

Facilitating Effective User Navigation for Improving Website Structure through Minisessions

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Abstract — Web-site structuring and its designing to provide effective navigation to end user is most challenging since ever. The reason behind it can be the difference of understanding between the web designer and the end user, as the need and design of web-site may vary from that imagined by the user. Also to relink web pages so as to improve the ability of navigation of user data various techniques have been proposed, the new reorganized structure can be unpredictable and the disorienting users cost remains unanalyzed after the changes are made. The paper addresses the problem to improve a website without introducing any substantial changes after reorientation. A mathematical programming model is proposed to minimize alteration to current. The use of real data sets is done to define two evaluation metrics and used it for assessing their performance. The use of mini sessions are used which keeps the track of accessed data or navigated data by the users and helps in locating any target page.

Keywords — User navigation, Mathematical model, Website design, web mining, mini sessions.

I. INTRODUCTION

Most of user uses web browsers to navigate their data. A web page is searched through a search engine, and the hyperlinks are followed the starting page which are relevant and the subsequent pages in web site, until they have find the desired data in one or more pages for improving navigation data. For a Web pages and hyperlinks which are in between them, the methods used by user to search any desired data is not fixed or predefined. The Two predominant Paradigms for findings data on the Web are user navigation and web Search in online. There are many facilities provided on internet to speed up the procedure of finding data.

A main important cause of failure of few website design is due to the lack of understanding of the user needs by the designer and the web developers perspective of designing a website.

However, the effectiveness of any website depends on user the satisfaction than that of developers. Such difference result in case where users can find difficult to get the desired information in a website. The work, on the other side, is related to improve Website navigability in server through online using user navigation data. This issue is not easy to tackle as web developers do not have a clear idea of users preferences and may organize pages based on their own ideas and may not be accurate idea for navigation of website. Hence, organization of WebPages should be in such a way so that users can access the proper websites. The main issue with online navigation is to improve it with minimum changes to present structure. This problem can be addressed in two categories as,

(1) by providing individual facilities with reconstituting pages based on profiles and traversal paths which are referred as personalization search
(2) transformations by updating site structure enabling easy user navigation. Reorganization by adding new link may change the place of familiar data sets.

This issue can be handled by making mini sessions which can keep track of user navigated links. Previous studies give focus on various data mining issues as to find relevant page related to any given page link, web structure understanding, online extraction of templates from websites, information mining of new links structure. The usability of reorganized website can not be studied properly as it is being structured by experts with business gaining logics.

II. RELATED WORK

Min Chen and Young U. Ryu [1] proposed an mathematical programming model for improving navigation effect of the website by making minimum changes to current structure. The model was suitable for informational websites with stable contents. The performance of website is improved instead of reorganizing it and hence suitable for maintenance

of website. The Mathematical programming model solves large size problems within some seconds. Perkowitz and Etzioni [02] proposes an approach which can Synthesize index pages automatically, to facilitate navigation of user by pertaining the co-occurrence of pages frequency in users traversal. This is web personalization actually. Mobasher et al. [3], [4], [5] and Yan et al. [6] proposed a method to create clusters of users profiles obtained from weblogs and make links for users classified into different categories according to access pattern followed by them. It is also web personalization based method.

An Website navigation among all design aspects has long been one of the crucial design principle for any domain like finance, entertainment, e-commerce, government, education, or medical [7]. Website design quality has been researched from qualitative as well as quantitative perspective [8]. In literature, website design has been studied in different viewpoints; however it has long been termed as a hypermedia or a database. In engineering perspective, web engineering and IDEAL consider modelling and further enhancement. In human computer communication’s perspective for website design the interface elements like graphical, layout, usability design and analysis play a major role. System design aspects like hardware design, cache scheduling, etc. influence the website performance. Structure design like hyperlinks configuration and information structural design affect website navigation.

Jia-Ching Ying, Chu-Yu Chin, Vincent S. Tseng [9] proposes a model which avoids the effort required to scan database, this data structure is named as Ideal-Tree i.e., Inverted data- base Expectable Tree. The Ideal-Tree Miner algorithm proposed for web navigation mining with dynamic threshold. The navigation prediction model is provided based on patterns discovered. Dean and Henzinger also proposed algorithm which finds relevant pages from similarities of. The algorithms page source consists only the sibling pages of provided page and other relevant semantically similar pages may get neglected. The number of similarity among a page and given page is calculated by number of common parent pages provided called cocitation degrees. The pages with highest cocitation degrees with the given page is termed as relevant pages. The deeper relationship page algorithm is easy and simple but it is not efficient to identify the relevant pages.

III. PROBLEM STATEMENT

Navigation difficulties experienced by the users is main problem that make the user abandon the respective website and switch to the competitors. This problem can be tackled by designing effective website and providing faster navigation with minimal change in website and use of re-links. The goal of making mini sessions is to define the

maximum number of allowed paths used to reach the target page.

IV. PROPOSED SYSTEM

The proposed website has focus on a various issues as understanding structure of web, finding nearly relevant pages of provided page, Mining informative structure of a news link website, and extracting template from more web pages. The website is model as a directed graph, in which the nodes represents the pages and the arcs represents links in online for navigation. The system emphasizes on improvement of navigation by using user data navigation sets, they can be generally classified into two categories as , (1) by providing individual facilities with reconstituting pages based on profiles and traversal paths which are referred as personalization search, (2) transformations by updating site structure enabling easy user navigation. Mini sessions are used to improve the target path depending on the threshold paths, various weights of penalties can be imposed on various pages depending on the application, whose out-degree exceeds the respective out degree threshold. The main function is to minimizes the cost required for improvement of web structure used for navigation and this cost consists of two parts as, (1) The number of new links to be established in site and (2) The penalties on pages containing Various links. The Proposed system Architecture for website navigation providing effective navigation is as shown in fig. 1

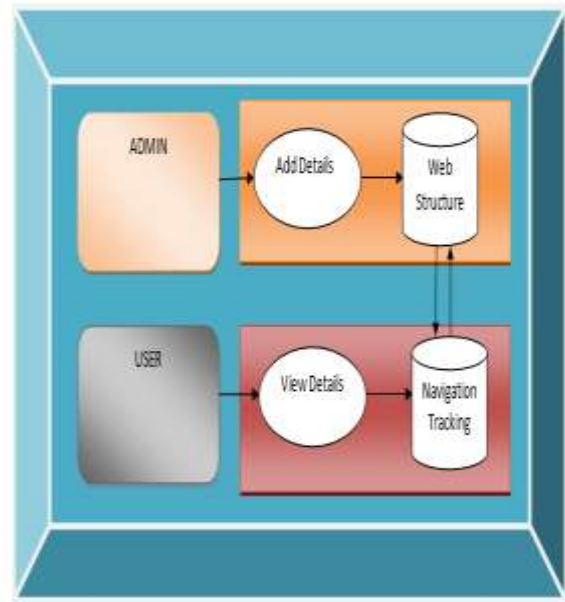


Fig.1 Proposed System Architecture

The proposed system consists of following modules :

- A) Web Transformation
- B) Web Personalization.
- C) Maximal Forward Reference.
- D) Mini Sessions.
- E) Out-Degree Threshold.

A. Web personalization

The first module is web personalization used to create admin, and explores the problem of improvement of user navigation with minimal change in current web structure. The admin adds the URL and the description of related site. The data is updated after adding the details, now the user can gain access to the contents in user entity by typing URL.

B. Web transformation

Instead of personalizing web pages for single user, the Web transformation makes the change in the structure of a website which can facilitate the navigation to large group of users. It deals with the method used to reorganize the web pages to facilitate the users retrieval in few clicks. But, the method only makes consideration for local website structures than the site as whole. Hence a new structure may not be optimal. To improve navigability a heuristic method is used to re-link web pages, which is based on simulated annealing. To improve link structure in wired and wireless devices this method makes use of aggregate user preference data.

C. Maximal Forward Reference

The backtracks are used to find the paths traversed by user, here backtrack is nothing but revisit to previously browse page. This can be done if the user is unable to find the page at its desired target place. A path is sequence of pages accessed by any user without the use of backtracking. The end of path is a backtracking point. The site structure can be more discrepant than the user expectation if the number of paths used by the user to reach target are more.

D. Mini Sessions

1) Mini session Through Relevant :-

Only mini sessions through relevant can be considered for improvements and helps to eliminate number of irrelevant mini sessions in Mathematical programming model. A mini session can be relevant only if its length is more than particular path threshold value of re-link.

2) Mini sessions Through Dominated :-

The constraints corresponding to mini sessions are redundant through dominated and can be eliminated from consideration in the Mathematical programming model. When a mini session is improved in the new structure, the mini sessions that are dominated by this one or more are also improved. Mini session S_a dominate mini session S_b the set of relevant candidate links for S_b contains all relevant candidate links S_a . Another reason for the Problem size reduction is that many relevant mini sessions “dominate” others with respect to relevant candidate. The improved is structure generated using training data set and evaluate it on the testing data set using two metrics:

a) the percentage of mini sessions both enhanced to a specified threshold.

b) the average number of paths per mini session

First metric shows measurement of user suffering navigation difficulties which can prove beneficial for the improvements made to web structure, and the second metric used measures the performance improvement of website structures to check the effectiveness of website navigation is good or not. Specifically we partition the real time data set both a training set and testing set in server side. Whether the improved website structure can facilitate users to reach their targets faster. The evaluation procedure follows the steps as below by using first metric are :

1. Apply the training data set to obtain the site of new links or Re-link and links to be improved user navigation on the Mathematical programming model .
2. Acquire from the testing data set the mini sessions that can be improved

E. Out-Degree Threshold

In generally, Web pages are classified into two categories as (1) content pages and (2) index pages. A content page consist of user interested information having least links and an index page could have many links which is designed to better user navigation. The website and its page purpose defines the out-degree threshold for a page. Index page threshold is larger than content pages threshold.

V. RESULTS ANALYSIS

The mathematical model created is able to reconstruct the website structures. The main drawback is the lack of re-linking. The mini sessions can improve the efficiency dealt with the problem of re-links. The paper can be extended to re-rank the links.



Mini Session					
Id	Transaction Id	User Name	URL Name	Session (min)	Status
68	34	monika	www.lenovo.com	1	Processing
68	34	monika	www.samsung.com	0	Processing
66	30	monika	www.lenovo.com	27	MP Model
67	33	monika	www.samsung.com	0	MP Model
69	31	monika	www.nokia.com	0	Processing
64	31	moni	www.lenovo.com	1	Processing

VI. CONCLUSION

The paper represents a mathematical programming model used to improve the effective navigation of a website with minimum changes to the current website structure. The model is appropriate for websites whose contents are stable. It is suitable for maintenance of website as it does not reorganize website, instead makes improvement in it. The model can be enhanced by addition of constraints which improved user navigation. The model could provide significant improvements to user navigation by adding only few new links or Re-link our model has a constraint for out degree threshold which is motivated by cognitive reasons. Re-ranking of the user navigated data sets can be extended as future work.

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REFERENCES

- [1]. Min Chen and Young U. Ryu Facilitating Effective User Navigation Through Website Structure Improvement” IEEE Transaction on knowledge and Data Engineering, Vol. 25, no. 3, March 2013
- [2]. M. Perkowitz and O. Etzioni, “Towards Adaptive Web Sites: Conceptual Framework and Case Study,” Artificial Intelligence, vol. 118, pp. 245-275, 2000.
- [3]. M. Eirinaki and M. Vazirgiannis, “Web Mining for Web Personalization,” ACM Trans. Internet Technology, vol. 3no. 1, pp. 1-27, 2003.
- [4]. B. Mobasher, H. Dai, T. Luo, and M. Nakagawa, “Discovery and Evaluation of Aggregate Usage Profiles for Web Personalization,” Data Mining and Knowledge Discovery, vol. 6, no. 1, pp. 61-82, 2002.
- [5]. B. Mobasher, R. Cooley, and J. Srivastava, “Automatic Personalization Based on Web Usage Mining,” Comm. ACM, vol. 43, no. 8, pp. 142-151, 2000.
- [6]. B. Mobasher, R. Cooley, and J. Srivastava, “Creating Adaptive Web Sites through Usage-Based Clustering of URLs,” Proc. Workshop Knowledge and Data Eng. xchange, 1999.
- [7]. M. Kilfoil et al., “Toward an Adaptive Web: The State of the Art and Science,” Proc. Comm. Network and Services Research Conf., pp. 119-130, 2003.
- [8]. C.C. Lin, “Optimal Web Site Reorganization Considering Information Overload and Search

Depth,” European J. Operational Research, vol. 173, no. 3, pp. 839-848, 2006.

- [9]. Jia-Ching Ying, Chu-Yu Chin, Vincent S. Tseng “Mining Web Navigation Patterns with Dynamic Thresholds for Navigation.