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# The Mechanism for Online Publishers to Monetize a Website and Manage the Contextual Advertising

Nor Edlina Binti Mohd Rosni
Business Information Systems Computer Information Science (CIS) Department Universiti Teknologi PETRONAS Tronoh, Perak

Ahmad Izuddin Zainal Abidin
Computer Information Science (CIS) Department Universiti Teknologi PETRONAS Tronoh, Perak

Abu Bakar Sedek B. A. Jamak
Management and Humanities Department Universiti Teknologi PETRONAS Tronoh, Perak

*Abstract-* **The evolution of technology and internet (World Wide Web) has brought about many predictions of their possibilities to transform the businesses, education, economy, and social at bigger perspective. With the advent of the internet and ad server in early 1990s, internet has become one of the marketing channels that have been used for advertising purpose. Based on the article stated in Digital Advertising Broke $100 Billion in 2012 it mentioned that "In 2012, web advertising approximately grew about 55.8% in the Middle East and Africa and 38.4% in Eastern Europe while 21.5% and 13.9% for North America and Western Europe". The latter shows that the users and the advertisers increasingly shift their attention on web applications that as well give the benefits to the publishers to maximize more revenue.**

**This project going to discuss further details the mechanism for publishers to monetize their website and to match the related advertisements with the website contents. Providing these kinds of advertising (contextual) will give a challenge to the publishers to display the advertisement that possibly will be clicked on by the users. Two main objectives will be addressed in these research papers are; to study the best approach for the publishers to maximize the revenues by displaying related advertisement with website and to develop a website prototype that shows important connection between the function of publishers to maintain and manage the website contents and Contextual Ads.**

**Hence, the scope of the study will be discussing on the major player in online advertisement which is publisher; to learn, discover and analyze the theory and concept of online advertisement and contextual advertising from publisher's perspective.**

## I. INTRODUCTION

### A. Background Study

Marketing mix is a combination of price, product, place, and promotion; it is a business tools that widely used in marketing area by marketers to serve the needs and desires of the product's customers while generating optimum income. One of the marketing mix under promotion that has been used broadly in a business is advertising. Advertising has been used to persuade, influence or control the viewers to take additional action where drive the customers behavior with respect to marketable offering as well as increase businesses' sales and revenues. Literally there are lots of medium that can be used for advertising purpose. For example, billboards, printed flyers, television and radio advertisement, and online advertisement. In addition, advertising allows company to sell their ideas, products and services that are differentiated by the brand identity.

The existence of internet allows the organizations to advertise their products and services to the whole world at a lower cost rather than using traditional advertising and it has bring a new phenomenon in the advertising industry. Internet becomes a medium of communication that brings the greatest impact and important achievement of humandkind and managed to change both civilization and communication (Gates. C.F., 1995, Hahn & Stout, 1994, and Otte, 1994).

Nowadays, internet advertising has embarked with excellent evolution. According to eMarketer CEO and co-founder Geoff Ramsey; they stated that the growth of online advertising has been robust and it already represents the second-biggest advertising after television. Besides that, it is forecasted that printed advertising (newspaper and magazine) will lose 9.3% of market share in 2015.

These days, online advertising is a large and has grown rapidly in the market and online advertising become a significant role in today's internet ecosystem. Worldwide spending on internet advertising was total $65.2 billion in 2008, or nearly 10% of all advertisement spending across all media, and will grow 15- 20% a year to reach $106.6 billion in 2011, or 13.6% of total ad spending, according to Digital Marketplace Model and Forecast (Pak. A & Chin-Wan Chung, 2010).

Most of the online advertising consists of textual advertising where it takes mainly; contextual advertising and sponsored search. Contextual advertising is a textual advertising where advertisement is placed in the website contents while sponsored search is a placement of paid links as a response to

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the users' queries that displays the "best match" and relevant advertisement. Therefore with the context of this research paper that focusing on publisher's perspective, the publishers have to know the mechanisms to display the related advertisement that are linked with users' interest and with this approach it will help the online publishers to maximize their revenues from online advertising. Figure 1 below shows the ecosystem and major players involves in the internet advertising.
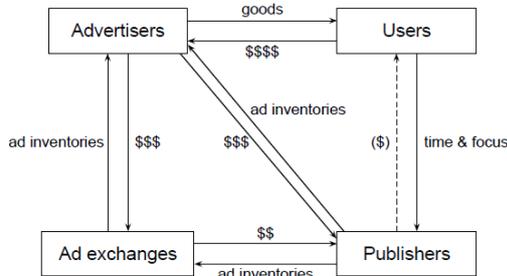


Source: Internet Advertising: An Interplay among Advertisers, Online Publishers, Ad Exchanges and Web Users

Figure 1: The basic system of Internet advertising. Advertisers spend budget to buy ad inventories from ad exchanges and publishers; ad exchanges serve as matchers for ads and inventories; publishers provide valuable information to satisfy and keep visitors; users read ads and purchase goods from the advertisers. Note that normally users would not receive cash from publishers.

One of the publisher's goals is to maximize the revenue by displaying the advertising in the sponsored search. However, this objective is symbiotic with advertisers' need to attain better business results through advertising. There are many approaches for the publishers to gain more revenues from online

advertisement. For instances CPI (cost-per-impression) where the advertiser pays the display advertisement on a website; CPA (cost-per-action) an advertiser pays to the publisher based on each users that was brought by the advertisement and last but not least is CPC (cost-per-click) where the advertiser need to pay whenever the users click-on the advertisement which reflects the interest of users.

B The problem statements of this study would be as follow:

 Display relevant advertisement that match with website contents; publishers need to find the best approach to display the best match between the advertisement and content of the websites. An example of irrelevant display advertisement could be display ads related to "Diving in Malaysia" on website about "Boutique in Malaysia".
 Maximizing advertising revenues for online publishers through online advertisement; where the publishers have to increase the possibilities that the users going to click on the advertisement when the users visit the website.
 Establish a platform for small businesses to advertise their ideas, product and services; where publishers need to effectively and successfully display the advertisement in the website with an optimum advertising costs and at the same time generating as much revenue as possible.
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C. Objectives & Scope of Study:

The objectives of this project are:
 To study the best approach for the publishers to maximize the revenues by displaying related advertisement with website contents through independent web publishing.
 To develop a website prototype that shows important connection between the function of publishers to maintain and manage the website contents and Contextual Ads.

The scope of study for this project:
 Theory and concept of online advertisement and contextual advertising from publisher's perspective.
 Explore the best approach to increase advertising revenues for online publishers.
 Study the major player in online advertisement which is publisher.

I. LITERATURE REVIEW

A. Current Trends in Online Advertising

Online advertising is one of the marketing processes that use internet to promote the ideas, products and services to the consumers. Example of online advertising are search engine marketing, email marketing, and mobile advertising. Literally, online advertising will involve four major players which are publishers, advertisers, ad exchange and users.
Today, online advertising expenditures are rapidly increase and growing throughout the year and the total spend of online advertising in the worldwide reached $503 billion at the end of 2013. Based on the total spend of online advertising recorded in 2013, it shows that there are still much potential for the industry to grow in the coming year and the advertisers have lot of opportunity to be grabbed to reach more audience hence, increase the awareness of the customers towards the products and services that has been advertised on the internet. It shows that advertising that use internet or online approach to deliver and promote the business message is more attracting and could keep the new and existing customers.
Since its inception, the Internet has been a testing ground for different marketing approaches to online advertising (Shankar. V. & Hollinger. M. 2007). The advancement and innovation of internet has drive online advertising from text advertisement to interactive advertisement. Recently, Google declared that the company earns revenues on advertisement more than newspapers and magazines starting from year 2012 onwards. According to David (2013) he stated that almost all of Google's expected $60 billion in revenue will come from advertising this year. This news proves that traditional advertisement (printed advertisement) suffered declining in advertising revenue.
Online advertising spending continued to grow throughout the year and predicted to continue into the foreseeable future. However, the percentage change of online advertising decreases over the year as the online advertising industry becomes more matured and many businesses start to use online advertising as part of the promotional campaign. Hence, advertising industry has changed the dynamics of the business world from traditional advertising methods to online advertising due to the evolution of technology. According to Haque (2007), the developments of computer mediated communication technology, brings up the chances for the businesses to get direct feedback from the customers and website visitors with the ability to customize individual messages. It is believed that in the future online advertising will start to dominate the advertisement industry since online advertisement is in the edge of facing "explosive growth".

B. Theory of Contextual Advertising
Contextual Advertising is one of the types of online advertising that will be adapted and implemented in this research paper

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which mainly focuses to "best match" the user queries with the relevant advertisement hence to increase advertising revenues for online publishers. According to Merle. (n.d); contextual advertising is the text of a web page that scanned for "keywords" or a theme, then ads will be shown related to the website content. In this context of advertising, the owner of the web page (web publisher) need to match the website contents with the related advertisement to be displayed in order to increase the users' satisfaction. For instance, if the users search for "Top Islands in Malaysia", the website must be able to display advertisement related with that particular island (such as hotels, resorts and holiday package ads). The advertisement normally will be displayed in the right hand side or the website or at the top and bottom of the website.

In the internet advertising, there are four major players involved: ad exchange, advertiser, publisher and user. Based on the internet advertising ecosystem, ad inventories are operated with the force of demand and supply from the advertisers. In this context, advertiser will demand his advertisement will be displayed in the ads inventories. Therefore, advertisers can achieve and matches their goals in the advertisement through find the available ad inventory in the market. Ad exchange will provide advertising service that allows the advertisers to display and promote their products and services to the targeted group of internet users. An ad exchange also manages contract negotiation between advertisers and content publishers that wish to sell ad spaces (Yuan et al, 2012). Advertisers and ad exchange will bid the keywords for the ads to be displayed and listed in a search result page (e.g: Google, Yahoo Search) or in the publisher's website at the auctioned price.

Website publishers provide a platform to the advertiser to advertise the products and services to their targeted customers. Literally, they can maximize the revenues through online advertisement by displaying the advertisement and enhancing the website contents. Google AdSense was the first website publisher who implements contextual advertising program. It works by providing webmasters with JavaScript code that, when inserted into web pages, displays relevant advertisements from the Google inventory of advertisers (Wikipedia.org, 2014). Mediabot is a tool that has been used by Google to calculate the relevance of the advertisement to be displayed on the webpage. Today, Google has more complex systems that they use to support contextual advertising which is "language-independent proximity pattern-matching algorithm" with a goal to increase the accuracy of matching. With the invention of AdSense, AOL Sponsored Listings, Microsoft adCenter and Yahoo! Publisher Network started to make an action to offer similar services just like Google. However, it will be a challenge for the website publishers to select the optimal contract or estimate the optimal price to be offered to the advertisers (Yuan, et al. 2012).

In the context of contextual advertising, advertisers is the player who needs advertising space to position its marketing messages and also they provides the information of advertisement to attract targeted customer to click on the advertisement. Advertisers have to ensure that the ads are "narrowly focused" so that the ads can be reached to the target market and not for those who does not use the product or services. Besides that, for each of the advertisement, its position and the total number of ads on the page have a significant influence on its click-through rate (CTR) (Joachims et al, 2005).
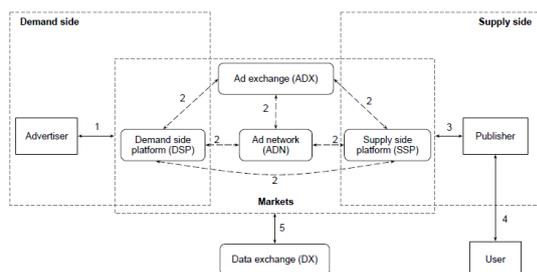


Source: Internet Advertising: An Interplay among Advertisers, Online Publishers, Ad Exchanges and Web Users

Figure 2: "Various players of Internet advertising and the trading process: 1) The advertiser builds campaigns in markets 2) The markets can trade campaigns and impressions to balance the demand and supply for better efficiency 3) The publisher registers impressions with the markets 4) The user issues queries or visits websites 5) The markets can query data exchanges for user profiles in real-time bidding."

In the rapid expansion of the online advertising industry and increasing revenue, more numbers of companies are engaging with the business by offering new tools and platforms which makes them different, exclusive and valuable to the rest of traditional players of online advertisement. Based on the figure 5 above, there are two major platforms that involved in the online advertisement which are Demand Side Platforms (DSP) and Supply Side Platforms (SSP). DSD will focus on advertisers' site where it will provide the advertisers or advertisement agencies by bidding for their campaigns in multiple ad networks automatically and allows the advertisers to display and promote their products and services to the targeted group of internet users. While SSP will serve the publishers by registering their ad inventories in multiple ad networks and publishers will receive the most beneficial ads automatically. In addition, Ad Exchange (ADX) will integrate all the ad networks together in one place. Publishers will request ads with a given context to serve users, the ADX contacts candidate Ad Networks (ADN) in real-time for a wider selection of relevant ads (Yuan, et al. 2012).

In this research paper, contextual advertising will display the advertisement based on geography, language and other preferences of the visitors of the websites. Hence, with the existence of contextual advertising, the publishers manage to maximize the utilization of advertising opportunities and also revenues

### C. Issues of Contextual Advertising

Users will browse the website and they will perform searches using search engine and view the result in the website contents; the task of the website publisher is to display one or more advertisement on such pages. Madani. O and DeCoste. D (2005) found that the contextual advertising problem consists of making such selection and placement decisions of the advertisement in order to maximize the expected return over some period of time, where expected return is a function of the likelihood of the ads being clicked – and possibly even a transaction or purchase taking place – and the prices of those clicked ads.

In contextual advertising, matching advertisement with user's queries is to a certain degree way forward. This is because advertisers need to choose the keywords that "narrowly focused" and portray their advertisement so that the targeted customers can be reached and there are possibility that the website users will click on the advertisement. Behind the architecture of contextual advertising, the matching process is set automatically by the website contents where it makes the task more complicated. Besides that, the major challenge of being website publisher is the concern on how each of the advertisement should be evaluate and how the systems select the best advertisement accurately, efficiently and effectively.

Furthermore, another major challenge in contextual advertising is the sparsity. There may be many ads available, whereas the number of interactions we may get from a single typical user, in a time period of interest, may be very small in comparison, furthermore click rates for arbitrary ads are relatively small as well (Madani. O. & DeCoste. D., 2005).

### D. The Perspective of Publishers in Online Advertising

Majority of the online publishers reserve spaces in their website for branding ads or contextual advertising purposes. Ads inventories can be sold to the advertisers in the form of contracts or in real-time basis. The publisher will be responsible for delivering a total number of impressions based on what was

agreed on the contract; in some condition when the publisher is unable to deliver all guaranteed impressions, a penalty will be applied (Yuan, et al. 2012). As a result, the online publishers might face the challenges either to opt for the optimal contract (a contract between publisher and advertiser that minimizes the costs as much as possible for all that involved) or estimate the optimal reserve price that will benefit both advertisers and publishers.

Most of the publishers decided to take the plunge into monetizing the traffic of their websites by providing valuable and unique content as well as serving contextual advertisement to the Internet users in order to gain revenue. Hence, in order to gain revenue from advertising, publishers choose to go for Google Adsense ad tags and allow Google's engines and algorithms to figure out the rest on how to match the related advertisement with the contents of the website. By having this mechanism, the publishers can take care of doing what they do best (e.g. content management of the website). However, there are also some publishers (smaller publishers specifically) that prefer manual transmission rather than automatic because it lends a publisher far more control and power even though it requires a lot of works.

In the other context of contextual advertising, the publishers and ad exchanges will share the revenue. As a publisher they have to ensure that the contents of the websites are beneficial, accepted and "profitable keywords" so that the keywords that found by the contextual advertising system can be matched with the keywords that the advertisers have bid. It can be concluded that; the more relevant ad displays on the websites, the higher the chances of the users will click on the advertisement and the more revenue that can be earned by the publishers.

i. Revenue Maximization

In contextual advertising, publishers will share the revenue with ad ad exchange; how and when an ad is delivered and displayed in the publisher's website in not within the publishers' control. This is because there is an engine or algorithm that will automatically plug the ads in the website based on the selected keywords by advertisers to display their ads in the publishers' websites. The contents of the websites play a major role in determining the relevance ads to be displayed within a website. However, there is one of the most natural questions about how the publishers can gain the revenue from the website: How should online publishers generate the highest expected payoff from the advertisement that is displayed in the publishers' webpage?

The focus here is on maximizing the revenue for the publishers; apparently publishers will have more control over advertisers due to the advertising requests that they receive from the advertiser. According to Roels and Fridgeirsdottir (2009) and Feige et al. (2008); their model allows publishers to dynamically optimization select which advertising requests are awarded advertising contracts. The equation below shows the model that has been explained by Roels, Fridgeirsdottir and Feige et al:

$$(n_i, \mathcal{W}_i, r_i, \pi_i)$$

Where:

$n_i$ = Number of impressions requested;

$W$ = Set of websites/viewers/time of delivery;

$r_i$ = Cost-per-thousand (CPM) impressions;

$\pi_i$ = Goodwill penalty in case the requested number of impressions cannot be fulfilled.

Source: Internet Advertising: An Interplay among Advertisers, Online Publishers, Ad Exchanges and Web Users

## II. METHODOLOGY

Rapid Application Development (RAD) methodology will be implemented throughout this project. By definition, Rapid Application Development (RAD) is a type of software development methodology that required minimal planning and it will focus more on the rapid prototyping. In RAD model the functional modules are developed in parallel as prototypes and are integrated to make the complete product for faster product delivery (tutorialspoint.com, n.d). Since minimal planning is required in this type of methodology, it will make the project easier to adapt with any changes during the development process. The most important part for this model is to ensure the development of prototype is successful and reusable.
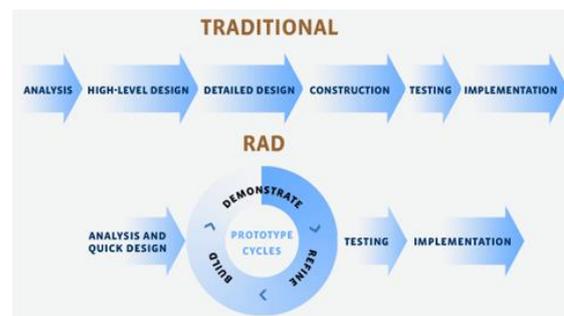


Figure 3: Traditional Methodology vs. Rapid Application Development Methodology

One of the main reasons this methodology has been chosen because RAD is focusing on small projects that can be launched in a short time and it can be concluded with tangible deliveries. Hence, by implementing Rapid Application Development (RAD) in this project it will enable rapid delivery as it will shrink the development time due to the time constraint, reusability of project prototype and shortage of people to work on the project. Tools that have been used for this project are:

*i. Wix*
Wix is a web development platform that enables the users to build and develop HTML5 websites using simple cloud-based creation and management tools. In this project, this tool is used to create a website that easily to customize and can be used almost for anything.

*ii. Adobe Photoshop*
Adobe Photoshop is a graphic editing software that developed and published by Adobe Systems. In this project, this software will be used to design the content and advertisement that will be displayed in the web pages.

*iii. Bannersnack*
BannerSnack is a banner maker software that allows publisher to create interactive flash banner ads and other types of ads very quickly. Besides that, bannersnack also enable the publisher to monitor every ads that has been displayed in the publisher's website through the number of view/click by the Internet users.

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## III. RESULTS AND DISCUSSIONS

The author has conducted a survey questionnaire mainly aimed to identify the perception of Internet users' on Internet advertising as well as contextual advertising. The survey was conducted online using Kwiksurvey.com and 42 responses of Malaysian Internet users' responded on the survey. The results of the surveys will be analyzed and deduce further details to come out with further conclusions and for the development of the project on the perspective of Malaysian Internet users' towards online advertising that advertised on the websites. In the survey questionnaire, there are 22 close-ended questions being asked in the survey. The questionnaire divided into two sections: 1) Demographic Data 2) About Internet Advertising and Contextual Advertising.

Based on the questionnaire, it can be concluded that more than 90% of respondents aware of online advertising and more than 50% of Internet users click on the online advertisement to seek for more information about the advertised product or service.

**Question: You click-on online ads to seek additional information about the advertised product/service?**
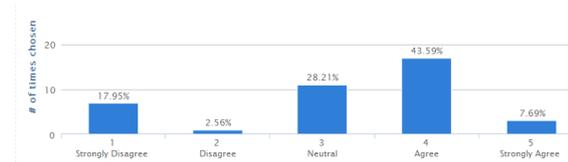


Figure 4: Survey Analysis

### B. System Prototype Design

Based on the questionnaires that have been conducted to 42 respondents in Malaysia, the author proposed to have an ads matching system and getting the best match between the display advertisements and the content of the websites; in which the website will be managed mainly by the publishers.

The website namely "Corners of Malaysia" will act as a publisher that provides the information needed by the Internet user to learn and discover about Malaysia. Furthermore, the online publisher needs to keep updating the website with the latest information in order to generate more traffic of the website at one time and also the possibility that the Internet users will likely click on the display advertisement to seek for more information. The higher the traffic of the website, the higher the possibility of the Internet users to likely click on the display advertisement that related with the website contents and the user queries. Therefore, the more the revenues that gain by the publishers from online advertisement based on cost-per-click (CPC).

Besides that, there will be an agent in between that act as a platform to serve the publisher and advertiser to manage the placement and position of the ads and to get more targeted customers that will likely click on the ads. Therefore, in order to perform this project *bannersnack* will be used as an ad serving management. *Bannersnack* is an online advertisement maker that allows the publisher to monitor every advertisement that has been displayed in the publisher's website through the number of view/click by the Internet users. However, the process involved requires lot of works in putting the advertisements on the site in order to ensure the advertisement is situated on the right place and right position. Even though it takes a lot of time but it has high degree of customization.

Thus in this project, the author integrated Bannersnack with the website. The website of Corners of Malaysia is developed by using wix and its fully customized template. The website is created in order to demonstrate and stimulate the ads-matching varieties. Below are a few screenshots of the website built by the author:
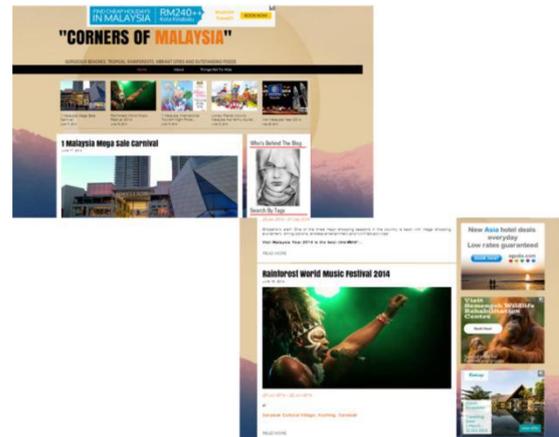


Figure 5: Corners of Malaysia Interface



Figure 6: Prototype of the Website created

The author will need to create advertisement inventories in the Bannersnack ads management. Bannersnack allows the publisher to manage the ads inventory and third-party advertisers to be displayed on the publisher's website. In this project, the author simulated both automatic and manual way of setting up the ads placement in each page of the website. This approach requires lot of works however the publisher and the advertiser can reach the targeting customers and there is high possibility that the visitor of the website will likely to click on the advertisement displayed since it is relevant with the website contents. Below are a few of ads designed by the author:

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Figure 7: Banner ads prototype

Next, advertisement campaigns will be created where it is a series collection of ads that share a single idea, properties and themes which make up an integrated marketing communication (IMC). The publisher of the website will create a campaign within the Ad Campaigns tab on the Bannersnack account. In this context, price of the ads and ad size will be set by the publisher then sends a link over to the advertiser for the campaign. Once the advertiser (the organization or business) decided on how the ads will look like, destination or landed link in the Corners of Malaysia, agrees to the terms and conditions including approval of the price; the publisher needs to confirm the link and ad creative. After campaign is created, it will be linked to the ads spaces that have been reserved by the publishers on the webpage. Every page in the website of Corners of Malaysia, there will be a zone (or multiple of zones) in which it will automatically display the ads that are in the campaign and have the exact size of the ads as requested by the advertiser.

Once ads inventories and ads campaigns are created, it is time to link the ads on the right zone. In Corners of Malaysia, there are more than one zones or spaces of ads that the publisher reserves in every page to display the advertisements. According to business term, zone is a pool of multiple advertisements that will display, serve, rotate and randomize ads.

In order to set up zone(s) on website, it depends on the publisher on how they want to arrange the zone and it is flexible. The publisher has to integrate the Bannersnack ads management with the website in order to perform, manage and display the advertisements. Furthermore, in order to setting the zone(s) in the page of the website; the publisher will need to have serving code for every ads zone on the website. This zone's serving code will be displayed the ads within their own zone.

Additionally, ad position can be determined by looking at the performance of the ads. This means that some ads are more profitable, get more clicks and earn higher click through ratio. It is fact that some advertisements can perform better than the other advertisements. By having this element, publisher can choose to display the ads that perform better on the top or display it more often. Hence, this can maximize the Return on Investment (ROI) for the better ads and revised or improved the ads that are less performed.

Bannersnack ads management allows the publisher to monitor and adjusts the ads priority. Therefore, publisher can optimize the ads much better based on the higher clicks and most visited advertisements by the Internet users. Equation below shows the relationship between the website of the traffic, number of ads click by users and the revenues gain by the publisher.



Hence, let
$$W = \text{Website traffic}$$
$$A = \text{Ads}$$
$$CTR = \text{Click Through Rate}$$
$$Rev = \text{Revenue (RM)}$$

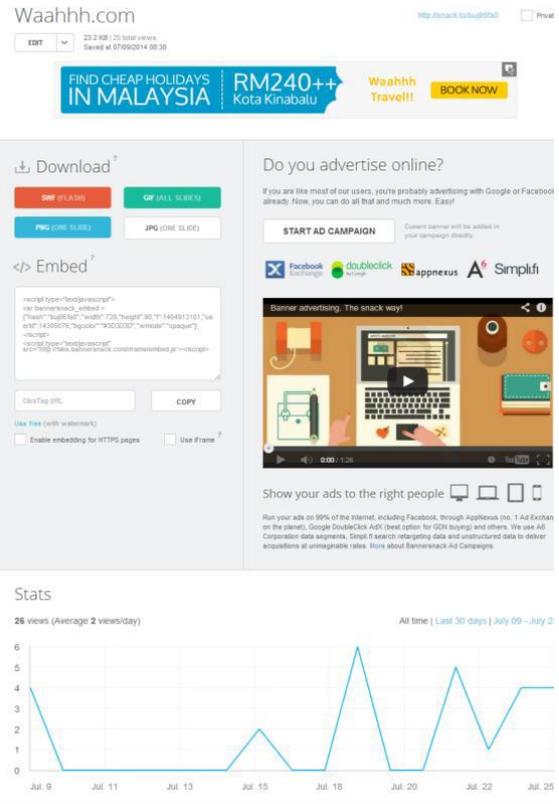Therefore; $\Delta W + \Delta A \longrightarrow \Delta CTR + \Delta R$



Figure 8: The Statistics Shown for the Display Ads

Figure 10 shows the statistics for the Wahhh.Com advertisement where the ads gained the highest click among the other ads. The good performing ads get higher ad priorities (located as the ads leaderboard) on the website and the opposite situation happens to the poor performing ads.

In this example, the publisher has 2 ads; A and B on click optimization. Both ads are started out at the same priority. After a week, it has been monitored that ad A has 15 clicks while ad B only has 10 clicks. It means that the Internet users respond to ad A better than ad B. Therefore, priority will be given for ad A to be displayed on the top of the webpage and it will display more frequently than ad B.

## IV. RECOMMENDATIONS

Recommendations for future work that needs to be done are the ads need to be delivered and displayed to the Internet users will become more targeted where it can maximized the satisfaction and will become more helpful. In order to have that feature in contextual advertising; it can be done through providing a system that have a good algorithm of predicting the user behavior based on their browsing history and able to select keywords that matches with search queries accurately. Therefore, publishers will be able to understand its audience much better and also able to place the ads on the right position on the website.

Besides that, it is suggested that as online publishers they need to improve the contents of the websites in order to generate more traffic and maximize the ROI. One of the mechanisms that could be employed by the publishers is by implementing

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fractional factorial design. It can be used to test which features of the website are attractive and most beneficial to users and it also can be used by the advertisers to improve the quality of ads that will be displayed on the webpage. Thus, this approach makes good utility of remain impressions and can boost income for publisher and advertiser occasionally.

## V. CONCLUSION

As a conclusion, this research paper is focusing on to successfully match the contents of the websites with the related advertisement through the theory of contextual advertising. Besides that, the purpose of having this paper also to ensure there is a valuable connection between the websites and the contextual advertisement that could benefits the

Internet users and also to maximize the revenues of the publishers from online advertisement through cost-per-click (CPC). Internet advertising has a big potential to continuously expand in the advertising industry to assist the businesses to reach their target customers in promoting their products or services.

In addition, contextual advertisement approach that match to the website contents and user queries will make the Internet as beneficial platform for the users to gain information hence the ads are more likely to be clicked on by the users. In addition, this research paper also shows that the theory of contextual advertising from the publisher's perspective is directly applicable in practice. By having this kind of platform, the organization specifically for small medium enterprise could employed to advertise their ideas, products and services at a lower cost and it will contribute to bringing forward the future of online advertising.

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