspaper website have a huge differences. Newspaper is a printing design meanwhile newspaper website is digital design. Both of them have differences (Nielsen, 1999) as follows:

1. *Dimensionally.*
2. *Navigation.*
3. *Response Time, Resolution, and Canvas Size.*
4. *Multimedia, Interactivity, and Overlays.*
5. *Respect (no, Relish) the Differences.*

USABILITY

Usability was begin to introduced in scientific publication in 1979 by John Bennett with title *"The Commercial Impact of Usability in Interactive Systems"* (Sauro, 2013). On this publication usability was explain as the effectiveness of human work. After years passed, in 1991 Shackel state that usability as the ability when it used by human easily and effective, in other word it can be defined as the measurement when user access or using a system easily, effectively and nicely (Galitz, 2007; Shackel & Richardson, 1991). Jeff Rubin stated that usefulness, efficiency, effectiveness, satisfaction and accessibility are elements of usability (Rubin, J., & Chisnell, 2008). In Handiwidjojo, Nielsen also state that the measurement of usability depends on user ability when user completed the task that given to them. Some of question for measuring usability are (Handiwidjojo & Ernawati, 2016):

1. Success Rate.
2. The Time a Task Requires.
3. Error Rate.
4. User's Subjective Satisfaction.

ANOVA

ANOVA method also called variety analysis method because of its process, ANOVA deliver variety of data based on data which it might be used as a comparison to find the causes of variations (Siagian & Sugiarto, 2006). ANOVA method usually used to find the significance differentiation of group rates. ANOVA method described by Ronald A. Fisher for helping in data analysis collected from experiment result, designed to comparing instrument from a number of experiments group or condition without increase the level of error (Rutherford, 2011).

According to Siagian (2006) there are two decision possibilities on ANOVA method i.e. accept H_0 (early hypotheses) or reject it. Early hypotheses (H_0) that stated there are no connection between Independent variable (x) and dependent variable (y). If the result from ANOVA accepted H_0 then it can be concluded that there is no real difference between groups of variance. However if the result from ANOVA refused H_0 than it can be concluded that there is difference between groups of variance. A decision to refuse or receive H_0 can be determined by ANOVA table as following:

Sources of Variation	Independent Degree	Total Quadrate	Variant	Fcount	Ftable
Between Columns	$V_1=k-1$	JKK	S^2_1	$\frac{S^2_1}{S^2_2}$	$F(V_1, V_2)$
Within Columns	$V_2=N-k$	JKS	S^2_2		

	$N-1$	JKT			
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k = Number of population or treatment

N = Number of observation = $n_1 + n_2 + n_3 + \dots + n_k$

Statistic test used was F count H_0 refused if $F_{count} > F_{table}$. It is used In order to find differentiation between variant data, ANOVA method very compatible to be used because it has various strength. With ANOVA method error risk relatively became small however analysis of several different group samples has easily to be done. Through ANOVA method, the average differences (μ) between group of variant can be seen its significance or not.

PROBLEM STATEMENTS

The development of technology faces transition in reading, including reading newspaper. People start to change from reading on printing newspaper in to reading online newspaper. The development of technology also led to the existence of different platform for accessing website including newspaper website. Some people used Personal Computer (PC), and other use different devices such as Tablet or Mobile Phone. Each device used different monitor size which led to the change of newspaper website layout. From the change on those layout, will effect on user usability. This research was conducted to find the user success rate on measuring usability in the changes of layout on Indonesian newspaper responsive website.

METHODOLOGY

Participants

Total participants in this research are 115 respondents. All respondent are student from Universitas Dian Nuswantoro who took web design course. All respondent were familiar with technology and often used PC, tablet or mobile phone.

Procedure

As for the procedures which conduct in the implementation of survey are as follows:

- 1) Participants were asked to access and open 3 Indonesia national newspaper website.
- 2) Each participants were given 3 task which contain the order to find headline, other news and economic menu. All task will be done through 3 devices, PC, tablet and Mobile Phone. Those devices have different monitor size.
- 3) After all task had done, participants were asked to fill the questionnaire containing 9 questions about success rate which is part of parameter to measured usability. Therefore this research only focus on measuring user success rate in solved all task in website.

Measures

After participants finished all assigned tasks, all result data processed using excel and counted using ANOVA method analysis to find how significance the level of user success rate toward the change of layout that occur in newspaper website, accessed on different devices which have different monitor effect user.

RESULTS OF ANALYSIS

After data processing was conducted toward questionnaire distributed to 115 respondents regarding user success rate level to find headline, other news, and economic menu in different devices (PC monitor, tablet and mobile phone) several following result are: **a. KOMPAS Website**

Ease level in finding Headline

Respondents easily found it on PC monitor compared with tablet and mobile phone. As for significance value can be seen that significance analysis for PC monitor, tablet and mobile phone in finding headline on Kompas website were significant. It can be seen from P-value (0.00023) smaller than 0.05 so Ho was rejected. The significant also can be reached from F count (8.59689) bigger than F critical (3.02213).

Ease level in finding other news title of Kompas

Respondents easily found it on PC monitor compared with tablet and mobile phone. As for significance value can be seen that significance analysis for PC monitor, tablet and mobile phone in finding other news title on Kompas website were significant. It can be seen from Pvalue (2.72523E-08) smaller than 0.05 so Ho was rejected. The significant also can be reached from F count (18.33614106) bigger than F critical (3.02213).

Ease level in finding economic menu of Kompas

Respondents easily found it on PC monitor compared with tablet and mobile phone. As for significance value can be seen that significance analysis for PC monitor, tablet and mobile phone in finding economic menu on Kompas website were significant. It can be seen from Pvalue (1.26049E-07) smaller than 0.05 so Ho was rejected. The significant also can be reached from F count (16.64795526) bigger than F critical (3.02213).

b. JPNN Website

Ease level in finding the headline title of JPNN

From data it can be seen that when finding headline in JPNN website, respondents easily found it on PC monitor compared with tablet and mobile phone. As for significance value can be seen that significance analysis for PC monitor, tablet and mobile phone in finding headline on JPNN website were significant. It can be seen from P-value (0.011118059) smaller than 0.05 so Ho was rejected. The significant also can be reached from F count (4.558896197) bigger than F critical (3.02213).

Ease level in finding other news title of JPNN

Respondents easily found it on PC monitor compared with tablet and mobile phone. As for significance value can be seen that significance analysis for PC monitor, tablet and mobile phone in finding other news title on JPNN website were significant. It can be seen from P-value (0.003376465) smaller than 0.05 so Ho was rejected. The significant also can be reached from F count (5.786683107) bigger than F critical (3.02213).

Ease level in finding economic menu of JPNN

Respondents easily found it on PC monitor compared with tablet and mobile phone. As for significance value can be seen from Pvalue (1.81337E-06) smaller than 0.05 so Ho was rejected. The significant also can be reached from F count (13.74479516) bigger than F critical (3.02213).

c. REPUBLIKA Website

Ease level in finding the headline title of Republika

Respondents easily found it on PC monitor compared with tablet and mobile phone on Republika website were significant. It can be seen from P-value (8.3858E-05) smaller than 0.05 so Ho was rejected. The significant also can be reached from F count (9.648778795) bigger than F critical (3.02213).

Ease level in finding other news title of Republika

Respondents easily found it on PC monitor compared with tablet and mobile phone. As for significance value can be seen that significance analysis for PC monitor, tablet and mobile phone in finding other news title on Republika website were significant. It can be seen from P-value (6.57496E-06) smaller than 0.05 so Ho was rejected. The significant also can be reached from F count (12.35840708) bigger than F critical (3.02213).

Ease level in finding economic menu of Republika

Respondents easily found it on PC monitor compared with tablet and mobile phone. As for significance value can be seen that significance analysis for PC monitor, tablet and mobile phone in finding economic menu on Republika website were significant. It can be seen from P-value (6.31769E-07) smaller than 0.05 so Ho was rejected. The significant also can be reached from F count (14.88748663) bigger than F critical (3.02213).

DISCUSSION

In this research there are several matters that can be able to identified the level of success rate on change of Indonesia newspaper website on PC monitor, tablet and mobile phone.

1. On Kompas.com, PC monitor has average distribution value higher than tablet and mobile. Distribution value on PC monitor higher for each task that given to user for finding headline, other news and economic menu on website. While P-Value for each task given to user having a value less than 0.05

	P-Value
Easy to find headline title on website.	0.000227635
Easy to find other news title on website.	2.72523E-08
Easy to find economic menu on website.	1.26049E-07

2. On JPNN.com PC monitor also has average distribution value higher than tablet and mobile. Distribution value on PC monitor higher for each task that given to user for finding headline, other news and economic menu on website. While P-Value for each task given to user having a value less than 0.05

	P-Value
Easy to find headline title on website.	0.011118059
Easy to find other news title on website.	0.003376465
Easy to find economic menu on website.	1.81337E-06

3. On Republika.co.id, PC monitor has average distribution value higher than tablet and mobile. Distribution value on PC monitor higher for each task that given to user for finding headline, other news and economic menu on website. While P-Value for each task given to user having a value less than 0.05

	P-Value
Easy to find headline title on website.	8.3858E-05
Easy to find other news title on website.	6.57496E-06
Easy to find economic menu on website.	6.31769E-07

When it seen deeply, average distribution value on kompas, jpnn, and republika website for each tasks that were given have not very far range yet still having significance different which be proven with P-Value in each website are bellow 0.05.

CONCLUSION

From the results and discussion exists using ANOVA, it found that the change of layout newspaper website on PC monitor, tablet and mobile phone significantly effect user on success rate which is a component of usability. That result not only be found on one website but in several website in this case were Kompas website: <http://www.kompas.com/>, JPNN website: <https://www.jpnn.com/>, and Republika website: <https://www.republika.co.id/>. As for distribution value show that PC monitor has high value which

show that user more familiar when using PC monitor at the time when accessing online news from website compare with tablet and mobile phone.

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