Evaluation of Social Media Mining Strategies to Increase Business Intelligence (A case of Kisumu County Government)

by Gonza Omoro

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Evaluation of Social Media Mining Strategies to Increase Business Intelligence

(A case of Kisumu County Government)

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Abstract

With the rise of mobile phone usage globally social media has gained a lot of popularity in its use. The government of Kenya has also implemented e-government strategies to be used by counties and ministries to disseminating information through online channels. These has made it so easy for county government to operate effectively. Social media enable members of the public are able to share and exchange a lot of very rich information about governance. The objectives of this study were; To find out the most common social media application in use in Kisumu county government to increase business intelligence, To investigate to which extent Kisumu county government make use of social media to increase business intelligence, To identify the benefits of using social media to improve business intelligence in Kisumu county and To identify which social media data mining technique is used in Kisumu county to increase business intelligence. Quantitative and qualitative research designs were used. Data was collected using questionnaire and also focus group discussion. Results shows that a lot of Kisumu county residents use social media to share and exchange information about the county performance. However these information is never used appropriately by the county government for any purposes. The county government has very little mechanisms for obtaining feedback from the members of the public. The county government need to work on social media mining techniques so that they are able to extract and analyze the feedback from both the county residents and also the county government staffs. These feedbacks and data streams generates substantial noise that must be filtered in order to detect meaningful patterns and trends these can used to improve transparency, accountability, and good governance.

Key Words: Social Media, Social Media Mining, Governance, Accountability, Transparency

1.0 INTRODUCTION

1.0.0 Background of the study

This chapter introduces the study and provides the background to research topic. It discusses the concept of social media and social media mining and narrows down to social media techniques and business intelligence. The research problem and objectives are stated, research questions provided along with justification, significance and the scope. The chapter will therefore define the operational terms that will be used in the study.

With the rise in social media, the web has become a vibrant and lively realm in which billions of individuals all around the globe interact, share, post and conduct numerous activities daily, (Reza Zafarani, Mohammad Ali Abbasi, & Liu, 2014). Information is collected, collated and published by citizens journalists and simultaneously shared or consumed by huge amounts of individuals who give spontaneous feedback . (Reza Zafarani, Mohammad Ali Abbasi, & Liu, 2014). Social media enable us to be connected and interact with each other anywhere anytime, allowing us to observe and mine human behavioral patterns. By understanding human behavior we are better placed to design better computing systems tailored to individuals needs that will serve them and society better (Reza Zafarani, Mohammad Ali Abbasi, & Liu, 2014).

1.0.1 Social Media

As defined by (Kaplan & Haenlein, 2012), social media is the "group of internet-based applications hat build on the ideological and technological foundations of web 2.0, and that allow the creation and exchange of user-generated content." Social media exists in many categories including but not limited to social networking (Facebook or Linkdln), microblogging (Twitter), photo sharing (Flickr, Photobucket, or Picasa), news generation (Google reader, StumbleUpon, or Feedburner) video sharing (Youtube, Metacafe), livecasting (Ustream or Justin. TV), virtual worlds (Kaneva), social gaming (World of Warcraft), social search (Google, Bing or Ask.com) and instant messaging (Google Talk, Skype, or Yahoo! messenger).

Social media refers to the means of interaction among people in which they create share, exchange and comment on contents among themselves in virtual communities and networks. (Kaplan & Haenlein, 2012) define social media as "a group of Internet-based applications that build on the ideological and technological foundations of and that allow the creation and exchange of user-generated content. Furthermore, social media employs mobile and web-based technologies to create highly interactive platforms through which individuals and communities share, co-create, discuss, and modify user-generated content.

1.0.2 Social Media Mining

Social media mining is the process of representing, analyzing, and extracting meaningful patterns from data in social media, resulting from social interactions , (Reza Zafarani, Mohammad Ali Abbasi, & Liu, 2014). It is an interdisciplinary field encompassing techniques from computer science, data mining, machine learning, social network analysis, network science, sociology, ethnography, statistics, optimization, and mathematic. It faces great challenges such as big data paradox, obtaining sufficient samples , the noise removal fallacy ad evaluation dilemma, (Reza Zafarani, Mohammad Ali Abbasi, & Liu, 2014). Social media mining refers to data mining of content streams produced by people through interaction via Internet based applications. Social media mining is usually associated with noisy, distributed, unstructured and dynamic data, as well as with informal text processing, (Novalija I., Miha P., & M., 2014).

Social media analytics "is concerned with developing and evaluating informatics tools and frameworks to collect, monitor, analyze, summarize, and visualize social media data to facilitate conversations and interactions to extract useful patterns and intelligence, (Weiguo Fan & Gordon, 2014). Accor illustrates how social media analytics can help businesses improve their reputations and resulting business performance. Ubiquitous smartphones and other mobile devices, Facebook and YouTube channels devoted to companies and products, and hashtags that make it easy to share experiences instantly combine to create a social media landscape that is quickly becoming part of the fabric of everyday business operations. As the number of users on social media sites continues to grow, so does the need for businesses to monitor and use them to their advantage, (Weiguo Fan & Gordon, 2014).

Social media analytics involves a three process: capture, understand and present. Key techniques go beyond text analytics to include opinion mining, sentiment analysis, topic modeling, social network analysis, trend analysis and visual analytics. Businesses can use them to realize value in all phases of a product or service life cycle, including insight into changing consumer interests and tastes, influential users, ad-campaign effectiveness, how to respond to crises and competitive intelligence, (Weiguo Fan & Gordon, 2014).

1.0.3 Social Media in Business

Social media have profoundly changed our lives and how we interact with one another and the world around us ((Qualman, 2009); (L Safko & Brake, 2009)). Recent research indicates that more and more people are using social media applications such as Facebook and Twitters for various reasons such as making new friends, socializing with old friends, receiving information, and entertaining themselves (Andreas M. Kaplan & Haenlein, 2010); (PH Keckley & Hoffman, 2010); (Sebastian V., Namsu P., & F.K, 2009). As a result, many large companies are adopting

social media to accommodate this growing trend in order to gain business values such as driving customer traffic, increasing customer loyalty and retention, increasing sales and revenues, improving customer satisfaction, creating brand awareness and building reputation (Mary J. C., Patrick J. M., & Z., 2010). Typical activities supported by social media applications include branding (advertising, marketing, and content delivery), sales, customer care and support, product development and innovation ((Mary J. C., Patrick J. M., & Z., 2010); (Paul M. Di G., Molly M. W., & H., 2010). An example is that many hotel chains and Resorts have been leveraging the power of social media in recent years to stay connected with guests, seek feedback from guests on their service, address customers' complaints and issues, and help potential guests make their travel decision ((Leora H. L., Barbara W. F., & L., 2010); (Wu He, Shenghua Zha, & L., 2011)

The wide adoption of social media tools has generated a wealth of textual data, which contain hidden knowledge for businesses to leverage for a competitive edge. In particular, marketers can dig into the vast amount of social media data to detect and discover new knowledge (e.g., brand popularity) and interesting patterns, understand what their competitors are doing and how the industry is changing, and use the findings and improved understanding to achieve competitive advantage against their competitors ((Lipika D., Mirajul H., & S., 2011); (Guido G. & R., 2011). Decision makers can also use the findings to develop new products or services and make informed strategic and operational decisions. It is believed that competitive intelligence can help organizations to realize strengths and weaknesses, enhance business effectiveness, and improve customer satisfaction ((Kin-Nam L., Kam-Hon L., & H., 2005). Competitive intelligence is defined to be "the art of defining, gathering and analyzing intelligence about competitor's products, promotions, sales etc. from external sources" (Lipika D., Mirajul H., & S., 2011).

A successful organization should have the ability to process all available information (e.g., customers' opinions, product prices from competitors, reviews of services and products), identify what has happened and predict what will happen in the immediate future. As many companies are not familiar with social media competitive intelligence ((Yue Dai, Tuomo K., & S., 2011)) and analysis and lack enough understanding of the process of mining social media data, the authors conducted an evaluation of social media data mining to increase business intelligence.

1.0.4 Social media in Governance

Social media has a lot of potential to be used for governance, that this is not capitalized on in most contexts. Many governments are using e-governments strategies an disseminating information online channels, but no soliciting citizen feedback, (Browne, 2015). Social media improves transparency of organizations and government ministries. There exists a lot of evidence that suggest that social media is not widely used a direct route of communication with governments, (Browne, 2015)

In general, there is a strong assumption in the literature that internet access and social media will improve transparency, accountability, and good governance, but little evidence on how this is achieved, (Browne, 2015).

1.1 Objectives of the study

The objectives of this study is to evaluate social media mining stretegies to increase business intelligence in Kenya. Specific objectives include:

1. To find out the most common social media application in use in Kisumu county government to increase business intelligence
2. To investigate to which extent Kisumu county government make use of social media to increase business intelligence.
3. The benefits of using social media to improve business intelligence in Kisumu county
c. To identify which social media data mining technique is used in Kisumu county to increase business intelligence

1.2 Research Questions

1. Which is the most common social media application in use in Kisumu county government to increase business intelligence
2. To what extent does Kisumu county government make use of social media to increase business intelligence.
3. What are the benefits of using social media to improve business intelligence in Kisumu county
c. Which is the social media data mining technique is used in Kenya to increase business intelligence

1.3 Scope of the study

The study covered an evaluation and utilization of social media and mining strategies used in Kisumu county. The research was conducted only on the residents of Kisumu county aged between 30-50 years old, and also Kisumu county government officers. Only those who have ever used social media softwares were included in this study.

1.4 Problem Statement

With the rise of mobile phone usage globally, social media has gained a lot of popularity in its use. The government of Kenya has also implemented e-government strategies to be used by counties and ministries to disseminating information through online channels. Members of the

public are able to share and exchange a lot of information about governance and services offered by the government. However there is very little evidence of how the governments solicit these information and feedback using these online strategies to inform decision making. Social media mining strategies can help counties receive the feedback from the members of the public, these can used to improve transparency, accountability, and good governance. This paper evaluated social media mining strategies used in Kisumu county government.

2.0 LITERATURE REVIEW

2.1 Introduction

This section examines existing publications on social media in governance to increase business intelligence. It illustrates how different organizations have adopted social media to gain competitive advantage, and also how social media has impacted on governance.

Some of the ways as written by Evie Browne that social media has impacted on governance include: (Browne E, 2015)

- **Political participation:** governments have provided formal online channels for citizens to report crime, comment on policy, or petition for change. Largely this is restricted to a small elite of internet users, and government websites are not popular. Citizens often use social media to organize between themselves for activism and protest.
- **Transparency and accountability:** citizens have used social media to communicate, report and map issues in society, which has increased pressure on governments to respond.
- **Peace building:** social media have been used to monitor violence, which can support peace building, although media can also be used to incite violence.
- **Private sector:** social media used by businesses can increase transparency and customer communication, as well as create new forms of leadership.
- **Internal governance**: new legislation and regulation of social media is controversial. Some online hate speech constitutes a crime, and some governments have shut down internet services in an attempt to control social media.

Text mining is an emerging technology that attempts to extract meaningful information from unstructured textual data. Text mining is an extension of data mining to textual data (Ananiadou, 2008; Liu, Cao, & He, 2011; Romero & Ventura, 2010; Zafra & Ventura, 2009; Zeng et al., 2012b). Study indicates that an estimated 80% of an organization's information is contained in text documents, such as emails, memos, customer correspondence, and reports (Tan, 1999). To glean useful information from a large number of textual documents quickly, it has become imperative to use automated computer techniques (He, 2013a; Liu, Cao, & He, 2011).

Text mining is focused on finding useful models, trends, patterns, or rules from unstructured textual data such as text files, HTML files, chat messages and emails (Abdous & He, 2011; Chiang, Lin, & Chen, 2011; Hung & Zhang, 2008; Lin, Hsieh, & Chuang, 2009; Romero, Ventura, & Garcia, 2008). As an automated technique, text mining can be used to "efficiently and systematically identify, extract, manage, integrate, and exploit knowledge from texts" (Ananiadou, 2008). Different from traditional content analysis, text mining is mainly data driven and its main purpose is to automatically identify hidden patterns or trends in the data (Tsantis & Castellani, 2001) and then create interpretation or models that explain interesting patterns and trends in the textual data (Guo, Xu, Xiao, & Gong, 2012; Romero,Ventura, & Garcia, 2008).

Many researchers have successfully used text mining techniques to analyze large amounts of textual data in business (Ingvaldsen & Gulla, 2012), health science (Li, Ge, Zhou, & Valerdi, 2012) and educational domains (Abdous & He, 2011; Hung, 2012). Witten, Don, Dewsnip, and Tablan (2003) used text mining techniques to extract metadata from documents in a digital library and to enrich documents by marking up appropriate items in the text. They found that text mining can add additional values to the documents stored in the digital library and enrich the user experience.

Tane, Schmitz, and Stumme (2004) used text mining to group e-learning resources and documents according to the similarities among different topics. Abdous and He (2011) used text mining techniques to analyze the online questions posted by video streaming students and identified a number of learning patterns and technology-related issues. Fuller, Biros, and Delen (2011) used text mining to detect deception and lies in real world data. Their results show that automated text mining techniques have the potential to aid those who must try to detect lies in text. Hung (2012) used clustering analysis as an exploratory technique to examine e-learning literature and visualized patterns by grouping sources that share similar words, attribute values and coding rules.

Some major applications of text mining include: clustering, information extraction (text summarization), and link analysis (He, Chee, Chong, & Rasnick, 2012; Hung, 2012; Ingvaldsen & Gulla, 2012; Wetzstein, Leitner, Rosenberg, Dustdar, & Leymann, 2011). In particular, clustering analysis is a well-studied technique in data mining (Lin, Hsieh, & Chuang, 2009) and has the advantage of uncovering unanticipated trends, correlations, or patterns from data (Ananiadou, 2008). Currently, there are a wide range of tools that can be used for text mining, such as the SPSS Modeler (formerly Clementine), Leximancer and the SAS Enterprise Miner. These tools use sophisticated computing paradigms including decision tree construction, rule induction, clustering, logic programming, and statistical algorithms to find insights and patterns from unstructured textual data (Abdous & He, 2011; Duan, Street, & Xu, 2011; Duan & Xu, 2012; Romero & Ventura, 2010; Zeng et al., 2012b). Due to the powerful capabilities of text mining, it is believed that applying text mining to social media data can yield interesting findings on human behavior and human interaction (Abdous, He, & Yen, 2012; Barbier & Liu, 2011; He, 2013b; Pang & Lee, 2008).

3.0 METHODOLOGY

3.1 Introduction

This section covers research design, target population, sample size and sampling procedures, research instruments and, their validity and reliability, and data collection procedures.

3.2 Research design

Research design is a plan and the procedure for research that span the decisions from broad assumptions to detailed methods of data collection and analysis (Anthony J. Onwuegbuzie & Johnson, 2006). The research deign adopted for this study was quantitative and qualitative design.

3.3 Target Population

The sample size of this study comprised of 100 individuals residing in Kisumu county headquarters who have ever used a social media platform.

3.4 Sample size and Sampling procedure.

A sample is a subset of a particular population. Generally, the sample size depends on factors such as the number of variables in the study, the type of research design, the method of data analysis and the size of accessible population. She perceives sampling as a process of selecting units from a population of interest so that by studying the sample, one may fairly generalize the results back to population from which they were selected (OM Mugenda & Mugenda, 2003). In this study simple random sampling was employed to get the required sample size.

3.5 Research instruments

The data collection instruments included questionnaires. The questionnaire items comprised of both close ended and open- ended questions.

3.6 Validity of the instruments

Validity answers whether the data collected are accurate enough to reflect the true happenings in a study (Mugenda & Mugenda, 1999). In this study, pilot was used to validate research instruments to determine accuracy, clarity and sustainability of the instruments. The questionnaire was pretested using a sample of five individuals from Kisumu city, 5 members f the county government staffs (James R. L. & M., 2001). Based in analysis of the pilot study results, rectification was made to the research instruments. The researcher's supervisor helped the researcher to assess the concepts the instruments was to measure in order to determine whether the set of items accurately represents the items under study. The recommendations of the supervisor were used to enhance the validity of the instruments.

3.7 Reliability of the instruments

A correlation coefficient was obtained which indicated the reliability of the instrument used. The scores were correlated using Pearson's product moment co-efficient and this was taken as an estimate of reliability. According to Best and Khan (2006), if a co-efficient of 0.5 or more was attained, the instruments would be adopted for use in the study otherwise necessary adjustments would be made to research instruments and process repeated until an acceptable co-efficient is attained.

4.0 Research Findings and Analysis

One hundred individuals were interviewed for this study, 56% of them males and 44% were females. The mean age was 35years old. Facebook was the top most common social media in used in the city at 60%, followed by Twitter (16%), Instagram (10%), YouTube and Skype at 9% and 5% respectively.

Top 5 Commonly used Social Media Software	**Freq, (n=100)**
Facebook	60%
Twitter	16%
Instagram	10%
Youtube	9%
Skype	5%

Fifty five percent of the Kisumu residents use social media platforms several times per week, 35% of them use social media platforms daily, 10% use 0f them social media platforms several times per month.

How often do you use the social media platform	**Freq, (n=100)**
Daily	35%
Several times per week	55%

Several times per month	10%
Several times per year	0%

Eighty nine percent of the respondents think that the information that is being shared in social media for or against the county government is important, 11% of them think that the information that is being shared in social media for or against the county government is not important. 24% of the respondents think that social media information is being used by the county government for any purposes, 76% of them think these information is not being used by the county government for any purposes. Currently 90% of the respondents said that information that is currently flowing through social media is not used for any purposes. Eighty six percent of the respondents agree that there are no strategies that the county government uses to collect social media data from the members of the public.

Questions	**Yes**	**No**
Do you think that information that is being shared in social media for or against the county government is important?	89%	11%
Do you think that these information is being used by the county government for any purposes?	24%	76%
Does the county government currently uses social media information for any purposes?	10%	90%
Is there strategy that the county government used to collect social media data from the members of the public?	14%%	86%

Through the focus group discussions with the Kisumu county government staffs, there is no social media data mining technique that the county uses to analyse the huge amount of information that sis being generated from social media. Instead the county has a facebook page where questions and comments raised in facebook can be responded to. There is also no structure to such initiatives.

5.0 Conclusions and Recommendations.

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Social media is an integral part of an organization development. Results shows that a lot of Kisumu county residents use social media to share and exchange information about the county performance. However the county has very little mechanisms for obtaining feedback from the members of the public. With the growth of android phone and internet, organization need to take full advantage of social media to get information from within and without the existing systems of government. The county government need to work on social media mining technique so that they are able to analyze the feedback from both the residents and also the county government staffs. These feedbacks and data streams generates substantial noise that must be filtered in order to detect meaningful patterns and trends these can used to improve transparency, accountability, and good governance.

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Appendices

Evaluation of Social Media Mining Strategies to Increase Business Intelligence

(A case of Kisumu County Government)

1. Gender

- Female
- Male

2. Age (in complete years): _____Years

3. Which social media platform do/have you use(d) (Tick as appropriate)

- Hyves
- Facebook
- Myspace
- Skype
- LinkedIn
- Twitter
- hi5
- Netlog
- Friendster
- XING
- Orkut
- Skyrock
- Tagged

4. How often do you use the social media platform(Choose one)

- Daily
- Several times per week
- Several times per month
- Several times per year
- Never

5. Why do you use social media. (Tick as appropriate)

- Keep in touch
- Find info (general and specific to Kisumu County)
- Info about contacts
- Share interests and information
- Exchange files
- Find info (for study)
- Make appointments

- Contacts of my contacts
- Meet new people
- Advertise expertise
- Material used by contacts

6. How you rate the performance of the Kisumu County government
   - Excellent
   - Good
   - Fair
   - Poor

7. Do you think that information that is being shared in social media for or against the county government is important?
   - Yes
   - No

8. Do you think that these information is being used by the county government for any purposes?
   - Yes
   - No

9. How would you wish that these information be used by the county government and the stakeholders

_____
_____
_____
_____
_____
_____
_____
_____

10. Does the county government currently uses social media information for any purposes?
    - Yes
    - No

13. Is there strategy that the county government used to collect social media data from the members of the public?
    - Yes
    - No

14. If Yes, which is this method?

_____
_____
_____
_____
_____

Thank you.

Evaluation of Social Media Mining Strategies to Increase Business Intelligence (A case of Kisumu County Government)

GRADEMARK REPORT

FINAL GRADE

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GENERAL COMMENTS

Instructor

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