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Content Analysis in Social Network Analysis using Sentiment Analysis

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ABSTRACT

This paper shows about content from social network tools sites or social media tools like twitter or face book user document are analyzed with the help of Social network Analysis tools like Gephi, NodeXL and Pajek using positive, negative, neutral and emoticons. In Sentiment Analysis the text are classified in to various levels like word, sentence, phrase, and feature and document level. The content mining is divided into five categories. The major analysis is Sentiment Annotation, Sentiment Classification, Sentiment Detection, Sentiment Determination, Sentiment Extraction and Sentiment Lexicon.

Keywords: Social network Analysis, Sentiment Analysis, Sentiment Annotation, Content Analysis, Sentiment Classification

I. INTRODUCTION

Social Network (SN) is a term used to express web-based services that let individuals to make a public / semi-public profile inside a domain such that they can communicatively bond with others users within the network through the text or images. It is enabling the structure and exchange of user –generated content. SN is a graph consisting of nodes and links used to represent Social relationship on Social Sites. SNs are important foundations of online interactions and contents sharing, subjectivity, assessments, approaches, evaluation, influences, observations, feelings, opinions and sentiments expression allow out in text, reviews, blogs, discussions, news, remarks, reactions or some other documents[1].

SN data is varying in size, noise and dynamism. SN sites are commonly known for information dissemination personal activates posting, product reviews, online pictures sharing, professional profiling, advertisements and opinion/ sentiment expression. Mostly current news alerts updates, breaking news political debates and government policy are also posted and analysed on SN sites. It allows users to express their views be it positive, negative, neutral or emoticons. SN based on virtual communities has begun to publish members' public profile information, including social links, using the semantic web language like resource description framework (RDF).

II. SEMANTIC WEB

Web 2.0 has changed the technological landscape of the Internet computing world today. The volume of the data on the web is doubled since the emergence of Web 2.0 technologies. The data mining in the user generated entities and extracting the derived knowledge and information patterns is the new threat to privacy of individuals [2]. One of the simplest and most common approaches for collective intelligence is the full-text search methods which allow people to query large data set using some key words. The query results are ranked according to some criteria such as

frequency of key words in target resource and/or trustworthiness of the resource publishers. Algorithms for full-text searches are among the most important collective intelligence algorithms and a deciding factor for the success of search engines.

Web 3.0 or semantic web desires to decrease human tasks and decisions and leave them to machines by providing machine readable contents on the web. It is included two main platforms, semantic technologies and social computing environment. The semantic technologies represent open standards that can be applied on the top of the web. The social computing environment allows human machine co-operations and organizing a large number of the social web communities. The semantic web offers an ambitious vision of an internet populated with intelligent agents and services able to exchange information, tasks and knowledge using simple protocols coupled with a rich knowledge representation language. Exploring the roadmap leading toward this vision will take some time.

III. SENTIMENT ANALYSIS

Sentiment is called mental feeing. It is tender emotion which is expressed by human being whether in positive, negative, or neutral. Sentiment is naturally a localized phenomenon that is more correctly computed at the paragraph, sentence or entity level.Sentiment Analysis (SA) is named with other names are Opinion extraction, Opinion mining, Sentiment mining and Subjectivity analysis. Sentiment Analysis aims to detect positive, neutral, or negative feelings from text, whereas Emotion Analysis aims to detect and recognize types of feelings through the expression of texts, such as anger, disgust, fear, happiness, sadness, and surprise [5].

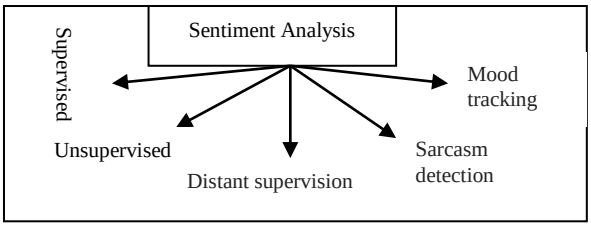

Figure 1. Content Mining is divided into Sentiment Analysis.

The content from social sites is in under the SA words like positive, negative and neutral. It is divided five categories are supervised, unsupervised, Distant supervision, sarcasm detection and mood tracking. In Supervised Sentiment Analysis is analysing media with very informal language benefits from involving novel features, such as emoticons without employing any external information and resources in social sites [4].

In unsupervised Sentiment Analysis the words excellent and poor as a beginning set. The emotion correlation and emotion indication are calculated in this term. The Distant supervision data consists of tweets with emoticons serve as noisy labels and it also had positive and negative words. Sarcasm detection produces a negative opinion using with positive words and express the message in a hidden way [3]. The last category Mood tracking is to find the different way of thinking of human being and lot of emotional experience collections to analyse the problem of public issues.

SA is the computational study of people's opinions, attitudes, and emotions towards individuals, events, or topics covered by reviews or news. The target of SA is to find opinions, identify the sentiments they express, and then classify their polarity.SA can be considered also a classification process which is the task of classifying text to represent a positive or negative sentiment. For most rich content sources, it's a lot added important to compute and compare the sentiment of an individual entity than it is to get the on the whole sentiment of the document [10].

SA is useful to a wide range of problems that are of interest to human-computer interaction practitioners and researchers, as well as those from fields such as

sociology, marketing and advertising, psychology, economics, and political science. Its processes are opinions in order to learn about public perception. It uses natural language processing (NLP) to collect and examine opinion or sentiment words. SA has various sub streams including emotion analysis, trend analysis and bias analysis etc.

Table. 1. Sentiment Analysis sample words

Emotion	angry, sad, joyful, fearful, ashamed, proud, elated
Mood	cheerful, gloomy, irritable, listless, depressed, buoyant
Interpersonal Stances	friendly, flirtatious, distant, cold, warm, supportive, contemptuous
Attitudes	liking, loving, hating, valuing, desiring
Personality Traits	nervous, anxious, reckless, morose, hostile, jealous

By the collections of sentiment Analysis words or contents were taken from the social media or social network sites like twitter and Face book where analysed in different methods. The major analysis is Sentiment Annotation, Sentiment Classification, and Sentiment Detection [9].

Semantic Annotation is where one is to label instances as +ve, -ve and neutral. It is more specific and more involved, than the simple sentiment questionnaire approach. Aspects of annotation- good practices in crowd sourcing how to aggregate information from multiple annotations, and how to automatically detect and discard poor annotations are beyond the collections of words. Semantic Annotation and search tools are at the core of semantic web technology. Annotations involve tagging of data with concepts so that data becomes meaningful. Annotating data can help to search for information by keyword based search and well-defined general concepts [6].

Sentiment Classification Once the task of finding whether a sentence is opinionated is done, we have to find the polarity of the sentence i.e., whether it expresses a positive or negative opinion. Sentiment classification can be a binary classification, multi-class classification (extremely negative, negative, neutral, positive or extremely positive), regression or ranking. Depending upon the application of sentiment analysis, subtasks of opinion holder extraction and object feature extraction can be treated as optional [8].

Sentiment detection" means to find the polarity (positive, negative, or neutral) of a given text. The texts are single sentences or very short texts from a single source. This includes the special case of Twitter documents. There exist several other types and tasks in the realm of sentiment detection, e.g. emotion detection, document-based sentiment detection, target-specific sentiment detection, or rating prediction, where the number of stars for product reviews is predicted from the text. In general a good overview of sentiment detection and its variants are in positive, negative or neutral words.

Sentiment detection is an integral element of social media monitoring tools. For this explanation, comparisons of social media monitoring tools typically also explore their sentiment detection abilities. In Freshnetworks.com's comparison of 7 social media monitoring tools prove that on common they coded positive and negative sentiment correctly for about 30% of the texts messages containing overlapping subjective phrases [7].

IV. RESULTS AND DISCUSSION

Table 2. shows the Filtering process mGephi Framework

Attributes	Nodes	Edges	Nodes in %	Edges in %
Betweeness centrality	31	21	2.33	0.96
Component ID	21	8	1.58	0.36

Degree	234	32	12.55	1.46
Eccentricity	60	56	4.5	2.55
In-degree	138	34	10.36	1.55
Modularity class	145	157	10.89	7.16
Out-degree	51	21	3.83	0.96
Weighted degree	166	0	12.46	0
Weighted in-degree	129	76	9.68	3.47
Weighted out-degree	61	50	4.58	2.28
Queries self loop	1332	2192	90.8	96.8

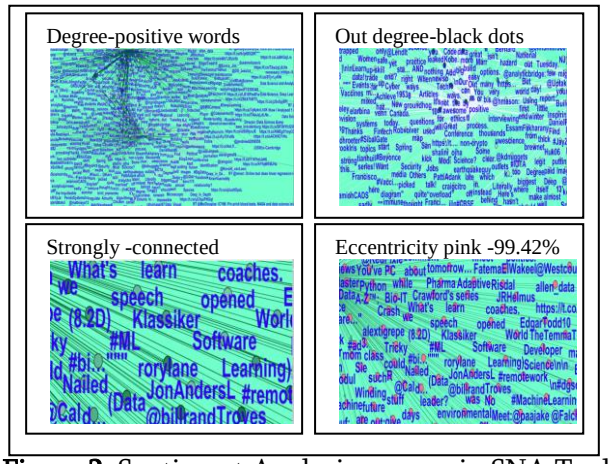

Figure 2. Sentiment Analysis process in SNA Tool

Figure 2. Shows that 2600 positive words edges and nodes how the degree is calculated and strongly connected elements are mentioned in Gray colour dots. The out-degree is showed in Black Dots and Eccentricity is indicated in pink dots which is 99.42%

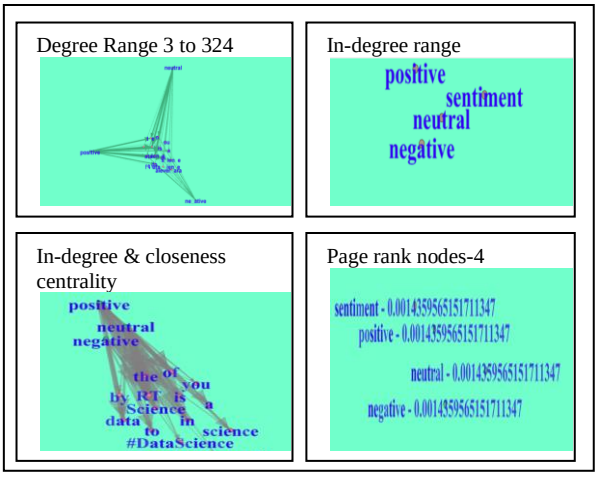

Figure 3. Filter process in Sentiment Analysis

By the use social network analysis tools the output is shown in Figure 3. The Degree range is 3 to 324 and strongly connected with nodes 17, edges 42 and the Label adjust speed is 1.0. In node attribute the closeness centrality is 99.42%.In degree range Node is 4 (0.58%) visible and Betweenness centrality 100%.The Page Rank double value is calculated, value=0.001. minimum value =0.00144 and maximum=0.00205.

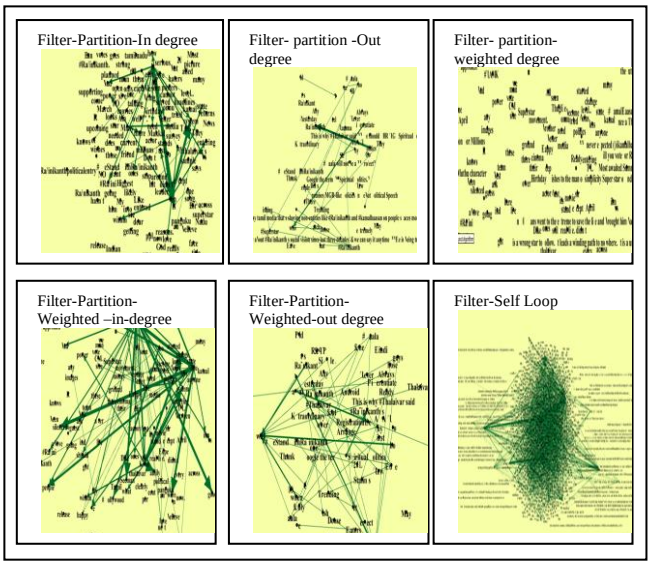

Figure 4. Output of Filter process in SNA tool

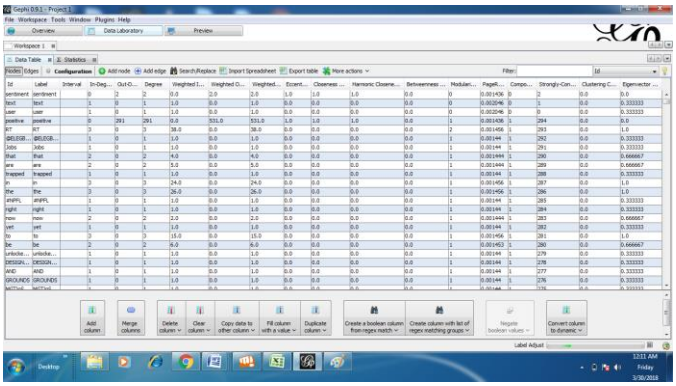

Figure 5. Shows output in Data table.

The Data table gives the output of process using nodes in dataset. It completely calculates the In-Out-Degree, Weighted –In-out Degree, Eccentricity, closeness, Harmonic closeness, Betweeness, Modularity, page rank, Component ID, Strongly connected and clustering Coefficient.

V. CONCLUSION

In this the content analysis process is done by using Social Network Analysis tools mGephi framework to find the relationship between the sentiment text (positive, negative, neutral and emoticons). The various sentiment process like sentiment Annotation, sentiment classification, sentiment detection are find out the text taken from the twitter dataset. The filtering operations are done in within the collection of nodes. Labels are display in degree and concluded with the data table. It shows the public or common profile updater text about the public issues and results are in Positive, Negative, Netural or Emoticons.

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