Analysis of the 2015 Presidential Campaign of Burkina Faso Expressed on Facebook

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Abstract. Since the Arab spring, the social media have become more popular among young people in Africa. Their uses have been illustrated during political and social events that occurred recently in the continent. Not long ago, Burkina Faso has been a field of important political events, the insurrection followed by the presidential election. In this work, we study how Facebook has been used during the 2015 presidential campaign. We use a language model to analyze many Facebook pages of political parties and media. We find that the campaign debates have been focused on campaign slogans and on the candidates rather than their political programs. Our findings show that the Facebook pages content reflect the election result. The most quoted candidate has been the winner.

1 Introduction

The recent years have been characterized by the emergence of the social networking services in the Web, also called the Web 2.0. More and more people particularly young, are user of the social media like Facebook, Twitter, Linkedln, Instagram and so forth, to build their social environment [2,4,5,9,13,14].

In the hardware side, the mobile phone is become a "hand computer" allowing more applications that concern the daily life and making the Web more reachable. The cell phone has become more and more accessible and the number of users is increasing in developing countries, particularly in Africa [1].

These social media opened a new way to the population, allowing them to participate in the social and political events that occur in their cities or anywhere in the world. The election of the American president Obama in 2008 who made use of the social media for the campaign, has shown that henceforth these new media should be taken in count in the political events [8,10]. After the revolutionary wave of protests in North Africa called Arab spring, the West African has

also known the experiment of social media during social and political protests. For instance, the civil society organizations in Senegal and Burkina Faso are particularly active and use the social networking services as their main media to spread information. Their succeeded experience is now referred as a model in other countries.

In this work, we investigate the 2015 presidential election campaigns expressed on Facebook. We consider the official period of the presidential campaign and we analyze the activities of the different members of political parties on the Facebook pages. We utilize the Netvizz application to retrieve the posts and comments made by the users on the Facebook pages of political parties and media.

Most parties or their candidates have at least a Facebook page or group but only few of them are used. The majority has less than ten posts and comments. This leads us to keep only the most important pages in our study. We use an 1-gram language model to analyze both the content and the structure of the pages. Our findings show that the debates of the electors were more oriented toward campaign slogans than the political programs of their candidates. The content of the Facebook pages reflects the election result. The most quoted candidate in the pages is the one who has been elected.

The rest of the paper is organized as follow; the Sect. 2 describes the data used; Sect. 3 presents our approach to analyze the page data; Sect. 4 presents the results and the Sect. 5 presents the relation work and discussion.

2   Data

This section describes the data used and the retrieving tool. Netvizz is an application designed to extract data of Facebook pages and groups, usually for research purposes. The personal information of users are hidden, therefore Netvizz provides freely anonymous data[1].

We retrieved the data of the Facebook pages of the main political parties of Burkina Faso during the first presidential campaign after the insurrection, that lasted from 8 to 27 of November 2015. We have discarded the pages which have less than 10 posts and comments during the campaign, constraining us to keep only two pages of the two important parties, MPP which stands for *Mouvement du Peuple pour le Progrès* and UPC which stands for *Union pour le Changement et le Progrès.*

The Facebook page of the UPC party has 121 posts and 3481 users have made comments on these posts. The Facebook page of MPP party has 283 posts and 3413 users have made comments. We also considered the presidential campaign activities on the media pages. Radio Omega, Lefaso and Burkina24 are the most important media which have the most frequented Facebook pages during the campaign. There are 2201 posts on the page of Radio Omega and 36018 comments have been made on these posts. Burkina24 has made 681 posts

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[1] https://apps.facebook.com/netvizz/.

that received 15390 comments and Lefaso has 919 posts that received 18523 comments of users.

3   Approach

Our approach consists to act in two directions. First, We aim to study the content of the posts and the comments made by users. Afterwards, we want to analyze the structure of the pages. Indeed, the posts and comments can be view as a bipartite graph where an edge between two nodes represents an user that commented a post.

We base our content analysis on the language model [3] We use the *Bags of words* which is an unigram language model. The Bag of words provides corpus made of the terms of the text document. The text document is represented by a set of terms, where each term t is associated with the number of times $n(t)$ it appears in the document d. The term frequency *tf*, that gives the weight of terms in the document, is the normalized Bag of words.

We consider the Facebook page as a text document. The corpus is denoted by $C = \bigcup_i d_i$, where d_i is a text document of Facebook page. For different purposes, we define several corpuses depending on the text document considered.

4   Results

This section of the paper aims to present the main results of our contribution. We analyzed the content and the structure of the Facebook pages of parties, then we compare the quotes of the political parties and other topics expressed on the Facebook pages of the media.

4.1   Structure Analysis

We used the graph properties to represent and analyze the interactions of users on the posts of the pages. We consider the graph G whose the nodes are the posts and users that made comments on the Facebook page. An edge between two nodes of the graph means that an user represented by one node commented a post represented by the other node.

Netvizz provides each edge with a weight that represents the number of times an user commented a post and obviously the edges are always oriented toward the posts. We do not consider the weight and the orientation of the edges, accordingly the graph G that we obtain is unoriented and bipartite.

The page of the UPC party has 3 602 nodes and 18 750 links and the page of the MPP party has 3 696 nodes and 18 868 links between them. The two pages have approximately the same number of nodes and edges and this gives them the same density[2].

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[2] We utilize the density definition of $\frac{2|Edges|}{|Nodes|^2 - |Nodes|}$.

We found that the density of the pages is roughly the same to similar study [7] done in U.S 2010 election. The comparison of the densities shows a satisfying use of the Facebook pages in the first post-insurrectional presidential. However there is an important contrast with the pages of other parties where most of them have less than 10 posts and comments.

The union of the two pages gives a graph G which has 7 089 nodes and 37 618 links. There are users that have commented both the UPC page and the MPP page. The common users are 209 and represent around 5 of the users of the party page. These users are probably not the MPP and UPC members but are members of other parties or internet surfers that spend time on Facebook (Fig. 1).

Fig. 1. Graph of posts and comments made on MPP and UPC Facebook pages during the presidential campaign of November 2015

The average path length of the graph G is 4 and its diameter is 8. The average path length is the average distance in number of edges between two nodes of the graph G. As the graph G is bipartite (posts and users), if the average path length is 2, then this means that averagely, any couple of users has commented the same post.

The average path length 4 of the graph G means that on average, between two users, there exists a third user that has commented a post with each of them. In the same ways, the diameter 8 of the graph signifies that for any couple of users there is at most two persons between them. The user comments are not spread but relative close, and this means some proximity of their interests in the pages.

4.2   Content Analysis

We utilize the bag of words model and we obtain for each Party Facebook page the probability distribution over its sequence of words which is the *tf* of the page.

Table 1 shows a comparison of the most important words in the posts and user comments made in the Facebook pages of UPC and MPP during the campaign. We have an overview of the main topics that have been debated during the campaign on the Facebook pages of parties.

We supposed that the words like employment, job, health, youth and poverty, usually quoted in the political agendas, should have the highest *tf* in the campaign debates. But, we observe that these words did not appear in the top ten of the Facebook pages of the two most important parties.

This shows that the main topics of the debate between the party members during the campaign were not focused on their political programs. We found that the words related to political programs have low *tf*, for instance the *tf* of *santé* quoted six times is 0.000781 and éducation quoted twice is 0.00026 for the MPP page. The same words are quoted once in the page of UPC. Surprisingly, the word textitpauvreté do not appear in the two pages. The debates on the Facebook pages of MPP and UPC are dominated by campaign slogans and centered on the presidential candidates, as shown in Table 1.

**Table 1.** Top ten of words based on the *tf* of the Facebook pages of the political parties UPC and MPP.

	UPC		MPP	
	Word	TF	Word	TF
1	Changement	0.1496	Bukina	0.1747
2	UPC	0.1414	Peuple	0.1123
3	Zephirin	0.1200	MPP	0.1044
4	Diabre	0.0954	Roch	0.1037
5	Progress	0.0769	President	0.0850
6	President	0.0527	Kabore	0.0779
7	Victoire	0.0302	Roch2015	0.0705
8	Burkina	0.0266	Progress	0.0520
9	Peuple	0.0145	Programme	0.0412
10	Insurrection	0.0133	Victoire	0.0291

Figure 2 shows a daily repartition of the number of posts and comments made by users on the Facebook pages of the parties UPC and MPP during the presidential campaign.

There is roughly the same amount of comments and posts in these two pages but the daily repartition gives interesting information. At the beginning of the

campaign the UPC page received more comments than the MPP page. But some days in the middle of the campaign, there is practically no activity in the UPC page. This is not the case with the MPP page.

If the presidential campaign took end two days before the election day, we note that the parties did not observe this instruction. The political parties have posted campaign messages on their official pages after the 27 November, date of the end of the campaign. For instance, the MPP party has made 9 posts that received many comments on November 29.
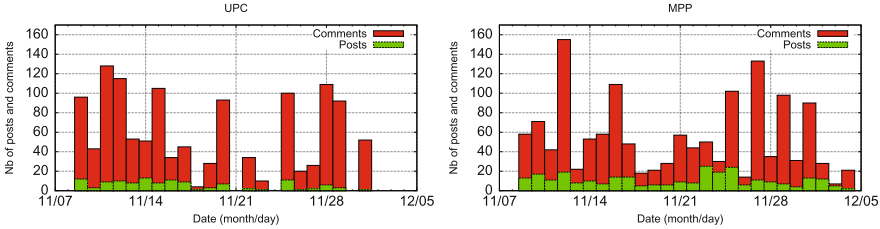
Fig. 2. Daily volume of posts and comments on political party pages

4.3   Campaign on Media Pages

Some media pages are popular among the youth of Burkina both within and at the diaspora. During the presidential campaign, these pages have been a field of debates between the different political members. Most of the internet surfers are accustomed to comment and to debate on the media pages long time before the 2015 elections.

We consider three media that are *Radio Omega, Lefaso.net* and *Burkina24*. Their Facebook pages are the most important regarding to the number of posts and comments made by the users during the presidential campaign. We found that these pages have received more posts and comments than those of political parties, see Table 2. The party pages have been created for the campaign purpose so they are not popular among internet surfers. In addition, their users are only among their party members. This may explain the pages of the political parties are less used than media pages by the internet surfers during the campaign.

Table 2. Basic statistics of the graphs of the media pages.

	Nodes	Edges	Avg. path length	Avg. degree	Diameter
Lefaso	19 442	64 160	3.85	6.6	10
Omega radio	38 219	191 398	3.85	10	11
Burkina24	16 071	45 852	3.87	5.7	8
Union of 3 pages	56 739	301 410	5, 6	10.6	12

The good coverage of the insurrectional protests of October 2014 by Radio Omega has made it rise among the most important radios in the city Ouagadougou. Since, Radio Omega has become more en more popular among the listeners. Table 2 shows that the Radio Omega has the most important Facebook page and even gets ahead of the online media like Omega and Burkina24.

In order to analyze the content of the media pages, we define classes of words for the main topics. This aims at quantifying the importance of topics on the media pages during the presidential campaign. Each class consists of words relative to the concerned topic. We compute the frequency of each word which is the number of times that this word appears in the pages.

Table 3 shows the different classes and their words. Obviously, each class may have tens of words that can represents it in the pages but we just kept those among the most important and relevant. For instance,
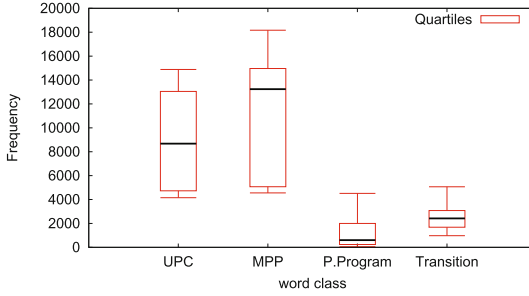
Table 3. Classes of words

Class	Words
UPC party	*upc, diabre, zephirin, zeph*
MPP party	*mpp, kabore, roch, christian, marc*
Political program	*jeunesse, development, sante, travail, politique, ecoles, changement, energie, agriculture, programme, emploi, femme, enfant, justice*
Transition government	*kafando, zida, transition, martyrs, insurrection, isaac, michel*

We compute the distribution of the frequencies of the classes. Figure 3 It shows that the MPP party has more references than the others in the comments and posts made during the campaign. The top word is the first name of the MPP candidate. The UPC party comes secondly. The reference to this party is fairly less than the MPP. The top word is also first name the party candidate.

However, we found that the political agendas of the parties did not interest the members during the campaign. The words like youth, job, education and the health are weakly mentioned in their Facebook pages.

The majority of the electors did not consider mainly the political programs of the candidates but their choice is lying on other considerations. Indeed, most electors are poorly or not literate and few of them know the democracy rules, so that they do not understand or even decline the advantages given by this political system.

We also found a significant number of quotes related to the government of transition on the posts and comments during the campaign. The transition, established after the insurrection, has done some acts before and during the campaign that has been perceived as favors to the MPP party. For instance, the weekly Council of Ministers has been moved to a city where the MPP party held a campaign meeting. This probably explains the relative high *tf* of the transition.

Fig. 3. Distribution of the frequencies of classes of words

5   Related Work

Since the emergence of social media and their integration in the political arena, many researchers are interested in their usage in the political campaign [2,6,7,10,14]. Most of earlier contributions concern the U.S. elections. The authors of this contribution [15] studied the influence of Facebook on the vote share in the U.S. 2008 Presidential primaries. This study shows that Facebook as a support, is an important indicator of candidate electoral success, in addition of the traditional measures. But Facebook had no impact on vote share for candidates who had not cultivated a social network presence during their campaign.

Another study has been made on twitter for the 2010 midterm election in the U.S. [7,11,12]. Smith has pointed out the level use of the Internet in 2010 campaign in U.S. and has shown that more than half of all American adults has used the Internet for political purpose [12]. Among them, 22% has made use of Twitter or other social media in 2010 campaign [11].

The authors of this work [7] have studied deeply the 2010 election campaign expressed on Twitter. They used thousands tweets of more than six hundred candidates of the three most important parties (Democrats, Republicans and Tea party) and analyzed the difference between them. Their main finding is the differences in the usage pattern of Twitter by the candidates. The Republicans and Tea party candidates have used Twitter more effectively than democrats. The authors have designed a model trying to predict candidate victory.

Our work belongs to the same stream of studies but we do not aim to predict victory of a candidate or party. We analyze the data of Burkina Faso 2015 election campaign on Facebook, mainly to find usage patterns and the main topics that dominated the elector debates.

6   Conclusion

In this paper we presented an analysis the campaign of the first post-insurrectional presidential election, expressed on Facebook. We utilized the

Netvizz application designed to retrieve the data of the Facebook pages and groups. Most of pages of political parties have few posts and comments leading us to consider only the pages of the most important political parties and media.

The analysis of the content has shown that the political programs of the candidates have not been debated by their members on the Facebook pages. We ranked the parties by the *tf* of words assumed to be their quotes in the posts and comments. We also found on the media pages similar results to those of the election.

Predict the results of the election is out of scope of this paper but our preliminary results show that it is possible to know, by the Facebook pages, the trends of opinions on social and political issues.

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