Targeting and Scheduling of Advertisements to Maximize Revenue

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***Abstract*— The increasing popularity of the World Wide Web had made it an attractive medium for advertisers; online advertising has became a very powerful and popular method of marketing. Many web sites like Hotmail, Yahoo, etc. Provide free services to the users while generating revenues from advertising. As more advertisers place Internet advertisements it has become important for web site owners to maximize revenue through the optimal selection and placement of these ads. Main goal is to schedule ads such that each ad is displayed with the correct frequency, each ad is allocated enough space for the specified geometry, and all the ads to be displayed simultaneously can be arranged in the space available for advertising . The proposed system is implemented using ASP.NET and SQL server for storage requirement .It employs the Knapsack Relaxation algorithm which delays the issues such as maxspace and minspace related to the scheduling of advertisements.**

I. INTRODUCTION

Advertising is a form of marketing communication used to promote or sell something, usually a business's products or services. Advertising is at the front of delivering the proper message to customers and perspective customers. The purpose of advertising is to convince customers that a company's services or products are the best, enhance the image of the company, point out and create a need for product or services, reinforce the salespeople's individual messages, draw customers to the business, and to hold existing customers.

Online advertising is a form of promotion that uses the Internet and World Wide Web for the expressed purpose of delivering marketing message to attract customers. Online advertising, also called online marketing or Internet advertising is a form of marketing and advertising which uses the Internet to deliver promotional marketing messages to customers. It includes email marketing, search engine marketing(SEM), social media marketing , many types of display advertising(including web banner advertising) , and mobile advertising. Like other advertising media, online advertising frequently involves both a publisher , who integrates advertisements into its online content, and an advertiser , who provides advertisements to be displayed on the publisher's content. Other potential participants include advertising agencies who helps generate and place the ad copy, an ad server which technologically delivers the ad and tracks statistics, and advertising affiliates who do independent promotional work for the advertisers.

Important aspect of Internet advertising is space sharing, using the same advertising space to display several different ads. This can be done by displaying different ads to different users by periodically updating what is displayed to a given user or by displaying a set of small ads that together use the available space.We address the problem of scheduling ads on a web page for a given planning horizon. Since the maximum space to be used by ads on a given screen is always limited, the web site owner may not be able to place all the ads that are competing for space in a given planning horizon. The web site owner will then try to select and place ads in such a way that his/her revenue is maximized. Unscheduled ads may compete for space in the next planning horizon with new ads demanded by the advertisers. In order to maximize revenue, the web site owner will try to maximize the utilization of space available to place the ads. Here the maximization of space utilization is equivalent to the minimization of unused space. For scheduling the ads, we consider three factors: the amount of time that an advertiser would like the ad to appear, the number of users who could possibly view the ad, and the size of the ad.

II. LITERATURE SURVEY

The original pricing model for the online advertising industry was the CPM model. The CPM model is a basic pricing structure which was adopted from traditional print advertising, within which the publisher is compensated an agreed upon rate for every thousand advertisement impressions that they deliver. This model was very popular in the 1990's and is still being used by many companies [8]. Adler et al. [1] presented a space-sharing model. In this model, a fixed area on the web page is available for advertisements and the demands of each ad are specified by geometric size and display frequency.

Menon et al. [3] introduced another model to address the Internet ads scheduling problem to obtain maximum revenues for ad agents. They relaxed the constraint of reaching all demands of accepted ads, which allowed the ad agents to realize better revenues, but just satisfy the ad's partial demands in the schedule.

Amiri et al. [2] also presented a more flexible and practical model, using the same relaxation of ad demands previously mentioned, but suggest a more precise pricing scheme for real-world trading. Ad customers can list several levels of demands to be implemented, and each ad display pays to ad agents according to its levels.

Yager [14] describes a general framework for the competitive selection of advertisements at web sites. A methodology is described in the paper for the use of intelligent agents to help in the determination of the appropriateness of displaying a given advertisement to a visitor at a site using very specific information about potential customers. Fuzzy system modeling is used for the construction of these intelligent agents. A paradigm for advertising on the web is created, which can make optimal use of the general capability available for instantaneous processing of information in real time. Authors in [6, 7, 9, 10, 13] Dreze, Zufryden, Kohda, Endo, Marx, and Risdel, tackled the issue of increasing the effectiveness of web ads.

Authors in [8, 11, 12] McCandless, Novak and Hoffman describes web advertising theories and terminologies. Authors in [4, 5] Aggarwal and Adler describe a framework and provide an overview of general methods for optimizing the management of advertisements on web servers. A high level framework is provided in this paper. They describe a minimum cost flow model in order to optimize the assignment of advertisements to the predefined standard sizes of slots on web pages. This paper is intended as a starting point for further discussion and details are not provided to apply the described methods in practice.

III. EXISTING SYSTEM

The seminal online advertisement scheduling introduces two basic problems, the Minspace and the Maxspace problem, and proved that both are NP- hard in the strong sense. The Maxspace problem is formulated based on the CPM pricing model. The objective of the Maxspace problem is to find a feasible schedule of ads such that the total occupied slot space is maximized given that the slots have a fixed capacity and the ads are of differing sizes and differing display frequencies . There are several assumptions which are inherent int the formulation of these two models.

IV. PROBLEM STATEMENT

As more advertisers place Internet advertisements it has become important to maximize revenue through the optimal selection and placement of ads and maximize resource utilization through minimizing the idle time of the resources. The problem is finding an schedule to maximize the Web site revenue and resource utilization under a hybrid pricing model.

VI. OBJECTIVE

We are looking forwards to develop an improved dynamically scheduling scheme for online advertisements.

- To target advertisements that are closely aligned to user's interest and needs.
- To find a schedule of the ads such that each ad is displayed with the correct frequency by applying time stamps.
- To efficiently allocate each ad with minimum space in available slot i.e minimum resource utilization.
- To schedule ads such that revenue is maximised i.e profit maximizing.

V. SYSTEM DESIGN

System design is a transition phase from a user oriented documented system to a purely programmatic oriented system for programmers' database personnel. The system design makes the high level decisions about the overall architecture of the system. The system design phase provides the understanding and procedure details necessary for implementing the system recommended study. The target system is arranged into subsystems based on the analysis structure and the proposed architecture.

The system design has been in two phases-logical design and physical design. In the logical design, the user specification for the proposed system were formulated Physical design follows the logical design phase, in this phase, emphasis is put on how the requirements are to be achieved in terms of hardware equipment and procedures were formulated. The method of inputting data to the system and to process them so as to produce the desire output was decided after the advantage and disadvantages of each available alternative.

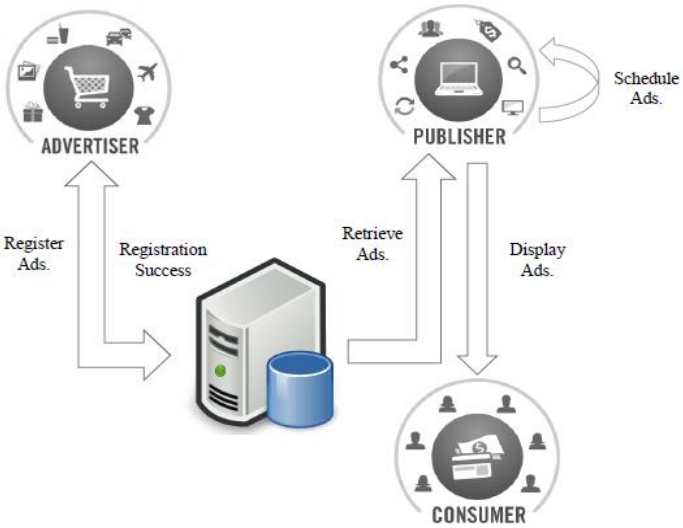

Fig 6.1: System Architecture for Targeting and Scheduling of Advertisements.

VI.1. MODULES DESCRIPTION

Advertiser Module:

Advertiser register the advertisements to publish it on website by uploading the ad in image or text format.

Publisher Module:

Publisher fix the cost to ads according to the priority and sizes selected by advertiser. Then retrieve the ads from database by considering the cost paid to them and schedule the highly paid ads first in the dynamically divided slots and retrieve all the ads and schedule them by dynamically dividing the slots according to the size of ads.

Customer Module:

Customer views the ads published on the websites.

VII.FLOWCHART

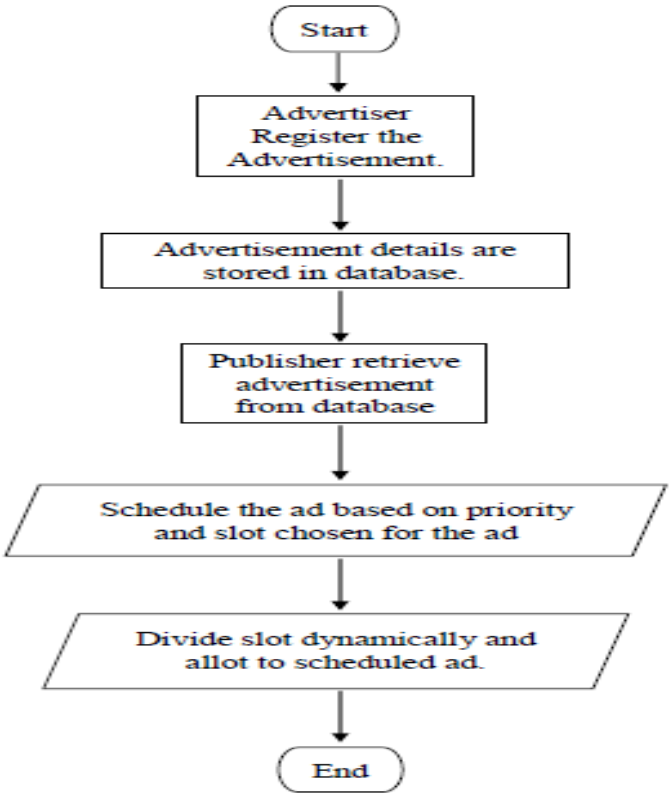

Fig 7.1: Flow Diagram.

Advertiser register the ad to the system by uploading advertisements and its details.
Publisher retrieve the advertisements from the database and schedule them according to their priority and slot choosen by the advertiser to dynamically divided slots.

VIII. APPLICATIONS

- Reach clients on every screen.
- Engage with native and video ads.
- Maximize programmatic revenue.
- Scale ads business with ease.

Fig 8.1: percentage of users search for various ads

IX. CONCLUSION

Drastic increase in the size of Internet has led to the growth of many firms that use the business model of providing free services to customers and advertising for revenues. It is now well known that these firms can only allocate a limited space on their websites for advertisements. Hence, these firms need to be able to judiciously use this limited space in order to maximize their revenues. The proposed system maximize the space utilization by optimal placing of advertisements on web pages.This system schedules the advertisements using the different time stamps according to the priority given. The revenue is increased as multiple advertisements are displayed in the limited space with the help of time stamp.

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