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RESEARCH ARTICLE

In & Out Degree Based Effective User Navigation through Website Structure Improvement

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Abstract — Designing a multi page well structured websites to facilitate effective user navigation has long been a challenge because of many myths available where one of them is a web developer understand how a website should be structured can be considerably different from that of the users point of view and moreover a user needs to be satisfied because user is considered to be the stakeholder. There are many methods available to interconnect the web pages to improve navigation based on the user navigation data and whenever there is an upgradation in the existing the new version is almost unpredictable and the cost of habitising the upgraded version of web page to users always unanalyzed. In this paper we propose a method that shows how to improve a website without introducing substantial changes to improve the user navigation on a website while minimizing alterations to its current structure. We have generated results by testing the proposed system on large synthetic data sets to demonstrate that it scales up very well and the execution results confirm that the user navigation on the improved structure is indeed greatly enhanced.

Keywords— Website, Web page

I. INTRODUCTION

Now a day's almost everyone is utilizing the services rendered by world wide web or the Internet which is emerged into a huge platform using which many of us have acquired knowledge and explored information and still this process is continuing massively according to the latest senses acquired in the month of September 2014 there are almost 3 billion internet users worldwide with 30% of the internet users are female and 70% are male users with an increase of 16% when compared with previous year [1]. Due to the fast growing number of Internet users many people and organizations are creating opportunities to increase their market and according to a survey conducted in Warangal the utilization of internet services in day to day life is shown in below figure.

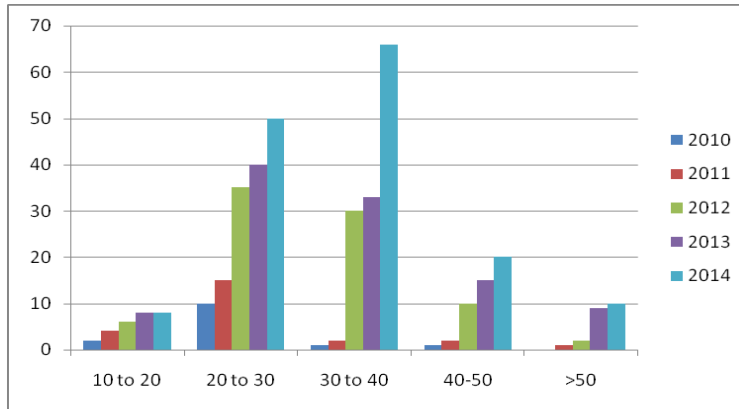


Fig. 1 Internate Usage rate

In the above figure fig1 the data is taken from year 2010 to 2014 from different households comprising almost 5000 households with different aged people from 10 to 20, 20 to 30, 30 to 40, 40 to 50 and more than 50 years of age are considered with daily percentage of usage and we came to a conclusion that the users for age group 20 to 40 are more dependent on internet usage.

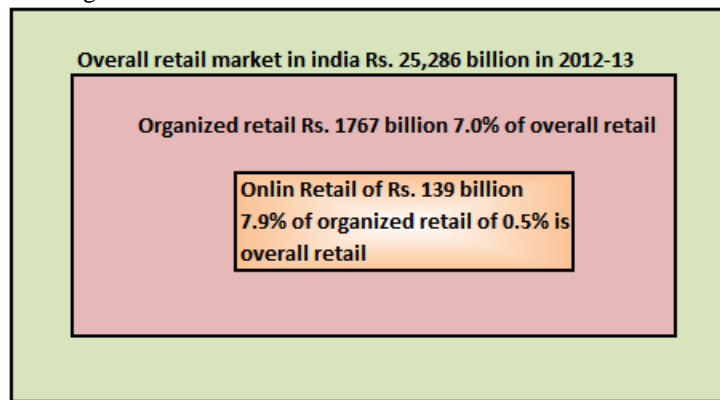


Fig. 2 Comparative picture of internet usage with respect to online and retail market

In the recent past India's online retail industry has grown at a rapid pace in the last 5 years from around Rs 15 billion revenues in 2007-08 to Rs 139 billion in 2012-13 which makes us to translate into a compounded annual growth rate over 56 per cent by implementing the 9 fold growth came on the back of increasing internet penetration and changing lifestyles and was primarily driven by electronics and apparel and market researches such as CRISIL estimates the market will grow at a healthy 50-55 per cent to Rs 504 billion by 2015-16 based on these analysis many new investors are willing to invest in the areas of jewellery and furniture too as shown in the above figure fig2.

In order to meet the day to day increasing demands of online customers online firms are heavily investing in the development and maintenance of their websites, many reports specify that firms will spend around 11 percent on overall website operations spending due to heavy and increasing investments in the area of website design which is not considered to be a trivial task.

Some online sales websites tend to fail online sales due to many reasons and the major is considered to be due to website maintenance and poor stereo type and cumbersome nature of a website irritates a user from purchasing a product which happens because developers understanding of how a website should be structured is considerably different from those of the end users due to such differences users cannot easily locate the desired information in a website because when creating a website the web developers may not have a clear understanding of users preferences and needs based on which web pages are supposed to be organized but what happens is the web pages are created based on the developer imagination and judgement which happens due to lack of knowledge about user by a developer and the measure of website effectiveness should be the satisfaction of the users rather than that of the developers.

II. PROPOSED SYSTEM

Once we identify the drawbacks of a website we can create a reconstruction model which is intended to improve the structure of the website instead of reorganizing it from scratch the proposed approach which we use will facilitate the user navigation on a website with minimal changes to its current structure for example in a informational websites whose contents are static and relatively stable over time such as universities, hospitals, etc. and our proposed method doesn't work effectively on dynamic websites which may use scripting languages because only a static site can be improved at runtime instead of a dynamic website which changes all the time based on certain attributes.

In a directed graph g may have vertices and edges unless it is a null graph and in such graph there may be a incoming edge and may be some outgoing edges based on which indegree and outdegree of vertices are being calculated and in the same manner a webpage will be having calculation of degrees based on which we can model the web structure. If a website is having too little web pages then calculating the indegree and outdegree is considered to be undesirable and too many links which may exceed the threshold value of the allowable degrees may led to overloading of information and is being considered to be undesirable and in our study we considered outdegree threshold value to be 10 and based on this threshold value we eliminate the excess links to improve website performance.

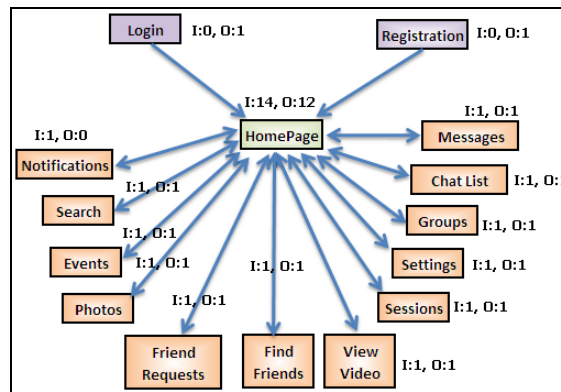


Fig. 3 Sample website structure where I represents indegree and O represents outdegree.

In the above figure we have taken a sample website with 14 pages and links between them based on the analysis we found that the outbound of homepage is greater than the threshold value which is considered as to be 10 and the .outbound value of home page is 12 so we need to remove atleast 2 outbound paths and after implementing the proposed system the figure will be as shown in fig 4.

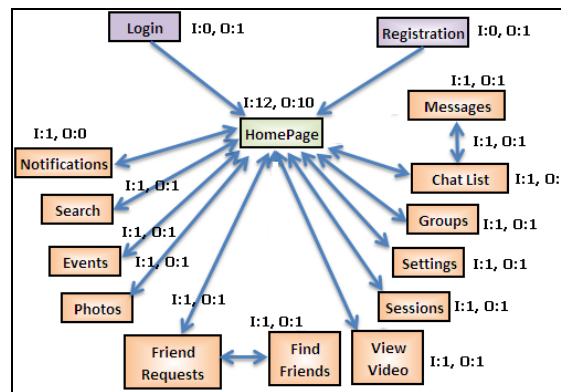


Fig. 4 modified website structure based on the threshold value of outbound to be 10.

Our proposed system is based on improving the navigation effectiveness of a website with minimal changes and the thumb rule of any webpage is it becomes useful only when it is presented in a better way to reach the intended users expectation by allowing users to access desired data without getting lost or having to backtrack and we also concentrate on the aspect of navigation effectiveness which is based on how consistently the information is organized and as per the user's requirement as written in SRS or SRD documents.

Mini Session					
Id	Transaction Id	User Name	URL Name	Session(min)	Status
5	2	kutty	www.java.com	1	Eliminated
6	2	kutty	www.javajava.com	0	Eliminated
1	1	kutty	www.java.com	4	MP Model
2	1	kutty	www.javatutorial.com	2	MP Model
3	1	kutty	www.java.com	2	MP Model
4	1	kutty	www.javatutorial.com	2	MP Model

Fig. 5 list of websites being checked.

We also measure the total number of paths a user has visited and which is the frequently visited path by the users based on such data the web page can be remodified such that it can be loaded faster than the other pages or we can fetch the page before hand by predicting which page will be loaded next by an user as we have implemented the proposed system one of the screens is shown in Fig 5.

III.CONCLUSION

In this paper we have proposed an approach to improve the navigation effectiveness of a website while minimizing changes to its current structure and resolved a critical issue that arose in websites whose contents are relatively stable over time and improve a based on the inbound and outbound tree that is constructed and reorganized the links instead of redesigning the website on a progressive basis.

We have implied our proposed system on real website and the results showed that our model could provide significant improvements to user navigation by adding only few new links and the optimal solutions were quickly obtained and along with suggestions that the model is very effective to real world websites within very few seconds.

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