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MAdTech Software System using Social Media Mining

Rohan Chaubey[1], Saurabh Pandey[2], Prof. Uma Goradiya[3]

[1,2]Department of Computer Engineering, Shree L.R. Tiwari College of Engineering, Maharashtra, India
[3]Assistant Professor .Department of Computer Engineering, Shree L.R. Tiwari College of Engineering, Maharashtra, India

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Abstract - *Traditional purchase cycle is long, manual and time-consuming with no guarantee of success. The process is intuitive, not based on data. The buying process involves multiple meetings, emails or phone calls to close the sales. Thanks to progress in technology, enterprises can leverage MarTech + AdTech tools and easy-to-use user interfaces to reach their target audience faster with no physical meetings. The large amount of data enables companies to create customer profiles which can be used for micro-targeting distinct audiences. New-age technologies and growth hacking have encouraged enterprises to leverage MarTech and AdTech tools to fuel growth. The use of big data, data mining, and automation can exponentially increase profits and bring down the user acquisition cost for enterprises. It also enables companies to tap into granular audience segments which previously was only possible through paid advertising on social networking sites. Programmatic and automation tools (MarTech, AdTech and MAdtech) softwares have become very popular among enterprises because they allow micro-level user targeting, personalization opportunities and media buying easier than ever. We will be developing a software that employs social media mining technology to obtain big data from user-generated content on social media sites and mobile apps in order to extract patterns, form conclusions about users, and act upon the information, for the purpose of advertising to users. The MarTech tool based on social media mining technology will crawl and collect data. The output data (typically contains email addresses, names and phone numbers) of the software will be the input to the AdTech platform to assist media buying.*

Key Words: **data mining; MAdtech +Adtech; user interests; Big data.**

1. INTRODUCTION

Here we will elaborate the aspects like description, problem statement, scope, motivation and also the objectives of our project.

Traditional purchase cycle is long, manual and time-consuming with no guarantee of success. The process is intuitive, not based on data analysis. Second, the large amount of data enables companies to create customer profiles which can be used for micro-targeting distinct audiences. Generally, advertisers and data providers use predictive modelling to place users into granular audience segments. For instance, customers may be classified into different age groups (inferred from the sites they visited or from information they filled in somewhere) or marked as being associated with certain product categories (again, based on the websites they have browsed over time). For media campaigns, such detailed information on individual customers can be employed to personalize creatives (e.g., showing a person's favorite product color) or better match the product category of an ad to a person's interests. For example, car enthusiasts can be shown automotive ads or manufacturers of cosmetics can target women of certain age groups, thereby minimizing wastage. Programmatic advertising is the single most efficient way to acquire users for enterprises. Internet is working as an 'expressway' for enterprises to develop.

Scope and Motivation: There's more opportunity out there than ever before, which helps to offset the competition. History shows us that as competition increases, so does available opportunity. There's plenty of space for new innovation especially for the new age digital companies. The MAdTech software system using social media mining can help all enterprises of any industry who use digital channels for customer acquisition. The proposed system increases ROI (Return On Investment) and decreasing CAC (Customer Acquisition Cost) for enterprises through the MAdTech system. Currently, it is limited to media buying, in future, the data from the MarTech system can also be used for organic media campaigns. The idea that motivated us to take on the project is 'Growth Hacking' taken from Rohan Chaubey's international bestselling book 'The Growth Hacking Book' in six countries (ISBN: 978-1-7330955-5-6). The idea is copyrighted under the USCO (United States Copyright Office), a part of the Library of Congress.

Project Objectives

•To find a proven social media data mining framework through experimentation that delivers predictable results.

•To automate the data mining process and store it either locally or on cloud.

•Based on the technical feasibility, a social networking platform has to be chosen that will be ideal to implement social media mining.

•Building the MarTech system to obtain the first-party customer data.

•Configuring the MarTech system to produce output dataset per the API limits of the chosen social networking platform.

•Establishing a connection between MarTech system and data enrichment software to enhance the massive output dataset so as to take more informed media buying decisions.

•A unit to upload output of MarTech system as the input to the AdTech platform.

•To engineer the MAdTech system by integration of MarTech and AdTech systems.

•To create a user-friendly GUI (Graphical User Interface) that hides the complexity of the code-heavy proposed system from the end user.

•To make media buying cheaper than the traditional way and more efficient due to granular interest-based audience targeting.

•Increasing ROI (Return on Investment) and decreasing CAC (Customer Acquisition Cost) for enterprises through the MAdTech system.

2. LITERATURE REVIEW

Here we will elaborate the aspects like the literature survey of the project and what all projects are existing and been actually used in the market which the makers of this project took the inspiration from and thus decided to go ahead with the project covering with the problem statement.

The MAdTech tools are limited and there is no other systems that have a functionality of producing declared data based on customer profiling.

[1] MarTech and AdTech software systems based on Big Data have become very well known in the advertising industry because of Two important advantages: (1) automatic purchasing procedures and (2) Micro-targeting / personalization. First, to know the value behind automation to media buying, it ought to be mentioned that the conventional buy procedure is long and manual for many years. Typically, this procedure entails multiple meetings, emails or telephone calls. Due to advancement in technology, brands and agencies are now able to reach the right audience using software systems and Big Data.

Secondly, the Big Data enables businesses to carry out customer profiling, which subsequently may be used to get micro-targeting. For Example, targeting can be based on different age classes or marked as being related to specific product groups. Such comprehensive information on individual clients can be used to customize creatives (e.g., demonstrating an individual's favorite product colour) or better suit the product group of an advertisement to an individual's interests. As an Example, car enthusiasts can be shown automobile ads and cosmetics can target women of particular age groups.

[2] This paper utilized the social networking mining technology to forecast the stock price. With the increasing number of social networking sites, it has become easy to obtain access to Big Data about an audience set. Social Networking mining originates in the relevant area of Data Mining, which decodes patterns from structured info rather than unstructured. The paper used social media mining for opinion mining. The same principle can be applied to collect declared data of a specific target group of netizens.

[3] The paper outlines to benefits of online advertising versus offline advertising. Higher rate of launch campaigns, the capability to immediately correct the parameters of the advertising effort, the alteration of the advertising materials in a given span of time, interactivity - the capacity to respond quickly to the behaviour of this audience, extensive targeting. The quantity of online advertising is continually growing. As of 2017, the advertising sales online and on TV has been equalized. The consumers consume more information online than offline. Now, while the online advertising using technology is considered among the most cheap. The occurrence of multimedia lets you retain the consumer's attention and "attract" him to purchasing.

[4] Among the world's most well-known IT companies are actually advertising firms deriving their major revenues through digital advertisements. Because of this, these IT giants are capable to continually drive the evolution of information technology In ways that serve to improve our daily lives. The advantages of the connection include free web browsers using strong search engines and mobile applications. Still, it turns out that, it comes at a price that's paid via our interactions within a digital advertising ecosystem. Digital advertising is not without its own challenges. Issues arise from the complicated platforms used to support advertising over the web. Additionally, as new methods for advertisements create so too does the potential for impacting its underlying ecosystem. Additionally, advertising principles with a variant of other advertisements approaches, both malicious and legitimate, are researched so as to compare and contrast competing digital advertising methods.

[5] In the information technology age, many Enterprises have to modify their advertising strategies. The paper shares how enterprises' advertising approaches have been altered to accommodate to the current business trend, also to realize their business value and competitive benefits. The transformation of advertising in e-commerce age is examined and a forecast of future growth has been given.

3. PROBLEM DEFINATION

It's never been easier to start an enterprise. It's never been harder to build one. The startup growth hacking is always innovating. What helped unicorns like UBER get initial traction won't help other early stage startups grow. That's why growth hacking is the need of the hour to find unconventional growth opportunities in minimum investment. Currently, India has 650 Million Internet users. However, as there are more companies fishing for the same set of audience, the cost for media buying and user acquisition through digital channels is skyrocketing. Thereby making traditional paid advertising expensive, inefficient and less effective.

4. SYSTEM ARCHITECTURE

The figure depicts a block diagram of the proposed system - MAdTech Software System Using Social Media Mining.

Key Concepts:

Social APIs: API stands for Application Programming Interface. This is a concept in software technology that essentially refers to how multiple applications can interact with and obtain data from one another. In the proposed system, the social APIs will help us collect data from social media platforms and send it to the MarTech system.

Social Platform: Any social networking platform can be used to extract consumer information Capturing consumer motivations, intentions, interests, and preferences at scale lets you truly personalize each customers' experience.

MarTech System: The MarTech system includes data mining unit, data enrichment service and sends output to the local storage or cloud storage.

Data Mining Unit: The data mining unit will use social media data mining technology to extract massive data sets.

Website Crawler: The crawler program will be employed to find the structure of the social sites and web elements from which data needs to be extracted.

Subscription Management System: The proposed system will be based on SaaS (Software as a Service) model. Hence, to manage the user accounts and subscriptions, a subscription management system will be added.

Data Enrichment Service: Data enrichment service merges third-party data from an external authoritative source with an existing database of first-party customer data. Brands do this to enhance the data they already possess so they can make more informed decisions. This helps in audience building and profiling by validating and enriching the data.

Local Storage: The output of the MarTech system can be stored locally on the system on which the application is installed.

Cloud Storage: The output of the MarTech system can be stored on cloud. Example, the large database of consumer data can be stored on Amazon Web Services.

AdTech System: The output of the MarTech system is the input to the AdTech system. The omnichannel personalization is carried out by AdTech platform. The programmatic tailored or retargeted ads are then deployed over the internet.

Enterprises witness a 10X return on ad spend using declared data-powered custom audiences.

The integration of all the independent units build the MAdTech system.

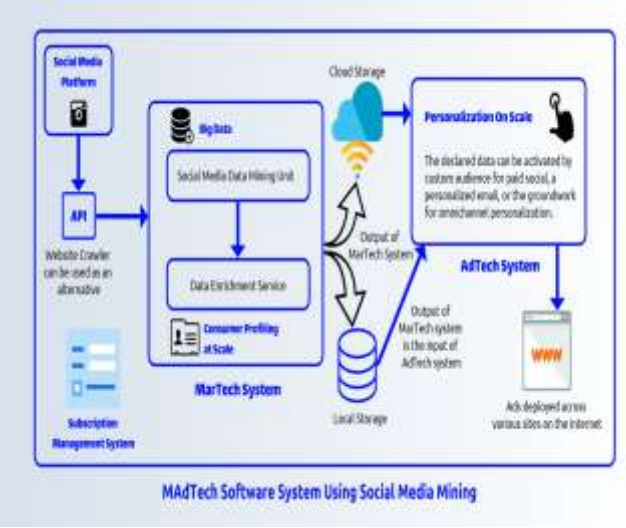

Fig -1 System Architecture

5. Requirement Analysis and Planning

In requirements analysis encompasses those tasks that go into determining the needs or conditions to meet for a new or altered product or project, taking account of the possibly conflicting requirements of the various stakeholders, analyzing, documenting, validating and managing software or system requirements. Project planning is part which relates to the use of schedules such as Gantt charts to plan and subsequently report progress within the project environment. Initially, the project scope is defined and the appropriate methods for completing the project are determined

Functional Requirement:

Requirement Analysis will cover the topics like the Functional, Non-Functional and the specific requirements of the project and touching all the software and the hardware requirements as well.

Data Enrichment Services: The Data Enrichment Services will help enhance the first-party data of MarTech system by verifying information like email address, phone number, etc.

AdTech: The AdTech platform will be used to run programmatic tailored ads.

Website Crawler: The crawler program will be employed to find the structure of the social sites and web elements from which data needs to be extracted.

Nonfunctional requirements:

Performance:

The response time of the system is one of the major aspect for successful functioning of the system. Since the main objective of this system is to detect the drowsiness of the driver in real time so that fatal accidents caused by drowsiness could be prevented, hence it is essential for the system to generate the response with minimal time consumption

Reliability:

The reliability of our system is predicted to be very high and critical for proper functioning of the overall system. Our reliability is a factor which will be focused more than any other factors affecting it. The user may suffer very severely if the reliability is low as the main purpose of the system is to detect drowsiness of driver and warn him so that any fatality or casualty caused due to accident can be avoided.

Availability:

The availability of the system is predicted to be high also downtime cannot be accepted because it may lead to fatal result.

System requirements:

This section contains all of the functional and quality requirements of the system. It gives a detailed description of the system and all its features.

Hardware requirements:

The proposed system can be a web app, mobile app or a desktop app. Most likely it is going to be a desktop application.

Software requirements:

Application: It will be primarily developed as a Desktop application for Windows Operating System. The desktop software can also run on macOS using Virtual Machine.

Social API's: The APIs of social networking websites will be used to assist in data mining process.

Social Account: The social account is used to register the API key on respective social networking website.

Subscription Management System: The proposed system will be based on SaaS (Software as a Service) model. Hence, to manage the user accounts and subscriptions, a subscription management system will be added.

Cloud-based or Local System Storage: The output data from MarTech system can be stored locally or on cloud. Since the MarTech system will produce massive datasets, storing it on cloud will be less expensive.

6. IMPLEMENTATION AND RESULTS

In Figure 7.1 Result of the project is declared data extraction from Instagram. It will extract name and username of all followers of a particular Instagram account. If follower have public business account, it will scrape email addresses and phone number additionally (if they are presented). Data will be written to csv file. Scrapper will run in Windows 10 environment. Application writes all necessary files to same folder. There will be two helper file: .log- it is scrapper log file and .json- for saving configuration.

Application will be written in Python language (version 3.7) and packaged to single file with pyinstaller.

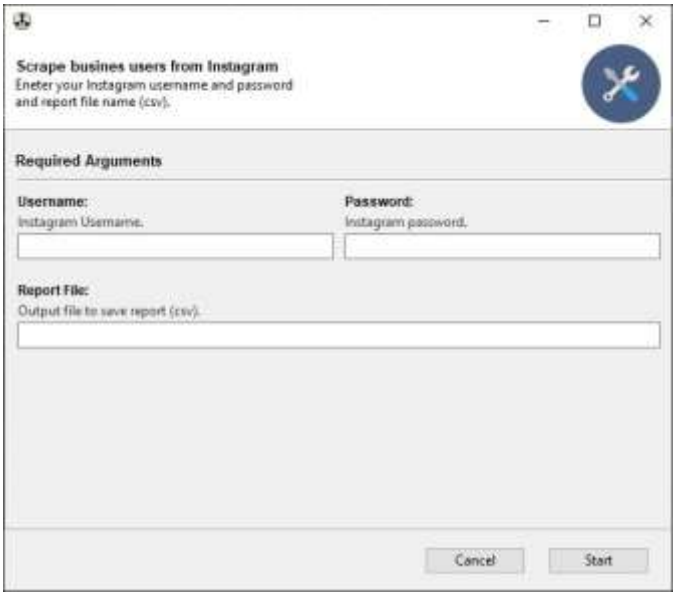

Fig -7.1 data extraction from Instagram

Data Enrichment (Email Verification algorithm)

Fig 7.2 email verification system

In Figure 7.2 shows a email verification service (also available via API). It checks the data and determine whether the emails are correct or incorrect.

7. CONCLUSION

MadTech (MarTech + AdTech) system are of interest to companies,governments and not-for-profit organizations, as these organizations can use data and trends to design their strategies or introduce new programs, new products, processes or services.

Declared data is personal and specific information that an individual willingly shares. Declared data is considered high quality because it is directly reported by an individual, and it implies permission for future use of the information, meaning it is transparent.

The declared data can be activated by custom audience for paid social, a personalized email, or the groundwork for omnichannel personalization.

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