

Impact of Web Readability on Cultural Usability

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Abstract

Web is considered one of the greatest developments of twentieth century. It provides a diverse range of applications and therefore needs different usability designs. Web usability has become a vital aspect for the success of web applications. Web usability is about fulfilling the goals and expectations of users and making their stay on the website pleasant. Web usability design includes three aspects: User Research, Web Design and Web Evaluation [1].

Today, the web design is moving from technology to users i.e. it is more user-centered than ever before. “Web design must directly face users with the specific needs, and must ensure that users are pleasant to successfully complete tasks with it.” [1].

In this study, we have studied the factors which affect the web readability in this part of the world. We conducted the survey in order to check how different factors play their part for the people who speak languages which are written right to left.

Keywords: *Usability engineering, cultural usability, accessibility, human computer interaction, web readability.*

1 Introduction

Culture plays an important role for the success of any software project especially for success of web applications and websites. It is because the web applications are accessed throughout the world by people who belong to different cultures, have different beliefs, have different mindset and perception. Everyone expects from the websites according to his/her own mental level.

Web readability is one thing which is affected too much by cultural differences. It is because the differences in the spoken languages and the way these languages are written. Some languages are written left to right for example English Language. Others are written from right to left for example Urdu and Arabic. Still others are written from top to bottom such as Japanese. When people belonging to these languages access a website which is developed for example in English language, they may find difficulty in reading.

Many researches have been carried out to find the cultural aspects which affect the web readability the most. Web readability is mostly affected by the factors including The Physiology of Reading, Typography, Upper Case vs. Lower Case, Text Alignment, Column Width, Hierarchy, Contrast, Line Height, Letter Spacing, Line Length, User-Friendly Headers, Scannable Text, White Space, Consistency, Density of Text, Organization of Information, Use of Separators and Margins [8, 9]

2 Methodology

a. Cultural Usability:

i. Culture:

“Culture is defined as the shared patterns of behaviors and interactions, cognitive constructs, and affective understanding that are learned through a process of socialization. These shared patterns identify the members of a culture group while also distinguishing those of another group” [6].

ii. Localization:

It is defined as the adaptation of a product to meet the language, cultural and other requirements of a target market [7].

iii. Internationalization:

It is defined as the design and development of a product that provides easy localization for different target markets [7].

Cultural aspects cannot be ignored in this globalization time. Today, the websites are designed which are accessed throughout the world by people belonging to different ethnic groups having very different religious beliefs. All these people have different cultures and varying expectations from the websites. Today the websites do offer some customizations, ignoring any culture specific designs or aspects.

There are many cultural factors which need to be focused while developing the websites for different cultures. These factors include: Content Type, Language, High and Low Context, Color Combination, Page Layout,

Representations, Symbols and Icons, Hyperlinks, Graphics and Animation, Cognition, Personality, Individualism, Perception, Power Distance, Masculinity and Femininity, and Uncertainty Avoidance.

Majority of the software and interfaces developed in America are based on the culture of America including American metaphors, color combinations, representation and navigations. Such systems ignore the fact that color combinations and text layouts differ from culture to culture. Visual representations and icons are among other cultural issues [2].

In order to achieve compatibility and standardization, the cultural aspects are lost often times. Research conducted by Legend Holdings Ltd has found that people from southern Chinese provinces use bright colors while people from north Chinese provinces use subdued colors [3]. With better understanding of cultural differences and values, we can design products which meet the users' needs and expectations and provide them more pleasant user experience.

Inga Burgmann et al. [4] conducted a research of cultural impacts on Web design. Their research was conducted in Germany, Britain and Greece. They found out that on average the German sites use more number of hypertext links than others while Greece use the lowest number of links. Cognition, Personality, Individualism, Perception and Uncertainty Avoidance are the dominant factors in interface design and usability [2].

Another study was conducted on the users of the smart phones in Korea and USA [5]. Smart phone users spend enough time on reading and writing text messages. The study found out that Koreans prefer the font size on the other hand the Americans prefer font height. The differences were found because of the differences in the languages.

b. Readability:

Readability refers to how efficiently a reader's eyes follow the flow of the text [8]. Readability is another important aspect of web usability which can affect the success of a website. Readability affects the information presented in the text. More readable text is easy to extract the information from while poor readability makes users run away from the website. Page layout design focuses on readability as you want the users to absorb the information presented in the text rather than misinterpreting it.

There are a number of factors that affect the readability of a website. These factors include: The Physiology of Reading, Typography, Upper Case vs. Lower Case, Text Alignment, Column Width, Hierarchy, Contrast, Line Height, Letter Spacing, Line Length, User-Friendly Headers, Scannable Text, White Space, Consistency, Density of Text, Organization of Information, Use of Separators and Margins [8, 9].

Page layout that is more natural, enhance the comprehension of the reader. In contrast, any layout which does not follow the natural eye movement will lose the reader's concentration. In a research conducted by Wheildon, 67 out of

100 users found that the layouts which provided natural eye movement were easy to comprehend and extract information [9].

Typography plays a vital role in providing good readability. Font face, size and height are the important factors too. Researchers recommend that the font size be 10 or more points. Fancy font faces distract the users and thus affect the readability.

Another readability factor is the use of Upper Case and Lower Case letters for headings. Often times, users find it hard to read a text or heading that is written in all upper case letters while for other users all lower case letters can be hard. It is recommended to capitalize the first letter of the first word of the heading and use lower case letters for rest.

Text alignment is another issue. According to some researchers, justified text alignment is considered easy to comprehend as it provides natural eye movement. It creates even line ends. Some researchers emphasize on using the left aligned text as it provides even word spacing and easy recognition of word groups [9].

Using Hierarchy improves the readability. It refers to the differentiation between headers and body. Generally, the header has larger size than the body for differentiation. It tells the users where to start and where to stop.

Color contrast also affects the readability of the web. Black text on white background or white text on black background is recommended contrast. It suits people with eyesight problems. Some contrasts affect readability like black on red black on blue or light grey on white as these combinations strain the eyes [10].

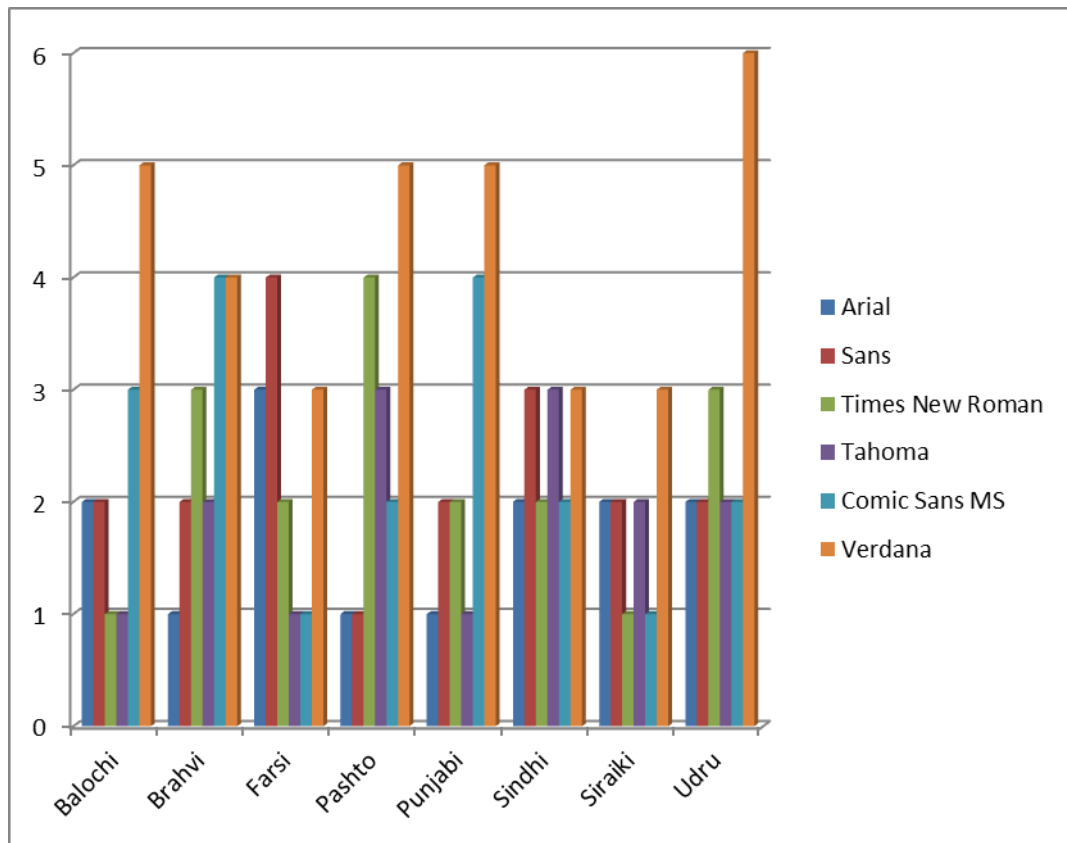
Line Height, length and Letter spacing are important factors too. Enough line height is important. If the height is too small, the lines will mix together. Lines with large heights will make them appear separate sections. Line length signifies the words per line. Good line length is important as it makes moving from one line to another natural and easy for the reader.

Consistency is considered one of the important factors in usability as well as for the readability. It implies that all headings of the same importance must have a consistent look i.e. they must have same font face, size and color. It also helps in organizing the contents of the web.

Use of separators can also enhance the readability. It is normally used to divide contents into different sections and makes content appear clean and organized.

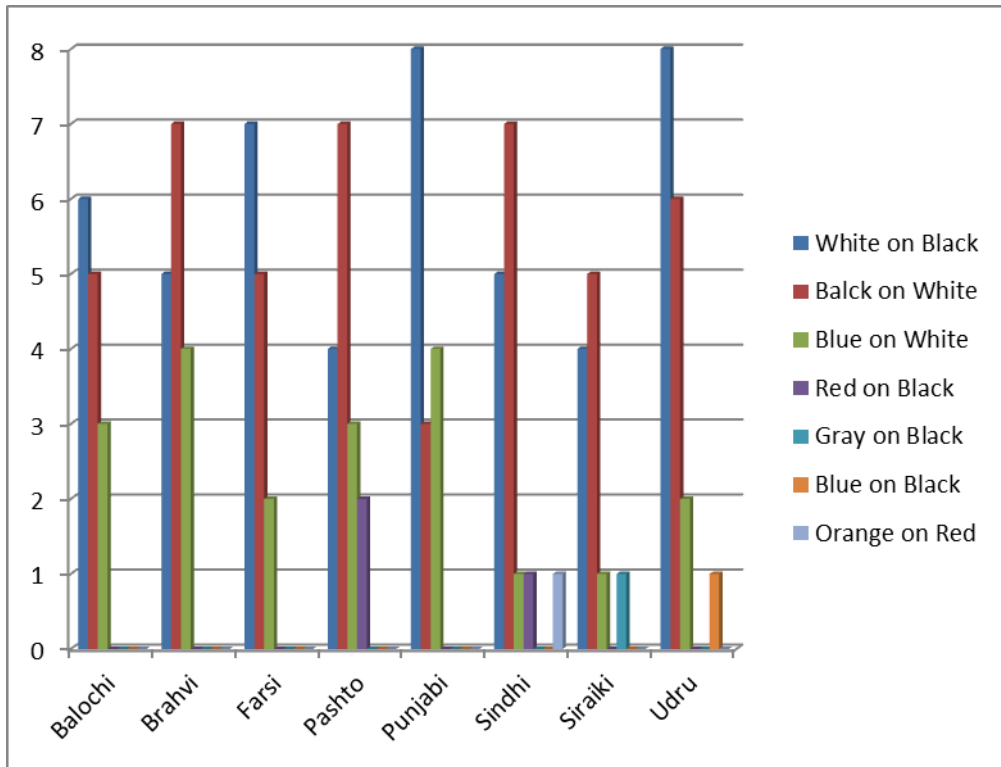
3 Survey

| Question 1: Which font do you prefer? | | | | | | | |
|---------------------------------------|-------|------|-----------------|--------|---------------|---------|-------|
| Cultures | Arial | Sans | Times New Roman | Tahoma | Comic Sans MS | Verdana | Total |
| Balochi | 2 | 2 | 1 | 1 | 3 | 5 | 14 |
| Brahvi | 1 | 2 | 3 | 2 | 4 | 4 | 16 |
| Farsi | 3 | 4 | 2 | 1 | 1 | 3 | 14 |
| Pashto | 1 | 1 | 4 | 3 | 2 | 5 | 16 |
| Punjabi | 1 | 2 | 2 | 1 | 4 | 5 | 15 |
| Sindhi | 2 | 3 | 2 | 3 | 2 | 3 | 15 |
| Siraiki | 2 | 2 | 1 | 2 | 1 | 3 | 11 |
| Udru | 2 | 2 | 3 | 2 | 2 | 6 | 17 |

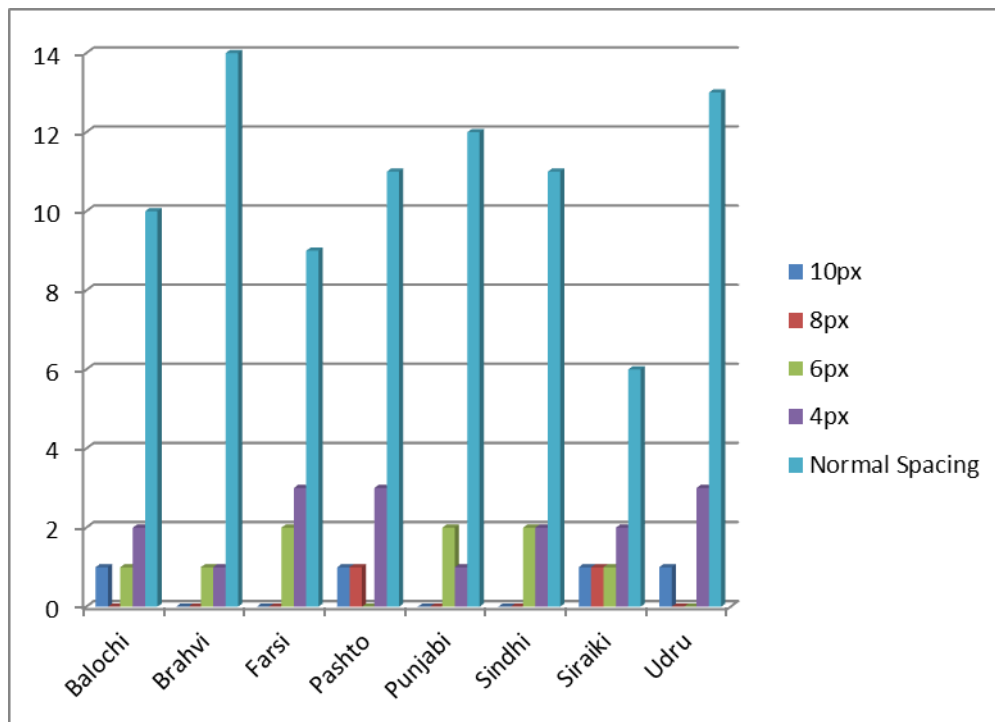


Question 2: Which combination is more readable?

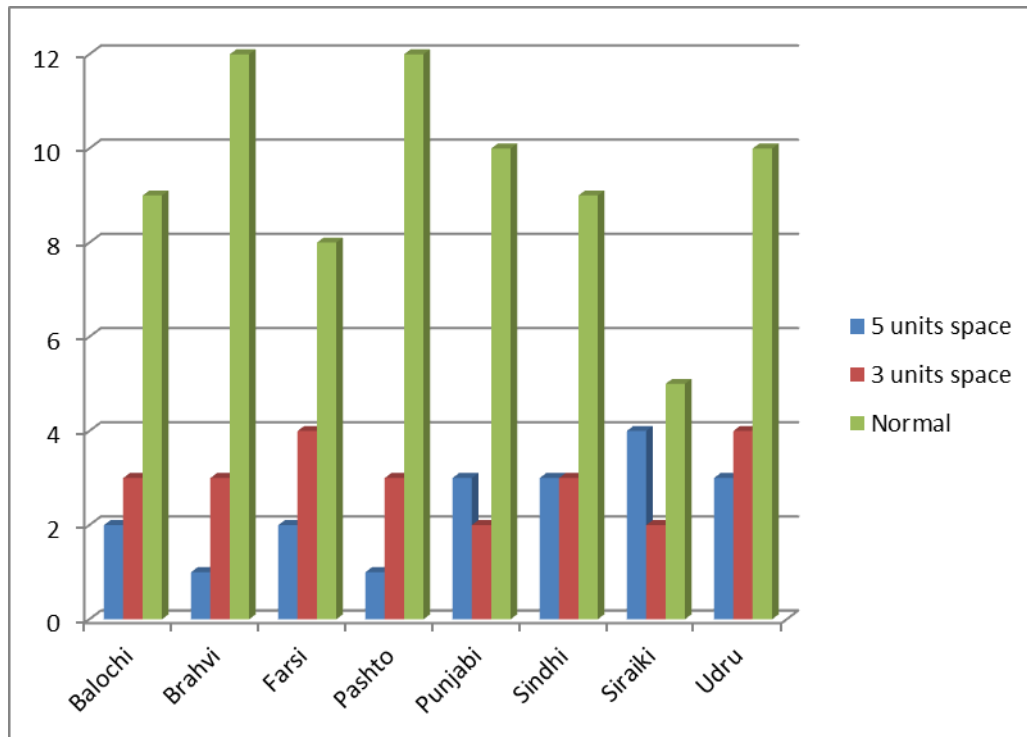
| Cultures | White on Black | Balck on White | Blue on White | Red on Black | Gray on Black | Blue on Black | Orange on Red | Total |
|----------|----------------|----------------|---------------|--------------|---------------|---------------|---------------|-------|
| Balochi | 6 | 5 | 3 | 0 | 0 | 0 | 0 | 14 |
| Brahvi | 5 | 7 | 4 | 0 | 0 | 0 | 0 | 16 |
| Farsi | 7 | 5 | 2 | 0 | 0 | 0 | 0 | 14 |
| Pashto | 4 | 7 | 3 | 2 | 0 | 0 | 0 | 16 |
| Punjabi | 8 | 3 | 4 | 0 | 0 | 0 | 0 | 15 |
| Sindhi | 5 | 7 | 1 | 1 | 0 | 0 | 1 | 15 |
| Siraiki | 4 | 5 | 1 | 0 | 1 | 0 | 0 | 11 |
| Udru | 8 | 6 | 2 | 0 | 0 | 1 | 0 | 17 |



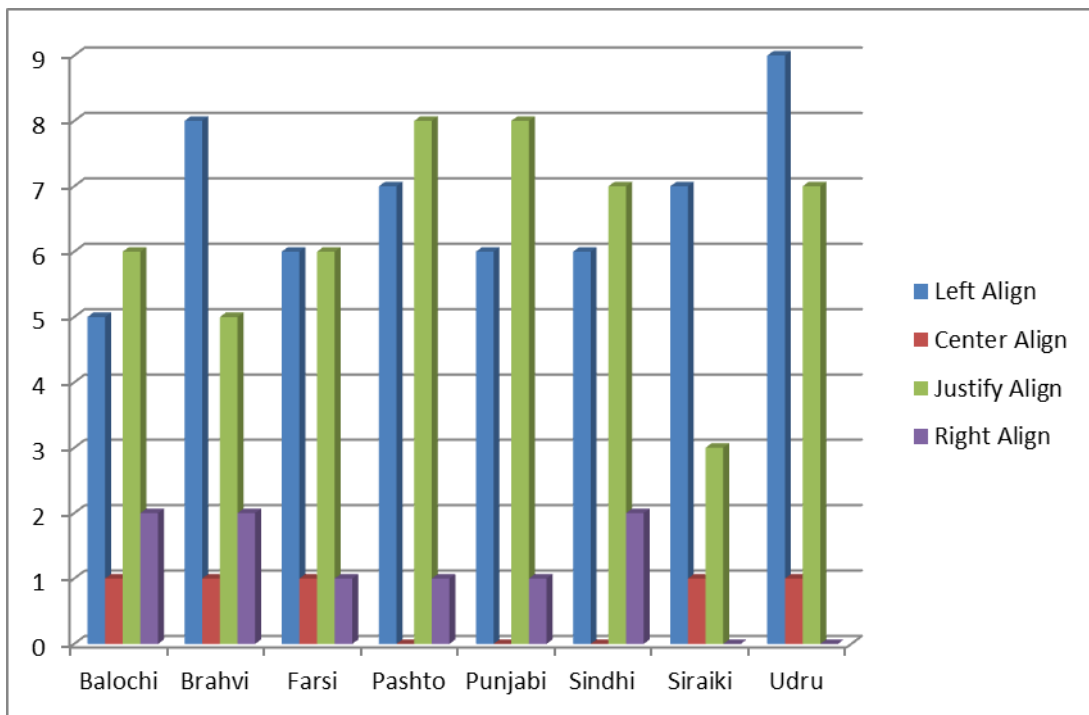
| Question 3: Which character spacing is more readable? | | | | | | |
|---|------|-----|-----|-----|----------------|-------|
| Cultures | 10px | 8px | 6px | 4px | Normal Spacing | Total |
| Balochi | 1 | 0 | 1 | 2 | 10 | 14 |
| Brahvi | 0 | 0 | 1 | 1 | 14 | 16 |
| Farsi | 0 | 0 | 2 | 3 | 9 | 14 |
| Pashto | 1 | 1 | 0 | 3 | 11 | 16 |
| Punjabi | 0 | 0 | 2 | 1 | 12 | 15 |
| Sindhi | 0 | 0 | 2 | 2 | 11 | 15 |
| Siraiki | 1 | 1 | 1 | 2 | 6 | 11 |
| Udru | 1 | 0 | 0 | 3 | 13 | 17 |



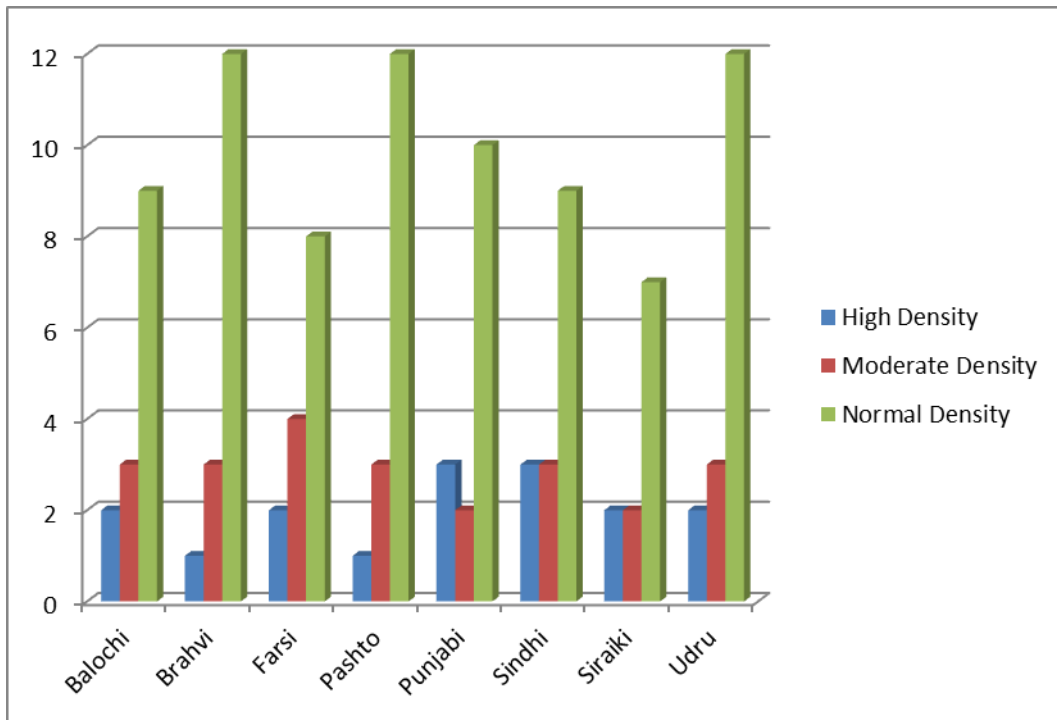
| Question 4: Which line spacing is more readable? | | | | |
|--|---------------|---------------|--------|-------|
| Cultures | 5 units space | 3 units space | Normal | Total |
| Balochi | 2 | 3 | 9 | 14 |
| Brahvi | 1 | 3 | 12 | 16 |
| Farsi | 2 | 4 | 8 | 14 |
| Pashto | 1 | 3 | 12 | 16 |
| Punjabi | 3 | 2 | 10 | 15 |
| Sindhi | 3 | 3 | 9 | 15 |
| Siraiki | 4 | 2 | 5 | 11 |
| Udru | 3 | 4 | 10 | 17 |



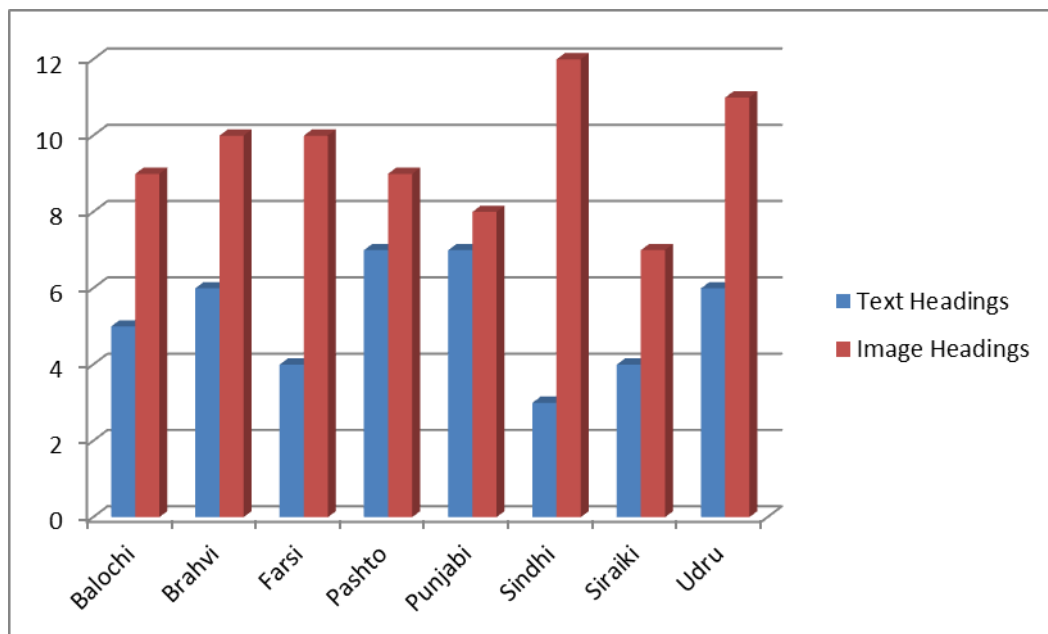
| Question 5: Which of the following paragraph is more readable? | | | | | |
|--|------------|--------------|---------------|-------------|-------|
| Cultures | Left Align | Center Align | Justify Align | Right Align | Total |
| Balochi | 5 | 1 | 6 | 2 | 14 |
| Brahvi | 8 | 1 | 5 | 2 | 16 |
| Farsi | 6 | 1 | 6 | 1 | 14 |
| Pashto | 7 | 0 | 8 | 1 | 16 |
| Punjabi | 6 | 0 | 8 | 1 | 15 |
| Sindhi | 6 | 0 | 7 | 2 | 15 |
| Siraiki | 7 | 1 | 3 | 0 | 11 |
| Udru | 9 | 1 | 7 | 0 | 17 |



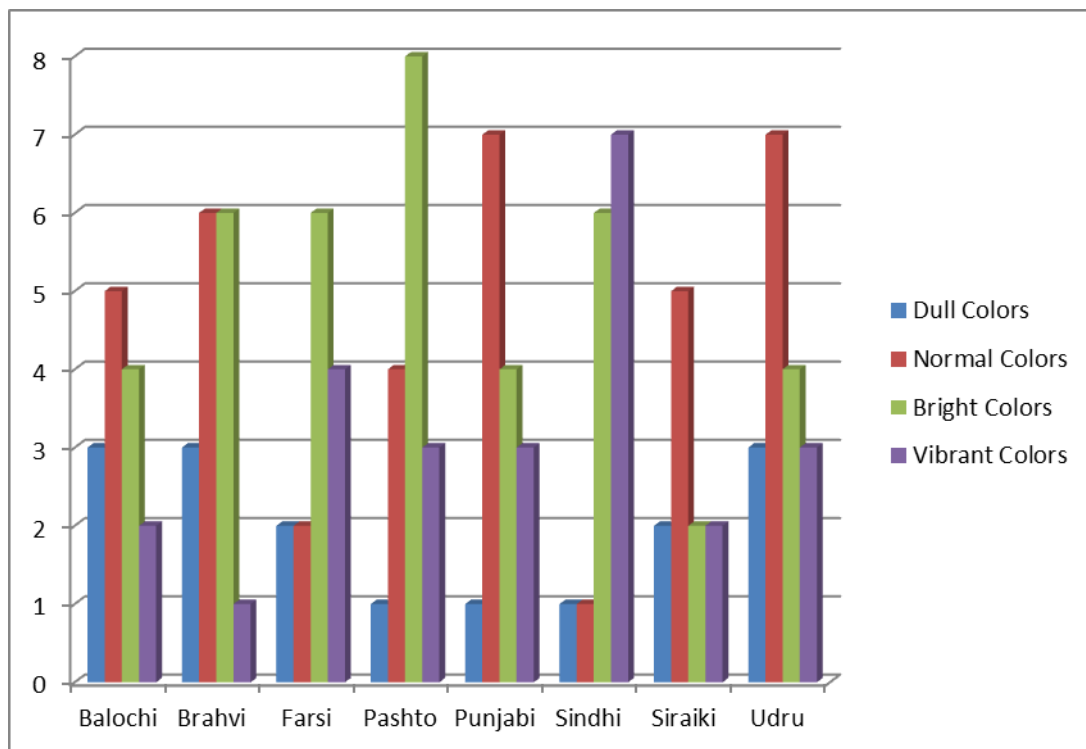
| Question 6: Which of the following paragraph is more dense? | | | | |
|---|--------------|------------------|----------------|-------|
| Cultures | High Density | Moderate Density | Normal Density | Total |
| Balochi | 2 | 3 | 9 | 14 |
| Brahvi | 1 | 3 | 12 | 16 |
| Farsi | 2 | 4 | 8 | 14 |
| Pashto | 1 | 3 | 12 | 16 |
| Punjabi | 3 | 2 | 10 | 15 |
| Sindhi | 3 | 3 | 9 | 15 |
| Siraiki | 2 | 2 | 7 | 11 |
| Udru | 2 | 3 | 12 | 17 |



| Question 7: Do you prefer simple text headings or image headings? | | | |
|--|----------------------|-----------------------|--------------|
| Cultures | Text Headings | Image Headings | Total |
| Balochi | 5 | 9 | 14 |
| Brahvi | 6 | 10 | 16 |
| Farsi | 4 | 10 | 14 |
| Pashto | 7 | 9 | 16 |
| Punjabi | 7 | 8 | 15 |
| Sindhi | 3 | 12 | 15 |
| Siraiki | 4 | 7 | 11 |
| Udru | 6 | 11 | 17 |

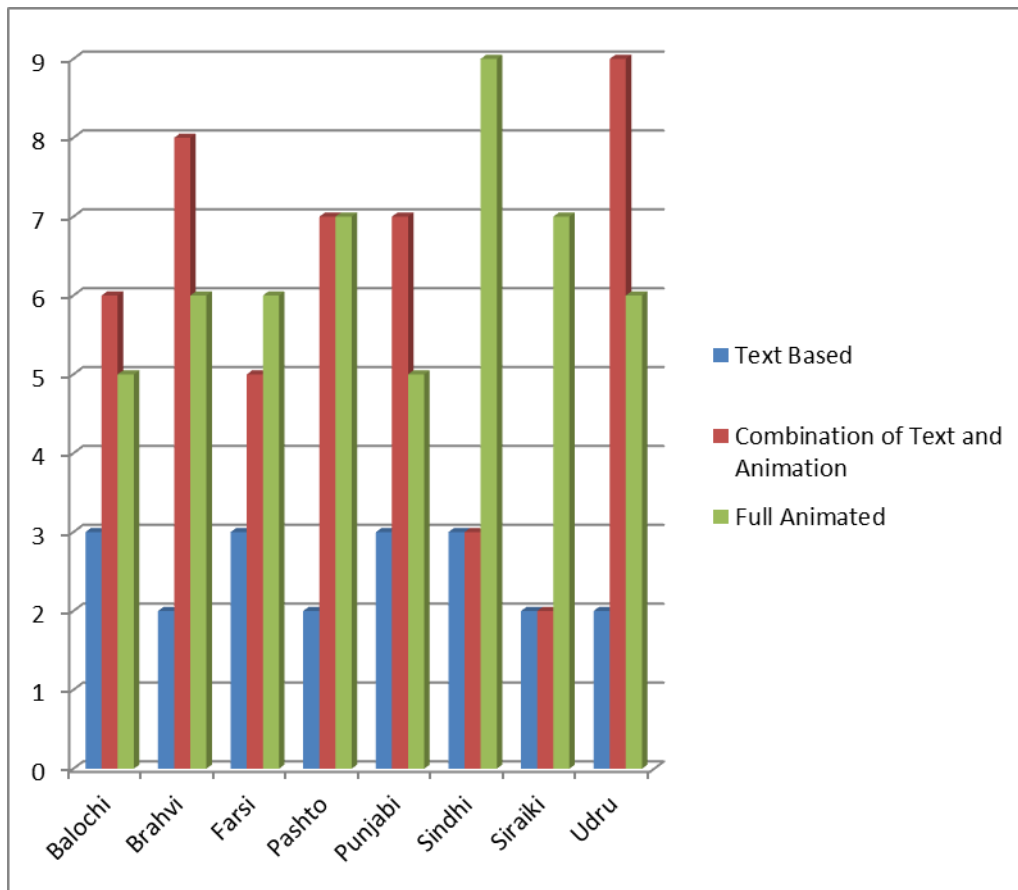


| Question 8: Which color scheme would you prefer on the web? | | | | | |
|---|-------------|---------------|---------------|----------------|-------|
| Cultures | Dull Colors | Normal Colors | Bright Colors | Vibrant Colors | Total |
| Balochi | 3 | 5 | 4 | 2 | 14 |
| Brahvi | 3 | 6 | 6 | 1 | 16 |
| Farsi | 2 | 2 | 6 | 4 | 14 |
| Pashto | 1 | 4 | 8 | 3 | 16 |
| Punjabi | 1 | 7 | 4 | 3 | 15 |
| Sindhi | 1 | 1 | 6 | 7 | 15 |
| Siraiki | 2 | 5 | 2 | 2 | 11 |
| Udru | 3 | 7 | 4 | 3 | 17 |

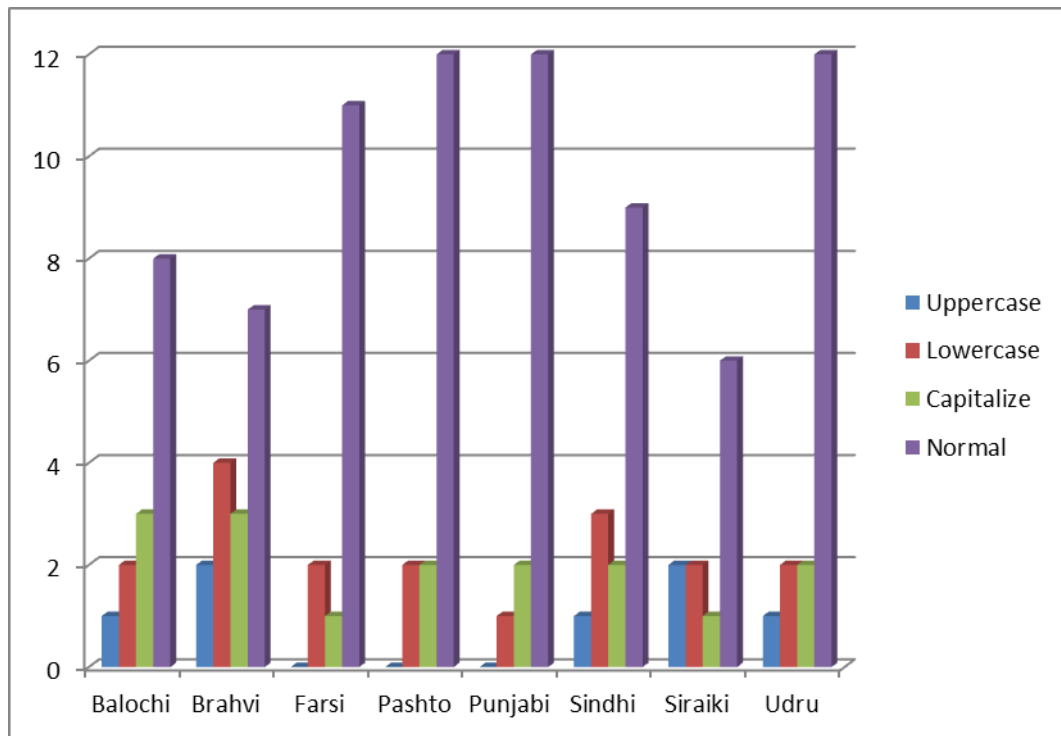


Question 9: Do you prefer text based web or animated flash based web?

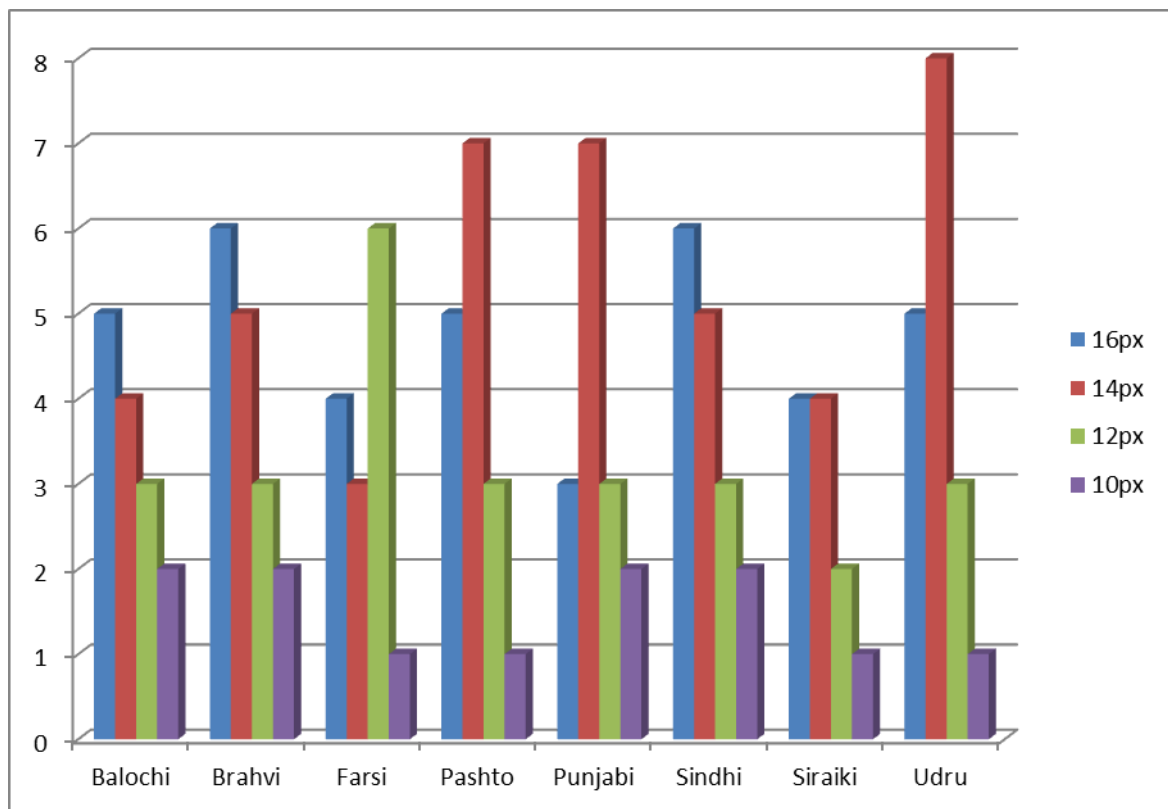
| Cultures | Text Based | Combination of Text and Animation | Full Animated | Total |
|----------------|------------|-----------------------------------|---------------|-------|
| Balochi | 3 | 6 | 5 | 14 |
| Brahvi | 2 | 8 | 6 | 16 |
| Farsi | 3 | 5 | 6 | 14 |
| Pashto | 2 | 7 | 7 | 16 |
| Punjabi | 3 | 7 | 5 | 15 |
| Sindhi | 3 | 3 | 9 | 15 |
| Siraiki | 2 | 2 | 7 | 11 |
| Udru | 2 | 9 | 6 | 17 |



| Question 10: Which of the following paragraph style is more readable? | | | | | |
|---|-----------|-----------|------------|--------|-------|
| Cultures | Uppercase | Lowercase | Capitalize | Normal | Total |
| Balochi | 1 | 2 | 3 | 8 | 14 |
| Brahvi | 2 | 4 | 3 | 7 | 16 |
| Farsi | 0 | 2 | 1 | 11 | 14 |
| Pashto | 0 | 2 | 2 | 12 | 16 |
| Punjabi | 0 | 1 | 2 | 12 | 15 |
| Sindhi | 1 | 3 | 2 | 9 | 15 |
| Siraiki | 2 | 2 | 1 | 6 | 11 |
| Udru | 1 | 2 | 2 | 12 | 17 |



| Question 11: Which of the font size would you prefer? | | | | | |
|---|------|------|------|------|-------|
| Cultures | 16px | 14px | 12px | 10px | Total |
| Balochi | 5 | 4 | 3 | 2 | 14 |
| Brahvi | 6 | 5 | 3 | 2 | 16 |
| Farsi | 4 | 3 | 6 | 1 | 14 |
| Pashto | 5 | 7 | 3 | 1 | 16 |
| Punjabi | 3 | 7 | 3 | 2 | 15 |
| Sindhi | 6 | 5 | 3 | 2 | 16 |
| Siraiki | 4 | 4 | 2 | 1 | 11 |
| Udru | 5 | 8 | 3 | 1 | 17 |



4 Conclusion:

In this study, cultural usability aspects as well as readability aspects have been discussed. Some case studies have also been presented. Culture and Readability have become the important features in this globalization era. For a successful software system, it is important to provide customization based on cultural aspects. Providing merely theme customizations will not be sufficient.

On the other hand, readability is important too. People want to get information from the websites rather wasting their time and stay on the websites. There is a need to provide text that follows the natural flow and is easily scannable and comprehensible.

Different cultures have different languages and each language poses its own readability challenges. Some languages are written left to right, others are written from right to left while other are written top to bottom. While developing a website which provides support for multiple languages, must fulfill the readability issues discussed here.

Languages in this part of the world are written from right to left while the language mostly found on the web is English which is written left to right. Therefore people prefer to use left align or justify align text. Text in normal casing is preferred one. They also prefer to use bright colors over dull or vibrant colors. Text size of 14px or more is the preferred one. Generally graphics work is more preferred for headings and other web contents. Normal letter spacing and line height is more readable too

In order to create fully usable websites, we need to implement all the rules of readability and cultural usability.

References:

- [1] Pei Yen, Jiao Guo, The Research of Web Usability Design, 2010, Volume 4, IEEE
- [2] Huiyang Li, Xianghong Sun, Kan Zhang, Culture-Centered Design: Cultural Factors in Interface Usability and Usability Tests, 2010, IEEE, Eighth ACIS International Conference on Software Engineering, Artificial Intelligence, Networking, and Parallel/Distributed Computing
- [3] Marcus, A., Cross-cultural, global, and mobile user interface design, 2005, HCI International: 11th International Conference on Human-Computer Interaction, Las Vegas, USA
- [4] Inga Burgmann, Philip J. Ktchen, Russell Willians. Does culture matter on the web? Marketing Intelligence & Planning, 62-73. 2006.

- [5] Sungwook Jung, Youngjae Lim, Eui S. Jung and Jean Jung, Cultural differences in display design for mobile web-browsing tasks, 2010, IEEE
- [6] <http://www.carla.umn.edu/culture/definitions.html>
- [7] <http://www.w3.org/2006/Talks/fundamentos-web-ri/>
- [8] <http://www.smashingmagazine.com/2009/03/18/10-principles-for-readable-web-typography/>
- [9] http://writing.colostate.edu/guides/documents/desktop_publishing/pop5q.cfm
- [10] http://www.w3schools.com/quality/quality_readability.asp