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Centralized Regional-Based Decision Making and Management System for Effective Advertisement

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Abstract - In this paper, centralized regional-based decision making and management system is proposed for effective advertisement on billboards in the urban areas. The system will be used in the advertising industry and will analyze big data obtained through the social media (e. g., Twitter, Facebook, Instagram etc.) for decision making on corresponding advertisements. Nowadays, advertisements have been published and displayed on digital billboards randomly and most of those adverts don't address to the people who are shopping or travelling in the regional areas. This will cause several issues such as visual pollution, non-effective advertisement visualization, cost consumption etc. With the proposed approach, the data entered on the social media by the people in regional areas will be obtained for analyzing the requirements and desires of the community. Thus, advertisements will be chosen based on the social demand in specific regional areas and the selected advertisements addressing to the people will be displayed on the digital billboards. Based on the people's demand in the urban areas, different advertisement may be published for each region. Also, duration and frequency of the advertisements on digital billboards may also be organized depending on the needs and behaviors of people in the public areas.

Keywords *– Advertisement Management, Big Data, Decision Making, Text recognition.*

1. INTRODUCTION

The Social Network involves people's sharing, writings, pictures, different multimedia data such as video and audio, information about their lives, thoughts etc. [1]. In the social networks, people in groups may create different types of content, and share and send messages each other and also they can talk to each other mutually.

Social Networking platforms provide a setting in a very fast and uncontrolled spread of all kinds of content. Fast access to information can be provided via by social networks but people can also get false information via social network. Many events in today's world, Social Networking can be routed through the different sections and the shares cannot be timely and accurately analysis. Such shares emitting identification of the person or group and prediction of mass action that may occur, is of great importance to the relevant institutions or companies. To accomplish this, multiple data sources to be able to monitor at the same time, the relationship between people and sharing should be able to analyze correctly.

A significant number of users of the social network platform that audience interaction is published daily on millions of content applications. Today, social network grows uncontrollably and all shares cannot be analysed by the human power. Therefore, it has become inevitable to develop intelligent systems and software. In the proposed method, analysis of both positive and negative share will be done according to specific criteria (location, time, event etc.). The method will classify the relationship of sharing, time, place and help to monitor the social network on a regular basis. The paper presents an efficient big data and decision making method in the advertising industry which will analyze data on social media. Data analysis revealed that the advertisements published time and frequency of social demand are important categories because people may demand different or similar products at the same time. Therefore, it is needed an efficient method which will analyse the big data to publish advertisements on billboards depending on the needs and behaviour of community. Social media is very popular for sharing knowledge, information and thoughts of people and almost 12 million tweets have been shared every single day in Turkey [2]. Advertisements selected by the

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community through a wide instant analysis of the customer by posting billboards with digital display to reach an audience well are provided.

Large data usage and removal decisions significantly by using Big Data is currently one of the most popular topics. Many complex data using big data solution for analysis and decision-making problems are available [1]. Large data problems are often a result of removal of such a significant numerical algorithm making a decision or word analysis. Data as reliable, fast and consistent analytical (signal processing, data mining [2], statistical [3], etc.) should be handled with the help of models. Platforms are usually obtained or prepared in English letters are different decision making process based on their content and results. In addition, the systems are often made depending on the results of the analysis are to remove the problems. For example, [4] are also identified specific problems in the petroleum refining industry big data (volume, velocity, variety, inconsistency) and real-time data to verify compliance with these environments and settlement solutions are presented. Differences compared to similar projects are as follows:

- Providing a text searching algorithm for the Turkish Language
- New Generation Social Network Monitoring and Analysis approach
- Big Data on new data storage techniques
- Machine learning algorithms and behavioral analysis to make meaningful conclusions
- Providing communication between different platforms
- Geographic Information Systems through the target location detection depending on the results obtained from decision-making
- Display the right advertisement on the billboards in the selected region

The proposed method will be based on Big Data, not only sharing or trend analysis, at the same time, usage patterns, epidemics, consumer trends, such as brand preference and satisfaction, training profiles, etc. regardless of who will provide the necessary infrastructure to make the statistical and demographic analysis of the population. Using text searching algorithm to process large data obtained from social media is a good approach to analyse the Big Data. Using this algorithm will be more efficient and it will be improved over the existing methods in the literature based on the following field. (1) The given specific word will be searched in a sentence shared in the Social Media. (2) The method will also provide other necessary details of users. The system will be analyzed based on Social Networking (Facebook, Twitter, etc.). The data will provide input to the system from automatically the social network.

The rest of the paper is organised as follows. In section 2, Social Media Networks are explained with details. The methodology is described and explained in Section 3. In section 4, results are discussed. In the last section, the paper is concluded.

2. SOCIAL NETWORKS

Today, people are being activated in organizing and Social Networking (Facebook and Twitter in particular) is an undeniable facts that play an important role. On Earth, there are many local and global group interaction and communication which appeared on The Social Network.The social network environment, Facebook, LinkedIn, MySpace, Twitter, YouTube, Flickr, WordPress, Blogger, Typepad, LiveJournal, Wikipedia, ekşisözlük, Wetpaint, Wikidot, Second Life, Digg, Reddit, are examples of well-known sites like Lulu.

As of 2014;

- YouTube has reached over 1 billion monthly number of users and 4 billion views per day and in order to obtain revenue figures, for some content has activated payment system.
- The number of Facebook users has risen to 1.4 billion. The number of users in Turkey has reached 35 million.
- Twitter has reached 288 million registered users. There are 11.5 million users in Turkey.
- In Instagram, there are 300 million users, reaching 5 billion photographs are sharing.

The Social Network, allowing the person to provide information on the one hand while on the other hand is around recognizing provides information about what is happening and be aware of other people. Furthermore, the exchange of information about the social events and developments have become an important because these information can be used to analyse the demands and needs of the population. However, it is very hard and complex to make such a decision and best approach is to use machine learning algorithms.

Many studies indicate that individuals who are members of the social network platform, visiting Social Networking websites during the day and spends a long time on these websites. Currently, there are 38 million active users of social media in Turkey (Source: wearesocial.net Accessed: 28/09/2015). Active Social Media users depending on the percentage distribution of the number of users is shown in Figure 1. Based on these data, the percentage of Facebook users has the most active users with the 38 million users by %94. On the other hand, Instagram and LinkedIn social media sharing websites have the least percentage of users by 34% in Turkey.

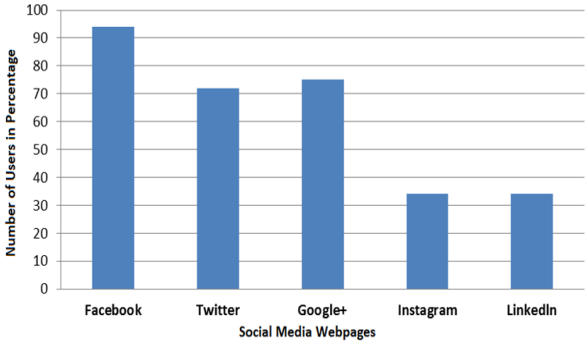


Figure 1. *The percentage of social media in Turkey [5].*

The percentage of time spent is shown in Figure 2. Based on this figure, people mostly visit google sites and Facebook is the second website that people spent longer time in Turkey. Consequently, we see that Facebook as a social sharing website is the most popular website for spending time in Turkey.

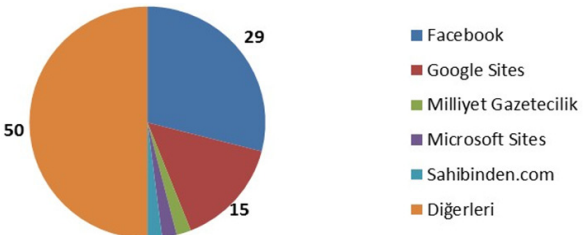


Figure 2. *Most spent time for the Social Media Webpages in Turkey.[6]*

3. METHODOLOGY

Digital billboards are located in different areas and places where people are busy as city squares. These places may be shopping centres, public transportation vehicles, large avenues etc. Central advertisement management system is shown in Figure 3. The design of the system includes sharing of automation modules (B), and graphics, data, video and (C). Content Management Tool (H) through media management, template input, planning and scheduling, contact management, monitoring and reporting functions are also provided in the system. The television broadcast vehicles (D), Video Wall (E), LCD / LED (F), Kiosk (G) are as equipments which are used. Digital billboards are being used currently rented by different companies, they show different advertisements to the people in different regional areas and these advertisements are mostly unnecessary advertisements in the day. The traditional advertisement approach is not and efficient method to make effective advertisement to the people on the billboards. The traditional method results visual pollution, a lot money for companies and these advertisements are usually advertisements that appeal to the general people in that area. Our method is to prevent visual pollution and the advertisements will help people to respond in a certain area. The method will consider the demand of the people and their desire will be published on digital billboards. Also, other important parameters including time, ambient characteristics (weather, etc.), will be considered in the system. The proposed system will increase the impact on the people and will be instrumental in the opportunity to more effective advertising.

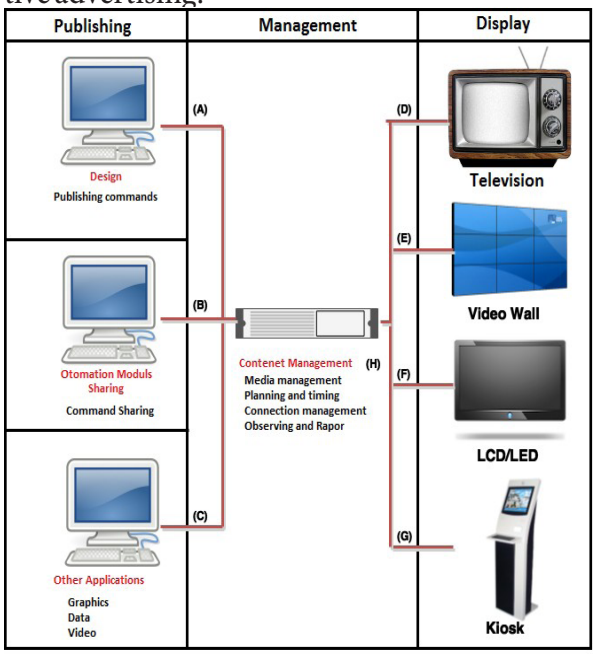


Figure 3. *Traditional advertisement method.*

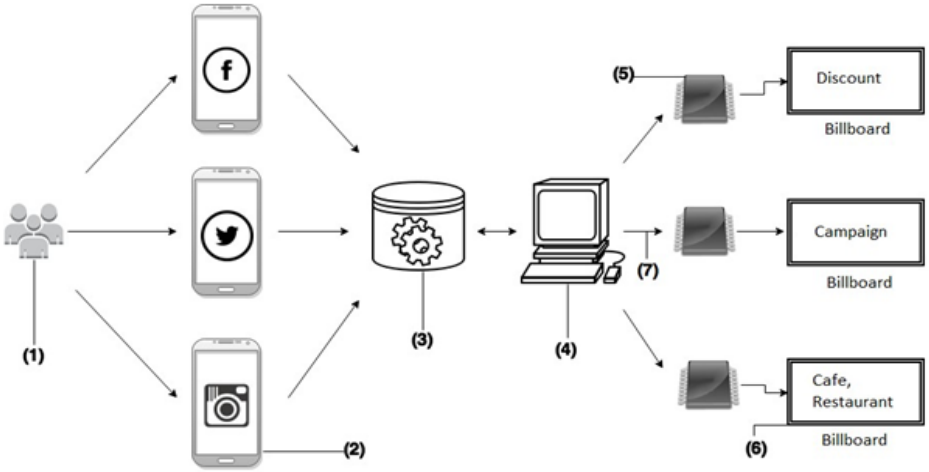
The primary purpose of our method, the majority of people in certain parts of requests, demands and to ensure as shown on digital billboards advertisements for instant desire. To do this, the people in certain regions on Twitter, Facebook and Instagram as a social decision making by processing large data instantly receive their share of the media will be created.

The present structure is analyzed and the needs of society in spatial base in existing ad management system. But the most important advantage of our system, and the difference arises at this point. Thus, each billboard will publish different ads for different groups of people in the regions close to the clipboard. After mounting the panels we prepare digital billboards, the system will provide continuous service with our automated ad exchangeinstant with no other costs.

Working independently within the system digital billboards can be controlled by a centralized management system after our invention. Developing natural language processing algorithms, which help make sense of the data we pulled from social media digital panel ads will be displayed in a more qualified way.

In today's technology it is accessed via a remote desktop connection to the advertising panel management system. Our present invention provides systems which communicate continuously with each other will be present. One for the remote desktop system you will not need a running wheel connected to each ad management system. Thus exertion level loss will be minimized. Other benefits of our system of increased advertising pollution prevention in the last days; improving the quality ads, image and environmental pollution caused by the removal of advertising posters and it is visually similar to minimize the unpleasant process. The amount spent on trees to advertisements printed on paper, such as posters and billboards are all examples of bad use of both too much and natural resources.

Figure 4. *Proposed method for smart advertising on billboards.*



The aim of our method is an instant decision-making through the use of data and display advertisements on digital billboards ensuring the management of the needs and demands of the regional community. The data entered by users of social media services are taken in real time via internet. This data set consists of all advertising appropriate word. Each advertisement be will be defined entirely with its own words. Social media sets the word in the text will be searched taken with natural language processing algorithms. For example "Match", "Cold", "Shopping", "Food", " hungry" are words that users share in the social media. By using the natural language processing algorithms, the related advertisement will be determined for the needs of the community immediately. In the shared sentence in social media will be analyzed by using the algorithm and adverts will be displayed on billboards which are located on the map. Sharing text of community will be obtained from the regional area for further process and related advertisements will be displayed in the regional area based on popular words. Thus, each digital billboards will show different advertisements in different regions of the city. Instantly advertisements will change and the current ones will be considered. Digital billboards management system through billboards on communicating with positioned the centre and video playback when the apparatus by contacting the wireless ad well as videos will be changed. If necessary, the remote access system of public notice and advertising can be done will be provided.

4. RESULTS AND DISCUSSION

The proposed method searches specific words in the sentences that people share in the social media. Thus, the method provides a result of demand of community in a specific area based on decision making. After that, an advertisement can be published on billboards based on the demands of community and this will result in effective advertisement approach on billboards. For example, green circles, shown in Figure 5, illustrates the results for sharing the word "hungry" in Istanbul. Based on this, we may know and find out how large of groups talk about food, drink, restaurant etc. After, that billboards displays related advertisements in the specific areas. Figure 6 shows the result for the word "cold" which is shared by the people in Istanbul.

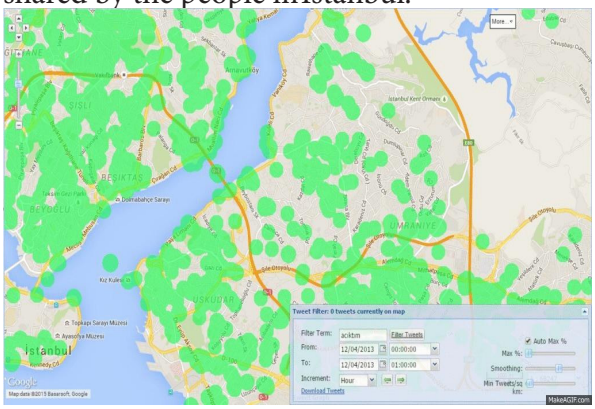


Figure 5. *Result of method to find the word "hungry" shared in the city of Istanbul.*

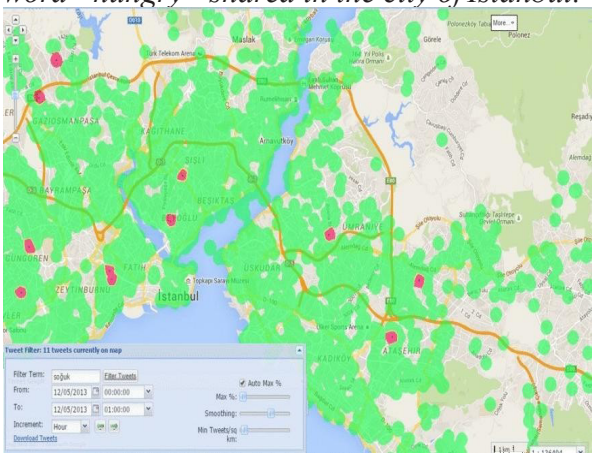


Figure 6. *Result of method to find the word "cold" shared in the city of Istanbul.*

The proposed method provides the following advantages:

- Intelligent advertising
- Big data analytics
- Continuity
- The prevention of visual pollution
- Advertising with natural language processing
- Social media analysis
- Real-time advertising system
- Qualified advertising

5. CONCLUSION

We have proposed centralized regional-based decision making and management system for effective advertisement big data shared by the people. The system analyzes big data obtained through the social media (e. g., Twitter, Facebook, Instagram etc.) and it makes decision for corresponding advertisements. The text searching method has been applied to the data. The method solves several important issues such as visual pollution, non-effective advertisement visualization, cost consumption etc. By using the proposed approach, the data entered on the social media by the people in regional areas is obtained to understand the needs and desires of the community. Specific advertisements are selected based on the community needs in specific regional areas and the chosen advertisements addressing to the people will be shown on the digital billboards.

6. REFERENCES

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