

Increasing Text Readability Using list Structure for Web

Sadaf Riaz, Sadique Ahmed Bugti, Walayat Hussain

Faculty of Information and Communication Technology,
Balochistan University of Information Technology, Engineering and Management Sciences,
Quetta, Pakistan

Abstract

With the increase of internet usage information circulation is majorly carried out via web pages for which web readability is a major concern and efforts are being made for improving web readability taking several factors into consideration. This research paper is based on an empirical survey that is carried out for examining the impact of text lay out on web readability identifying the preferred user choice. In this paper comparison on three different text structures on web page readability is done. The results show that majority of the participants preferred numbered list text lay out over paragraphed and pictorial in terms of both readability and time conservation.

Keywords: Readability, Reading behavior, Visual structure, Text structures, Numbered list, Flow chart, Paragraph

Corresponding author's email: sadafriaz786@hotmail.com

INTRODUCTION

Readability can be termed as the behavior through which a person reads the interactive material rather than he focuses on the meaning of the text. Readability is deemed as a human psychological response and many factors are associated with influencing its performance (Mirko et al., 2006).

In the last decade rigorous growth of the Internet, defined the organization of information as an essential significant part of the web site development. The majority of the websites uses a convenient and attractive graphical user interface design with the motive of catching user's attention and reflecting graphical picture of the organization, as a matter of the fact readability of the content presented is not well treated (Connolly, 1998).

It has been known since decades that the pictorial pattern of a text has significant consequences on the reading pattern, text conception and its memory, text pointing methods like headline, previews and composition prompts that emphasizes the properties of the text substance generally provide the beneficial outcome on readability

(Lorh, 1989).

Previous research was conducted on examining the consequence of constitution of black and white content, recent studies are focused on reading from computer panels, these days information is extracted and read through web pages however, limited research has been conducted on investigating the effects of text layouts on web readability and lacks generalized results on the readability property of web pages compared to those of printed materials (Bartell et al., 2006).

Often the text is presented in a list wise/ bulleted lay out, especially in methodological texts where procedures are given for example in manuals listed lay outs are widely used, the most common reason for using such format is that it helps in describing actions to the user immediately preserving their time, enumerated and bulleted lists are most often seen in several text types but little literature is available on the effects of list lay outs on web readability, furthermore the results of many studies are found to be ambiguous (Boekelder and Steehouder, 1998). The major aim of this research report is to examine the influence of text lay outs on

web readability property, to investigate this matter we have carried out an empirical study based on users from different age groups and backgrounds.

The study was empirically designed based on practical experimentation, where participants were made to use computers with web pages available in three different formats at a time and they were asked to read the content in equal specified time intervals to enhance the exterior strength of our study. The effects of the text lay outs were measured by asking the respondents to fill out.

The designed questionnaires based on their experience with the three lay outs. The data was analyzed and the percentages were drawn for formulating the results.

Background

The Web is becoming the standard media for disseminating information, special matter of concern in using web is its property of readability which consists of both legibility and comprehension, legibility is based depends on several factors, like font size, typeface, layout, color schemes, background texture, font style as well as technical aspects like computer pixel size where comprehension relies on sentence structure, length and word choice (Mirco et al., 2006, Chen et al., 2008, Graham, 1999).

Much research has been conducted on online content reading with emphasis on new interaction methods for improving readability, these include as footnotes, imaging, skimming, fast navigation and obtaining previews (Chen et al., 2008, Graham, 1999, Schilit et al., 1998).

Few researchers also focused on the effect of changes in presentation of fonts on reading speed and conception (Bernard et al., 2001, Boyarski et al., 1998, Dillon et al., 2006. Hornbæk *et al.*) analyzed the reading models and visualizations for reading the electronic documents, the analysis depicted that different visualization interfaces may aid in diverse conditions (Hornbaek and Frokjaer, 2001).

Yu and Miller studied web prototypes utilizing distraction elimination and text transformation and identified that a lengthy web page complicates readability and found to

important factors as remedial these include text separation layout and spacing (Yu and Miller, 2010).

Lorch and Chen (1986) worked on numbering sentences and explain that numeral statements in the description text collect more awareness to the statements, and these statements were improved remembering than non numerical statements, though the members in this experiment had to study the descriptive statements, containing the convention of figures give the impression to be rather aberrant and that could cause for drawing attention of the readers.

Diehl and Mills (1995) performed a comparative analysis conducted and examined the outcomes of list wise statement smeasure up tostaments that were arranged by means of complete extensive paragraphs, their consequences or out put shows that listed statements provides improved and proficient job presentation though, statements in paragraph format resulted in improved memory for the content. Geiger and Millis (2004), informed that a technical textual content that is comprises of paragraphs direct to enhanced impression of the content than the enlisted content structure events, present that the study members were requested to memories that they had to carry out the same joblater on, theirs study proved, unpredictably, quite opposite belongings of lists.

MATERIALS AND METHODS

It has been recognized for a long time that the pictorial representation of a text has significant belongings on understanding and reading performance, but amazingly small research based on empirical survey has been done to describe guiding principle for the presentation of textual material on websites. (Figure 1-3).

Participants

A total of fifty participants were involved in carrying out the survey, the participants were grouped for data analysis based on several aspects like age groups, sex, computer skills, literacy aspects, reading proficiency and occupational status.

Web Pages

Three web page carrying information about university admission system was designed and used for conducting experiments.

The first web page consisted of paragraph format having detailed text content including all the information required for taking admission in the university. The second web page had numbered list format, having summarized procedural text in the form of list. The third web page had pictorial format, showing admission procedure in the form of flow chart. Apart from the textual formation, the web page design and color scheme was exactly the same for all three pages.



Figure 1: Paragraph web page template used for analysis

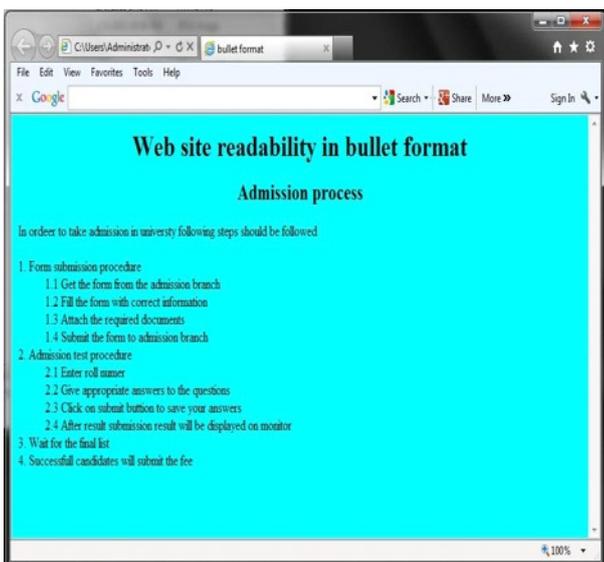


Figure 2: Number list web page template used for analysis

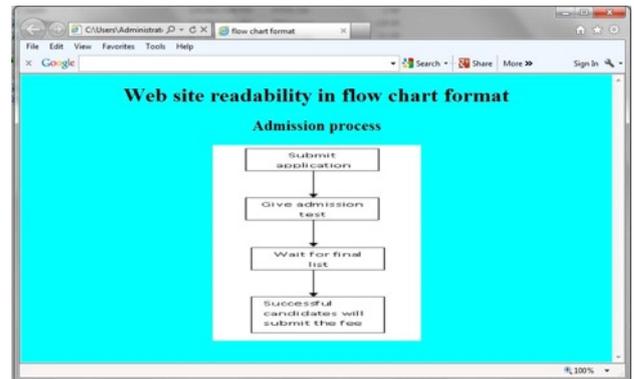


Figure 3: Flow Chart web page template used for analysis

Questionnaire Design

For data analysis and measuring participants preference over the content of the web page, a survey questionnaire was assembled that contains 10 multiple choice questions.

Survey

All the participants were asked to read the contents on the three web pages. The respondents were then asked to fill out the designed questionnaires.

Data Analysis

Data analysis was based on the data gathered from each questionnaire. The respondent group was analyzed and the percentages were drawn out.

RESULTS

The results of the study are presented in the following figure:

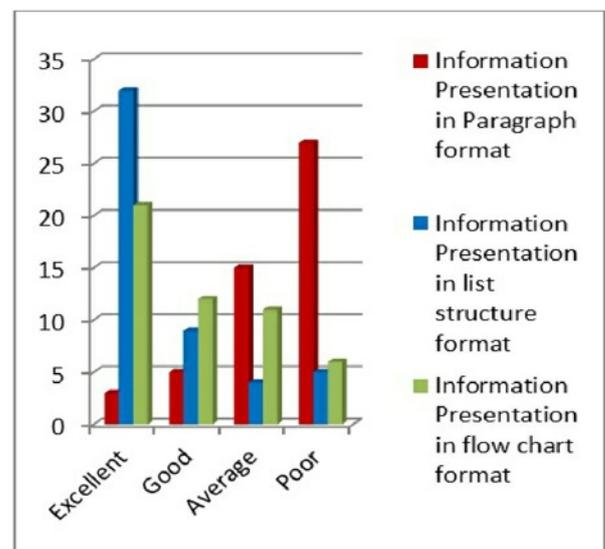


Figure 4, shows that the highest number of participants appreciated numbered list layout.

DISCUSSION

The visual lay out of a text has substantial outcomes on the reading pattern, text conception and its memory, text pointing methods like headline, previews and composition prompts that emphasizes the properties of the text substance generally provide the beneficial outcome on readability of the web page (Lorch, 1989).

The current study investigated the effect of text structures or text layouts on web page readability in an experimental setup with participants having different age groups and back grounds.

The results of this study are quite apparent and depicts that the numbered list was preferred over paragraphed and pictorial text lay outs when tested for readability property. Numbered list format was also appreciated with the maximum score by the majority of the respondents. Furthermore numbered list format also scored highest when tested for the parameter of shortest time in comprehending the task over the other two web page formats.

The results signify the importance of structured text on web readability and strengthens the usage of list wise structuring of text on web pages in terms of users' preference and improving readability, the results are quite in agreement with the study that investigated the effect of paragraphed and list wise structuring of texts on browsing behavior (Karrema and Loorbach, 2007).

The results presented in this research report are distinctly related to some of the outcomes of study that examined the consequence of the organization of the text in black and white (Diehl and Mills, 1995).

Future Work

Further thorough research is required for finding finer details on effects of text layouts on web readability so the next plan is to focus on three different directions in our future work. First plan to take more parameters in to account like memory and comprehension in finding out the effects of text structure on web page readability. Second plan to test text structures for diverse and complicated web sites and third plan to induct large number of participants in our survey of similar capacity

and educational background to find out their preferences and appreciation for the text structures in terms of readability.

CONCLUSION

The current study proposes that the text structure is seemed to have a significant impact on web page readability, for the procedural instruction type of web pages it is recommended to organize text in numbered list in order to improve web readability. The shortest comprehension time for performing the task was also associated with the numbered list structure therefore, the survey also recommends that numbered list conserves time as well.

Based on the results of this study it can be predictable that a list text structure has additional complimentary results than the text structure in paragraph or graphical format.

REFERENCES

- Bartell AL, Schultz and Spyridakis JH. (2006). The Effect of Heading Frequency on Comprehension of Print versus Online Information. *Technical Communication*. 53: 416-426.
- Bernard M, Liao CH and Mills M. (2001). The effects of font type and size on the legibility and reading time of online text by older adults. *CHI '01 Extended Abstracts*. 175-176.
- Boekelder A and Steehouder M. (1998). Selecting and Switching: Some Advantages of Diagrams over Tables and Lists for Presenting Instructions. *IEEE Transactions on Professional Communication*. 41: 229 -241.
- Boyarski D, Neuwirth C, Forlizzi J and Regli SH. (1998). A study of fonts designed for screen display. *Proceedings of CHI*. 98: 87-94.
- Chen N, Guimbretiere F, Dixon M, Lewis, C and Agrawala M. (2008). Navigation techniques for dual-display ebook readers. *Proceedings of CHI '08*. 1779-

1788.

- Connolly K Legibility and Readability of Small Print. (1998). Effects of Font, Observer Age and Spatial Vision. A Master of science Thesis, Department of Psychology, Calgary Alberta.
- Diehl VA and Mills C. (1995). The Effects of Interaction with the Device Described by Procedural Text on Recall, True/False, and Task Performance. *Memory & Cognition*. 23: 675-688.
- Dillon A, Kleinman L, Choi GO and Bias R. (2006). Visual search and reading tasks using ClearType and regular displays: two experiments. Proceedings of CHI 06. 503-511.
- Geiger JF and Millis KK. (2004). Assessing the Impact of Reading Goals and Text Structures on Comprehension. *Reading Psychology*. 25: 93-110.
- Graham J. (1999). The reader's helper: a personalized document reading environment. Proceedings of CHI 99. 481-488.
- Hornbaek K and Frokjaer E. (2001). Reading electronic documents: The usability of linear, fisheye, and overview+detail interfaces. In Proceedings of the ACM Conference on Human Factors in Computing Systems, CHI Letters. 3: 293–300.
- Karreman J and Loorbach N. (2007). Paragraphs or Lists? The Effects of Text Structure on Web Sites. *IEEE*, 1: 1243-9.
- Lorch RF. (1989) .Text-Signaling Devices and their Effects on Reading and Memory Processes. *Educational Psychology Review*. 1: 209-234.
- Lorch Rf and Chen AH. (1986). Effects of Number Signals on Reading and Recall. *Journal of Educational Psychology*. 8: 263- 270.
- Mirko G, Iztok H and Tomaz T. (2006.) Factors Affecting the Readability of Colored Text in Computer Displays. 28th Int. Conf. Information Technology Interfaces ITI. 19-22, Cavtat, Croatia.
- Schilit BN, Golovchinsky G and Price MN. (1998). Beyond paper: supporting active reading with free form digital ink annotations. Proceedings of CHI. 98 249-256.
- Yu C and Miller RC. (2010). Enhancing Web Page Readability for Non-native Readers. *CHI*. 10–15, ACM Atlanta,