

# Online Ad Manager based on Autonomic Principles

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**Abstract**—The ever increasing complexity of computing systems will cross the borders of human capabilities, leading to systems that are too complex to be administrated by human beings. System administrators will no longer be able to install, configure, maintain and optimize these computing systems of the future. The solution to this problem is developing a technology that allows computing systems to manage themselves. This solution is referred to as autonomic computing. Online advertising is a method of campaign that customs the Internet and World Wide Web for the conveyed purpose of providing marketing messages to appeal customers. Examples of online advertising contain related ads on search engine results pages Social network advertising, banner ads, Rich Media Ads, online classified advertising, advertising networks and e-mail marketing, including e-mail spam. One key advantage of online advertising is the instant broadcasting of information and content that is not restricted by space or time. To that end, the emerging area of interactive advertising presents fresh challenges for advertisers who have hitherto adopted an interruptive strategy. Another advantage is the effectiveness of advertiser's investment. Online advertising allows for the customization of advertisements, including content and posted websites. For example, AdWords, Yahoo! Search Marketing and AdSense enable ads to be shown on relevant web pages or alongside search results of related keywords. This Paper titles Online Ad Manager: Based on Autonomic principles is an attempt to develop a model framework for - autonomic online advertising and related standards. It will also delve into the theoretical background of specific techniques, which can be applied in this scenario.

**Index Terms**— Autonomic, ad management, autonomic computing, online ad

## I. INTRODUCTION

“Online Ad Manager Based on Autonomic Principles” is an attempt to provide a common interface for all online ads independent of ad engines. This interface provides the functionalities of managing the campaigns including analyzing and allocating budget. Though major ad engines provide interface for their own ads say Ad Words and AdCenter by Google. But there is no common interface available with which one could manage ads belong to different ad engines. Google analytics and Yahoo analytics provide an interface in which we get different ad engines performance in different parameters, but we don't have any option to manage the ads from there. There is no option to see the performance campaign wise in above interfaces. This paper made an effort to combine the features of Google AdWords and Google analytics in a single interface

called Online Ad Manager. Human involvement in the interface is needed only in initial configuration, later, interface manage the ads automatically based on predefined algorithms. Algorithms are designed based on autonomic principles. Interacting to the third party ad engines through the program is done by web services provided by corresponding API say AdWords API and yahoo API. Analysis of ads which don't have API is done through tracking codes.

## II. ADMANAGER

Ad Manager deals with advertising analysis and management including mainly budget allocation and management. Online advertising is a form of promotion that uses the Internet and World Wide Web for the expressed purpose of delivering marketing messages to attract customers<sup>1</sup>. The emerging area of interactive advertising grants new challenges for promoters who have hitherto adopted an interruptive approach. The following Process flows are designed for AdManager.

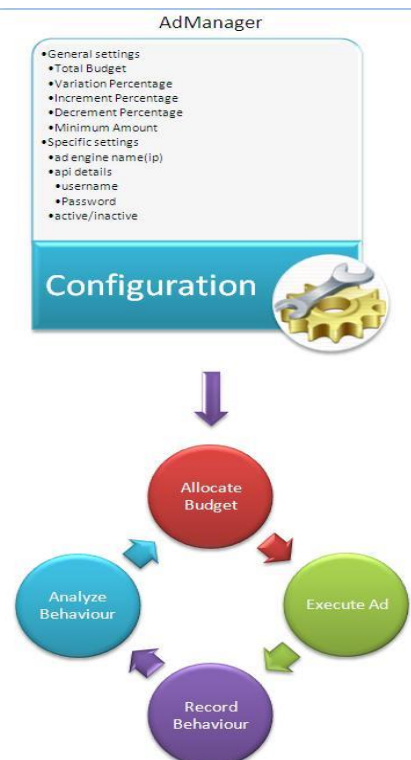


Figure 1: Full Process Flow

**A. Allocate Budget**

Three most common ways in which online advertising is purchased are CPM, CPC, and CPA.

- CPM (Cost per Mille), also called "Cost per Thousand (CPT), is where advertisers pay for exposure of their message to a specific audience."Per mille" means per thousand impressions, or loads of an advertisement. However, some impressions may not be counted, such as a reload or internal user action.<sup>2</sup>
- CPV (Cost per Visitor) is where advertisers pay for the delivery of a targeted Visitor to the advertiser's website.<sup>3</sup>
- CPV (Cost per View) is when an advertiser pays for each unique user view of an advertisement or website (usually used with pop-ups, pop-under and interstitial ads).<sup>4</sup>
- CPC (Cost per Click) is also known as Pay per click (PPC). Under the Pay per click pricing system, advertisers pay for the right to be listed under a series of target rich words that direct relevant traffic to their website, and pay only when someone clicks on their listing which links directly to their website. CPC differs from CPV in that each click is paid for regardless of whether the user makes it to the target site.<sup>5</sup>
- CPA (Cost Per Action) or (Cost per Acquisition). In this payment scheme, the publisher takes all the risk of running the ad, and the advertiser pays only for the amount of users who complete a transaction, such as a purchase or sign-up.<sup>6</sup>

**Define Policy Definition:**

Allocate minimum amount for new ad engine.

Allocated Budget = AdM\_AB\_MinimumAmount

**Policy Parameters:**

AdM\_AB\_MinAmount: Minimum amount for allocation

AdM\_Budget : Total Budget for ads

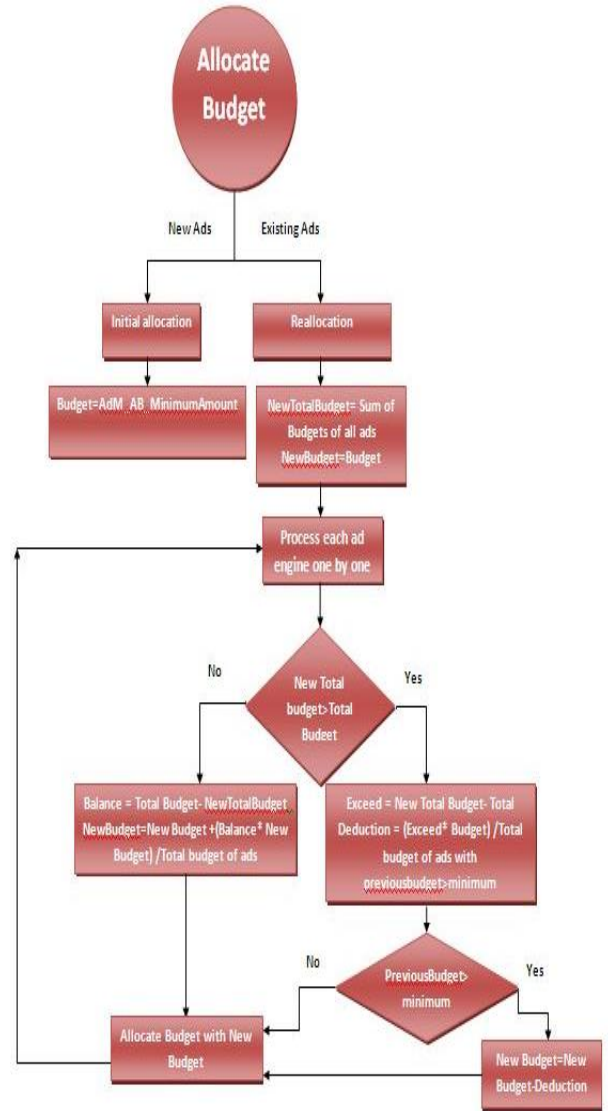


Figure 2: Allocate Budget Process Flow

**B. Execute Ad suggestions**

- The Ad Suggestions are executed in two ways:
  - List of suggestions are displayed on the screen and the user will confirm, if this has been executed or not.
  - List of suggestions are automatically inputted into the Ad machines like Google Adwords, Yahoo etc.



Figure 3: Execute Ads Process Flow

**C. Record Navigational Behaviour**

Record the daily performance in the data base.

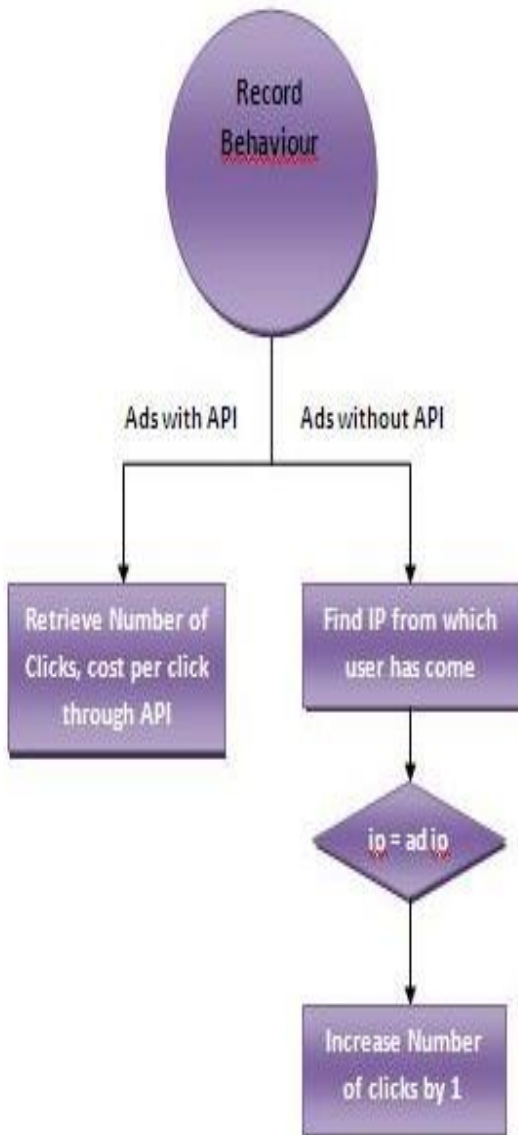


Figure 4: Record Behaviour Process Flow

**D. Analyse Navigational Behaviour**

If the previous day clicks are greater/less than today's no of clicks with AdM\_IncrB\_VariationPercentage, algorithm increase/decrease the budget according to the cpc of the ad engine.

$$\text{Average cpc} = \text{Total Budget} / \text{total no. of clicks}$$

$$\text{Cpc} = \text{Budget of ad engine} / \text{no. of clicks}$$

If the previous day no. of clicks is greater than current day and increase percentage is greater than or equal to AdM\_IncrB\_VariationPercentage increase the budget of the ad engine. If the previous day no. of clicks is less than current day and decrease percentage is greater than or equal to AdM\_IncrB\_VariationPercentage decrease the budget of the ad engine

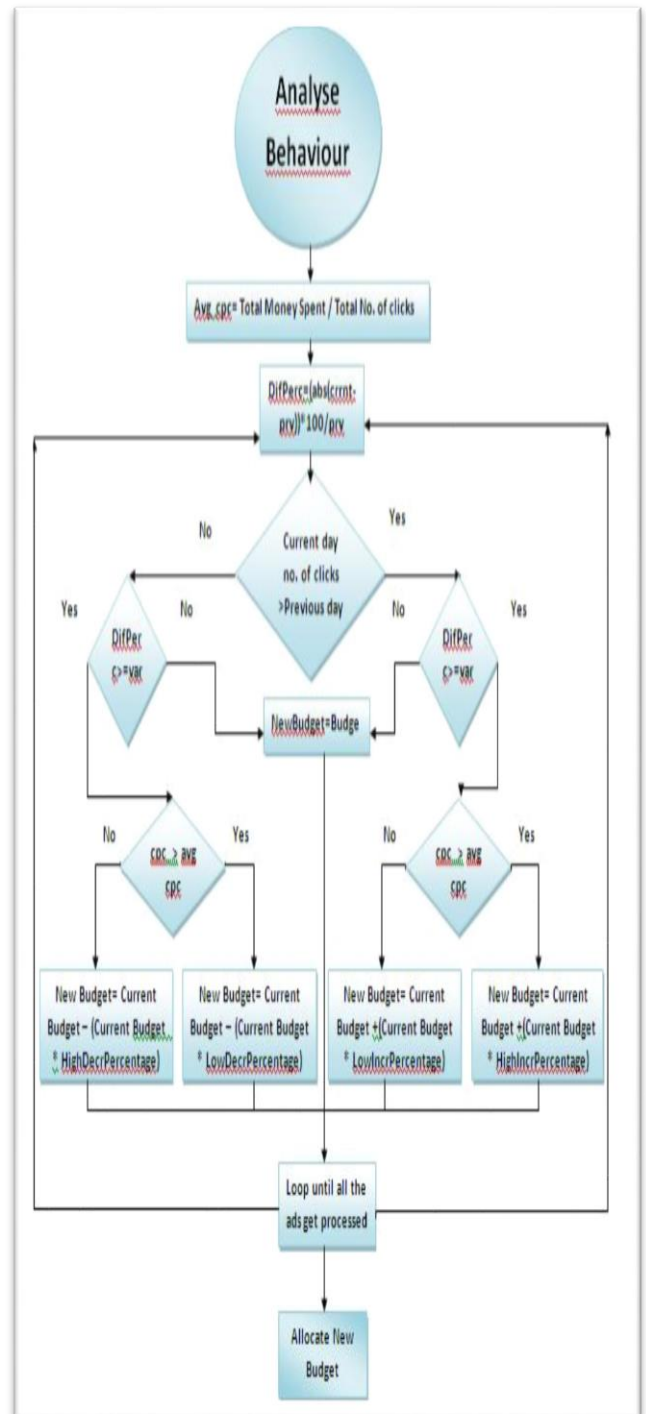


Figure 5: AnalyseBehaviour Process Flow

**III. CONCLUSION**

Even after a decade of the launch of the Autonomous system manifesto, though we have a good understanding of what autonomic systems should look like, are nowhere near developing and deploying such systems on a wide scale<sup>7</sup>. This paper attempted to apply autonomic principles to the very dynamic area of ad management. Online ad manager uses the principles to simplify the work of an ad manager and become an indispensable tool in their arsenal. Ad companies like Google and Yahoo provide API to allow for access to ad related information. Some services do not.

Online Ad manager is able to work with both kinds. It integrates the information from various ad providers and analyzes them. It is able to determine and fix the budget across engines. It simplifies ad and campaign management and is able to automate much of the routine work such as daily budget setting. It allows the ad managers to see performance reports with graphs. The vendor neutral architecture with the ability to utilize the vendor specific API if available enhances the project. Currently the project supports Google AdWords and Microsoft AdCenter.

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