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## Haters vs. lovers on Facebook: Sentiment analysis of user's comments

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### ABSTRACT

Relying on the idea that the Internet and social media may increase citizens' political engagement, this paper tries to answer what is the dominant sentiment of comments that users leave on the Facebook fan pages of politicians in power. To answer this question, first the auto-code sentiment analysis of nearly 44,000 comments posted on the Facebook fan page of former US president Barack Obama was conducted. Secondly, content analysis was conducted on 2,411 comments posted on former Croatian president Ivo Josipović's Facebook fan page. The results of auto-code sentiment analysis showed that examined comments in Obama's case were mostly neutral and positive, while negative sentiment was the least represented in Obama's case. The results of content analysis in the Croatian case revealed that the dominant sentiment of all comments was also positive. Finally, it was revealed that the response rate in both cases was zero, what tells us that Obama and Josipović used Facebook only for top-down communication, while the interactive potential of Facebook was neglected.

**Keywords:** Barack Obama, Facebook, interactivity, online participation, sentiment analysis

### 1. Fairytale about the democratic potential of the Internet

Many authors believe that the Internet would cure chronic distrust in politics, that it would help to engage citizens in politics (Norris, 1999; Coleman, 2003, 2017; Breindl & Francq, 2008). The

argument that advocates the role of the Internet in reconnecting fellow citizens and invigorating civic engagement is two-fold: first, the Internet seems to have the potential to engage people in public discussion about issues of common concern, thus bringing politics back to the people and restoring the public sphere (Coleman & Hall, 2001); secondly, the Internet is believed to have the capacity to restore broken social ties (Bebić & Grbeša, 2007). Likewise, Chadwick (2006, p. 26) finds that the Internet emerges as: “a medication for the perceived ills of modern society: isolation, fragmentation, competitive individualism, the erosion of local identities, the decline of traditional religious and family structures, and the downplaying of emotional forms of attachment and communication.” Further, Coleman noted that “the democratic deficit is facing many governments, and that two key questions arise from that: How to make the political process more participatory; and how can public engagement in policies that affect everyday life become more deliberative? (Coleman, 2003, p. 11).”

Optimistic viewpoints about a possible role of the Internet and new communication technologies in politics, strongly stress the strengthening of ties between the representatives and the represented, a two-way communication with citizens in the role of strengthening democracy, enabling citizens to inform themselves about the politics, discuss issues, register to vote (Barber, 1984; Budge, 1996; Coleman, 2003; Grossman, 1995). Also, many scholars believe that information and communication technologies have the potential to mobilize citizens and empower them to exercise influence on decision-making processes and public policy (Bennett, 2012; Castells, 2012). Gibson et al. point out that: “the online world is offering a space for political engagement among those who might not have been otherwise active (2005, p. 578).”

Of course, pessimistic viewpoints about the negative effects of the Internet and social media exist and have been especially loud in the last few years with the advent of the 2016 and 2020 Presidential elections in the USA, and of Brexit in the UK. Phrases that have often been mentioned in the past few years are *information crisis*, *fake news*, *disinformation*, *misinformation*, *mal-information*, *echo chambers*, *filter bubbles* and, especially worrying, the terms *alternative facts* and *post-truth*. All these phrases come with negative meanings and far-reaching consequences. In this context, the Internet and social media, are seen as amplifiers of these negative trends. Another argument that underlines negative trends on the Internet demonstrate that the dominant content of the Internet and social media is hedonistic entertainment, “that not only inhibits the growth of personal identities and social intelligence needed to develop individuals as autonomous social and political actors, but, at worst, it serves as the functional equivalent of an anaesthetic, an opiate that dulls the senses of thought, understanding and critical thinking (Lutz and du Toit, 2014, p. 117).” Also, many discussions about the role of the Internet and social media in politics go in the direction of “real value” of online participation. Authors ask if online participation has any impact on political life in general or it is completely meaningless or even worse does it work in the direction of increasing trivialization and distrust in politics.

However, the growing literature suggests that the Internet will enable the greater participation of those who are represented. Gibson et al. point out that: “the online world is offering a space for political engagement among those who might not have been otherwise active (2005, p. 578).”

## 2. Online participation

Following, when speaking about the political engagement and political participation, in the academic

literature, four dimensions of political participation are recognized: voting, campaign activity, contacting officials, and collective activities (Verba & Nie, 1972). However, due to the development of internet platforms and new forms of online participation, for a long time these traditional measures of political participation have not been sufficient to cover the range of political activities that are available to the public in recent times. Bennett says that the Internet “enables people to organize politics in ways that overcome limits of space, time, identity, and ideology, resulting in the expansion and coordination of activities that would not likely occur by other means (2003, p. 20).” Moreover, Gil de Zuniga et al. find that current conceptualizations of online political participation typically do not consider the different dimensions of online participation, such as displaying campaign slogans on personal Web sites, signing up for a political news-letter, signing and forwarding an online petition, different formats, such as writing e-mails with political messages and sending them to representatives, creating videos with political messages and posting them on YouTube (2010, p. 38).

Hence, many studies demonstrate that the Internet, because of numerous benefits, such as reduced costs of engagement and no time and space limits, can drive individuals into political life through different online forms of political engagement: gathering political information, connecting with others, mobilizing, organizing and recruiting individuals to causes and actions, expressing political views on the Internet; following politics on Facebook, Twitter, Instagram; commenting, liking, sharing, creating online content in different formats – photo, video, infographic; inclusion in an interest group through online networks, etc. (Hafner Fink & Oblak Črnič, 2014; Norris, 2000, 2004; Tolbert & McNeal, 2003). In this context, Bennett and Segerberg (2012) developed the theory of connective action that is based on personalized content sharing across media networks. The authors say that people can now express their opinions online without being a part of a formal organization. They discuss how people who are commenting, liking, sharing, are already engaged in political activity.

In the context of social media engagement, Gerodimos and Justinussen (2014) define communication on Facebook as posting content, on the one hand, and reacting to that content by using social buttons (like, comment, share), on the other (2014, p. 11). Further, they explain why people like something, saying that ‘like’ is an expression of the endorsement of posted content, an expression of affirmation, and an acceptance of what is said in the post. Gerlitz and Halmond (2013, p. 5) say that ‘like’, in some, stands for “congratulations” and “awesome” (in Gerodimos & Justinussen 2014, p. 11). Although these authors’ explanations are reasonable, it does not have to be true at all times, meaning that ‘like’ is actually not always endorsement, and the ‘liking’ of what is said, can also be explained only as an expression of “wanting to react”. For that reason, users have, for a long time, been asking Facebook to introduce a ‘dislike’ button, but that request has never been accepted. Instead, Facebook offered six different emotions in 2016. Obviously, ‘liking’, before these new reactions were rolled-out, and ‘liking’ afterwards are somewhat different. From 2016 onwards, besides like button six different emoji-based reactions were introduced, which include “love”, “haha”, “yay”, “wow”, “sad” and “angry”, followed with the matching emoji picture. No matter of what kind of reaction is used, we can agree that: “a post with many interactions has evidently grabbed more attention and spread more widely, whereas a post with fewer interactions has not been deemed worthy or interesting to engage with (ibid)” and I will be using this interpretation for explaining the number of likes. Another type of engaging is sharing (ibid). It can be said that sharing is a stronger way of engagement in comparison with liking because it is assumed that in sharing something you also want others to get the piece of information that you have shared. In this constellation, commenting can be considered to be the strongest way of “reacting” on Facebook, because it assumes an action that is more demanding than only pressing one “button”. Gerodimos and Justinussen (2015) in mentioned study found that the Obama campaign in 2012 used Facebook as a tool of top-down promotion, rather than as a means

of bottom-up empowerment. They also found that users were often willing to engage with posts that had issues in the focus.

Peoples' views, opinions and emotions that can now be expressed in online forums, blogs, and on SNS are important, among other reasons, because whenever individuals and organizations need to make a decision, they want to hear the opinions of others (Stieglitz & Dang-Xuan, 2013: 1287). Stieglitz and Dang-Xuan find that: "It thus becomes increasingly important for political institutions to get a feel of prevalent sentiment (positive or negative emotions) or opinions expressed by others about themselves as a person or organization as well as on certain political topics (ibid)."

Following, Alashri et al. studied the 2016 U.S. elections and how candidates and commentators (Facebook users who were commenting) engaged on Facebook. They extracted 9,700 Facebook posts by five presidential candidates (Hillary Clinton, Donald Trump, Bernie Sanders, Ted Cruz, and John Kasich) from their official Facebook pages and 12,050,595 comments on those posts. The focus of their paper was to investigate 1) "variations in activity between the candidates on Facebook, 2) the dynamics of activity by candidates and their commentators on Facebook in terms of sentiment, and 3) how online activity might be correlated to offline activity and events" (2016: 796). By studying sentiments and the level of positive or negative emotions they found that the significance (strong/weak) and nature (positive/negative) of sentiments varied between candidates within political parties based on perceived credibility of the candidate's degree of credibility on a given issue (2016: 801). Authors stress that the sentiments of users' comments reveal how they perceive candidate's ability to lead on certain issue.

In the next section we will discuss an interesting example of organized citizens' engagement that was initiated by former US president Barack Obama.

## 2.1 Obama's grassroots movement – OFA case

The US Presidential elections of 2008 and 2012 together demonstrate how political elites embraced and then adapted to the changing communication environment (Bimber, 2014, p. 131). Specifically, the 2008 U.S. Presidential election marked "a significant shift in political campaigning, with the Obama campaign making unprecedented use of social media (Gerodimos & Justinussen, 2015, p. 113)." It is suggested that the "new paradigm in organizational structure of networked campaigning" occurred with the new ways of fundraising, organizing and messaging strategy for the campaign (Stromer-Galley, 2014, p. 110). Barack Obama was the first to use online platforms "to empower his advocates by organizing online and by extension in their social networks offline (p. 125)." The new political communication environment enabled Obama to make the most sophisticated and intensive use of digital media, and that helped him to build the "social-movement-like enthusiasm and personalized entrepreneurialism among his supporters, while also running a highly disciplined, centrally organized campaign (Bimber, 2014, p. 131)."

The evidence of social-movement is the OFA. OFA can be defined as information-age, "multi-issue, grassroots organization that serves the president's ambitions and agenda (Milakis and York, 2017: 3)." The group was a crucial part of Obama's strategy in building his image, in winning the elections and in promoting and conducting his policies. The initiative was very successful because they married "top-down direction and bottom-up grassroots mobilization, both facilitated by the digital toolkit built during Obama's election campaigns (ibid: 21)". The OFA case is a brilliant case study of a movement that was built from nothing, in a cohesion between ordinary citizens and one politician. OFA is an acronym for three different organizations: Obama for America, Organizing for

America, and Organizing for Action (Figure 1). The first organization initiated by Obama helped him to build the movement and to take him into office. It was also the first glorified “information-age campaign” (Milkis & York, 2015, July 29). Beyond that, it was a candidate-centered campaign, which is suggested by the name of the organization. The second organization, which was transformed from the first one, was launched in his first term in 2009, in order to help him to keep his supporters, volunteers and voting base. Organizing for America “was inserted in the DNC, where it was tasked with several things: mobilizing support for Obama’s signature program, the Affordable Care Act; supporting Democratic midterm campaigns; and keeping alive — even strengthening— Obama’s grass-roots network and voter and contributor databases, to be ready for the President’s re-election campaign (ibid).” In 2013 the OFA morphed into Organizing for Action, a non-partisan progressive grassroots network, issue oriented and fighting for the policies that Obama advocated during his second-term: immigration reform, efforts to fight climate change, gun safety legislation, LGBT rights, and the implementation of health reform in the face of continuing intense opposition (Milkis and York, 2017). Today, the organization is merged National Redistricting Action Fund and called “All on the line” (allontheline.com).

### Figure 1: OFA and how it changed over time

Source: Author’s own presentation.



OFA also had a special division called the OFA Truth Team. Although they never mentioned ‘fake news’, it is obvious that this was their way of fighting fake news, one piece of which was the so-called birther theory that was spreading a lie that Obama was not born in the USA. OFA fought this misinformation, for instance, by selling cups showing Obama’s birth certificate, which was proof that Obama was born in the USA. They also took many other actions, which completely overlapped Obama’s political program and the issues he was advocating. The OFA case is interesting because it shows step by step how to build a movement and how to utilize advantages of social media in doing that. Moreover, some authors suggest that OFA’s evolution, especially its development as a policy advocacy group, is an example of an innovative way how to strengthen the president’s influence over policy and his party (Milkis and York, 2017: 2).

Barack Obama is someone who will grab attention of political and communication scientists and of general public in many years to come. The intention of this particular research is to analyse what the sentiment of comments that users were leaving on Barack Obama’s Facebook fan page was. Also, the aim is to discuss the sentiment of users’ comments in one completely different case, that of a former

Croatian president Ivo Josipović.

### 3. Empirical analysis

Relying on the idea that online engagement and expression of sentiments “is central to many studies of communication science, from negativity and polarization in political communication to analysing product reviews and social media comments in other sub-fields (van Atteveldt et al, 2021)”, in the empirical analysis we tried to answer the two research questions:

RQ1: What was the dominant sentiment of comments posted on Barack Obama's Facebook fan page?

RQ2: What was the dominant sentiment of comments posted on Ivo Josipović's Facebook fan page?

To answer the first question auto-code sentiment analysis of more than 43,000 was conducted by using automated program language NVivo 12. Additionally, manual content analysis was conducted on 1,600 comments in order to test the reliability of automated sentiment analysis. To answer the second research question content analysis was conducted on 2,411 users' comments.

#### *Selection of cases*

In the empirical part of this paper, I wanted to examine the sentiment of citizens' comments on the Facebook fan pages of a president in an established Western democracy (the US) and of a president in a young Central Eastern European democracy (Croatia). Although these are completely different countries, with different political and communication systems, it is most valuable and unique that we could analyse users' comments on the same platform and under the same conditions and rules of that platform, in similar time-frames (ranging from 2008 to 2016) on Facebook fan pages of two politicians who were incumbents in the examined periods but also running for the second terms in the office. Yet, it has to be emphasized that any kind of generalisation is beyond the scope of this study because it includes only two cases.

Although, numerous studies are written about Obama's political communication on social media, little is known about social media users on his social media profiles and channels. The intention of this study is to fill the gap in the literature and try to answer what the prevailing sentiment of users' comments on his Facebook fan page was.

In this context a Croatian case was chosen for the analysis because of several reasons which are also elaborated in Sinčić Čorić, Brečić and Šimunjak's article (2017, p. 67-68). In their paper about the use of social media in presidential elections campaign in Croatia in 2015, authors find that studying Croatia in the context of social media is important because Facebook is considered the most important social network for political communication in new member states of the EU (Lilleker et al., 2015, from p. 756-757 in Šimunjak et al, 2017, p.67). They also find that the potential of social media for engaging citizens, who generally show a low level of political engagement, is still underutilized. Further, in their research authors discovered that Josipović was the most active candidate on social media among nine candidates in the presidential election campaign. Moreover, political analysts graded Ivo Josipović's use of social media during his first campaign and during his term as very good and among the best on the political scene in Croatia (Barbir-Mladinović, February 5, 2011).

#### *Sample and data collection*

The final sample of users' comments included 43,785 comments posted on Barack Obama's fan

page and 2,411 comments posted on Ivo Josipović's fan page (Table 1). The unit of analysis was one comment. Comments left on different posts were selected for the analysis.

First, all available posts on Obama's fan page were extracted, resulting in 2804 posts. Second, stratified random sampling was applied to select posts which were included in the further analysis of posted comments. We stratified three groups of 10 posts each based on the shared characteristics: the largest number of likes, comments and shares. As it was expected, the same posts appeared in all three groups, which means that the same posts had the largest numbers of likes, comments and posts. In the main focus of these posts were his private (7) and political profile (1) and in two posts the main focus were issues (2). When defining the main focus we used differentiation between image and issue given by Kaid and Johnston (2002) who said: "Traditionally, early research defined issue content as dealing with specific policy stands, policies and topics tied to concerns of citizenry,...., whereas images have been coded as a concentration on candidate qualities or characteristics (in Kaid and Johnston, 2002, p. 282)." All posts with Obama's image, which is considered here as a political and private profile, in the main focus had a photo and Obama was present in most of them. Moreover, family members were also present, Michelle, his daughters, his mother, and his dogs. Two posts among selected ten had issues in the main focus, specifically a post about marriage equality, and a post about immigration law. The intention was to analyse all comments posted on these ten posts. However, cleansing of the data sets which contained comments appeared to be too time consuming. For that reason, we randomly chose two posts out of these ten posts. When selecting these two posts we chose posts with different topics in the main focus to see if the sentiment of the posted comments can be related to the main focus of the Facebook post.

**Table 1: Number of posts and comments analysed**

Unit of analysis	Number	Method
<b>Former US president Barack Obama</b>		
User's comment	43,785	Auto-coded sentiment analysis
User's comment	1,600	Auto-coded sentiment analysis + Manual content analysis
<b>Former Croatian president Ivo Josipović</b>		
User's comment	2,411	Quantitative content analysis

*Source:* Author's own calculation.

In Josipović's case the same sampling method was applied. First, we extracted 848 posts which were posted from 2010 to 2015. Among these 848 posts we extracted those posts that had the highest number of interactions. We found that the posts with the most interactions were posts of Christmas and Easter holiday greetings to everyone who celebrates them. Posts from the 2014/2015 campaign were also among those that had the highest number of interactions. In these posts, he was often inviting citizens to attend rallies and concerts that were organised as a part of his campaign. Interestingly, the post that had a significantly higher number of likes than any other post on Josipović's Facebook, was a status without a photo, in which he congratulated the new Croatian President Kolinda Grabar

Kitarović on the electoral victory in 2015 and where he acknowledged everyone who was with him during the campaign and the term. Two posts also had his private profile as the focus, once it was on his birthday and, the second time, it was a post in which he expressed gratitude to everyone worried about him when he underwent a surgical procedure. He explained in the post that the surgery was routine and that he would be back to work in a few days. Among these posts we randomly selected three posts with different topics in the main focus, one with the private profile in the focus, one with an issue in the main focus and one post that was posted during the election campaign. 2,411 comments were left on these three posts and all of them were manually content analysed. Posts and numbers of interactions they had will be described in detail in the results section.

Collecting the data from internet sources is not always as easy as it may look. The process of data extraction from different web sites is also popularly called “data scraping”. Scraping is a technique for the automated capture of online data (Marres & Weltevrede, 2013, p. 313). Scraping can extract “structured information” from online sources, which is why scraping is so valuable for social scientists (ibid). In this research the program language Python was used for scraping the data and Excel was used for organizing and archiving the data. Python script that utilized Facebook’s official Graph API to collect posts and comments from Barack Obama’s Facebook fan page was created.<sup>1</sup> Once the information from the selected pages was extracted, Excel files with the textual part of status messages in one column, the number of ‘likes’, comments, shares; the time when it was published, and the code or post ID of the original posts, were provided. Figure 2 shows how excel sheets with all these data looked like. The same procedure was applied in Josipović’s case.

Figure 2: Visual presentation of extracted data in Excel files

Source: Author’s own calculation.

id	link	name	created_time	message	likes	comments	shares
6815841748_10155376455326749	https://www.facebook.com/ObamaFoundation	Obama Foundation	2017-11-01T16:51	None	19658	832	4
6815841748_10155375836346749	https://www.facebook.com/GetAmericaCovered	Get America Covered	2017-11-01T13:04	Starting today, you can sign up for 2018 health coverage. Head o	85586	2866	26
6815841748_10155349552881749	https://www.facebook.com/Live:Obamaandthe	Live: Obama and the	2017-10-21T23:51	Tonight, the ex-Presidents are getting together in Texas to supp	260552	32073	43177
6815841748_10155311990586749	https://www.facebook.com/ObamaFoundation	Obama Foundation	2017-10-06T19:11	I feel lucky to spend time with young leaders like these. Keep up t	63595	4289	2
6815841748_10155308929626749	https://www.facebook.com/None	None	2017-10-05T15:31	When I left office, I told you all that the single most important th	119338	4489	7103
6815841748_10155303917731749	https://www.facebook.com/None	None	2017-10-03T19:51	I dropped in on Michelleâ€™s talk at the Pennsylvania Conferenc	436540	38928	95500
6815841748_10155251442326749	https://www.facebook.com/ObamaFoundation	Obama Foundation	2017-09-13T14:01	Michelle and I want the Obama Foundation to inspire and empov	184954	8246	6
6815841748_10155249876536749	https://www.facebook.com/None	None	2017-09-12T22:01	Americaâ€™s long journey towards equality has been guided by countl	184954	8246	43461

### Automated sentiment analysis of comments on Obama’s fan page

We used software NVivo to run automated coding sentiment analysis which answers the question as to whether the general tone of certain content is positive or negative. “NVivo looks at the sentiment of words in isolation—the context is not taken into account (NVivo 12).” “The process uses a scoring system. Each word containing sentiment has a pre-defined score. Each sentiment node represents a range on a scale (of sentiment) (ibid).” The scale goes from very negative, moderately negative, neutral, to moderately positive and very positive. This method is effective for a large amount of data, but like any other textual analytics, has numerous flaws. One of the biggest is the fact that the human perception of sentiment is always going to be more accurate than machine coding. Furthermore, like most textual analysis tools, NVivo cannot recognize sarcasm, slang, double negatives, ambiguity, dialect variations, idioms (ibid).

Furthermore, although the field of sentiment analysis use is growing and the method is being improved, sentiment analysis is often questioned for validity. For instance, van Atteveldt et al (2021) in

1 Data sets were scraped back in 2017 when it was possible to do that using only Facebook API, without special permissions that are asked today, and basic features of program language Python. So, in this case we have not been using any special packages for scraping.



their most recent study about the validity of sentiment analysis compare the performance of manual annotation, crowd coding, numerous dictionaries and machine learning using both traditional and deep learning algorithms. In their comprehensive study they came to a conclusion that “the best performance is still attained with trained human or crowd coding; that none of the used dictionaries come close to the acceptable levels of validity; and that machine learning, especially deep learning, substantially outperforms dictionary-based methods but falls short of human performance (2021: 1).” However, sentiment analysis together with different methods that are used to perform it, is a widely used method in social science. Bearing in mind all problems and the validity of different programs that are used to conduct sentiment analysis, the necessity for this kind of analysis, in times of social media is bigger than ever. Now we have a tremendous number of “big data” sets that may not be humanly readable given the volume.

While we have to take results obtained by using different machine learning and dictionary-based methods with huge caution, we believe that results obtained using these methods can still be valuable, especially when the accuracy of given results is to some extent validated with human coding.

### *Content analysis of comments on Obama’s fan page*

To test the accuracy of auto coding sentiment analysis manual content analysis of 1600 selected comments posted on Obama’s fan page was coded. The code sheet was derived to examine if the comments were positive, negative and neutral.

### *Content analysis of comments on Josipović’s fan page*

To see the sentiment of citizen’s comments on Facebook fan page of a completely different politician in a different country but in the same time period and on the same platform, we did content analysis of 2,411 comments posted on former Croatian President Ivo Josipović’s fan page. Comments were coded in three categories, dominantly positive, dominantly negative and neutral. NVivo was not used in this case because it is not programmed for analysing the Croatian language.

### *Response rate*

One of the questions in this research considers the element of interactivity between politicians and citizens, i.e., did Obama and Josipović ever respond to citizens’ comments? The response rate should give us an answer to the question as to whether political actors use their Facebook fan pages only as a PR tool to promote topics which they want to set on the agenda, and to present themselves in the light in which they want to be presented or if they are willing to engage in discussion with citizens. This was done by analysing if there was any comment posted from Obama’s page among the approximately 44,000 examined that were selected for conducting a sentiment analysis and among 2,411 comments from Josipović’s fan page.

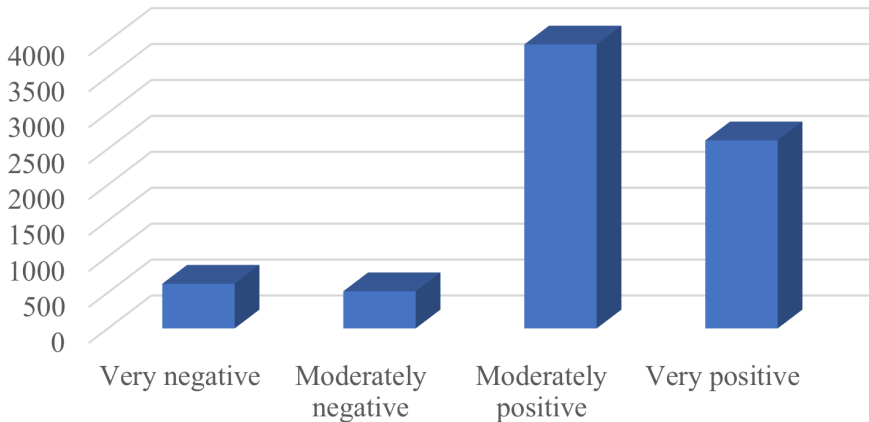
## **4. Findings**



negative or positive, i.e., moderately positive or moderately negative.

**Graph 1: The results of auto code sentiment of comments posted on the post “Summer”**

Source: Author’s own calculation



Looking at the aggregated data displayed in hierarchy charts in NVivo we find that that 67% of examined comments were neutral, 28% were positive, and 5% were negative, while 1.7% were mixed. Any node with child nodes is represented on a hierarchy chart as a parent node including its children. The number of items coded and the number of coding references that relate directly to the parent, as well as an aggregated figure of parent plus children is displayed in these tables. Also, hierarchy charts size a node based on whether or not it has children—therefore any node containing child nodes may appear larger than its actual coding (NVivo 12).

Although the positive sentiment dominated over negative in the comments, we notice that most of the comments were neutral, which means they did not contain words that could be classified as positive or negative. The themes most mentioned were “beautiful”, “father”, “dad”, “good”, “great”, “love”, “President”, “picture”. These words were mentioned more than 8,000 times in the comments.

Example of positive comments:

*“He is a loving father”*

*“The strongest leader on our planet, yet down to earth! A great man indeed!”*

Example of negative comments:

*“Traitor of the United States of America”*

*“He forget those innocent Children being killed in Kashmir by the Men on duty.”*

Example of a neutral comment:

*“Save KobanĀ! Stopp ISIS!”*

Looking at the negative comments, the numbers are significantly lower. This finding is important, because it tells us that Obama’s official fan page obviously was not a place for expressing hate and

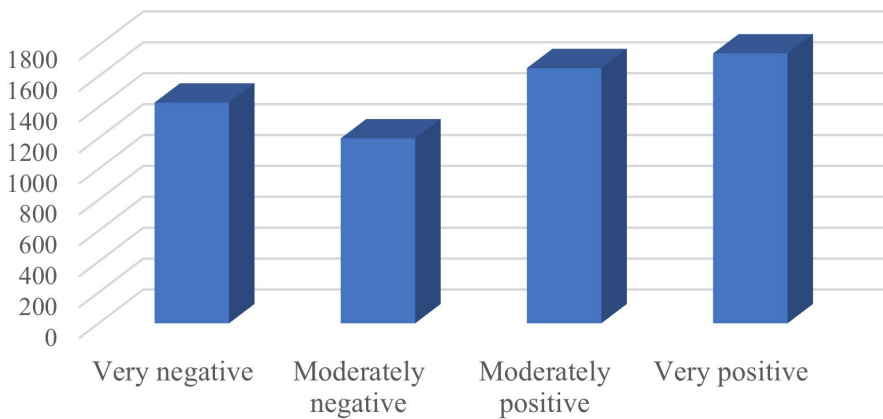
2 Example of a post that was repeated numerous times, most probably by bot.



Second selected group of comments was published on the post which had the issue of marriage equality in the focus. The textual part of the post contained statement “Love just won”, while in the photo we had a rainbow flag known as a LGBT pride flag with the caption in upper case: “Marriage equality.” And beneath that in lower case: “Now the law of the land”. Post had 1.3 million likes, 26 thousand comments and more than 412 thousand shares. It was posted on June 26<sup>th</sup>, 2015. That day history was made, because Supreme Court in the US declared same-sex marriages legal in all 50 States.

After cleansing the whole sample of comments, out of 26 thousand 14,726 was left for the analysis. The results of auto code sentiment analysis show that in this case we had more negative comments, although prevailing sentiment was again positive (Graph 2).

**Graph 2: The results of auto code sentiment analysis of comments posted on the post “Love just won”**



Source: Author’s own presentation.

Looking at the aggregated results which are displayed in hierarchy table in NVivo it is revealed that 65% of all examined comments were neutral, 17% were positive comments, 12% were negative comments and 6% were mixed comments. Having in mind that same-sex marriages are for many still a sensitive topic and that many do not approve of equal rights for homosexuals, and also that social media are often accused of giving stronger voices to “haters” it can be sad that 12% of comments which had negative sentiment is not that much.

Example of a negative comment:

*As a Christian I cannot support this. This is a sad day in history.*

Example of positive comments:

*Everytime I see news like this I’m very glad. Italy, we are waiting for you! I still have hope :)*

*Thank you President Barack Obama! You are an inspirational leader and have helped our country take a giant leap towards equality for all.*

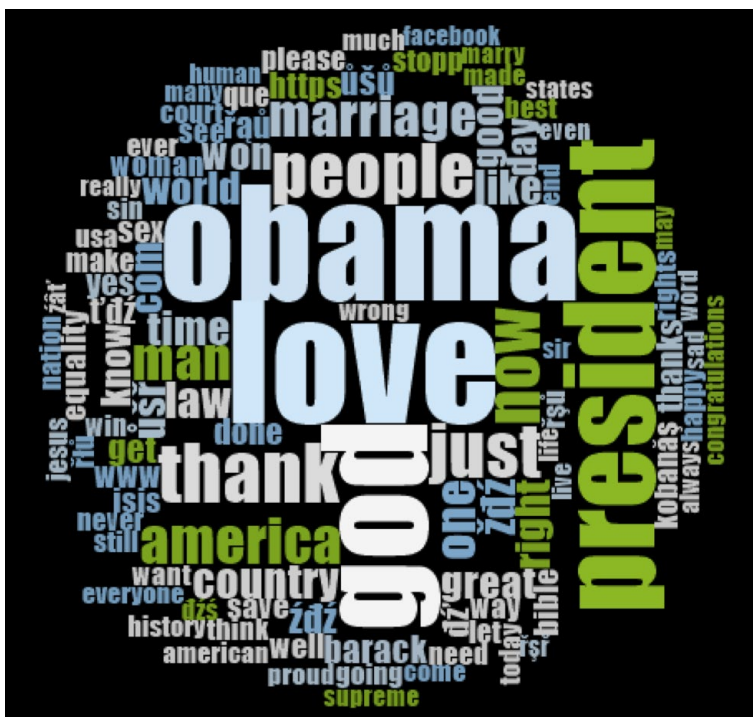
Example of a neutral comment:

*Obamacare did not receive one Republican vote. In crafting the bill the Democrats refused to work with Republicans. Republicans offered over 100 amendments to the Affordable Car Act but Democrats threw them in the waste basket. They would not even look at them never mind*

*consider them. Obama said "We won. We get to write the laws. When you win you can write the laws." The Democrats then locked the Republicans out of the Committee of Republicans and Democrats writing the bill.*

It is also interesting to compare that in the previous case the number of negative comments on a family photo of Obama with one of his daughters was 5%. Having in mind a completely different focus of the posts, messages and the photos, it can be assumed that a percentage of these negative comments are indeed posted by the same "haters" and/or Obama opponents. Also, the difference in positive comments is significant (17% - 28%), but not as much as expected. Again, it is to be assumed that one part of these comments comes from the same group of people, most probably Obama's supporters. Percentage of neutral comments are the highest in both cases. The number of neutral comments was the most unexpected for me, because I assumed that on the Obama's page we will have either those who openly support him or those who are his opponents. It would be really interesting to further investigate what motivates Facebook users to comment if they neither support nor combat certain politician or his policies.

Figure 4: Word cloud obtained in the NVivo analysis - "Love just won"



Source: Author's own presentation.

Looking at the frequency of most used words (Figure 4) in the comments we find that words Obama, love, good, president, thank, people were among the most often mentioned words.

### *Automated sentiment analysis vs. content analysis of sentiments*

We have already discussed some of the problems that automated, and computer-based sentiment analysis have. As noted in the NVivo manual for automatically detecting and coding sentiments, human coding will always be more reliable than most of the similar programs that are based on artificial intelligence. To control the reliability of the presented results that I reached by using automated sentiment analysis, I conducted a manual content analysis of 1,600 posts. I coded each of these posts as being predominantly positive, negative or neutral. A single post could be coded in only one category. On the same sample, the automated sentiment analysis was conducted using NVivo 12. The results for the aggregated categories positive and negative were compared, and the compatibility between them was beyond every expectation (see Table 2).

**Table 2: Auto-coded sentiment analysis of citizens' comments compared to the results of the content analysis (f: 1600)**

Sentiment	NVivo (%)	Manual (%)
Negative	31.18	30.32
Positive	22.30	22.25

*Source:* Author's own calculation.

Despite the problems that the program, which automatically detects and codes sentiments, may have, in this case, the program was almost as correct as the human coder. However, we have to have in mind that NVivo codes words and not entire comments while with the content analysis we coded the whole comment for being dominantly positive or negative. This makes these two methods completely different, and any comparisons of the results gained with these two methods should be taken with great caution.

### **Content analysis of comments on Ivo Josipović's fan page**

Although the focus of this paper was on well-known and widely studied case of Barack Obama, we also wanted to see the sentiment of citizens comments posted on Facebook fan page of a completely different case of former President of Croatia Ivo Josipović. Three posts were randomly selected among already ten selected posts which had the highest number of interactions. The first post had the private profile of Ivo Josipović in the overall focus. The post contained only textual part without a photo. In the post Josipović informed his followers about a routine medical procedure that he had. He also thanked everyone for their good wishes. The post was published on November 22<sup>nd</sup> in 2011, it had more than five thousand likes and almost nine hundred comments. Dominant sentiment of users' comments was positive (Table 3), while the negative sentiment was dominant in only 2% of all examined comments (n=848). Positive comments contained heart-warming wishes for a fast recovery of the President. Also, people in their comments appreciated that the President shared with them his private issue (Table 4).

**Table 3: Dominant sentiment of comments posted on Ivo Josipović's fan page**

Post	Positive (%)	Negative (%)	Neutral (%)	Could not be coded (%)	N
Private profile	96,34	2,24	1,06	0,35	848
Issue	30,60	58,91	9,43	1,04	477
Elections	32,87	50,46	15,65	1,01	1086
Total	54,74	35,1	9,29	0,78	2441

*Source:* Author's own calculation.

The second group of analysed comments was left on the post that had an issue in its focus, specifically it was the post in which Josipović congratulated everyone on the results of the referendum on the EU accession of the Republic of Croatia in which people voted in favour of entering the EU. The post was published on January 23rd, 2012, it had nearly six thousand likes and almost five hundred comments. The number of shares was 68. Again, the post contained only textual part without a photo. The results of content analysis revealed that in this case the dominant sentiment of examined comments was negative (Table 3) and comments were coded as positive in only 30,60% out of 477 examined comments. The negative sentiment in examined comments was mostly directed to the EU and the fear of people that Croatia will lose its' sovereignty once it enters the EU. Negative comments were also directed to the president who was among other politicians accused of giving biased and incomplete information about the EU (Table 4). Voter's turnout which was only 43% was also problematized in the comments which had negative sentiments. Neutral comments mostly referred to scepticism of people towards the EU, but also to the results of the referendum.



**Table 4: Examples of positive, negative and neutral comments on Josipović's fan page**

Post	Positive sentiment (example)	Negative sentiment (example)	Neutral (example)
Private profile	<i>Your post shows how much you appreciate and respect your inhabitants because you are trying to share with them everything. That is a good pledge for believing in better future.</i>	<i>I've been waiting for smaller surgery already for a year, dear Ivo.</i>	<i>Dear Mr. President how do you comment on today's TV show "Nedjeljom u 2"?</i>
Issue	<i>When everything is terrible, I always ask myself who gave us this kind of president? Unbelievable, always as it should be, a man without competition.</i>	<i>"The things are not always black or white. We had the right to know what is not good and not only to be persuaded that everything is only good... this is offends our intelligence, this undemocratic way in which you pressed the public... "</i>	<i>Who asks working class?</i>
Elections	<i>I can only wish you one big good luck! My vote is the same as in the first round.</i>	<i>This Bago is a true HDZ member, he is silencing you all the time and he doesn't let you reply, and he is helping Kolinda even to compose a sentence.</i>	<i>Listen, on parliamentary elections we are choosing real changes, president can only suggest some of them.</i>

Source: Author's own calculation.

Comments left on the post that was published in 2015 on January 15<sup>th</sup> after the final TV debate in the second round of presidential elections were analysed. In the post which had textual part but also a photo in which Josipović is alone and smiling with the blue background and outlines of Croatian coat of arms. The post gained 7,800 likes and more than a thousand comments and 178 shares. The results of content analysis revealed that 50% of all examined comments were negative, while around 33% were positive (Table 3). The number of negative comments does not surprise if we have in mind that these were posted only a few days before the second round of presidential elections in which Josipović was running for the second term. Negative comments referred to him and his presidency but also a significant number of them to his opponent HDZ's candidate Kolinda Grabar-Kitarović who won the election in the end. Interestingly, Facebook users commented also on TV host Mislav Bago calling him out for favouritisms towards Kolinda Grabar-Kitarović (Table 4). In positive comments users were mostly giving support to Ivo Josipović.

Looking at the aggregated results we can notice that the prevailing sentiment in examined comments on Josipović's fan page was positive (54,74%), while the total number of negative comments was 35% (Table 3). Also, the analysis showed that response rate in the examined sample of comments was zero, which means that Josipović and his team never commented back or engaged in discussion or responded to user comments.

## 5. Discussion and Conclusion

The intention of this study was to reveal the sentiment of comments that users were leaving on the Facebook fan page of former US president Barack Obama and on the fan page of former Croatian president Ivo Josipović.

To answer these questions, first, nearly 44,000 comments posted on Obama's fan page were analysed using software NVivo 12. The findings show that analysed comments were mostly neutral, meaning that they did not contain words that could be coded as positive or negative. In all cases the number of neutral comments was more than 60%. When looking at positive and negative comments, it is revealed that users more often leave comments which contain words with positive sentiments. However, negativity is also present on Facebook and is most visible in the posts which contain issues, in the specific examined post the issue of same-sex marriage equality.

Further, manual content analysis of 1,600 comments was conducted to test the reliability of machine coding. The results of both analyses were almost the same. This tells us that despite numerous problems the auto-code sentiment analysis has, it can still give valuable and fast insights into large data sets.

Second, 2,411 comments posted on Josipović's fan page were analysed using quantitative content analysis. Comments were coded as dominantly negative, dominantly positive or neutral. The findings revealed that in this case positive comments prevailed on Facebook. Moreover, it is shown in both cases that users tend to leave positive comments more often on Facebook posts which have private profile of politicians in the dominant focus, while issues and campaign related activities in examined cases attracted more negative comments.

Finally, the response rate in examined cases was zero. This means that in examined sample Obama and/or his team but also Josipović and his community managers, never responded to comments or engaged in discussion. Citizens were left alone to communicate with each other on examined politicians' fan pages.

To sum up, although the results of this study cannot be generalized in any aspect, the findings still give us valuable insights into Facebook users' communication on politicians' fan pages. Firstly, it tells us that citizens are willing to engage in commenting on politician's social media pages. Secondly, "haters" in this study were not louder, at least when looking at the number of comments with negative sentiments. Positive sentiments prevailed in US but also in Croatian case. This finding is very important because it is often believed that people on social media act as if they were in the "Wild West". The analysis of around 44,000 comments from Obama's page and 2,411 comments from Josipović's fan page shows that this was not the case. Thirdly, although Obama is seen as a role model of social media communication, in this paper it is shown that neither him nor his team ever responded to posted comments. This finding is disappointing, because it brings us to the conclusion that even Obama used the broadcasting function of the social media very extensively, while the interactivity dimension, in the sense of responding to the comments and questions of the social media users on his

fan page, was not used at all. Moreover, it would be expected that the “social media President” would have managed the comments on his own page, which was so extremely popular, at least to some extent. Since he did not do that, it can be concluded that Facebook served him only for promoting what he wanted to promote, and certainly not for listening to citizens, communicating with them, or interacting with them. The same results are found in the Croatian case, where Josipović also never responded to users’ comments. Fourthly, although, the content of the comments was not in the focus of this paper, while manually cleansing the Excel spreadsheets with comments it was observed that in the Croatian case, unlike in US case, citizens were often leaving constructive and well-informed comments and that in both cases, the use of uncivil and unpolite language was present.

Finally, why is it important to look at the sentiment of users’ comments on politicians’ Facebook fan pages? What can positive and negative comments tell us about political communication and citizens’ participation? As already emphasized, because of a small sample and only two selected cases, we can not bring any general conclusions to answer these questions. However, we can say that looking at positive and negative comments was important in order to reveal what the dominant sentiment of users’ comments is, if this specific examined piece of online political environment is painted in negativity or positivity, if users are more eager to express negative or positive sentiments, whether they are more negative or positive when features of personal profiles are communicated in Facebook posts, and what their sentiment towards certain issues is.

The study faces several limitations. First is the sample. For this kind of computational analysis larger sample would be an asset. Also, selection of only two cases is lacking. Secondly, although reliability was tested with conducting manual content analysis, the problem is still present, and the results cannot be taken for granted. Moreover, despite many advances, a sentiment analysis still faces many problems regarding the nature of informal texts with emoticons, acronyms, amplifications, slang, and sarcasm or irony (particularly on Twitter and Facebook) (Stieglitz and Dang-Xuan, 2013). Also, the validity of different methods used to perform sentiment analysis is questioned. Thirdly, a large number of the comments in Obama’s case could not be coded because they were written in different languages and alphabets. The number of these comments is significant, which leaves us with the big question about what was written in those comments and what their sentiment was.

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## Mržnja ili ljubav na Facebooku: Analiza sentimenta korisničkih komentara

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### SAŽETAK

Oslanjajući se na ideju kako internet i društvene mreže mogu povećati uključivanje građana u politiku, u ovom radu pokušavamo odgovoriti koji je dominantan sentiment komentara koje korisnici objavljuju na Facebook stranicama političara na funkcijama. Kako bi odgovorili na ovo pitanje, najprije je provedena računalna analiza sentimenta u program NVivo na gotovo 44.000 komentara objavljenih na fan stranici bivšeg američkog predsjednika Baracka Obame. Drugo, provedena je analiza sadržaja 2.411 komentara, objavljenih na Facebook stranici bivšeg hrvatskog predsjednika Ive Josipovića. Rezultati računalne analize sentimenta pokazali su kako su komentari koje građani ostavljaju većinom neutralni i pozitivni, dok je negativnih komentara u Obaminom slučaju bilo najmanje. Rezultati analize sadržaja u Josipovićevu slučaju također su pokazali kako su analizirani komentari bili pretežito pozitivni. Nadalje, nalazi otkrivaju kako su Obama i Josipović koristili Facebook prvenstveno za komunikaciju “odozgo prema dolje” (top-down), dok je interaktivni element društvene mreže u potpunosti zapostavljen, pa tako Obama i njegov tim, kao i Josipović i njegov tim, nisu odgovarali na komentare niti su sudjelovali u raspravama.

**Ključne riječi:** Barack Obama, Facebook, analiza *sentimenta*, interaktivnost, digitalna participacija