



ADHAWK WORKS ADVERTISING ANALYTICS ON A DASHBOARD

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ABSTRACT:

With the business moving online, most of the effort to draw visitors or the means of advertising the business has moved online. Drastic shifts in both technology and customer behaviour during the past decade has produced sources available to marketers and now they have access to a previously unimaginable trove of information about what exactly customers see and buy. Now, if a company has invested a large capital in online advertising or advertising in apps, there must be some method available to them to see if their investments in these programs are working. Therefore, our project is aimed at developing a platform which would be primarily focused at measuring and converting the user activities to numbers that tells the advertiser how it has affected the conversion rates and returns. In addition to achieving the above mentioned objective, developing a platform that would also help the companies to forecast their sales based on the current trends is our prime goal. The future sales trend can be predicted using the reports generated by the proposed system from all the media used to advertise the business.

Keywords: Advertising Analytics, Web Analytics, Dashboard for Ads, Digital Media Marketing, Ad Stats, Keywords Popularity

[1] INTRODUCTION

With most of the companies emerging out with their own e-business model, the dependency on technology, of both the company and their clients is increasing significantly. Many companies also make use of the digital media such as mobile application or websites to advertise their product and consequently expand their potential market. Due to this dramatic changes, a huge amount of data related to the user's interactions with the Web sites are recorded in the Web access log. Web access log plays an important role in predicting the user access pattern and pre-fetching and caching of Web data for better performance. ^[1] Web analytics is the measurement, collection, analysis and reporting of web data for purposes of understanding and optimizing web usage.

Web analytics ^[2] is not just a tool for measuring web traffic but can be used as a tool for business and market research, and to assess and improve the effectiveness of a website. Different data mining techniques like classification clustering, association mining can be applied on Web usage data to mine user access patterns and this knowledge can be used in a variety of applications such as system improvement, Web site modification, business intelligence etc. Web usage mining ^[3] is a type of data mining process used for discovering the usage patterns from web information for the purpose of understanding and provides the requirements of web-based applications. To apply data mining techniques we need pre-processing tasks that must be performed prior to applying data mining algorithms to the data collected from server log.

Web analytics applications can also help companies measure the results of traditional print or broadcast advertising campaigns. It helps one to estimate how changes traffic to a website after the launch of a new advertising campaign. Web analytics provides information about the number of visitors to a website and the number of page views. It helps gauge traffic and popularity trends which is useful for market research.

This paper discusses various data analysis techniques that are carried in order to predict future sales that can be used by the companies to scrutinize various digital advertising platforms.

[2] FRAMEWORK OF ADHAWK WORKS

AdHawk Works is a web based application which aggregates the advertising data from the network (Clickstream Data) and combines the same with revenue metrics to allow the organization to have an insight into their sales. It is the process of collection, measurement and analysis of user activity on a digital media.^[1] Based on the dataset containing the user activity combined with the revenue metrics, AdHawk Works will generate dashboard reports that will give an overview of the popular keywords and other stats for the given advertising campaign.

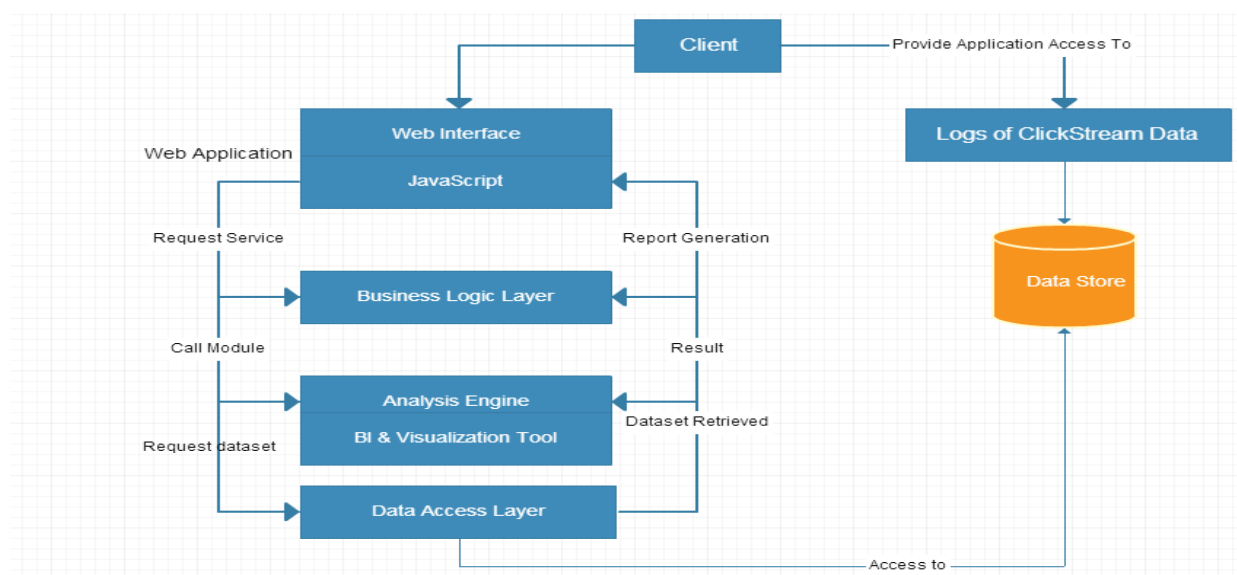


Figure 1. Framework of AdHawk Works

Data analysis, modelling and reporting is generally carried out through a set of interrelated steps and the process of data analysis reviews each step on the basis of both the previous and the subsequent step. The components and steps involved in AdHawk Works are:

1.) Client (User)

The client or the user of the system (digital advertising campaign) will first have to provide the system access to their logs of the clickstream data generated through the user activity. After having access to this data the system will store it in its data store and process the same in the Analysis Engine for pattern discovery.

2.) Web Application

The Web Application provides an interface to the user and communicates the user's service request to the Business Logic Layer using JavaScript. The reports that are generated in the analysis engine

can be viewed by the user on the Web Application. The user can even export the generated reports in different formats, for detailed study, using the Application.

3.) Business Logic Layer

This layer provides a communication mechanism between the Application and the Analysis Engine. The Business Layer Logic receives the user's service request from the Application and depending on the service request made it passes the call to the concerned module. This layer is also responsible for displaying the reports generated to the user. For the purpose of Data Visualization in our project we would be using the concept of Dashboard. Dashboards give an overview of how the properties are performing by displaying summaries of different reports as widgets on a single page. ^[4]

4.) Analysis Engine

Analysis Engine is responsible for the discovery and communication of meaningful patterns in data by application of different algorithms (explained in the next section). Using the data, the analysis engine tries to determine the popular keywords which has higher conversion rate (into sales) and which keyword would yield higher CTRs (Click Through Rate) for the ad campaigns based on their popularity. It provides a high level view of how the campaign is performing

5.) DataStore

For discovering the patterns from analysing the user's behaviour and usage archetypes, the first step is fetching data from the server log. The client will provide the application access to their server log which would be thereafter used by the Analysis Engine for pattern discovery.

[3] FEATURES OF ADHAWK WORKS

Our project's features help users or business organization to have an insight about which keyword is the most popular or most used on the website for a particular campaign based on metrics such as CTR, CPC, Clicks, Impressions etc.

1) Naïve Bayesian Classifier

Naïve Bayesian classifier is a simple but powerful technique for classifying the database according to Decision variable that is Class Labels. In our Project Ad Hawk Works, our aim is to analyse which keywords are the most popular for Draft Campaign which is provided in our dataset. So we have mentioned four CTR categories based on attribute CTR i.e. BAD, AVERAGE, GOOD and EXCELLENT. Our ultimate aim is to classify keywords in these four categories. So Naïve Bayesian analyses our dataset and classifies the keywords according to four CTR categories and displays it in usable form to user.

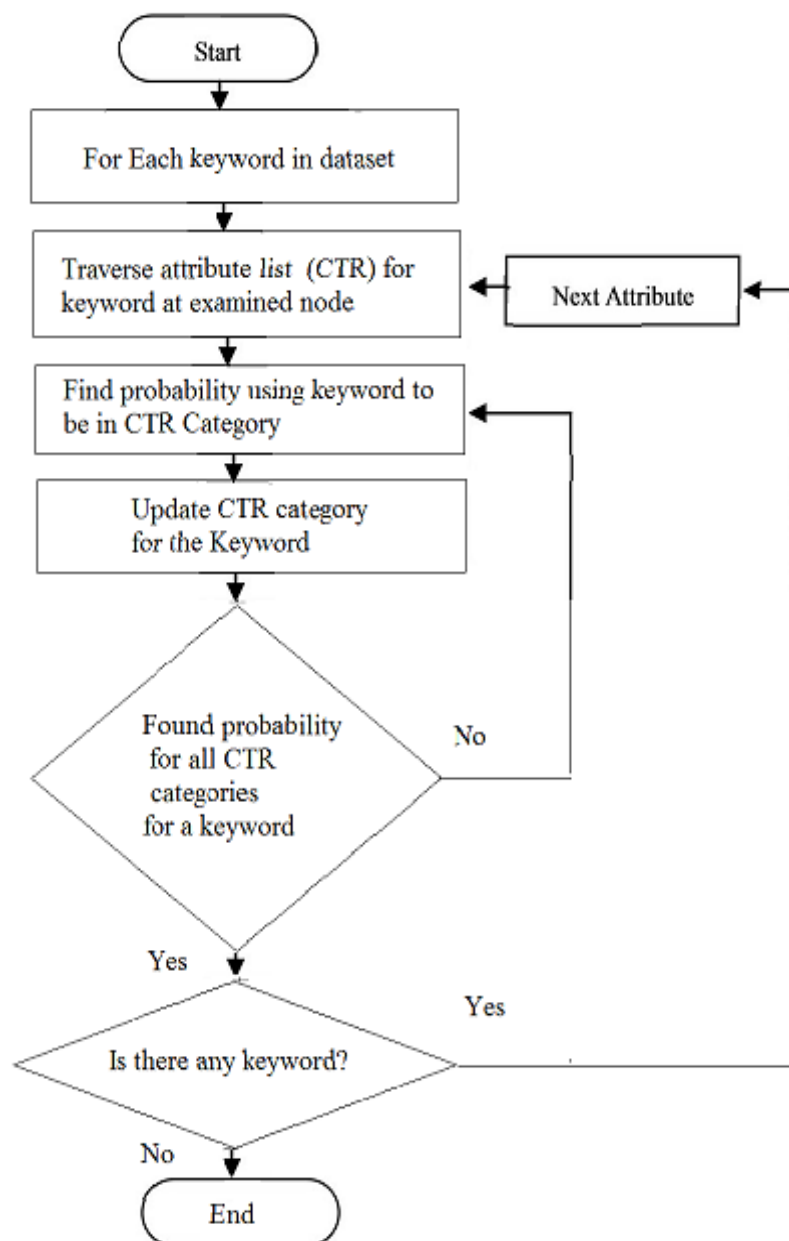


Figure: 2. Flowchart of Naïve Bayesian Classifier Algorithm

2) Clustering

Cluster is a group of objects which are closely related to each other. In our project Ad Hawk Works, we have used Clustering K-means Algorithm to find out the Top 10 or Top 20 most popular keywords. No of clusters depend upon unique keywords in the dataset. When user clicks on Top 10 popular keywords, he/ she gets Top 10 popular keywords based on frequency associated with each keyword etc.

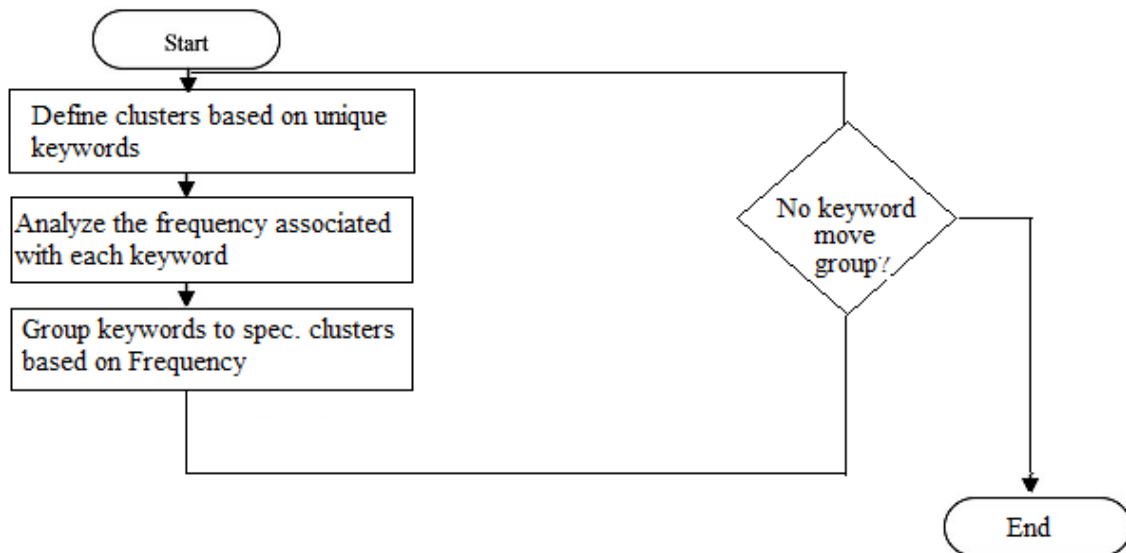


Figure: 3. Flowchart for Clustering Algorithm

3) Compare Keywords

User selects Keyword1 and Keyword2 from the list and compares them. The application checks the keyword in database and retrieves all the information like Clicks, CPC, CTR, and CTR Category. Based on CTR Category like BAD, AVERAGE, GOOD and EXCELLENT, application gives result which keyword is more effective for draft campaign.

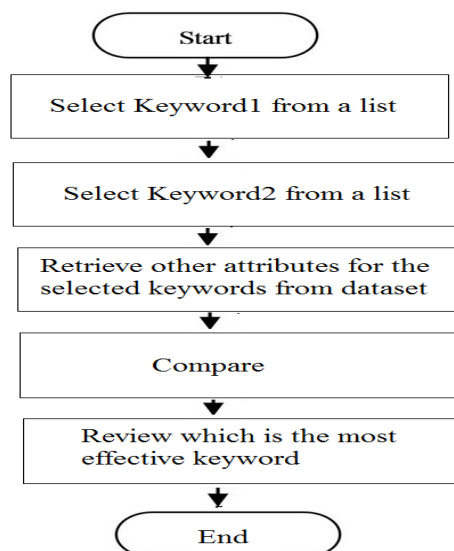


Figure: 4. Flowchart for keyword comparison

4) Association between Keywords and CTR Class

Association rules are used to discover relationship between the attributes in the dataset. So in our project, association rules gives the best rules that provide relationship between similar keywords along with CTR category. It displays top 50 association rules for the dataset. It helps in predicting the CTR Category of a given Keyword.

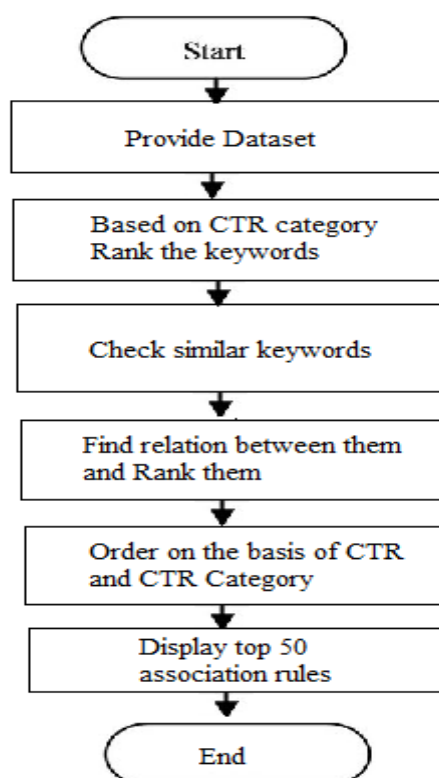


Figure: 5. Flowchart for Association Mining

5) Charts

After Data analysis, data visualization and report generation is very important step. To visualize advertising data analysis, we have generated different charts such as-

- Bar Chart
- Pie Chart
- Doughnut Chart
- Multiline spline chart
- Line chart
- Multi series bubble chart

[4] CONCLUSION

Companies these days invest a large capital in online advertising or advertising in apps, there must be some method available to them to see if their investments in these programmes are working. Therefore, our project is aimed at developing a platform which would be primarily focused at measuring and converting the user activities to numbers that tells the advertiser how it has affected the conversion rates and returns. Our aim is to not only track number of visitors to the site or the number of page views, it can be used to see which content (keyword search on search engines) gets the most visits, conversion rates, which ads are driving the most visitors to your site, which will help track the performances of various marketing campaigns. This collected data would be modelled into graphical reports like bar plot, scatter diagram etc. that will aid in analysing the same more efficiently. Means for comparing the

present trend with the historical or past trends to scrutinize the effect of each event would be a yet another important feature of the system. Thus, developing an effective platform that will help the online business advertisers to understand their performance by tracking the activities of the visitors and optimize the performance using inputs from the various reports generated is the overall idea of our proposed project.

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