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Misinformation & Democracy

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I hereby declare that the work submitted is mine and that where I have made use of another's work, I have attributed the source(s) according to the Regulations set in the Student's Handbook.

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Abstract

In this thesis study we tried to to prepare an analysis for one of the most important issues that our society faces during the last years, misinformation and democracy. Misinformation is not a totally new concept, yet, in the recent past, it has become a major topic for discussion and gained the attention of the research community since it is spreading in global society through the internet. A literature review was conducted in order to deeply understand the concept of misinformation, comprising key approaches to tackle the disinformation, including fake news and elections. Subsequently, we conducted an experiment analysis of news cases and/or post of EU political parties during the pre-election period of June 2018 to May 2019, to identify the portion of fake news, using open source free fact-checking tools, to gather and check for the fake news piece. In our methodology approach, we categorized each case based on three different fake news characteristics classifications, "Truth Information Ratio", "Time and/or Place Authenticity and Perceived Authenticity", and we analysed 25 different news cases regarding EU political parties and 2019 elections. Overall, we concluded in that fake news and misinformation, especially in EU, is all over the web and the social media, in various forms, and it can directly affect democracy. Totally and partially fake news, in our analysis, totaled for the 64% of the total news/posts fact-checked. Action needs to be taken to eliminate spread of fake news, improve fact-checking and thus, diminish misinformation in democracy.

Keywords: Misinformation, Fake News, Disinformation, Elections and Democracy, Fact-Checking Tools, False Information

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1. Introduction

Misinformation is currently a significantly integrant part of humanity's digital media environment(s) and it is compromising the ability of any form of society to appraise informed views. It creates misunderstandings and confusions, which have affected the decision making processes in many important aspects of everyday life, including mostly education, economy, health, environment, and democracy acts, like referendums and elections. Misinformation and its cohort, propagation, populism, impact, and management is being studied through a variety of lenses like computer science, social science, journalism, psychology, foreign affairs, political sciences, etc., since it extensively affects various parts of society (Alani and Fernandez 2018). Misinformation is not a totally new concept, as it has been in societies since the development of the earliest writing systems (Marcus 1993). However, in the recent past, it has become a major topic for discussion and gained the attention of the research community since misinformation is spreading in global society through the internet.

As of today, more than 4 billion people have access to the Internet worldwide (Wikipedia, 2019), where they can find and create, proliferate and disseminate, and also absorb information instantly and globally. At the same time, in Europe, Canada and USA only, ninety percent of adults use the Internet regularly every day, while the growth rate of social media has been surprisingly high the last couple of years. In 2018, Facebook reported 2.2 billion monthly users worldwide. Nowadays, there is a raising distress around the fact that the new information ecosystem could possibly create an abundant environment for the wide-spread of disinformation, misinformation, hoaxes, and false or 'fake' news, driven from the great expansion of Internet and especially social media. Despite the fact that disinformation and misinformation are a communal media issue, it is mostly aggravated in digital social media due to how quickly and easily the posts can be spread, the wide range of spread in all age and social groups and the struggle of granting counterbalancing relevant information. The internet, and especially social media platforms, allows people to easily blowout any information they want promptly and mainly without needing to confirm the truth, and to reword this information to fit their purposes and pre-set views and principles.

Several of those social media platforms have recently been criticized for allowing the wide circulation of fake news and creating an environment of misinformation, lies, and hoaxes. Mainly, social media are being blamed of confusing people's views and decision-making with extensively communal misleading information during key political and democratic events, like the European Parliament Elections of 2019, the US presidential elections of 2016, the Greek Referendum of 2015 and the UK's Brexit referendum. In reaction for the above, Facebook and Google disclosed their detailed agendas for fighting the spread of misinformation and fake news on their platforms. Nevertheless, even though some of the action items of their plans are appeared to be emerging and sustainable, they are considered to suggest only limited resolutions to the gradually issue of fake news and misinformation. It is easily understood that people and current technologies have not yet ready to fully acclimate to the age of misinformation, where false or misleading information and/or fake news are deliberately or accidentally spread.

Several studies have also been conducted globally on the topic of misinformation (e.g. Alani and Fernandez 2018; Acerbi 2019; etc.), comprising key approaches to tackle the disinformation (e.g. European Commission strategy 2019; Nenadic 2019. Etc.), also including fake news and elections (e.g. Guo and Vargo 2018; Benkler et al. 2017; etc.). Furthermore, the EU published Code of Practices against misinformation and its compliance status will be explored. Subsequently, following the literature review and the analysis of the theoretical background, an empirical analysis of the main social media activities of EU political parties, during the pre-elections period of June 2018 – May 2019, will be conducted. In our analysis we will also use open source free fact-checking tools to analyse the posts of each party and find out how many were fake or not.

Given all the aforementioned, the main aim of this dissertation paper is to study and deeply investigate one of the most important issues that our society faces during the last years, misinformation and how it is related and affecting democracy and decision-making process. A literature review was conducted in order to deeply understand the concept of misinformation, comprising key approaches to tackle the disinformation, including fake news and elections. Subsequently, we conducted an experiment analysis

of news cases and/or post of EU political parties during the pre-election period of June 2018 to May 2019, to identify the portion of fake news, using open source free fact-checking tools (Factcheckeu.info, EU Factcheck.eu and Fullfact.org), to gather and check for the fake news piece. We ended up with 25 cases to analyse. We have applied the methodology approach based on Bychkova and Sukhodolov (2017) research study, which has been slightly modified to fit our purposes. For each case we stated the source, country of origin, the real fact it was referring to, the true part of what was spread, the fake/false part of what was spread, the date when the fact was created and the date it was fact-checked, the media through which it was spread, the proof of fakeness and the type of fake news. Then, we categorized each case based on three different fake news characteristics classifications, "Truth Information Ratio", "Time and/or Place Authenticity and Perceived Authenticity". To the best of our knowledge, this is the first empirical research trying to collect and analyse posts and news in regards to European Union's 2019 pre-elections period to identify fake news or not.

The rest of the paper is structured as follows: the next section reviews the existing literature and also analyses the theoretical background of the study, presenting in detail the definitions of misinformation, disinformation and fake news, how misinformation and disinformation differ from each other, fake news on social media, common practises in elections and how to tackle fake news, as well as EU Code of Practices against misinformation and analysis of fact-checking tools. In the 3rd section, the data sample used and the designated methodology are described, while in section 4 we analyse our practical study on the fake news of the EU political parties and comment on our experimental results. Finally, the last chapter consists of our conclusions, final remarks and future implications.

2. Literature Review

The following section will discuss briefly similar studies in regards to how disinformation differs from misinformation, fake news in social media along to how to tackle fake news, and common practices in elections, according to an overtime literature overview. We will also make a brief examination of important definitions, such as misinformation and disinformation, fake news, and we will also explore such definitions and common practices which are used in the research studies specific to elections, in order to help us deeply understand them and move on to our study.

2.1. Disinformation & Misinformation

2.1.1. Definitions

Misinformation is defined as false or inaccurate information, including false rumours, insults and pranks, and more malicious content such as hoaxes, spear-phishing and computational propaganda, which was either intended or unintended spread and results in the misleading information of people. News parody or satire may also become misinformation if it is taken as serious by the unwary and spread as if it were true. Overall, according to Merriam-Webster, misinformation is “incorrect or misleading information,” which could be translated as the “twist” version of a lie.

Alani and Fernandez (2018) discussed online misinformation and analysed the theme of misinformation from a technological aspect, studying the present socio-technical progressions and developments in order to dig deeply into the problem, recognize some of the main restrictions and issues of current technologies, and propose some ideas to target such limitations. Overall, the purpose of this study was to actually replicate on how things are at the moment in terms of the technology in identifying fake news and to encourage deliberations on the future design and development of algorithms, practices, procedures and applications.

European Commission underlines that disinformation is valid fake or misleading data/information formed, presented and circulated for economic profit or to

intentionally falsify people and form their views accordingly. It quite possible to lead to extensive negative results, cause public harm, be a threat to democratic political and policy-making processes, and may even put the protection of citizens' health, security and their environment at high risk. Disinformation oxidizes citizen's faith in governments and democratic processes, as it prevents their capability to form their views and make well-versed decisions, while also challenges their trust in large organizations and in traditional media and in digital social media. But most and foremost, it could easily generate contradictory arguments and strains in among people of all ages and socio-environments.

Misinformation and disinformation are quite often being wrongly confused and interpreted to be the same thing. They look the same, they sound similarly, their understandings could be close enough, but they are two completely different foundations, with completely different meanings. We could say that their main difference is that disinformation has a more mischievous meaning, given the spread of the false information is deliberate and covertly presented in order to plant fake rumours and propagate people and their views, yet misinformation is mostly an unintended spread of not only misleading but also incorrect data/information/news. Also, it is worth mentioning, that the terms "misinformation" and "disinformation" have been associated with the coinage "Fake News" (refer below).

2.1.2. How Disinformation differs from Misinformation

According to Karlova and Lee (2012) inaccurate information, is often looked like a significant issue that needs to be revised and fixed or treated as either misinformation or disinformation without further deeper thoughtfulness. Misinformation and disinformation, however, it is quite possible to cause substantial complications for online users in social media or general web browsers, where they are continuously unprotected to plenty of erroneous and/or misleading information. Their study targets to create a theoretical base for any forthcoming practical investigation by scrutinizing the interactions among normal information, fake news, misinformation, and disinformation, as it discusses signs to fraud, as channels for perceiving misinformation and disinformation. In the paper, it is argued that misinformation and disinformation

are by any means correlated yet discrete sub-categories of information, given misinformation is a complicated concept, and way more compound than simply being imprecise or inadequate, and disinformation does not always involve misinformation. The final conclusion of the paper was the importance of context and time in describing and putting in context both misinformation and disinformation.

Fallis D. (2009) also discussed the problem of disinformation, arguing that, in order to deal with this problem, people first need to understand precisely what disinformation is. In this paper, the philosophical method of theoretical analysis is described, including the analysis of the disinformation's varieties, along with the conceptual analysis of disinformation. Fallis, in his analysis, debate if disinformation is essentially the same as lying. Finally, how this analysis can in practise help people to deal with the problem of disinformation is briefly discussed.

2.2. Fake News

2.2.1. Definitions

There are numerous definitions of fake news proposed by different authors. Wikipedia underlines that fake news (also known as junk news, pseudo-news, or hoax news) is a form of news consisting of deliberate disinformation or hoaxes spread via traditional news media (print and broadcast) or online social media. Fake news can be mostly delivered as misinformation spread on the Internet, and mostly in social media, but can also be found quite often to traditional media, too. Overall, fake news is written and issued normally with the intention to mislead in order to harm people, governments or various organisations/institutions, and/or financially profit or politically win, while they frequently use scandalous, deceitful, or unequivocal invented headlines and they try to invoke emotions in order to reach to wider audience and increase readership.

Fake news can be shortly defined as "fabricated information that mimics news media content in form but not in organizational process or intent." Himma-Kadaks (2017) defines fake news as the intentional falsehoods that imitate journalistic facts and is distributed via social media and, in some cases, mainstream media, while Gelfert

(2018) considers fake news as the deliberate presentation of (typically) false or misleading claims as news, where the claims are misleading by design. According to Shu, fake news is regarded as a news article that is intentionally and verifiably false.

Overall, we understand that in the scientific papers fake news is depicted as false information that appears as news. However, the researchers go deeper and state that fake news is disseminated deliberately and there is always an intention to mislead people. In addition to that, in papers the way of delivery of this information is also mentioned but it is narrowed down to social media, without completely casting-off mainstream media. In other words, fake news is defined as a piece of news, which is stylistically written as real news but which is completely or partially false (Sukhodolov & Bychkova 2017).

The pertinence of fake news has expanded in post-truth democratic issues. For news sources, the capacity to pull in bigger audience and increase viewers to their online sites is important to create income from advertising. Publishing a story with fake content that appeal more viewers benefits advertisers and improves appraisals. Simple access to online ad income, expanded political polarization and the ubiquity of internet based life, principally the Facebook News Feed, have all been involved in the spread of fake news, which contends with genuine reports. Unfriendly government entertainers have additionally been ensnared in creating and engendering counterfeit news, especially during election or referendum periods.

2.2.2. Types of Fake News

In 2018, Edson et al., based on a review of how previous studies have defined and used the term “fake news”, tried to identify, define and categorise fake news. An examination of 34 academic articles that used the term “fake news” between 2003 and 2017 resulted in a typology of the following types of fake news:

1. News Satire, which is the most well-known operationalization of fake news, referring to mock news programs, which typically use humour or exaggeration to present audiences with news updates;

2. News Parody, shares many characteristics with satire as both rely on humour as a means of drawing an audience and uses a presentation format which mimics mainstream news media. The difference from satires is their use of non-factual information to inject humor;
3. Fabrication, which refers to articles which have no factual basis but are published in the style of news articles to create legitimacy;
4. Photo Manipulation (visual news), which is people manipulation using real images or videos to create a false narrative;
5. Advertising materials, in the guise of genuine news reports as well as to refer to press releases published as news; and
6. Propaganda, which refers to news stories which are created by a political entity to influence public perceptions. The overt purpose is to benefit a public figure (political or not), organization or government.

The above mentioned operationalisations of fake news are grounded on two different classifications: the level of true authenticity and the level of dishonesty.

2.2.3. Fake News on Social Media

The widespread of fake news can potentially create tremendously negative effects on people individually and the society as a whole. Therefore, detecting fake news online and especially on social media has recently become quite popular in the research field that is appealing notable attention from not only academics, but also people in general. Fake news revealing on social media grants distinctive features and challenges that raises questions and make most of the already standing detection systems in relation to traditional news media unemployed or inappropriate. First of all, fake news are generally deliberately written to misinform readers to rely on incorrect and untrue information and form their views respectively, which makes it very difficult and challenging to detect them based on news subject; consequently, supporting information, such as user public actions and activities on social media, has to be contained to help people a determine their conclusions. Moreover, manipulating this aforementioned information is quite puzzling in and of itself as users' social engagements with fake news produce data that is big, incomplete, unstructured, and

noisy. So, given the matter of detecting fake news on social media is both demanding and currently applicable, Liu et al (2017) conducted a survey to deeply study on this challenge. They presented a complete analysis of identifying fake news on social media, including fake news characterizations on psychology and social theories, existing algorithms from a data mining perspective, evaluation metrics and representative datasets.

Hodson and Traynor's (2018) research recognized some of the current empirical studies and work in regards of fake news, trust and social media. Algorithmic approaches and fact-checking tools are regularly used to assist identify fake news sources and influences. Little work has been done on the influences of user experience, as is aesthetics, interface design, usability, and in how end users engage with and identify news. Standardized User Experience instruments, like the Percentile Rank-Questionnaire capture data on trust, loyalty and appearance, as well as usability. Other User Experience approaches such as concurrent think aloud and eye tracking could allow for richer data and in-depth exploration of user behaviour patterns in their social media use and sharing of news. Therefore, they have suggested a transdisciplinary approach to researching fake news that takes into account algorithmic methods, psychometric data, and qualitative explorations of user behavior.

2.2.4. Common Practices in Elections

Following the 2016 US presidential political race, many have communicated worry about the impacts of bogus stories ("fake news"), circled to a great extent through online networking. Hunt and Gentzkow (2017) examined the financial aspects of fake news and present new information on its utilization preceding the elections. Drawing on web perusing information, chronicles of truth checking sites, and results from another online review, it was discovered that internet based life was a significant yet not predominant wellspring of political race news, with 14% of Americans considering web based life their "most important" source; of the known bogus reports that showed up in the three months before the political decision, those preferring Trump were shared an aggregate of 30 million times on Facebook, while those preferring Clinton were shared 8 million times; the normal American grown-up observed on the

request for one or maybe a few fake news stories in the months around the political race, with simply over portion of the individuals who saw them trusting them; and individuals are considerably more liable to accept stories that favor their favored candidate, particularly on the off chance that they have ideologically isolated web-based social networking systems.

Benkler et al. (2017) broke down both traditional and online networking (social media) inclusion of the 2016 United States presidential political rally, as reported that most of prevailing press inclusion was negative for both Mr. Trump and Mrs. Clinton, however to a great extent followed Donald Trump's program outline. They discovered that the structure and organization of media on the right and left are very unique. The main media on the right and left are established in various customs and journalistic practices. On the moderate side, more consideration was paid to pro-Trump, exceptionally divided news sources. On the liberal side, on the other hand, the focal point of gravity was made up to a great extent of long-standing media associations saturated with the conventions and practices of objective journalism. The study examination incorporated the assessment and mapping of the media scene from numerous points of view and depends for enormous scope information assortment of media stories distributed on the web and shared on Twitter.

Guo and Vargo (2018) also analysed how fake news, misinformation, and satire, influenced the rising media system during the 2016 U.S. presidential elections through an incorporated intermedia agenda investigation, which considers expansive properties and bigoted stories and occasions. A computer-assisted content investigation of a large number of news stories was led close by a subjective examination of well-known news features and articles. The outcomes demonstrated that sites that spread falsehood had a genuinely close intermedia plan setting relationship with certainty based media in covering Trump, yet not for the report about Clinton. Parody sites scarcely collaborated with the motivation of other news sources. Generally, it appeared that instead of playing a novel plan setting job right now scene, counterfeit news sites added some noise to an as of now sensationalized news condition.

2.3. How to tackle Fake News

Nenadic (2019) discussed in more depth around how to tackle fake news. Their study underpins how the European Commission (EC) has recognised the exposure of citizens to online disinformation and micro-targeting of voters based on the unlawful processing of personal data as one of the major challenges for European democracies. In a response, the EC has put in place several measures creating a “European approach”. Thus, this paper analyses the approach to identify which are the key principles upon which it is based; and the extent to which it takes into account the complexities of the challenges identified. The initial conclusions are that, while being a significant step in the creation of a common EU answer to disinformation and political manipulation, the “European approach” requires further elaboration, primarily to include additional layers of transparency and public oversight.

2.3.1. EU Code of Practices against Misinformation

The introduction of citizens to enormous amounts of misinformation, including misdirecting or outright false information, is a significant test for Europe. The EU Commission is attempting to execute a solid, boundless and comprehensive arrangement of activities to test the spread and effect of online misinformation in Europe and guarantee the assurance of European values and democratic systems.

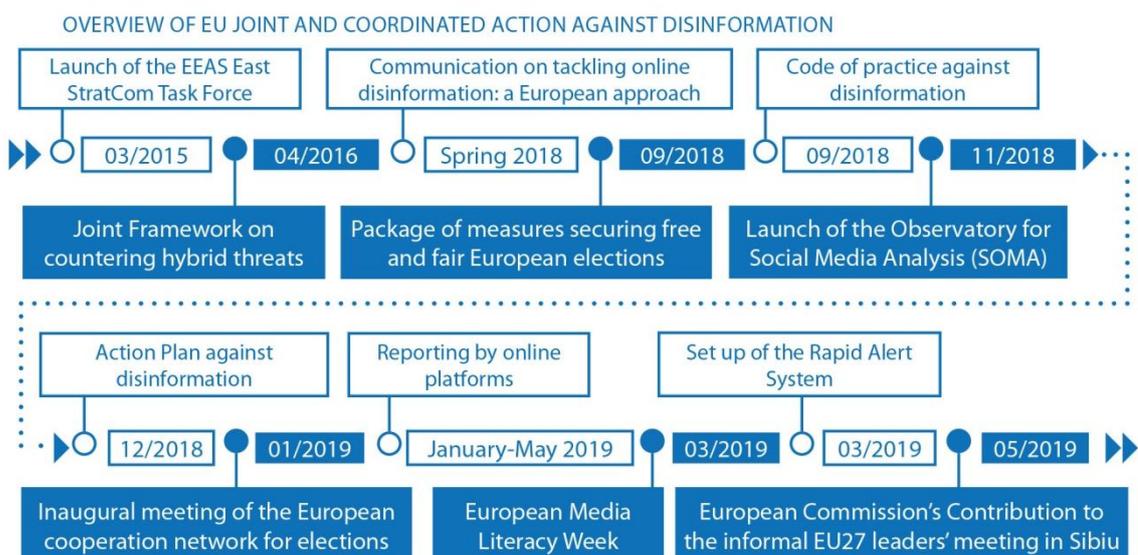


Image 1: Overview of EU joint and Coordinated Action against Disinformation, Source: ec.europa.eu

The European Union has drawn an Action Plan to increase determination to tackle disinformation in Europe and past focusing on four key parts. This plan serves to build EU's abilities and fortify collaboration between Member States by the below:

- Improving recognition, investigation and disclosure of disinformation;
- Solider collaboration and combined reactions to threats;
- Improving cooperation with online platforms and industry to block disinformation; and
- Raising consciousness and expand social flexibility.

According to European Commission, “The Code of Practice on disinformation is the first worldwide self-regulatory set of standards to fight disinformation voluntarily signed by platforms, leading social networks, advertisers and advertising industry in October 2018. Signatories of the Code presented detailed roadmaps to take action in 5 areas:

- Disrupting advertising revenues of certain accounts and websites that spread disinformation;
- Making political advertising and issue based advertising more transparent;
- Addressing the issue of fake accounts and online bots;
- Empowering consumers to report disinformation and access different news sources, while improving the visibility and findability of authoritative content; and
- Empowering the research community to monitor online disinformation through privacy-compliant access to the platforms' data.

Online platforms and trade associations representing the advertising sector have submitted a baseline report in January 2019 setting out the state of play of the measures taken to comply with their commitments under the Code of Practice on Disinformation”.

Among January and May 2019, the European Commission completed a focused check of the execution of the obligations by Facebook, Google and Twitter with specific relevance to the trustworthiness of the European Parliament decisions. Specifically, the Commission asked all three Platforms signatory to the Code of Practice to provide

details regarding a month to month premise on their activities embraced to improve the investigation of advertisement situations, guarantee straightforwardness of political and issue-based promotions and advertising and to tackle fake accounts and malicious use of bots. The Commission distributed publicly the reports received for the five months alongside with its own evaluation. In May 2019, Microsoft subscribed to the Code of Practice and also presented its roadmap.

2.3.2. Fact-Checking

Fact-checking is the act of checking genuine information in non-fictional text in order to determine the accuracy and precision of the factual statements in the text. This may be done either before (ante hoc) or after (post hoc) the text has been published or otherwise distributed. Fact-checking may be done privately, which is called internal fact-checking. Alternatively, the fact-checking analysis may be published, in which case it is called external fact-checking. Ante hoc fact-checking aims to remove errors and allow text to proceed to dissemination or to dismissal if it fails confirmations or other criteria. Post hoc fact-checking is most often followed by a written report of inaccuracies, sometimes with a visual metric from the checking organization (Wikipedia).

Fact checking tools and services, like Factmata, Crosscheck, Co-Inform, Politicgact.com and Full Fact, are being developed to use advanced natural language processing and artificial intelligence algorithms to recognize misleading content and fake news, in order to fight false information provided to readers of any kind. This requires both labelled datasets and communities of experts to help train applications to identify and categorize content (Hodson and Traynor 2018). Fact-checking process aims to gather online misinformation spread in online societies to invalidate false information. Thus, a lot of work is still required in order to realize how human judgment of false information and fake news occurs.

Table 1: Summary of Literature in chronological order

No	Author(s)	Year	Title	Main Theme
1	Fallis D.	2009	A Conceptual Analysis of Disinformation	Disinformation

2	Karlova N.A. & Lee J.H.	2012	<i>Notes from the underground city of disinformation: A conceptual investigation</i>	Disinformation
3	Hunt A. & Gentzkow	2017	Social Media and Fake News in the 2016 Election	Common Practices in Elections
4	Liu H. et al.	2017	Fake News Detection on Social Media: A Data Mining Perspective	Fake News
5	Benkler et al.	2017	Partisanship, Propaganda, and Disinformation: Online Media and the 2016 U.S. Presidential Election	Common Practices in Elections
6	Edson et al.	2018	Defining “Fake News”	Fake News
7	Fernandez M. & Alani H.	2018	Online Misinformation: Challenges and Future Directions	Online Misinformation
8	Guo L. & Vargo C.	2018	“Fake News” and Emerging Online Media Ecosystem: An Integrated Intermedia Agenda-Setting Analysis of the 2016 U.S. Presidential Election	Common Practices in Elections
9	Hodson J. & Traynor B.	2018	Design Exploration of Fake News: A Transdisciplinary Methodological Approach to Understanding Content Sharing and Trust on Social Media	Fake News in Social Media
10	Nenadic I.	2019	Unpacking the “European approach” to tackling challenges of disinformation and political manipulation	How to tackle Fake News

3. Research Methodology & Data

In this section, we present a detailed analysis of our data and methodology used. So, in the first sub-chapter, we report the sample that was used in the empirical part and then, we introduce the employed methodology of our research.

3.1. Data

As we have already mentioned, the purpose of this study is to examine and analyse one of the most important issues that our society faces during the last years, misinformation and democracy. This tested through an experiment analysis of the main news and social media activities in regards to EU political parties during the pre-elections period of June 2018 to May 2019. We have chosen to focus on this area of misinformation because elections are a very serious decision-making process of recent democracies, the majority of citizens are interested in this matter and more importantly all of them are socially and financially affected by the election's results.

In this sub-chapter we describe the selection of our data news and posts, regarding the EU pre-elections period of June 2018 to May 2019. The criteria for choosing the appropriate posts for our study were the following: they had to strictly come from a European Union country, and they had to be related to the EU pre-elections, for the time period under scrutiny.

We completed extensive research on the internet to gather relevant information about EU pre-elections fake news cases from three fact-checking sites Factcheckeu.info, EU Factcheck.eu and Fullfact.org. These websites differ from each other in terms of user interface, purpose, and content organization depending on the needs of their audience. Our search included the European Union 2019 Elections. We ended up with 25 cases to analyze. Articles from fact-checkers were gathered, and we reverse-searched for the fake news piece.

3.2. Research Methodology

In order to analyze the cases, we created a classification of migration of fake news based on the methodology approach of Bychkova and Sukhodolov (2017), which has been slightly modified to fit our purposes, and presented in the below Table. For each case we stated the source, country of origin, the real fact it was referring to, the true part of what was spread, the fake/false part of what was spread, the date when the fact was created and the date it was fact-checked, the media through which it was spread, the proof of fakeness and the type of fake news. Then, we categorized each case based on three different characteristics classifications. Following, we present the fake news characteristic classifications:

- Truth information ratio: this is in regards of three types of fake news for this category: totally fake, partially fake, true. This is a multiclass field, which means that only one of these choices is valid for each case.
- Time/place authenticity: this is a multiclass value field, which means that based on the information we have about time or/and place for each fake news case we can choose one of all possible combinations, such true time and false place, true time and true place, false time and false place, and/or false time & true place. The values that we have added are distinguished in table as underlined and bold.
- Perceived authenticity: this is a binary value field, which means that only one of two choices is valid for each case. We classify pieces of information as either easily distinguished by users as fake or written so convincingly that the reader cannot distinguish that it is fake.

Also, for every fake news case we note the country that this comes from and the platform that has been used for distribution of fake news.

Table 2: Characteristic Classification Framework of Fake News

Characteristic	Type of Characteristic	Type of Values
Truth Ratio	Categorical – Multi-class	Totally Fake Partially Fake True
Authenticity of Time & Place	Categorical – Multi-class	True Time & False place True Time & True Place False Time & False Place False Time & True place
Perceived Authenticity	Categorical – Binary	Easily Distinguished Convincingly Written

As mentioned above, using the aforementioned methodology approach and news classification, we analyzed 25 different fake news cases in regards to European Union parties during the 2019 European Union pre-elections period (June 2018 to May 2019).

4. Analysis & Findings

In this section, we will analyse and comment on our empirical results and specific findings on the pre-election activities of European Union political parties. As we have already mentioned, our experiment analysis included testing the main news and social media activities in regards to EU political parties during the pre-elections period of June 2018 to May 2019. We have chosen to focus on this area of misinformation because elections are a very serious decision-making process of recent democracies, the majority of citizens are interested in this matter and more importantly all of them are socially and financially affected by the election's results.

Our proposed analysis approach was based on the following steps:

- i. Search online on various fact-checking sites and collect all relative news and posts in regards to 2019 European Union pre-election activities;
- ii. Select our open source free fact-checking tools (Factcheckeu.info, EU Factcheck.eu and Fullfact.org) and analyse these posts via those tools; and
- iii. Eventually find and present, providing detailed analysis, how many posts were totally fake, partially fake or true.

Starting our analysis by analyzing the country of origin where the questionable fact was recorded. As can be seen from the pie chart (Figure 1) below, we conclude that there is a quite fair mix of where the news coming from. UK is the leading country, with 28% origin of the news coming from there, while Denmark, Sweden, Spain and Croatia are representing only 4% (one case each). Germany follows with 20% (five cases) of posts/news coming from there and Greece with 16% of cases. Then, Italy follows with 12% origin of cases and France with 8% (2 cases) of news/posts coming from there. Noting that, a common characteristic amongst the cases was that the sources that were responsible for spreading controversial information were usually from the same country or continent where the questionable fact was recorded.

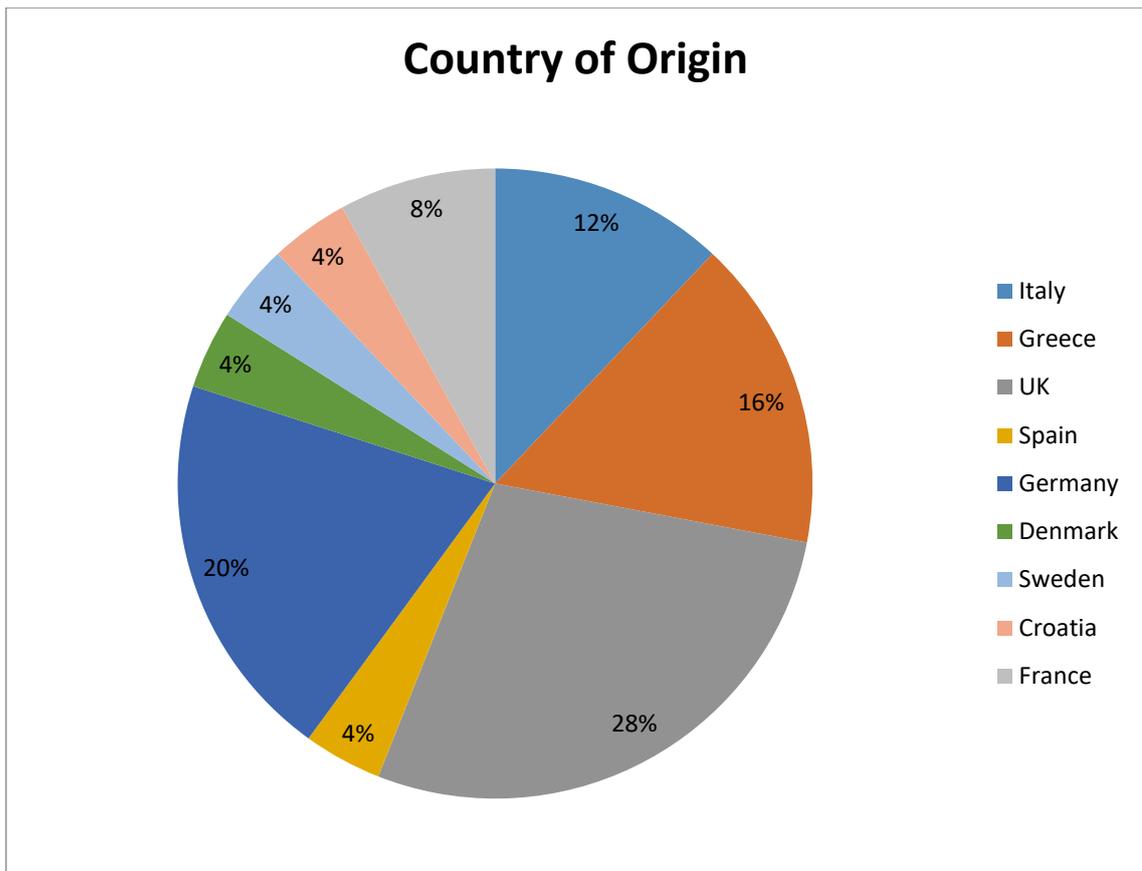


Figure 1: Country of Origin of Misinformation Cases

The next chart (Figure 2) shows the ratio of true and false information for each case, classified, as mentioned above, as either “Totally Fake”, “Partially Fake” or “True”. The majority of the cases enclosed false information (aggregated amount of both totally fake and partially fake news), amounting for 68% (16 cases) together. If we look at the results separately, 32% (8 cases) of the news/posts were totally fake, while exactly the same portion was also partially fake. This leaves a remaining 36% (9 cases) to be proven either mostly or completely true (classified as one). Overall, this imposes a significant risk of misinformation related to democracy spread online and especially on social media. The results indicate that fake news and misinformation, especially in EU, is all over the web and the social media, in various forms, and it can directly affect democracy and citizens’ decision-making process. Totally and partially fake news, in our analysis, totaled for the 64% of the total news/posts fact-checked, which 2/3s of the tested sample. Action needs to be taken to eliminate spread of fake news, improve fact-checking and thus, diminish misinformation in democracy.

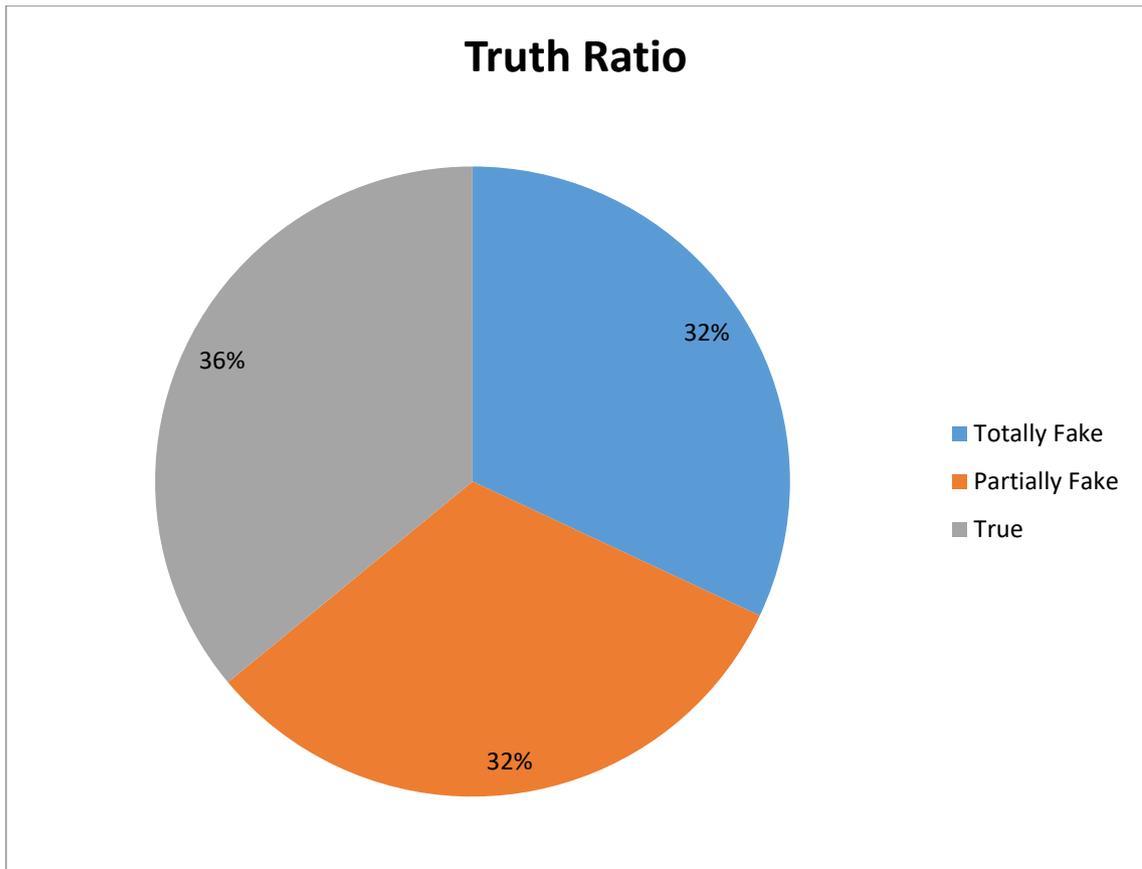


Figure 2: Truth Ratio of Misinformation Cases

As far as it concerns the level of posts' degree of authenticity (Figure 3), we came in the conclusion that the content is written quite convincingly and a reader will most probably be misinformed and get a corrupted perception of a subject or even a whole nation. 72%, which represents 18 cases, was found to be quite convincingly written, which raises questions around how easily and persuasible people can write and spread hoaxes and misinformation on the web, and most importantly, it pose significant threat to democracy. Yet, only 28% (7 cases) was easily distinguished from the reader and we can say that could not pose significant and direct threat to democracy or decision-making.

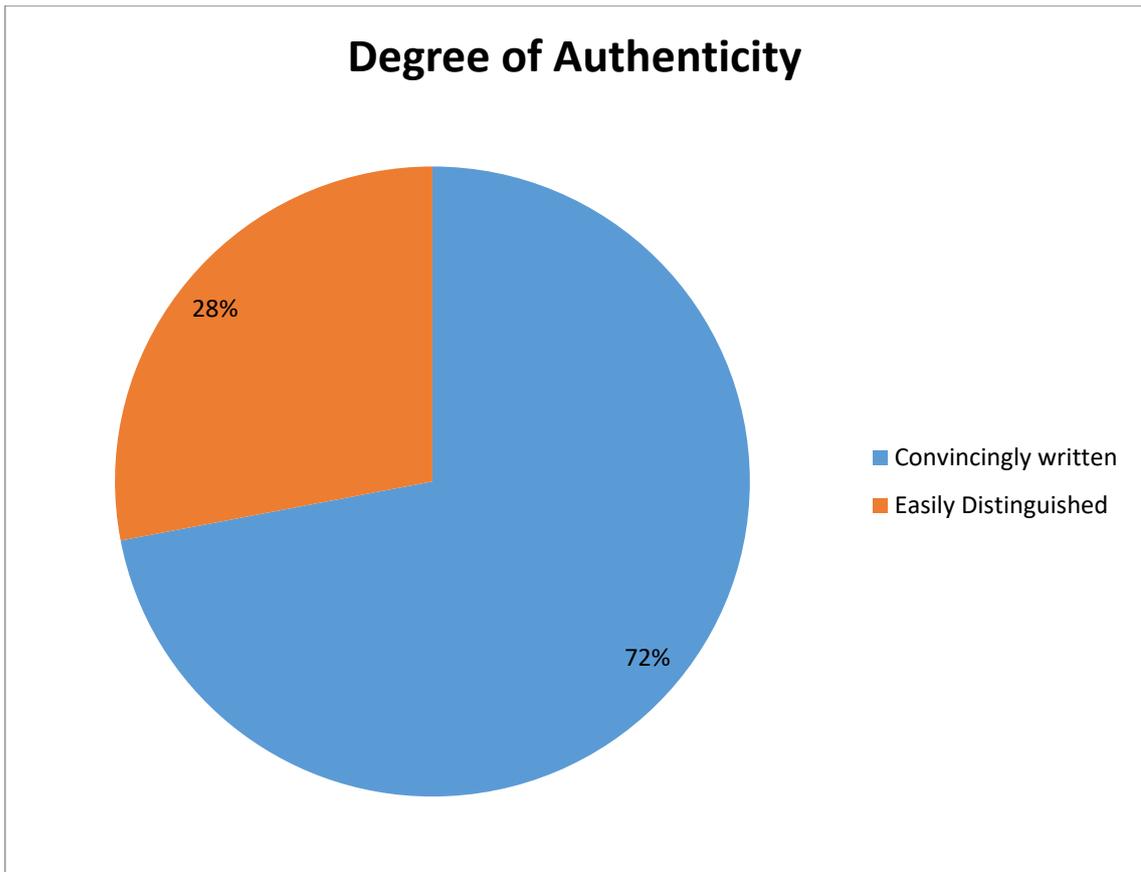


Figure 3: Degree of Authenticity of Misinformation Cases

Lastly, a common practice, typically used in identifying false cases in order to be projected as realistic, is the falsification of two major factors relating to an event – its time and place. As it is shown in the pie chart (Figure 4) below, the creators and producers of fake news falsify information about the time when an event took place more frequently than about the place where an event happened (12% or 3 cases versus 4% or only 1 case, respectively). However, in most cases (20) that we analysed, totalling 80%, the time and the place have been stated truthfully, though the case is usually fraudulent with fake or unidentified details.

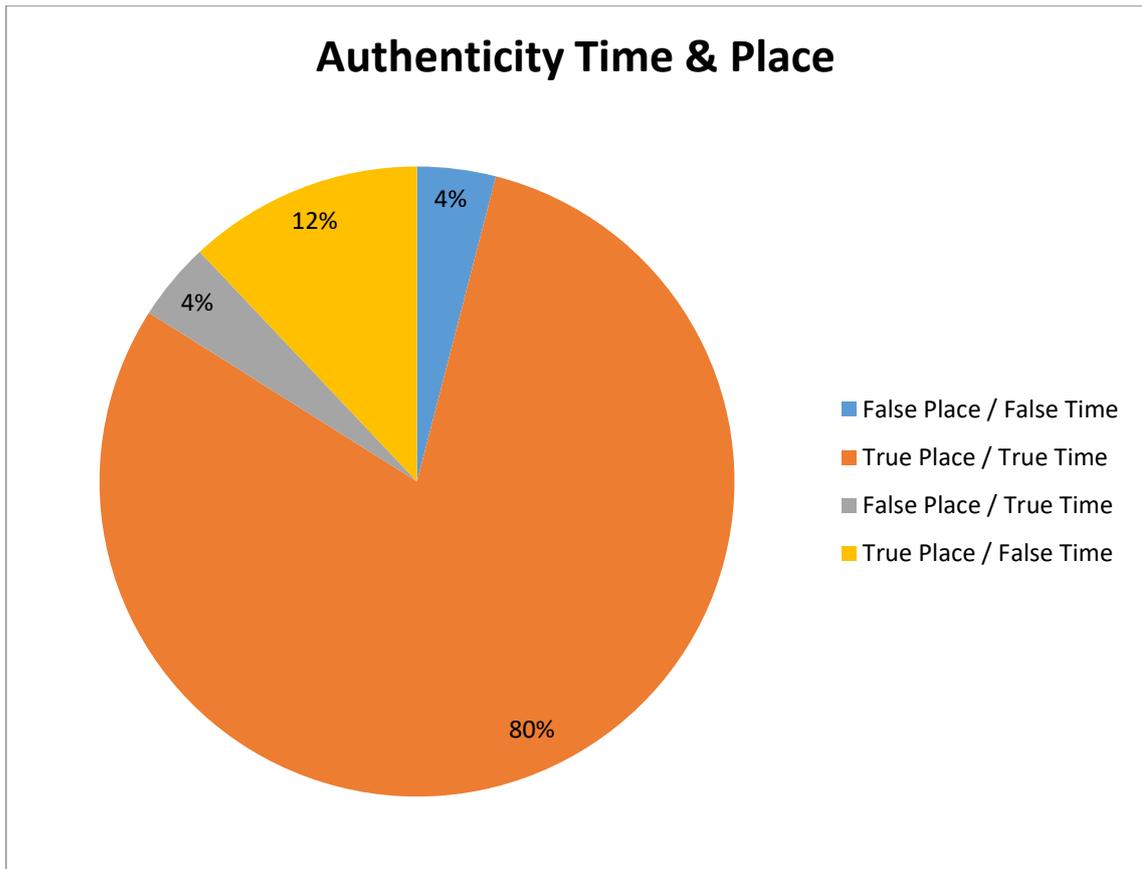


Figure 4: Degree of Authenticity of Misinformation Cases

Overall, we can say that the findings were quite similar and consistent with the literature review and other researchers' findings. Misinformation is a huge scourge of current democratic societies that can impose significant risks and threats to the decision-making process, given elections are the base line of democracy. There are three reasons why it's especially important to engage critically with election news, and especially political news in general. Firstly, the stakes, which is the way you vote (The How) and if you decide to vote (The Weather) and are actually among the most important decisions you make. Subsequently, because people often have strong feelings about political issues and they are more vulnerable both to self-own biases and to being manipulated by others. Lastly, politics is an area where scammers, hoaxers and manipulators are most active. They know that we are more likely to listen to and more inclined to seek out information that supports what we already believe, and that even outlandish claims can start to seem believable if they're repeated often enough.

5. Conclusions, Limitations & Future Implications

In this dissertation study, we aimed to examine and deeply analyse one of the most important issues that our society faces during the last years, misinformation and how it is related and affecting democracy and decision-making process. A literature review was conducted in order to deeply understand the concept of misinformation, comprising key approaches to tackle the disinformation, including fake news and elections. Subsequently, we conducted an experiment analysis of news cases and/or post of EU political parties during the pre-election period of June 2018 to May 2019, to identify the portion of fake news, using open source free fact-checking tools (Factcheckeu.info, EU Factcheck.eu and Fullfact.org), to gather and check for the fake news piece.

In this study, we have applied the methodology approach based on Bychkova and Sukhodolov (2017) research study, which has been slightly modified to fit our purposes. For each case we stated the source, country of origin, the real fact it was referring to, the true part of what was spread, the fake/false part of what was spread, the date when the fact was created and the date it was fact-checked, the media through which it was spread, the proof of fakeness and the type of fake news. Then, we formulated a framework to characterize fake news cases. This framework was based on existing literature and concepts in the wider area of fake news and misinformation. However, it was adapted in such a way to be simple to use, by categorising each case based on three different fake news characteristics classifications, "Truth Information Ratio", "Time and/or Place Authenticity and Perceived Authenticity".. The framework has been used to identify and characterize 25 news/posts cases. Results of this work were presented in an exploratory and visualization-based (figures/graphs) analysis. To the best of our knowledge, this is the first empirical research trying to collect and analyse posts and news in regards to European Union's 2019 pre-elections period to identify fake news or not.

Thus, the first benefit of this work is the provision of the framework to characterize fake news. This was encapsulated in a tabular form (Table 1). We tried to make this

framework easy to use and fill in. As a proof of concept, we attested the proposed framework by filing in table 1 for the selected 59 fake news cases. Exploratory analysis has been performed and we discuss here our major findings:

- We can presume that the impact of fake news has been more noticeably present in the UK and German media (Figure 1). This is not an unexpected phenomenon, as a major contributing factor to the rise of fake news has been Brexit and UK's participation in the European Union Elections prior their exit from the Union, as well as various statements, views and articles from one of the most active and leading European countries, Germany.
- As far as it concerns the ratio of true and false information for each case (Figure 2), we can definitely say that the majority of the cases enclosed false information (aggregated amount of both totally fake and partially fake news), amounting for 68% (16 cases) together, with 32% (8 cases) of the news/posts were totally fake, while exactly the same portion was also partially fake. All in all, this imposes a significant risk of misinformation related to elections spread online and especially on social media. The results indicate that fake news and misinformation in EU are all over the internet and they can directly affect democracy and citizens' decision-making process. Action needs to be taken to eliminate spread of fake news, improve fact-checking and thus, diminish misinformation in democracy.
- In most cases that we analysed the time and the place have been stated truthfully (Figure 4), although the case is usually fraudulent with fake or unidentified details. The level of posts' degree of authenticity (Figure 3), was proven that is written quite convincingly and a reader will most probably be misinformed and get a corrupted perception of a subject or even a whole nation.

In regards to the limitations of this work, there are some evident ones, therefore leads to some further directions and points of interest for future research. Firstly, our fact-checking analysis was only made using three free online tools from Europe. As a future work more fact-checking websites and sources could be using for checking, preferably established in different countries and continents (or even globally). Furthermore, our

analysis was only included 25 cases and therefore we prompt for future studies to include more cases to be selected than those used in this thesis.

There is another limitation of our work regarding the fake news case analysis. We analysed misinformation cases relating to EU elections and concluding how these cases are related with some characteristics of fake news. Nevertheless, in this study we did not aim to analyse all misinformation areas that fake news can be identified. Thus, we cannot state that our findings and framework are present and/or applicable in other areas of misinformation (e.g. besides elections and democracy related). Therefore, a direction for a future research could be to investigate also other areas of fake news. The false information affects all aspects of life. In the world of politics, for example, it can hurt an image of a candidate, potentially altering the outcome of an election. In the business community, it can be harmful for businesses and brands and therefore their profitability and even existence. For the government, it can create issues regarding people identity theft, law and order situations and governance. For immigration issues, it can damage the image of immigrants or citizens of the intake country, governments and presidents their selves (e.g. Donald Trump US). In this paper we focused on the area of misinformation concerning and affecting democracy, but in future, a wider study could incorporate even more cases from different and more areas (e.g. health sector, education, government, immigration, etc.).

We finally conclude this research study by highlighting that fake news by default attempt to mislead people and that in most of the cases it is quite hard to make a distinction between fake from real news. In this thesis, we found and presented different definitions about misinformation and disinformation, we researched and presented definition, types and classifications of fake news and how are spread through social media, while also discussed about common practices in Elections, what is the EU Code of Practices against misinformation and presented in detail fact-checking and the tools available in web. Based on this information, we shared our own views on some characteristics of misinformation and fake news definitions, and we presented an integrated model to be used as a framework for classifying fake news. Thus, we used our proposed framework (model) of misinformation to analyse fake news about the 2019 European Union pre-elections and identify the relation between

different characteristics of elections-related fake news. We believe that democracy and elections in accordance with misinformation and fake news in general is a matter of significant focus and importance that needs to be deeper researched since fake news about elections keeps gathering momentum and affecting all aspects of people's lives and citizens' decision-making process. Action needs to be taken to eliminate spread of fake news, improve fact-checking and thus, diminish misinformation in democracy.

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