Analyzing readability issues in an infographic webpage

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**ABSTRACT**

In this paper, we provide analysis and solutions of the problems faced by users while reading an infographic web page which contains image illustrations for textual information. An infographic webpage is susceptible to many design flaws. We collected data from different user groups by means of observations and survey. We established a cause-and-effect relationship between any particular design flaw and the magnitude of repercussions it has on the overall reading experience. After analyzing user feedbacks and common issues that they encountered on a daily basis, we identified potential areas of improvement. We developed 3 different Chrome extensions to solve these issues and worked closely with the user groups to further improve these solutions. In this paper, we present quantitative and qualitative evaluation of these solutions. Alongside, we gauge users’ proclivity for a certain solution and the reasons why they prefer one solution over the other.

**Keywords**

Readability, Comprehension, Context, Images, Web Page, Information, Concentration, Agile, Chrome extension

# INTRODUCTION

# In this age of internet, world wide web has become a major source of information. Majority of people use internet as a knowledge repository, thanks to the zetabytes of data uploaded on webpages. This knowledge comes from variety of sources such as blogs, science magazine, social media, community forums, websites etc. One common problem with information provided on the internet is that it does not come in the form of pure text. Articles over the internet are replete with image references and tabular data. It is observed by surveys and interviews conducted by our team, that not all peoples are really comfortable with way the information is provided over the internet.

Browser acts as a window to the world wide web and conclusively, browser extension provides the best outreach. An extension, is quite simply, a third party library that “plugs in” to the browser and process the pages that the browser loads, thus adding on to the browser UI. According to the usage statistics provided by w3schools, Google Chrome is the most used web browser worldwide[10]. Thus, developing the solutions as Chrome extensions was almost intuitive.

Since, user feedback was an integral part of this project, we have used Agile development methodology. We followed an incremental approach for development and incorporated feedback with every iteration. All the three solutions were tested throughout the project lifecycle. Ultimately, we achieved a high quality solution with this collaborative and cooperative approach.

# PROBLEM STATEMENT

# Many a times it is observed that a web page contains images and references to these images are made at multiple places across the page. In this case the reader has to scroll back and forth through the web page every time he has to refer to an image. This is highly inconvenient. Due to this, the user faces many problems like loss of comprehension, continuity and context. It also puts stress on user’s vision, due to which the user cannot concentrate fully. It also consumes considerable amount of user time. This results in spoiling the user’s reading experience. Our goal was to extract the source web pages and enhance them to increase visual comprehension through various means.

# TARGET USERS

All the people who use internet and read online content are affected by this problem. Image dense web pages are visited by users across all age groups. We have surveyed people from age groups ranging from 15 to 45 years to analyze the effect of this issue on their overall reading experience. We have surveyed around 100 people and observed and interviewed 50 people. The observations and findings are presented in this paper in sections below.

# LITERATURE SURVEY

## The readability of online web pages has been shown to be influenced by a number of variables including text size, type, positioning of image references etc. The users were more satisfied with the enhanced layout and reported it to be less fatiguing to read.[1]

## Data collection

To collect the data, we created a small survey using google forms (<http://goo.gl/forms/D5raoyVo2h>) and posted on various social media platforms like Facebook, WhatsApp and LinkedIn.

The questionnaire used for the survey included the type of articles users read, the device on which they prefer to read and issues while moving to and fro in search of images.

From the collected data, we found that 92.6% of the people who have taken the survey prefer web pages with text and images.

After developing the 3 solutions, we interviewed users about their feedback on their experience. We also gathered data through Google forms(<https://goo.gl/DUXFjD>).

We further incorporated the changes suggested by the user and took a final feedback from user through interviews and Google forms(<https://goo.gl/I61FdO>).

We tracked the user telemetry through the console logs which were a part of the script for the extensions. These logs provided a baseline for extracting the usage patterns and improving the functionalities to achieve better user satisfaction.

# OVERVIEW

The three solutions are as follows: (i) Solution 1- A sidebar with image thumbnails. (ii) Solution 2- Image pop-up on hover. (iii) Solution 3- Open image in new tab.

## Solution 1: A sidebar with image thumbnails

This solution is based on the idea that all the images are always available for reference. This means that the user doesn’t ever have to browse to a specific image when coming across it’s reference. All the images in the webpage are available in the sidebar. When a user wants to see any figure which has been referred in the text, the user can hover over that image in the sidebar and the webpage scrolls to the position of the image. Upon moving the mouse again/releasing hover, the webpage scrolls back again to its original position. So the user can continue reading effortlessly.

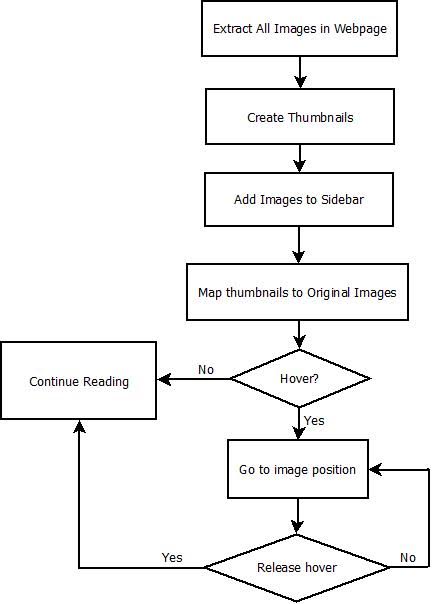


Fig 1. Flow chart for Solution 1(sidebar with image thumbnails)

## Solution 2: Image pop-up on hover

## The extension intelligently identifies all the occurrences of plaintext references to figures in the webpage. It then converts these plaintext references to hyperlinks to the actual figures. When a user hovers over its reference, the image pops-up instantly near the mouse. The best part about this solution is that the webpage remains at its position and the referenced image is popped-up over the current webpage. Thus the user doesn’t lose context even for a second.

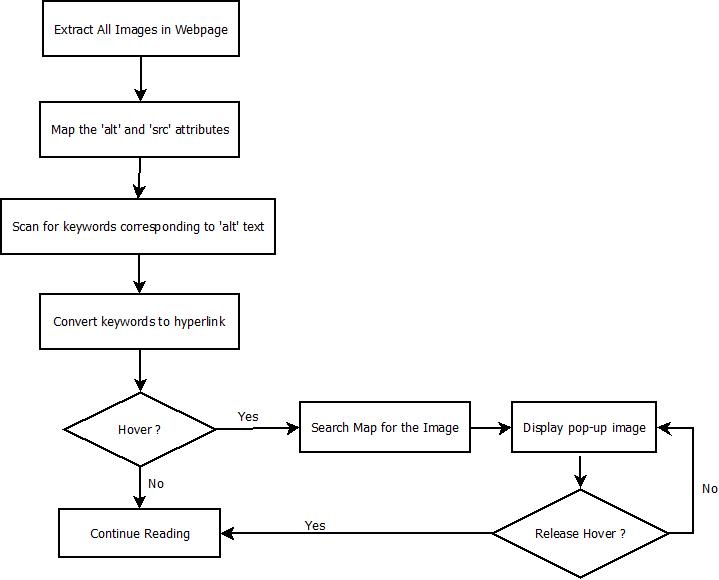


Fig 2. Flow chart for Solution 2(Image pop-up on hover)

## Solution 3: Open image in new tab

## The extension intelligently identifies all the occurrences of plaintext references to figures in the webpage. It then converts these plaintext references to hyperlinks to the actual figures. The user can click on these links and the image opens in a new tab.

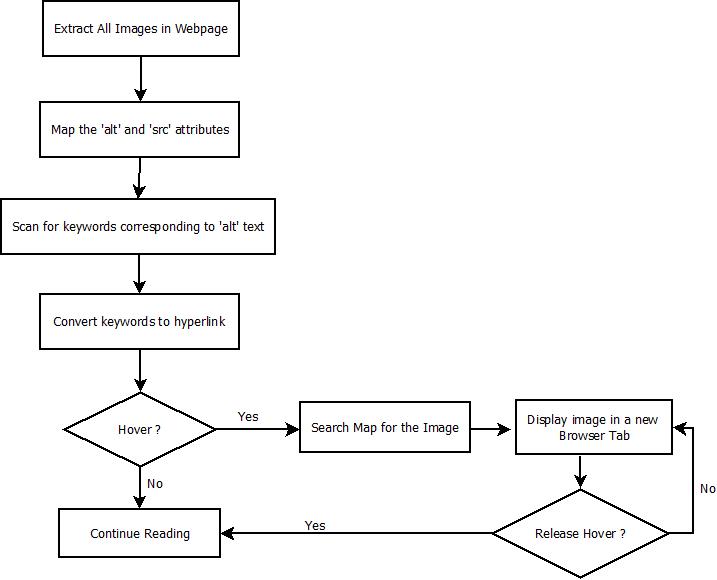


Fig 3. Flow chart for Solution 3(Open image in new tab)