Effective User Navigation in Dynamic Website

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Abstract— -*Constructing a well structured website to aide or assist user navigation are the problem now a days .A main primary cause is that web developers may understanding of how a web site should be design can be different from that of users. Since the mathematical programming model can give a solution only for website containing static information and also it cannot find the user target accurately. Additionally there is no constraint for improving navigation when accessing two or more websites simultaneously. In this paper, we propose an optimal solution method for improving the navigation for website containing the dynamic information and also find the user target accurately.*

Keywords— *web mining, optimal solution method, user navigation, website design, navigation techniques*

I.INTRODUCTION

Internet is a collection of two or more computers networks connected together to share the computer related resources over the web by using standard internet protocols to assist billions of user around the world. It is a *grid of networks* that consists of number of networks of various fields or function that are linked by expansive array of electronic, wireless and optical networking technologies. The Internet carries the wide range of information resources such as hypertext documents and services such as email, transaction services etc.

The internet has enhanced the human interactions by providing instant messaging, video-conferencing etc. The new Internet services such as Internet Protocol television (IPTV) and voice over internet protocol(VOIP) can remodel the traditional communication system such as telephone, television etc. Now-a-days we can view the newspapers and books over the internet. Online shopping has been increased for all kinds of business activities.

The arrival of the internet provides a platform for people to acquire knowledge and explore information. Today internet is widely used by 2.27 billion people around the world. The fast growing of number of internet user also presents huge business opportunities to firms. In order to satisfy the increasing demands from online customers, firms are heavily investing in the development and maintenance of their websites.

The Internet has no centralized dominance in either technological implementation or policies for access and usage; each integral network sets and follows its own policies. The Internet Protocol address space and the Domain Name System are the two fundamendal namespaces maintained by the Internet Corporation for Assigned Names and Numbers (ICANN).The Internet Engineering Task Force (IETF) perform the task of standardization of the core protocols.

Regardless of focusing investments in websites, discovery of required information in a website is a difficult task. According to Palmer [1], imperfect website design will lead to website failure. If the user is not able to reach their intended information, then the user can exit the website even containing more quality information find by McKinney et al. [2].

The process of obtaining unknown and useful information from the World Wide Web by using data mining techniques in order to improve the effectiveness of a website is known as web mining. Web mining is used to understand and evaluate user behavior and to evaluate the efficiency of a website .There are three types of web mining.

1. Web content mining:
It is the process of extracting and analyzing the information from the webpage content.

2. Web structure mining:
It is the process of extracting and analyzing the information from the web structure.

3. Web usage mining:
It is the process of extracting and analyzing the information from the web server logs. The information collected by the web mining process can be evaluated by using the data mining parameters such as association, classification, clustering, prediction, analysis of sequential patterns.

A main primary cause is that web developers may understanding of how a web site should be design can be different from that of users [3], [4].this cause will lead to the problem for user to locate their intended information. This is difficult to prevent because web developers can develop the

webpages and organize it based on their own ideas and prediction. The effectiveness of a website is highly based on the user satisfaction. Hence it is necessary to systematize the website based on the user preferences [5].

Prior studies on website is concerned with the problems such as understanding web site content, web site structure, web site usage patterns(i.e. finding related pages of required page),finding mini sessions, finding the candidate links.

Various techniques have been proposed to solve the problems by two approaches such as personalization and transformation. Web personalization is the process of adapting web pages based on the user navigational behavior information, user preferences and his profile patterns and web transformation is the process of changing the web site structure for group of users.

In this paper, Mathematical programming model is concerned with the transformational approach that is closely related to literature that examines how to improve website navigability through the use of user navigation data [9].

But the mathematical programming model can give a solution only for website containing static information and also it cannot find the user target accurately. Additionally there is no constraint for improving navigation when accessing two or more websites simultaneously.

In this paper, we propose an optimal solution method for improving the navigation of website containing the dynamic information by generating the links dynamically based on the user preferences and web site change and also find the user target accurately.

In mathematical programming model, the number of external links in a page is an important component for modeling web site structure design. In prior studies, it is necessary that the number of external links in a page should not exceed the path threshold but in mathematical programming model, it is not necessary because it considers number of external links in a page can be as a cost term such that if adding additional links can effectively the reach the intended information [9].

The rest of the paper is organized as follows: Section 2 reviews related literature. Section3 describes the existing system. Section4 describes the proposed system.section5 describes the experimental setup and result. Section 6 concludes the paper.

II.RELATED WORKS

Web personalization is the process of adapting web pages based on the user navigational behavior information, user preferences and his profile patterns [10]. Web transformation is the process of changing the structure of the web site for large group of users instead of changing the structure to the individual user [7]. Perkowitz and Etzioni [4] defines an approach that automatically create index pages which contain links to particular pages based on the links that can be highly (frequently) used for navigation to that page.

Gupta et al. [8] propose a heuristic method based on finding the maximum likely hood of links to improve the navigation by using the user preference data. Lin [6] develops integer programming models that uses the information about the inter relationship between the pages to restructure the website. it is efficient for small website to reduce information overload, but not for large website because it requires large computation time to obtain optimal solution. Lin and Tseng [7] propose an ant colony system to re-structure the website .it is appropriate only for small websites. It is not suitable for large websites.

Min chen and Young U. Ryu [9] develops the Mathematical programming model that can restructure the website to improve the navigation. This model provides only minimum changes to the current structure. Mobasher et al. [11] proposes that the web mining process into two sub-process. The first process is the processing of data (converting the data into another form).The second process is the use of data mining techniques to analyze the data.

III.EXISTING SYSTEM

In existing system, the mathematical programming model is used to facilitate effective user navigation. It reorganize the website with minimal changes to current structure and it reduces the number of links based on path threshold and out degree threshold it is done by following three phases they are:

1) Finding web page connectivity
2) Finding relevant mini session
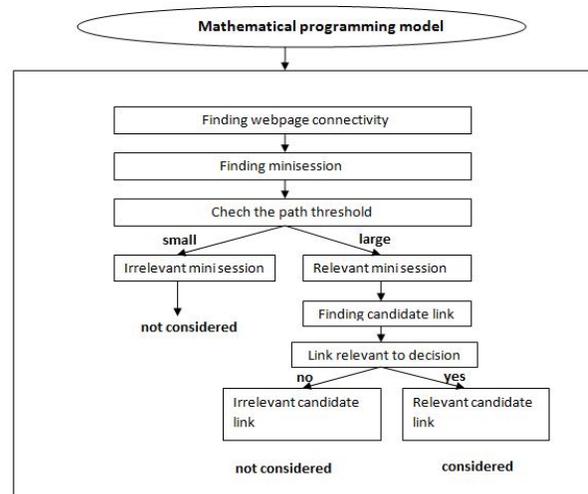3) Finding relevant candidate link

Fig: 1.Block diagram of mathematical programming model

Referring to figure, the steps involved to reduce the links using mathematical programming model can be described.

1) **Finding web page connectivity:**

In this phase links between web-pages are identified (i.e.) how the web pages in a website should be systematized can be understood and described. It is easily done by drawing the graph where the nodes represent the web pages and edges represent the links between the web pages.

2) **Finding relevant mini session:**

Mini session:
The group of pages visited by user for only one target is known as mini session

In this phase check the path threshold for each mini session. A mini session is relevant only if its length is larger than the corresponding path threshold otherwise it consider as a irrelevant mini session. This is necessary to do because only relevant mini session is considered for improvement.

3) **Finding relevant candidate link**:

Candidate link:
The links that can be selected to assist the user navigation called as candidate link which can be obtain from a mini session.

A link is said to be relevant to mini session, if adding the link can greatly improve the user navigation without increase in path threshold. Otherwise it is considered as the irrelevant candidate link. Relevant candidate link is found because only the candidate link relevant to the mini session should be considered for improvement.

Problems in a existing system:

Mathematical programming model can be efficient and effective for improving user navigation in a website containing static information. But it does not improve user navigation for website containing dynamic information and also it cannot identify the user target accurately, additionally there is no constraint for accessing webpage simultaneously.

IV.PROPOSED SYSTEM

In proposed system, we can dynamically generate the links based on the association rules generated by using the user access patterns from the weblog files. (in this association rules mining provides the end user with correlation among references to various pages for an effective navigation. The navigation technique usually consists of four stages. They are

1) Client side navigation
2) Client side browser redirect
3) Cross page posting
4) Server side transfer

Client side navigation:

In this navigation technique, web page contains all information and links about the next page where user needs to be navigated. A user selects the desired page by means of button with a hyperlink that relocates the user to the request page. This is widely used navigation technique by business peoples. In this method the webpage provides hyperlinks to the user. When these hyperlinks are clicked by users, they are automatically redirected to the requested pages.

When the client requests the particular page, then the server will find and send the particular page. The page is displayed by the browsers in a particular form.

Client side browser redirect:

This option of navigation was invented from side server. Code scrap which functions at server side notifies the browser when it needs to move to another page where certain conditions which are decided for upcoming page will be perceptible to the user. Then this option is set up. The server will decide to allow move on to the next page and then the post back occurs but it requires more time and moves.

Cross page posting:

In this technique, the data send by the user can be move on to another page in order to set web page control. The data collected about the particular page can be moved to another page for processing further. So the post back is occurred on another page when the user is redirected.

Server side transfer:

When the server receives the request from the client browser to the particular page, then the server will executes the request, find and detect the particular page and then redirect it to the client browser. it also sends the related pages to that particular page. Then the browser will display the required page in client system.

Our proposed system pays attention to time constraint handling. Once the required patterns are discovered, we illustrate how they can be used to dynamically customize the page organization. The user current behavior can be compared to one or more sequential patterns and navigational hints can be added to the pages proved to be relevant for the customer.

The proposed work consists of five phases:
1) Preprocessing
2) Pattern discovery
3) Pattern analysis
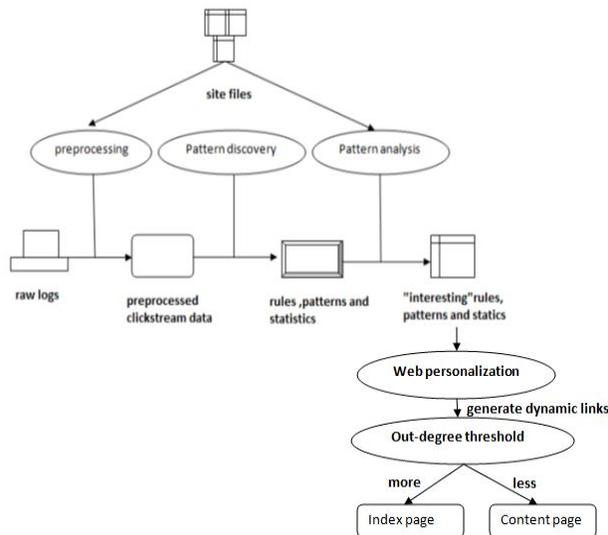4) Web personalization
5) Out degree threshold

Fig: 2 overall diagram of proposed system
The figure depicts the overall process of our proposed system.

Preprocessing:

In the preprocessing phase, first understand the webpage connectivity; incur the data from weblogs in which the user sessions are identified. In here first of all remove all irrelevant requests and only accept relevant request in to a consideration. Then remaining access log files is sorted by address and time. Finally, we cluster together entries sufficiently close over time and also check whether user accessing different websites simultaneously or not by checking the request. Links between the pages and the similarity between the contents of pages provide evidence that the pages are related.

Pattern discovery:

Pattern discovery is the process of extracting useful, interesting and unknown information and patterns from the weblogs by means of using various data mining techniques such as association, classification, prediction, pattern evaluation and recognition and statistics. Then the extracted knowledge can be represented in various forms such as graphs, tables, curves, pie-chart in order to describe the features of the knowledge.

Association rule generation can relate the pages based on the content and domain. Association rule generation refers to finding set of pages that are accessed together with a support value surpass maximum value. The association rule may also serve as a heuristic for pre-fetching documents in order to reduce user -perceived latency when loading a page from remote site

Pattern analysis:

The central idea behind pattern analysis is to filter out unwanted or irrelevant rules or patterns from the set found in the pattern discovery phase. The most common form of

pattern analysis consists of a knowledge query mechanisms such as SQL.

The patterns are represented in graphs, charts, curves, using different colors for different values.

Web Personalization:

Web personalization is the process of adapting web pages based on the user navigational behavior information, user preferences and his profile patterns. After analyzing the patterns, we can restructure the website based on the user navigation data because user behavior can be different from one another.

In this phase, we can generate the links dynamically to restructure the website to improve the navigation based on the analyzed data. Whenever a new page of content is uploaded, then the relation of this page is established and the links that can be generated and added to that particular domain.

Out-degree threshold:

Web pages can be organized into two types of pages, Index page and Content page. The index page contains links to various pages based on the particular domain and it can have more links. The content page contains the information that the user wants and it should have less links. The out-degree threshold (number of external links in a page) is depends on purpose of website and it is more for index pages and less for content pages.

Generally the links of the pages can be added to the index page and page containing the content can be added to the content page.

In our proposed method, the webpage is divided into frame that contains links of the content pages and also the links related to the content searched.

V.EXPERIMENTAL SETUP AND RESULT

MINIMUM HARDWARE REQUIREMENTS:

System	: Pentium IV 2.4 GHz.
Hard Disk	: 40 GB.
Monitor	: 15 inch VGA Color.
Mouse	: Logitech Mouse.
Ram	: 512 MB
Keyboard	: Standard Keyboard

MINIMUM SOFTWARE REQUIREMENTS:

Operating System: Windows XP.
Platform   : DOT NET TECHNOLOGY
Front End   : ASP.Net 3.5
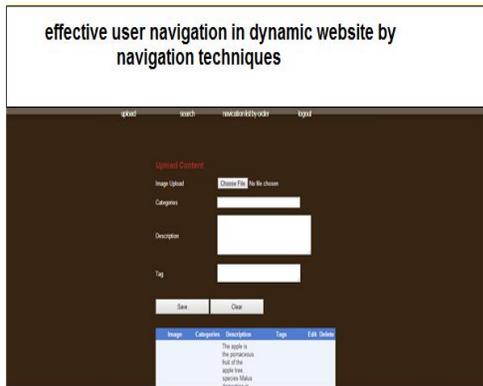Back End   : SQL SERVER 2005

The below screen shots experimentally shows the proposed work:

HOME PAGE:

The above snapshot shows the user login page .In this page only the authorized user will be allowed to login, use, upload the information.

UPLOAD PAGE:

The above snapshot shows the upload page.in this page only the authorized users should be allowed to upload.the links for the uploaded page can be generated dynamically based on the user preferences.

SEARCH PAGE:

The above snapshot shows the search page where the user can search their required data. The relevant tag shows the links relevant to your searched data.

SEARCH BY NAVIGATION LIST:

The navigation tag lists all the navigated webpage links. In addition to this it lists the frequently accessed and frequently needed pages in a first link.

The result from testing ensures that the client can reach the target page in a fewer clicks even in a dynamic website and it works well in real world. The testing result shows that all the links should take the user to the correct page and verifies that the no duplicate links must be allowed. Here we use the hierarchical search method that group the related links together so that the user can reach their target in fewer clicks and less time. Additionally we also implement the security methods so that only the authorized users can use the website.

VI.CONCLUSION

In this paper ,we proposed a optimal solution method for improving navigation for dynamic web site and finding the user target location accurately. we obtain a better solution than the mathematical programming model and also it is very effective to real world website by comparison both model (i.e. mathematical programming and association rule) shows that our model could achieve a better performance than the previous model within the fewer links and also experimental results shows that it will provide a better performance than the mathematical programming model. Additionally we implement the security methods so that only the authorized users can use the website.

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