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Comparison of Visual Content for Different Browsers

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Abstract- The expanding number of programs and platform on which the applications are executed, Cross Browser Incompatibilities (XBIs) are turning into a major issue for organisations to create online programming. Cross Browser Incompatibilities (XBIs) became a common issue which can be watched while accessing a similar Web application in various programs. The expanding number of program executions and the continuous development for Web pages, leads contrasts in how programs act in Web applications. Each component of a Web application concern to be effectively rendered and show a similar content, regardless of showing same content differently.Even if a few systems and appraisers have been proposed to distinguish XBIs, they can't guarantee a similar execution when the application keeps running crosswise over various programs as just express client movement is considered, and in this manner inclined to creating both false positives and false negatives. This exploration has the objective of explaining an approach for naturally recognizing Visual XBIs in Web applications by improvising the current picture examination and DOM investigation procedures and issues identified with these strategies.

Index Terms— Browser, Cross Browser Inconsistency, Reliability, Web application

I. INTRODUCTION

The Highly interactive web applications that offer user experience and responsive desktop applications are becoming increasingly popular these days. Applications such as Gmail and Google Docs now have enjoyed wide adoption and fulfilled all aspects of human activities. Unlike traditional web applications that perform the majority of their computation on the server, modern web applications have heavy client-side behavior footprints that need to be interpreted and executed in the browser. Users of such applications might use any web browser to access them, and the application is expected to behave consistently across these different environments. Web applications are expected to behave consistently across all of the popular browsers and platforms. However, it is well known that different web browsers render web content somewhat differently[1]. These inconsistencies lead to what we call cross-browser incompatibilities (XBIs) -differences in the way a web page looks and behaves indifferent environments[2]. Because of the increasing importance of XBIs, a number of algorithms and tools have been developed to address them. There are over 30 tools and services for cross-browser testing currently in the market.
Some of these are

1) **CrossBrowserTesting**- Cross Browser Testing instrument supports numerous OS and Browser Configurations for Cross Browser Compatibility Testing. This is an ideal instrument for cross program web testing tool which underpins Ajax, JavaScript and Flash. It likewise supports automated screen-shot tool to see web composition's crosswise over various programs.

Supported Browsers: Internet Explorer, Mozilla Firefox, Apple Safari, Google Chrome, Opera, Netscape and many more…

2) **Spoon Browser Sandbox**- It supports almost all web browsers and mobile browsers. It also supports the backwards compatibility. It won't take you to install web browsers on your machine, You have to only click on RUN to download these browsers from Microsoft and install onto your Spoon.net account.

Spoon Browser Sandbox also supports the multiple plug-ins like IE Developer Toolbar; Firebug, ActiveX controls, Java applets, CSS and Javascript debugging consoles etc.

Supported Browsers:

- Mozilla Firefox versions: Firefox 11, Firefox 12, Firefox 13, Firefox 14+
- Internet Explorer versions: IE6, IE7, IE8+
- Google Chrome versions: Chrome17+
- Opera versions: Opera 9+.

3) **Browsershots**- Browsershots is free open-source cross program testing device which is utilized to test the online web applications. This is free program similarity testing instrument and enables you to take screenshots of your page on various program and working frameworks mix. Along these lines, it is most broadly utilized device. It causes designer to get thought of how application will look like in different programs.

Supported Browsers: Chrome, Firefox, Navigator, Netscape, Opera, Safari, SeaMonkey, Avant etc.

4)**Adobe Browser Lab** -Adobe Browser Lab is one of the best online service used for Cross- Browser testing tool. It is basically Preview-Compare-Display the web site content. Here you can compare the screen shots of web pages in different web browsers simultaneously. Using this tool you can optimize the website efficiently.

One drawback of using this tool it not supports the Linux and other web browsers.

It allows you to choose the OS browser combination first and then you have to enter URL to check how it looks likes. For a free tool, the interface and current features are useful for daily use. It supports the zoom feature as well.

Supported Browsers: Internet Explorer, Mozilla Firefox, Apple Safari, Google Chrome

5)**IE Tester-** IE tester is one of the best compared to other choices which enable you to test your website page on various Internet Explorer versions in the same time. IE Tester program similarity tool is a free web application utilized when engineer need to simply supports just Internet Explorer program. This supports different versions of IE on various os like Windows 7, Vista and XP.

Supported Browsers: IE10 preview, IE9, IE8, IE7 IE 6 and IE5.5

Supported Operating System: Windows 7, Vista and XP

Although existing tools and techniques provided encouraging results, they still suffer from several drawbacks. Firstly, crawling technique only considers user activities, while ignoring other sources of non-determinism (e.g., timer , Ajax event) inside the browser. Therefore, it cannot assure the same execution when the application is crawled across different browser environments. For example, a click event may be triggered before a timing event in one browser, but be fired after the timing event in another browser. Secondly, existing works cannot isolate the impact from the server, and the resulting pages may have some differences when the same request is made multiple times from different browsers. For instance, submit a post request repeatedly may receive different responses from the server. Such limitations will result in extracting many problematic page data, and thus make existing techniques prone to generating some false positives or false negatives. XBIs are thus a serious concern for companies, which rely on such applications for business or for creating their public brand image. The current practice in industry is to identify XBIs through manual inspection of the web application screens across all the different browsers. Such testing is not only human intensive, but also error-prone.

II. LITERATURE SURVEY:

(I) Cross-platform Inconsistencies

An important problem in this domain is to identify inconsistencies arising due to the difference in the application's behavior when it is run on two different platforms. In the case of web applications, these inconsistencies can be observed when the web application is accessed on different web browsers. It results in Cross-Browser Incompatibilities (XBIs) which are discrepancies in a web application's appearance, functionality, or both, when the application is run on two different web browser environments[3].

According to the work, XBIs can be summarized as three main types: Behavior, Structure and Content

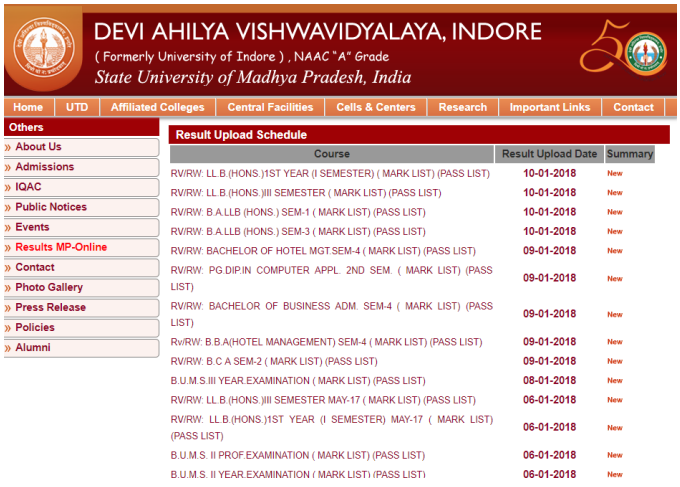
- **Behavior XBI:**This XBI indicates the difference in the behavior in same element of a web page in different browsers
  Example for such XBI is if a button performing some action like submitting or proceeding to next page but the same button performs different action when run on any another browser.
- **Structure XBI:** Such XBIs affect the structure, or layout, of individual web pages. The web page structure is essentially a particular arrangement of elements, which in case of structural XBIs is erroneous in a particular browser. This XBI's refers to the difference in the layout of the page. For example, two buttons in the pages are arranged horizontally (left to right) in one browser, but vertically in another browser.
- **Content XBI**:This kind of XBI is observed in the content of individual components on a web page. Such differences can occur, where the visual appearance of a web page element, or the textual value of an element, are different across two browsers. These can be further classified as visual-content and text-content XBIs. It refers to the

difference in the content of individual components of the web page. It can be further classified as text-content XBI and visual content XBI. The former involves the difference in the text value of an element, whereas the latter refers to the difference in the visual aspect of a single element (e.g., page title has shadow in Firefox and no shadow in Internet Explorer).

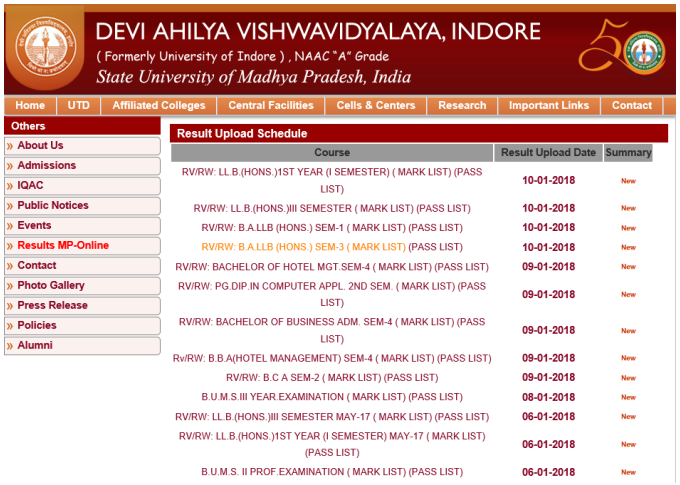
The XPERT tool was designed to identify the three main type of inconsistencies. It takes an input then compare it to different browsers and identifies which type of inconsistencies are there. Mainly XPERT focuses on text content XBI to identify visual inconsistencies they used OpenCV toolkit.
In this paper we will focus on visual inconsistencies and will learn to detect the visual inconsistencies.

Example of Structured XBIs

An example of such a problem is shown in Figure 1, which shows a section from the results page of DAVV website, http://www.dauniv.ac.in/UploadedResult.php, on two web browsers, i.e., Google chrome and Internet Explorer.



a) Rendering on Google Chrome Browser



b) Rendering on Internet Explorer Browser

Fig.:-1 Example of Structured XBIs

III. PROBLEM STATEMENT

A top notch website composition intends to offer an indistinguishable appearance to the site saw from any web program. Thus, a great quality website must be visible with its complete functionality on any web program[4]. As each site page is comprised of a scope of segments with its own particular uniqueness and it influences the execution of a website page in various settings. Like different parameters of execution evaluation the program similarity part of site is additionally influenced by various segments of a site page either specifically or in a roundabout way. Likewise, unique innovations deliver the similarity issue. Subsequently, for the time of the plan phase of the sites these must be tried fastidiously for its similarity at various perusing situations[5].

The cross browser incompatibilities arise due to various reasons as below–

- Different browsers
- Different browser versions
- Different Screen size and resolutions
- Different font size
- Due to HTML error
- Browser Bugs
- CSS responsiveness
- JavaScript support in different browser

Cross-browser inconsistencies (XBIs) are a serious problem for web developers and accounts for a great amount of time consumption in testing and XBI fixes[6].

Based on the literature survey, below problems can be inferred that are relevant to the web browser platform testing and maintenance –

a. Automated identification of inconsistencies in an application's behavior across multiple platforms.
b. Detecting features that are present in the application on one platform, but missing on another platform version of the same application.

IV. PROPOSED METHODOLOGY

Description

To identify cross browser inconsistencies, we propose a model to detect visual XBI. Figure 1 depicts an overview of the proposed XBI detection technique that takes the input as URL of the home page of the web application under test, URL and two browsers considered for the testing, Browser1 and Browser2. It produces output as difference in two images. Our proposed model compares images from crawler generated graph.

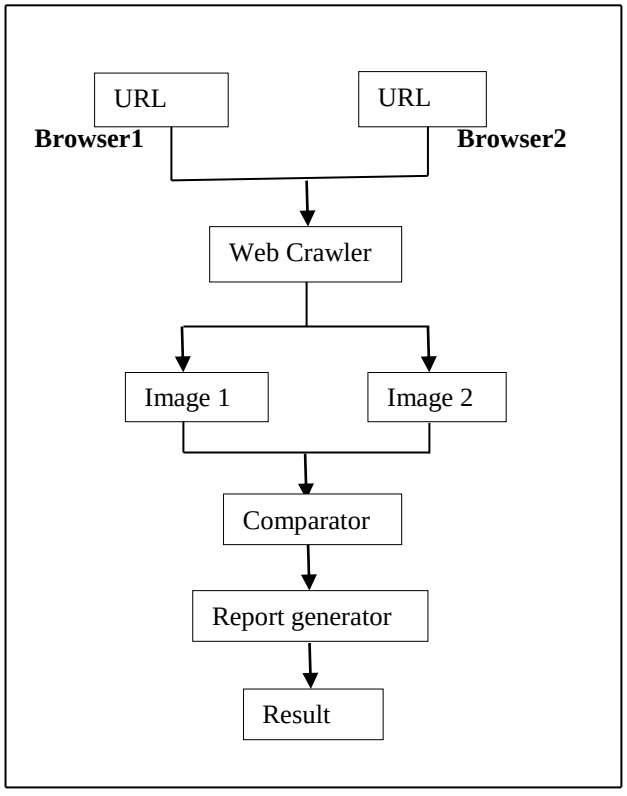


Fig.:-2 – Model to Detect Visual Inconsistency using web crawler

1. **Web Crawler** - A web crawler will be an robotized program, or script, which methodically filters alternately "crawls" through web pages should produce an list of the information it is set with search for[7]. This methodology will be known as Similar as Web slithering or Spidering. We recommended to Use a web crawler An web crawler known as "WebSPHINX (Website-Specific Processors to html data extraction)" composed for java. It slither distinctive sites and produces chart to that. It may be open sourball web crawler What's more source book may be accessible during websphinx. Zip.
2. **Comparator** - This module performs visual Investigation of relating components with recognize visual content XBIs. For identifying image-content XBIs, it compares screen pictures of the relating components on the web page. The structure of the page concentrated Eventually Tom's perusing the crawler will be broke down Toward the design examination part will make arrangement graphs, which speak to the relative arrangement of web page components. Correlation could be whichever match insightful the place two qualities starting with chart would compared or it might a chance to be 3 manner correlations the place three qualities concentrated starting with chart need aid compared.
3. **Report Generator** - This module generates a report written in HTML tabulates the set of detected XBIs.

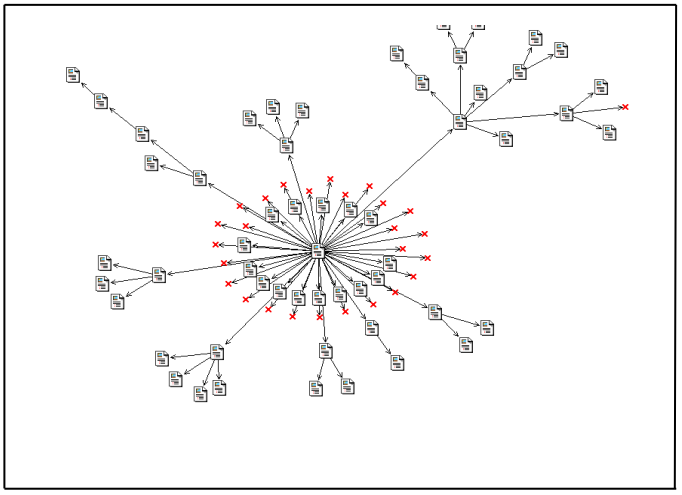


Fig.:-3 – Crawler graph generated for DAVV site using WebSphinx web crawler

V. EXPECTED OUTCOMES AND RESULTS

It has been observed that, when a web application is executed on multiple browser then expected outcome of our

proposed model is to identify three main types of inconsistencies,if exists. This proposed model also generates report of visual inconsistencies.The main motive of this model is to detect the visual inconsistencies which occur in the form of difference in image. This model takes two same images which run on two different browsers. The image is fetched by crawler generated graph then the tool will compare the images and the report will then be generated.

VI. CONCLUSION

Because Visual inconsistencies is also a major concern the idea of this paper will lead the developers to think once about the visual inconsistencies that usually occur in various browsers.

When the developers will design any update of any browser,they will make sure that the visual incosistencs should be removed from their updates.

VII. REFERENCES

[1]C.P.Patidar and Meena Sharma ,"An automated approach for cross browser inconsistency(XBI) detection", Ninth annual ACM India conference organized by ACM India, Oct 21-23,2016.

[2]Nepal Barskar, C.P.Patidar and Meena Sharma, "Analysis and Identification of Cross Browser Inconsistency Issues in Web Application using Automation Testing", International Journal of Computer Science and Information Technology & Security (IJCSITS), ISSN: 2249-9555Vol.6, No3, May-June 2016.

[3] A. Mesbah and M. R. Prasad, "Automated cross-browser compatibility testing," in Proceeding of the 33rd International Conference on Software Engineering, ser. ICSE '11. New York, NY, USA: ACM, 2011, pp. 561–570.

[4] Choudhary, S. R., Prasad, M. R., & Orso, A., "X-PERT: A Web Application Testing Tool for Cross-Browser Inconsistency Detection", 2014.

[5] S. Roy Choudhary, M. R. Prasad, and A. Orso. X-PERT: Accurate Identi_cation of Cross-browser Issues in Web Applications. In Proceedings of the 2013 International Conference on Software Engineering, ICSE '13, pages 702-711. IEEE Press, 2013.

[6]S. R. Choudhary, M. R. Prasad, and A. Orso. X-PERT: Accurate Identificationof Cross-Browser Issues in Web Applications. In *Proceedings of* the 35th IEEE and ACM SIGSOFT International Conference on SoftwareEngineering (ICSE 2013*)*, pages 702–711, May 2013.

[7]S. Mahajan and W. G. Halfond. Root Cause Analysis for HTML Presentation Failures Using Search-based Techniques. In Proceedingsof the 7th International Workshop on Search-Based Software Testing*(SBST)*, Hyderabad, India, June 2014

[8] S. Roy Choudhary and A. Orso, "Webdiff: Automated identification of cross-browser issues in web applications," in ICSM '10: Proceedings of the International Conference on Software Maintenance. IEEE, September 2010.

[9]Sonal Mahajan and William G. J. Halfond. 2015. Detection and Localization ofHTML Presentation Failures Using Computer Vision-Based Techniques. In Proceedingsof the 8th IEEE International Conference on So.ware Testing, Verifcation and Validation (ICST).

[10]Mesbah, A., & Prasad, M. R., "Automated cross-browser compatibility testing". 33rd International Conference on Software Engineering, ACM Proceedings, pp. 561-570, 2011.

[11]C.P.Patidar and Meena Sharma ,"An automated approach for cross browser inconsistency(XBI) detection", Ninth annual ACM India conference organized by ACM India, Oct 21-23,2016.

[12] Nepal Barskar, C.P.Patidar and Meena Sharma, "Analysis and Identification of Cross Browser Inconsistency Issues in Web Application using Automation Testing", International Journal of Computer Science and Information Technology & Security (IJCSITS), ISSN: 2249-9555Vol.6, No3, May-June 2016.

[13] Shauvik Roy Choudhary,"Detecting Cross-browser Issues in Web Applications", ICSE '11, Waikiki, Honolulu, HI, USA, ACM 978-1-4503-0445-0/11/05, May 21–28, 2011.

[14] Shauvik Roy Choudhary. 2015. X-PERT Code. Retrieved Jan 2017 from h.ps://github.com/gatech/xpert

[15] Sonal Mahajan, Abdulmajeed Alameer, Phil McMinn, and William G.J. Halfond.

2017. XFix: Automated Tool for Repair of Layout Cross Browser Issues. In Proceedings of the 26th International Symposium on So.ware Testing and Analysis (ISSTA) – Tool Track.

