Article

Deciphering shadows: A study on disinformation, its digital proliferation, and effects on organizational integrity

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Abstract: Managing the spread of "disinformation" is becoming an increasingly difficult task of our time, with an emphasis on digital marketing and its influence on organizational reputation. This paper aims to analyze the phenomenon of disinformation, with emphasis on the role of digital marketing and the consequent effect on organizational image. Thus, using the systematic literature review methodology, the study defines and categorizes different types of disinformation, namely fake news, misinformation, and propaganda, and how they are spread across different channels. Using the research, it is possible to conclude that digital marketing is more effective in spreading disinformation than traditional media and word-of-mouth; social media management and content marketing are the most effective. The work also evaluates the catastrophic impact of disinformation on an organization's image, fiscal health, and the trust of its stakeholders. Using the Chi-Square Test for Independence and Logistic Regression, the study determines the factors likely to lead to severe consequences of disinformation campaigns. Last but not least, the paper also suggests ways of preventing the spread of disinformation, which include improved education on the use of digital platforms, better fact-checking systems, and an improved code of ethics in digital marketing.

Keywords: disinformation; digital marketing; organizational reputation; ethical dilemmas; digital media channels; fake news

1. Introduction

In the modern world, disseminating false information is an urgent issue about the difficulties for organizations and people. This paper presents a detailed analysis of the types of disinformation. It examines the role that digital marketing plays process in spreading it. The study also explores how disinformation transfers from one platform or audience to another. Furthermore, it evaluates the effectiveness of various marketing media and techniques in spreading disinformation. Finally, the paper underscores how a company or organization's reputation can be severely undermined by the use of disinformation, highlighting the gravity of this issue (Dhiman, 2023; Diaz, 2023; Luo, 2021; Muhammed and Mathew, 2022; Shahzad et al., 2023; West, 2017).

By reviewing the existing academic literature utilizing this study, it is possible to offer readers comprehensive information about the disinformation phenomenon, helping them to orient themselves in this quite intricate and continuously developing sphere. Thus, the review helps establish a framework for examining the various interactions between digital marketing techniques and disinformation dissemination by scrutinizing current definitions of the phenomenon along with the theoretical concepts underlying it.

In addition, the study seeks to find out the process by which large volumes of disinformation gain access to society; the findings will reveal the identified tools and practices in digital marketing that advance disinformation. Most importantly, the review measures the success of those strategies in propagating fake news, which is helpful for organizations and individuals who want to overcome the effects of what has become an increasing issue today. In addition, we test the results outcomes by assessing whether there is a significant association between the tools and tactics applied using the Chi-Square Test for Independence and Logistic Regression to understand which factors most significantly predict the likelihood of a severe outcome.

Finally, it also concludes with a discussion on the managerial implications of disinformation stressing how the phenomenon poses a serious threat to the very heart and soul of the contemporary organization, its brand, and the consumers' trust in these brands as well as the relevant financial markets. Overall, the review provides the reader with a straightforward programmatic strategy for combating the complexities and hybrids seen with disinformation within the digital age based on the results of similar literature.

2. Methodology

Research design: The research design used in this study was the systematic literature review approach. A systematic approach is employed to assemble, assess and integrate all literature concerning a specific research theme. A systematic literature review is similar to a conventional literature review, which involves a search of the literature. Still, the significant differences include the following: The systematic literature review is guided by a protocol developed to reduce bias in identifying and including the literature identified during the review (Munn et al., 2018; Shaheen et al., 2023). Therefore, a systematic literature review facilitates a broad and all-rounded search of the current widely available literature on disinformation and how it affects organizations. Each step in the review process was carefully planned to ensure the study's validity and credibility.

Data collection: The literature search (see Supplementary materials) was performed for the sources in academic databases such as Scopus, Web of Science, and Google Scholar. The key terms to use while searching were "Disinformation," "Misinformation," "Fake News," "Digital Marketing," and "Organizational reputation." This review only included 100 studies published in professional, peer-reviewed journals, conference proceedings, and book chapters from 2018 to 2024.

In addition to the electronic databases, the targeted journals, which included the Journal of Management Information System, Journal of Computer-Mediated Communication, and Psychological Science, were manually searched for related studies. The choice of particular journals, such as the Journal of Computer-Mediated Communication (JCMC), was informed by the focus of this study on digital marketing and disinformation. Some examples include JCMC, which is a reputable journal in communication sciences, especially in the context of digital communication. Most of its articles discuss the role of digital technologies and platforms in sharing information and, therefore, help understand how fake news travels through digital advertising. The usefulness of JCMC for this research is based on its focus on digital communication,

which coincides with the study's interest in the spread of disinformation in the digital environment. Other journals may also have been excluded from the review because they are not entirely dedicated to communication or do not offer as much information about the digital marketing of disinformation. Some journals were excluded because they did not clearly focus on this work's digital strategies of interest. The bibliographies of the included articles were also reviewed to identify other relevant literature. All the selected journals were selected based on their direct relation to the core themes of the research. Therefore, the literature reviewed in this study was directly relevant to the study's objectives.

Data analysis: In order to ensure the independence, quality and transparency of research on digital marketing disinformation and its impact on the reputation of organizations, we followed the principles of a systematic approach to analysis (Munn et al., 2018; Naeem et al., 2023; Shaheen, 2023). The study involves four stages:

Formulation of the research problem. This study aims to analyze the mechanism of disinformation dissemination using digital marketing tools and, at the same time, how these actions affect the reputation of organizations (Dwivedi et al., 2023; Shaheen, 2009).

Classification of previous studies. The article examines works, including scientific articles, reports, and case studies. The search was conducted using several databases that included peer-reviewed and original sources (Dwivedi et al., 2021; Shahzad, 2023). As a result, the selection of works relevant to the research problem was carried out. The methods, conclusions, and contexts in which the research was conducted were evaluated and accepted as the basis for inclusion in the review (Khan, 2003).

Research data analysis. The article uses Python and its libraries, such as Matplotlib, Seaborn, Pandas, and Plotly, as software. These libraries provide a wide range of functionality for data visualization. To identify patterns, trends, and ideas related to disinformation and its impact on an organization's reputation, we conducted an inductive, qualitative, and exploratory analysis (Maguire, 2017).

Conclusions and results. Finally, the final stage was compiling a systematic review report that answered our research questions and was enriched with hypothetical tests and proposed solutions in a diagram generated using a diagram generation tool.

This article examines the impact of disinformation spread through digital marketing channels on an organization's reputation. Summarizing the results of previous research in this area allows us to systematize existing developments and develop a more comprehensive concept of the approach to managing the phenomenon of disinformation and its consequences.

Data sources: The literature review drew from the following academic databases and sources:

Scopus, Web of Science, Google Scholar, Journal of Management Information Systems Costume, Journal of Computer-Mediated Communication, Psychological Science, The enlightenment of the field, International Journal of Environmental Research and Public Health.

Opportunities for New Ideas in the Measurement of Scholarly Activities, BMC Medical Research Methodology, International Journal of Qualitative Methods.

Therefore, guided by the systematic and scientific spirit of the research, this study

wanted to construct an exhaustive and profound analysis of the phenomenon in question and its organizational consequences in the digital age.

Formulation of the research problem: The research framework, the adoption of research questions, and the selection criteria, including the inclusion and exclusion of literature, were comprehensively the results of the study consultation to the initial literature. Based on this foundational work, five critical research questions were developed to investigate the multifaceted issue of disinformation within the realm of digital marketing and its impact on organizational reputation: Based on this foundational work, five critical research questions were developed to investigate the multifaceted issue of disinformation within the realm of digital marketing and its impact on organizational reputation:

1) What are the definitions of disinformation as characterized in scholarly literature?

This paper aims to analyse lesser-discussed disinformation subgroups, such as propaganda, cyber-attacks, and misinformation. Such a shift demonstrates the scholarly tendency toward the recognition of more profound aspects of information warfare and methodologies of preventing and mitigating its outcomes, and vice versa, that the academic community is interested in identifying and adding new dimensions to the process of finding a solution to increasingly advanced and complex disinformation schemes.

2) In what ways does digital marketing facilitate the spread of disinformation, especially when compared with traditional media and word-of-mouth?

This paper will identify digital marketing as the most common form of internet propaganda compared to the traditional media covering word-of-mouth. In this sense, it is clear that digital platforms considerably impact disseminating reliable or false information at a speedy and wide range.

3) Through what mechanisms does disinformation proliferate across platforms and audiences?

It is predicted that social media tools and tactics and search engine optimization will emerge as the most effective disinformation vehicles, thus highlighting their superiority over all other digital marketing tools.

4) How effective are the various tools and tactics employed in digital marketing at disseminating disinformation?

The paper aims to argue that all digital marketing tools and tactics are extremely effective in spreading disinformation and, thus, are potent means of popularizing false allegations.

5) What impacts does disinformation have on the reputation of organizations?

The study expects that disinformation can have a disastrous impact on an organization's reputation and financial sustainability (Hauke et al., 2020). Studies that suggest the effect of disinformation on business entities could be devastating reinforce this anticipation.

These questions are the main elements of this study's theoretical framework, which seeks to disclose the structural patterns of the disinformation flow and its consequences. Thus, the study seeks to increase understanding and prevent adverse organizational effects.

Leveraging Secondary Data for Multidisciplinary Research on Disinformation: Strategies and Insights from 2018–2024: Second, data sources are essential as a

researcher attempts to build the categorized qualitative research process for relating and interpreting information. When direct observations are not possible due to obstructing factors like lack of time, money, or considerable resources, these sources can play a decisive role in building both the initial framework for new studies as well as providing supportive details, extra confirmation, and a tool for scholars to continue with their research (Srivastava and Hopwood, 2009). Among the secondary data resources are official statistics, earlier results, research findings, and data compilations by researchers or organizations. While, on the one hand, secondary data can help increase the depth and scope of research, secondary data can also help with long-term studies and give the possibility to make comparative analyses across different studies (Gusenbauer, 2020; Sarpong, 2023). This essay includes viewpoints from business law, psychological sciences, political science, sociology, management of information, education technology, journalism, humanities, and medicine to have fresh perspectives. This allows for forming specific categories of disinformation: The study explored the research timeline from 2018 to 2024. The Search terms that the researcher used were "Disinformation in digital marketing", "The effect of fake news on enterprise reputation", "social media misinformation and brand images", "information disorder trust and organizational", "detection of disinformation marketing", "corporate reputation management in this of misinformation", "digital marketing strategies and misinformation", "influence of social media disinformation on consumer behaviour" tools for fighting online disinformation". The "disinformation" term mainly attracts public interest because it is a relatively new buzzword that was popularized by academia and practitioners who highlighted that while disinformation became more and more prevalent, it still did not evolve into a sock concept that is distinct and separate from like misinformation and fake news (Rangapur et al., 2023; Scheufele, 2019; Van Raemdonck and Meyer, 2024; Wang, 2020). Implementing the set of keywords did not result in any major change in the review line, although the main focus on its disinformation remains the same.

Our methodological approach is based on the thematic coding procedure. Thematic coding is a qualitative data analysis approach that forms the basis of this study, whereby we find patterns or themes in the data. This process involves identifying sections of data relevant to particular topics to be indexed or "coded." This way, we are able to derive new meanings and bring out patterns that may be hidden in the code (Büchter et al., 2020). During the primary coding process of this study, we grouped the initially discovered categories, eliminating duplication of strategy types. These observations led to further improvements in the coding scheme and the development of a final analytical framework that opens up a new perspective on the topic of disinformation—in particular, in the context of digital marketing—and methodological approaches to managing the complex and detailed sphere of disinformation.

3. Discussion

3.1. Research data analysis

This article analysis touches on two aspects, namely how the attention of its audience is distributed by time and also the efficacy of different tools, methods, and

techniques that can be employed for the diffusion of such content. As illustrated in (Ledesma, 2019; Xiao, 2019), we track the change of viewpoints on the preferred administrative strategies. The year-to-year trend reveals a remarkable growth in publication output (See **Table 1**), illustrating the rising attention to the topic of the study on the part of academic communities (See **Figure 1**). The steady progression of this trend manifests the enhanced attention and engagement of academicians in the cause of unwrapping information's effectiveness and characteristics.

Table 1. Dynamics of publications over the years.

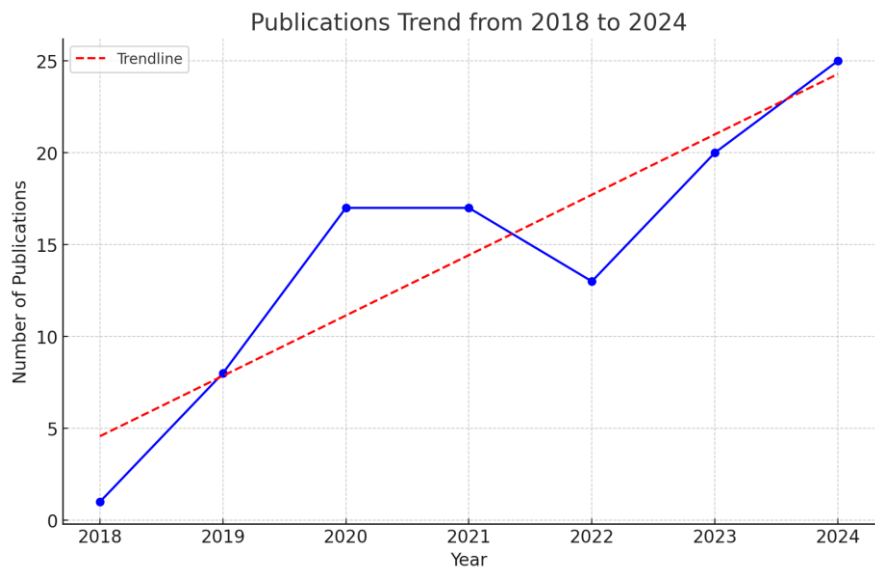| Year	Publications
2018	1
2019	8
2020	17
2021	17
2022	13
2023	20
2024	25

Figure 1. Publications trend from 2018 to 2024.

The graph below presents publication data for the past 3 years (2018–2020) and expected data till 2024, accompanied by the general trend line. Particularly, there have been more numerous new books put on the shelves. Several key factors contribute to the increasing number of publications that focus on disinformation, as outlined in (Ameur, 2023; Del Vicario, 2016): While digitalization increases at an unprecedented speed, disinformation races along with great intensity and covering huge areas, creating a significant problem for researchers, politicians, and all the people. At this point, the extent to which misinformation spreads via this proliferation of the digital becomes more evident. These studies should be read in detail and it is important to have plans about what to do to combat disinformation. Research into the unfortunate consequences of misinformation in the political arena, public health, and social

harmony calls for an immediate response. The 2016 presidential election misinformation and the fake news circulating during the COVID-19 pandemic indicate the need for research that can invent intelligent responses to the situation. The growth of artificial intelligence and machine learning has simplified the development of elaborate propaganda campaigns and given new opportunities to spot and prevent their influence. The opposite side of technology's sword leads to the constant studies of possible issues and ways of solving them. Disinformation has emerged as an interdisciplinary research area attracting psychology's attention (Greifeneder et al., 2020), computer science, communications, and political science. Apart from diversifying the body of research, this broad participation also stimulates the emergence of different methodologies and opinions. Disinformation has a global reach, and due to this, international collaboration among researchers has increased, leading to more publications. Several global platforms and partnerships have been created to share knowledge, approaches, and best practices in the fight against disinformation internationally. The attempt is coordinated to deal with and reduce the negative consequences of disinformation on society, which results in the growth of journal articles on the issue.

3.2. Diverse forms of disinformation across domains

There are various types of disinformation, each tailored to mislead within a specific (Baines and Elliott, 2020) (See **Table 2**):

Table 2. Category of disinformation presented in percentage.

Category of Disinformation	Percentage
Political	31%
Health	24%
Technology	19%
Social	14%
Financial	12%

Political disinformation seeks to mislead public opinion, change election results, and set political frames. The importance of disinformation, in the context of all of the referred disinformation cases, lies in the fact that hardly 31% of them happen online. Health disinformation is the definition of incorrect or misleading information about diseases, treatments, vaccines, and wellness habits. The practice of misinformation is rampant, particularly during public health emergencies when people are misinformed about vital health practices and hazards. Technology Disinformation: This is dedicated to disinformation on technological progress, cybersecurity, and the influence of techs on society. Unsubstantiated rumours of new tech developments or a pointless suspicion of technology's impact on society can be found in this section. The role of social disinformation lies in instilling a distorted picture of social issues and undermining the unity of society by propagating lies about activist movements or demographic groups, social debates, or norms. Financial disinformation seeks to disinformatively educate investors on financial markets, investment opportunities, economic policies, or financial products with the underlying intention of destabilizing

the market, adjusting market sentiments, or misleading investors. All the categories demonstrate that disinformation is multifaceted and can disrupt different domains of society. Therefore, vigilance and corrective actions across such domains are vital (Arif, 2020; Lewandowsky et al., 2020; Naeem and Bhatti, 2021; Pennycook, 2020; Tandoc et al., 2018).

Nearly a third of the literature discusses political disinformation. Disinformation seems to poison political processes and public opinion. At the moment, the share of health disinformation comes to 24% in the graph, which shows not only its significance but also in times of global health crises. Technology disinformation is addressed in about 19% of literature reviews, pointing at concerns associated with the fast dissemination of misinformation in the contemporary online world. Other than disinformation, social disinformation can also shape social narratives, which is about 14% of the total. The financial area is still considered one of the areas affected by disinformation in the literature. The authors propose numerous measures to fight disinformation based on the dataset offered. The most frequent suggestions were extracted, counted, and graphed.

3.3. Thematic analysis of its definitions, mechanisms, and impact in the digital era

3.3.1. Definition of misinformation in the scientific literature

In order to reveal the features of the concepts of "disinformation, misinforming distortion", an analysis of 100 literature sources was performed. The dataset covers various types of disinformation, with frequencies as follows (See **Table 3**):

Table 3. Types of disinformation, with frequencies.

Type	Instances
Disinformation	63
Misinformation	47
Fake news	46
Propaganda	7
Cyberattacks	5
Malformation	1

As for the analysis of the collected data, the following can be stated: the most frequent topic is disinformation, which was identified 63 times. From scholarly sources, disinformation can be defined as the spread of fake information to cause damage to individuals, groups, organizations, or nations (Folkvord et al., 2022). Disinformation is even more critical during special events such as the COVID-19 outbreak marred by misinformation (Zuluaga-Arias et al., 2023). Disinformation is hazardous because it can mobilize public opinion and distract people from trusting and adhering to the words of professionals in science (Costa-Sanchez et al., 2023). Hence, disinformation, understood as information intentionally false and meant to deceive, is one of the primary concerns of existing research. The intent factor differentiates misinformation from other forms of false information, referred to as 'misinformation', which is information that is not true but is not spread to deceive. False information is

ranked second with 47 mentions. This shows that it is hard to operate in the modern world and that there is a high chance of encountering fake information. Misinformation is defined as misleading and goes against current scientific knowledge and scientific methods (Southwell et al., 2022). It is fake and not in line with the current findings, which are as follows (Li, 2020). In high-risk conditions, false information can be received differently, as what one may not consider true may be considered so by others (Aven and Thekdi, 2022). Contrary to this, adverse effects of false information include low literacy, poor conduct and wrong choices (Cook, 2017). Realities of fake news affect the identification and description of risks, hence the need for the right methods and ways of identifying and coding risks (Aven and Thekdi, 2022). Misinformation is a growing menace particularly in politics, an alteration in the information landscape and hence there is a need to establish the prevalence, effects and how it can be identified (Li, 2020). The term 'fake news' (46 cases) is associated with misinformation, but it is more about false information that is presented as news. Fake news is a kind of disinformation which aims at manipulating the recipients by replicating the style of news texts (Baptista and Gradim, 2022). It is worrying when fake news is peddled deliberately and particularly in scientific journals because it means that false information is being shared (Swire-Thompson and Lazer, 2022). Fake news is often very aggressive in its dishonesty, especially if it is spread with the purpose of gaining attention, increasing engagement, and earning revenue from advertisements or promotion of a particular ideology (Baptista and Gradim, 2022). Even though fake news is primarily linked to political propaganda, scientific information also can be fake, including when the creators, and distributors, of the information are unaware of the truth (Galeotti and Meini, 2022). This problem is complex and poses a major threat to democracy and the way in which scientific information is transmitted, so it is necessary to analyze the phenomenon of fake news (Galeotti and Meini, 2022).

The words 'propaganda' and 'cyberattacks' are not very frequent; they are used 7 and 5 times, respectively, while the word 'distortion' is used only once. Propaganda is one of the most widespread and, simultaneously, the most debated terms in the scientific field. Propaganda is the systematic attempt to influence the thoughts and actions of many people with the view of altering their mindset (Hoffer, 1942). According to Hoffer (1942), this was a concept that the Catholic Church brought about in the 15th century in a bid to propagate the word of God. In Polish political linguistics, propaganda is mainly linked with the socialist system and the authoritarian regime, but some claim that it is present in democratic countries as well (Dudek-Waligóra, 2018). Propaganda appeals to emotions and senses instead of logic and reason in mass media, sometimes called 'the irrational approach' (Doob and Robinson, 1935). Some of the researchers have expressed concerns regarding the use of this term in the scientific analysis of the modern political rhetoric because of the negative connotations associated with it (Dudek-Waligóra, 2018).

Cyberattacks are unlawful activities that are directed at computers and/or networks with the purpose of stealing information or data and disrupting the activities of organizations (Kacła-Szwarczyńska, 2019; Sharma et al., 2020). These actions make use of malware or abuse conventional protocols to make computing devices execute actions that are contrary to the intention of their owners or operators (Kott,

2014). As is known, cybercrimes are becoming more frequent and sophisticated, which makes them dangerous not only for everyday consumers but also for state structures (Kacła-Szwarczyńska, 2019). Cybercrimes are of many types such as unauthorised access, spying, denial of network access, and data stealing (Uma and Padmavathi, 2013). It is, therefore, necessary to understand the different categories of these attacks and their purposes because of the emerging complexity of countermeasures. Thus, there is increased focus on the growth of the cybersecurity science that can facilitate understanding the attack, network schedules, and security tools (Kott, 2014).

Malformation is a relatively rare type of information disorder based on the truth but is being used for manipulation. Although many information distortions are described in this research area, most academic interest is directed at disinformation. The trustworthiness of the research environment is determined by the distinctions in the kinds of information issues, their attributes, origins, and effects. In a society that is gradually turning into a digital society, disseminating fake news can be one of the significant issues (Lim et al., 2024).

We compared the features of different types of disinformation and summarized the results in the Characteristics Matrix below (See **Table 4**).

Table 4. Characteristics of different types of disinformation.

Parameter/types of disinformation	Unreliability	Intentional damage	Conscious dissemination	The contradiction of scientific approaches	Important when identifying risks	In the form of news	It concerns ideas and beliefs	Are aimed at computer systems and networks	Causes harm
Disinformation	+	+	+	±	+	±	±	-	+
Misinformation	+	-	-	+	+	±	±	-	+
Fake news	+	+	+	±	+	+	±	-	+
Propaganda	±	±	+	±	-	±	+	-	+
Cyberattacks	+	+	+	±	-	±	±	+	+
Malformation	-	+	+	±	-	±	±	-	+

The table items (types of disinformation such as 'Disinformation', 'Misinformation', 'Fake news', etc.) are ranked based on some factors (such as 'Unreliability', 'Intentional damage', 'Conscious dissemination', etc.). The rows describe the kinds of disinformation. The columns correspond to some characteristics or attributes of each type. A 'plus' (+) sign shows the existence or application of a particular attribute to a specific type of disinformation. The minus (-) sign is used to show the absence or non-applicability of the characteristic. The plus or minus sign (±) indicates that the feature is optional or may vary depending on the circumstances.

3.3.2. The impact of digital marketing on the spread of misinformation, especially when compared to traditional media and word of mouth

Disinformation is spread through various mediums: In this promotional concept, there is a mix of digital marketing, traditional media, and word of mouth. The bar graph represents the mentioned frequency for each medium. The following is a breakdown of how each medium contributes to the dissemination of disinformation (See **Figure 2**):
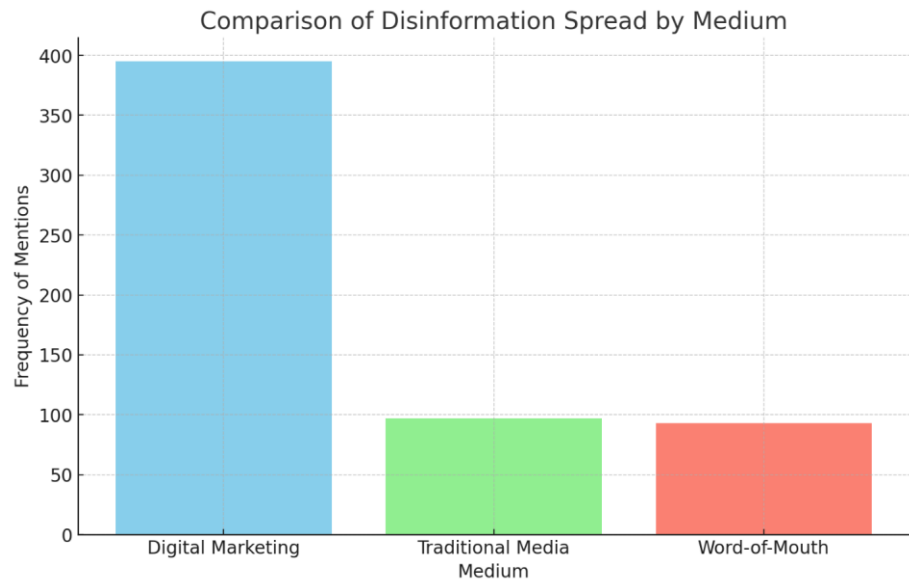
Figure 2. Comparison of disinformation spread by medium.

Digital adverts are the predominant channel used for disinformation. Besides their broad reach, they can accurately target specific audiences, hence being used to spread fake information quickly. In addition, users can repost and re-share misinformation on digital platforms, enabling the re-posting to spread virally.

Traditional media mediums, i.e., newspapers, television, and radio, may not receive many hits when it comes to digital marketing, but they are still a medium through which misinformation is propagated. Whatever fact that disinformation spreads slower and on a lower scale in terms of target when compared to digital marketing, traditional media hold the established trust and authority to make an impact (Arandas, 2021; Muzeoz, 2024; Makerczak, 2022).

Word-of-mouth (WOM) is another non-promotional communication that people use to talk about products and services (Karlíček et al., 2010; Yorke, 2015). Word-of-mouth happens to be the least talked about media when it comes to disinformation. This is because the platform is not very popular and lacks the mechanisms to amplify the information in digital platforms. Disinformation can also be spread through word-of-mouth, but in such cases, it does not have a virulent characteristic of digital dissemination (Dwivedi et al., 2021; Kim, 2020).

Because digital marketing is more dominant in spreading disinformation than traditional media and word-of-mouth, controlling the dissemination of disinformation is a significant challenge. All three mediums are vehicles for disinformation; however, the digital terrain characteristics like speed, scale, and algorithmic amplification make it an ideal medium for the swift spread of false information.

3.3.3. Mechanisms for spreading disinformation

In a bar chart diagram (See **Figure 3**) and a table (See **Table 5**) are generated, which displays the percentages of digital marketing tools and tactics pinned as culprits for spreading disinformation. Here are the calculated percentages based on the estimated frequency counts: Here are the calculated percentages based on the estimated frequency counts:

Table 5. Comparison of digital marketing tools and tactics in percentages.

| Digital Marketing Tools	Tools Percentages	Digital Marketing Tactics	Tactics Percentages
Marketing Automation Tools	6.25%	Influencer Marketing	6.25%
Pay-Per-Click (PPC) Advertising Tools	12.5%	Pay-Per-Click (PPC) Advertising	12.5%
Search Engine Optimization (SEO) Tools	18.75%	Search Engine Optimization (SEO)	18.75%
Content Management Systems (CMS)	37.5%	Content Marketing	25%
Social Media Management Tools	50%	Social Media Marketing	50%
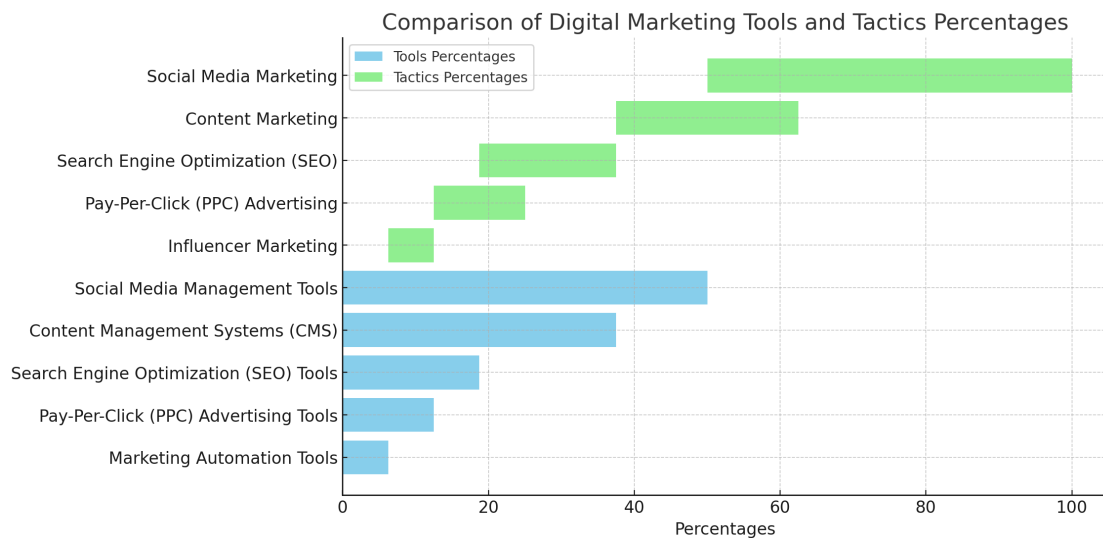
Figure 3. Comparison of digital marketing tools and tactics.

The data shows how different digital marketing instruments and tricks propagate disinformation through numerous platforms and among audiences. Here is the mechanism:

Social Media Management: Social Media Management tools, abbreviated as SMM tools, are software tools for managing, scheduling, analysing and posting content on various social media platforms (Lagodiienko et al., 2019). These tools simplify the experience of handling multiple accounts, as they offer facilities to create and disseminate content, monitor performance and engage with the audience (Singh et al., 2023). Examples of Social Media Management Tools include the Hootsuite application, which creates accounts for various social networks, creates posts and schedules them, monitors the various social networks, and analyzes metrics. Buffer is one of the simplest social media tools, Buffer allows users to post updates in one or more profiles simultaneously, as well as monitor interactions and invite their teammates. Sprout Social provides social media scheduling, monitoring, and analysis functionality and includes customer relationship management functions. Later is designed explicitly for the image-based social media platform Instagram; Later is a tool almost exclusively for posting content to it but also allows content to be posted on Facebook, Twitter, and Pinterest. Though Canva is targeted primarily at graphic design, it has certain social integration capabilities, enabling users to create engaging posts and schedule them. Social Media Management Tactics include: Content Scheduling is an exercise to always post on the events calendar and keep the name on different social media platforms. This makes it possible to plan content based on dates,

campaigns, and trends. Analytics Tracking the evaluation metric of post-performance with built-in social media analytics tools. Measures like engagement rate, click-through rate, and reach come in handy when it comes to identifying the type of content that the public actually responds to. Engagement and Interaction sustain comments section replies, messages, and tags in a suitable manner that will popularize the site and maintain an active community of users. Content Curation reposts content from other users/sources, which are in synergy with the brand developed and promoted through the page. This can help the brand to become an industry leader and can help the audience to remain informed as well. Social Listening tracks the brand, industry terms, and direct competitors. It also enables the identification of the sentiments and the trends regarding the customers to be prepared for them.

In our study, Social Media Management Tools and Social Media Marketing Tactics top the list at 50% each, implying that social platforms are the primary channels for disinformation. Besides enabling content creation, posting, and distribution across networks, many of these tools profit from algorithmic biases favoring engagement that can include controversial or fake content. Social media design allows disinformation to spread virally, reaching many people in a short period.

Content marketing system: A CMS is a tool for designing a website and managing its contents without needing to be a computer programming professional. Examples of CMS Tools include WordPress, the most used CMS system, which is suitable for newcomers and professionals and has many plugins and topics available. *Joomla* is a versatile and highly capable CMS for managing intricate websites and combined applications and services. It is for experienced users. Drupal integrates the opportunities to work with large organizational structures and the creation of various complicated websites. Magento is a CMS for e-business websites that provides practical store control features. Wix is an easy-to-use CMS with features like drag-drop so that even an average user, an end viewer, or a client, can easily change the site. CMS Tactics include Content Creation and Editing, allowing CMS to create and structure messages and content such as blogs, articles, or media content. You can also regularly update the content so it does not become monotonous. *SEO Optimization* connects SEO rules into CMS, including meta tags and keywords, and uses XML sitemaps to enhance the company's standings on the search engines. User Permissions and Roles allow only particular users to have permission to post, edit or approve content before it goes live or is published. Responsive Design ensures that as a result of the CMS, the templates created are equally responsive in features across devices, whether a desktop, tablet or mobile. Analytics Integration is one of the technologies available within a CMS to interact with other solutions, such as Google Analytics, that allow the identification of visitor behaviour and fine-tuning of traffic based on the materials placed on the site.

This study shows that Content Marketing is most prevalent after CMS, with 25% 37.5%, respectively. Content management systems make it easy to publish content, which may be distributed inadvertently or deliberately, using content marketing techniques.

Search engine optimization: It is, therefore, crucial that any strategic management of Internet marketing involves the use of one of the most critical tools known as Search Engine Optimization (SEO) or Search Engine Marketing (SEM), as stipulated by

Lagodiienko et al. (2019). SEO stands for search engine optimization, which, from a general perspective, can be defined as making a website more visible and known to the search engine results page, usually the commonly used search engines like Google, Bing and Yandex, among others. Standard SEO tools include Google Search Console offers information on how Google crawls through a site and assists in checking and diagnosing issues affecting a site's rank and visibility on SERPs. Ahrefs is a Tool for keyword research, competitors, backlinks and ranks by a search engine in a single software package. SEMrush is an SEO software suite that makes an SEO audit tool, a keyword research tool, and a competitor analysis tool available. Moz Pro provides research services for keywords, link building, site reviews and tracking websites' positions for better ranking. Yoast SEO is a popular WordPress plugin that assists in managing website content for search engines; it provides tools like keyword density, readability and meta tags. SEO tactics include specific actions to improve a website's rankings, such as Keyword Optimization, which involves using keyword research to ascertain the type of content and terms that visitors are likely to search for and placing those search terms in the body and meta tags and the title and headers of the website. On-Page SEO is direct on individual pages with amendments of title tags, meta description, headers, and internal link architecture. Content Creation creates valuable, functional, and updated content to fit the intent of the material and gain as many natural hits as possible. Technical SEO optimizes the website backbone for search engine indexer ability, speed optimization, mobile responsiveness, and security (for example, in HTTPS and XML sitemaps). Link Building gets quality backlinks from other outside sites in order to increase the site's authenticity and rank. Local SEO handles local placements, obtaining local links, and Google My Business profile optimization for the website.

This study finds that SEO tools and tactics account for 18.75% each. SEO manipulation enables disinformation to appear at the top of search results, which means that it is highly visible and seems credible.

Pay-Per-Click: Pay per click, commonly called PPC, is an online advertising model where entrepreneurs pay every time visitors click on their advertisements (Dwivedi, 2016; Kolambe et al., 2021). PPC can be done through Google AdWords, MSN, Facebook, Amazon, and LinkedIn Advertising. Examples of PPC Advertising Tactics include Keyword Targeting, which entails the application of particular keywords that the target client is likely to input in the search engines, causing adverts to appear. Geotargeting: One of the methods is Geographical Location, which shows advertisements only for the targeted geographical area, which is very effective for companies in a given region. The *remarketing* method addresses adverts to those who have once visited a website but did not purchase, urging them to do so. Ad Extensions are optimized ad extensions to overlay extra data onto an advert, as well as call buttons, location details, or extra site links to boost CTR. Run and Compare Multiple Ads A/B Testing—enables the testing of multiple ads to determine the best way to continuously enhance PPC ad campaigns. In this article, we find that Pay-Per-Click (PPC) advertising tools and PPC advertising account for 12.5% each, implying that paid digital advertising is focused on some particular audiences with disinformation and uses paid promotion to gain visibility.

Marketing automation tools and influencer marketing: Marketing Automation

Tools support marketing processes by allocating specific tasks and improving overall management. HubSpot, Market, Salesforce Pardot, and Mailchimp are frequently used marketing automation platforms. Influencer marketing uses key opinion leaders to sell brands and products to captivated audiences, significantly influencing customer acquisition and sales (Singh et al., 2023). However, we find that marketing automation tools and influencer marketing all account for 6.25%, signaling that even though they contribute to spreading disinformation, these two tools are underused. Automation can spread disinformation at volume, whether done on purpose or by accident (Bessarabova, 2024; Montasari, 2024), while influencers can give false narratives credibility. Based on this analysis, disinformation is spread in most cases via interactive and algorithmic-driven platforms, where content is easy to create, share and target. Using digital media's connected and network-based nature, these mechanisms allow almost instant and widespread disinformation.

Chi-square test for independence

The chi-square test of independence is the statistical test done in order to know if there is a significant relationship between two or more than two categories. It measures the extent of variation in the distribution of one categorical variable across the levels of another categorical variable. This test is often used when, in contingency tables, one wants to know whether two variables depend on each other (McHugh, 2013; Zibran, 2007). Our objective here is to determine if a strong relationship can be made between the tools employed and the strategies implemented.

Formula:

The Chi-Square statistic (X^2) is calculated using the formula:

$$X^2 = \sum \frac{(O_i - E_i)^2}{E_i}$$

O_i Observed frequency, the actual count in each cell of the contingency table.

E_i Expected frequency, the count that would be expected if the null hypothesis (no association between variables) were true. It is calculated as:

$$E_i = \frac{\text{Row Total} \times \text{Column Total}}{\text{Grand Total}}$$

Determine the Degrees of Freedom (df):

The degrees of freedom for the test are calculated as:

df = (Number of Rows − 1) × (Number of Columns − 1)

Outcomes:

Chi-Square Statistic (χ^2): 1051.40

p-value: 3.26×10^{-24}

Degrees of Freedom (df): 625

The value of the Chi-Square test statistic is substantial. It is accompanied by a significantly small *p*-value substantially less than the conventionally accepted significance level, for example, 0. 05. This, in essence, shows a statistically significant relationship between the type of digital marketing tools and the strategies utilized in the propagation of fake news. That implies that the selection of digital marketing tools is not entirely mutually exclusive with the tactics applied; these factors enjoy considerable covariance (See **Figure 4**).
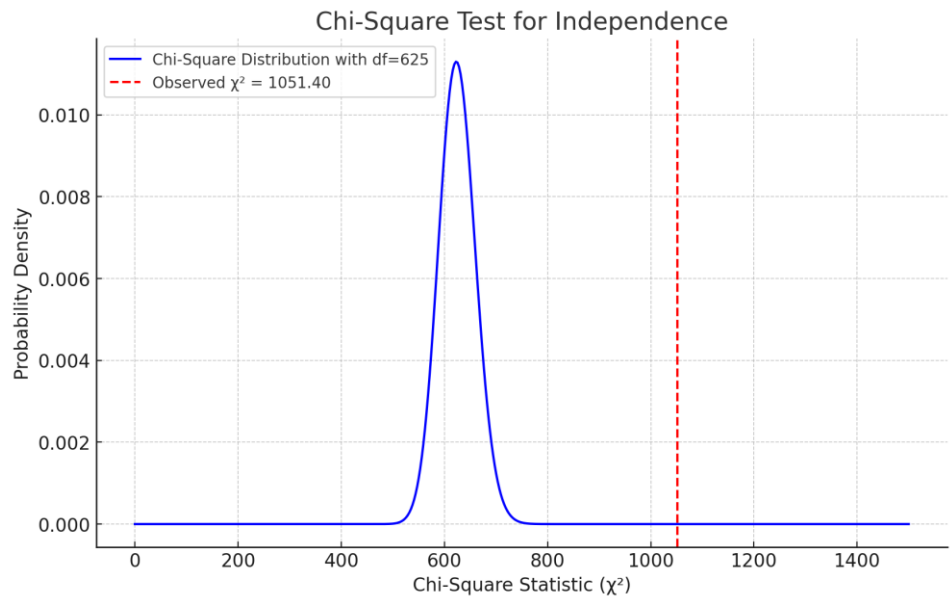
Figure 4. Ch-Square test for independence.

Above is a display of how the Chi-Square Test was conducted. Chi-Square at 625 degrees of freedom is shown by the blue curve used in the dataset's distribution tests. The red line dashed line represents the observed Chi-Square statistic and equals chi-square ($\chi^2 = 1051.40$). The shaded part of the red color represents the range of the distribution of this statistic. Because the *p*-value obtained is much less than 0.05, the observed value can be thought to be located far in the tail of the distribution, meaning that the result is statistically significant.

3.4. Analyze the effectiveness of digital marketing tools and tactics for spreading disinformation

Figure 5 presents a bar plot that shows the distribution of effectiveness ratings for digital marketing tactics and tools in disseminating disinformation using a simplified numerical scale from 1 (Low Effectiveness) to 4 (Very High Effectiveness).

In order to give a further understanding of the ratings of digital marketing tools and tactics in spreading disinformation, a visualization was developed that concentrates solely on these ratings. This visualization highlights the distribution of literature across the four effectiveness categories: Scale: 1–3: Ineffective, 4–6: Marginally effective, 7–9: Highly effective, 10: Fully effective. It should be noticed that the effectiveness of a digital marketing tool or tactic depends of many factors like the target audience, the message, and the overall marketing campaign. Moreover, the scores presented are only an overall estimation of the effectiveness of each tool or tactic (Chen et al., 2019; Heer and Shneiderman, 2012; Rieh and Hilligoss, 2007; Zeng et al., 2004; Zhang et al., 2019).
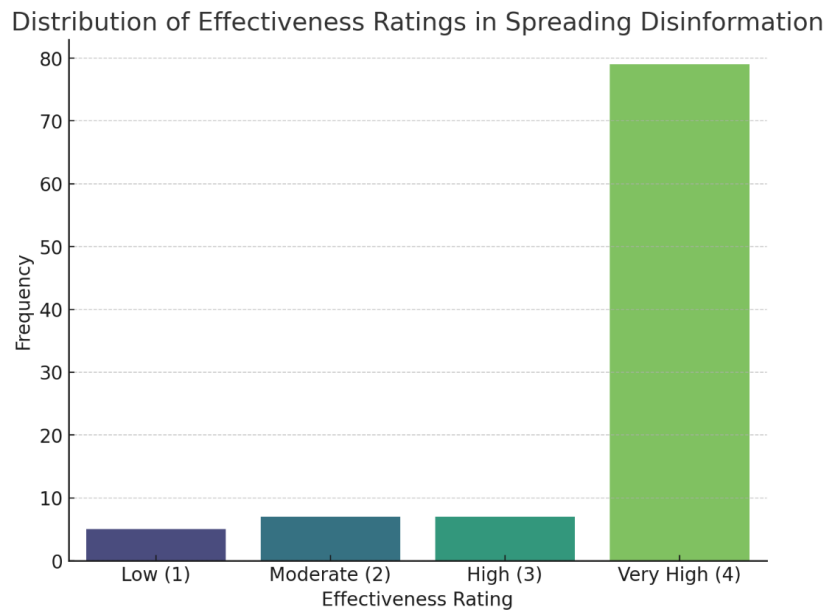
Figure 5. Distribution of effectiveness rating in spreading disinformation.

Interestingly, the category "Very High (4)" is the most abundant throughout the chart, implying that some digital marketing tools and techniques are extremely successful in spreading disinformation. Several points stand out from the data:

- The primacy of "Very High" effectiveness also signifies that digital marketing is not just a channel but a powerful disseminator of disinformation. It may be attributed to the advanced targeting capabilities of digital marketing instruments and the viral quality of digital content.

- Based on the fact that "Low (1)" and "Moderate (2)" effectiveness ratings are also low in number, it can be concluded that there are not many digital marketing tools and tactics that are less effective in spreading disinformation. However, they may be in the minority or be less often reported in scholarly journals.

- An absence of entries in the "High (3)" effectiveness rating may point to a bipolarity of views, whereby tools and tactics are considered either highly effective or not. This efficiency score is a synthesis of opinions in the literature and could sometimes be wrong. The effectiveness of a disinformation campaign is influenced by several factors, such as the audience, the campaign's complexity, and the campaign's timing. According to these results, the rest of the research should study the properties of digital marketing and the methods that make them highly effective tools for spreading disinformation. Besides offering countermeasures and policy formulation recommendations, lower effectiveness ratings could expose possible shortcomings or difficulties in deploying digital marketing for disinformation campaigns.

3.5. Impact of disinformation on the reputation of organizations

According to the bar chart (See **Figure 6**), disinformation has varying degrees of negative consequences.
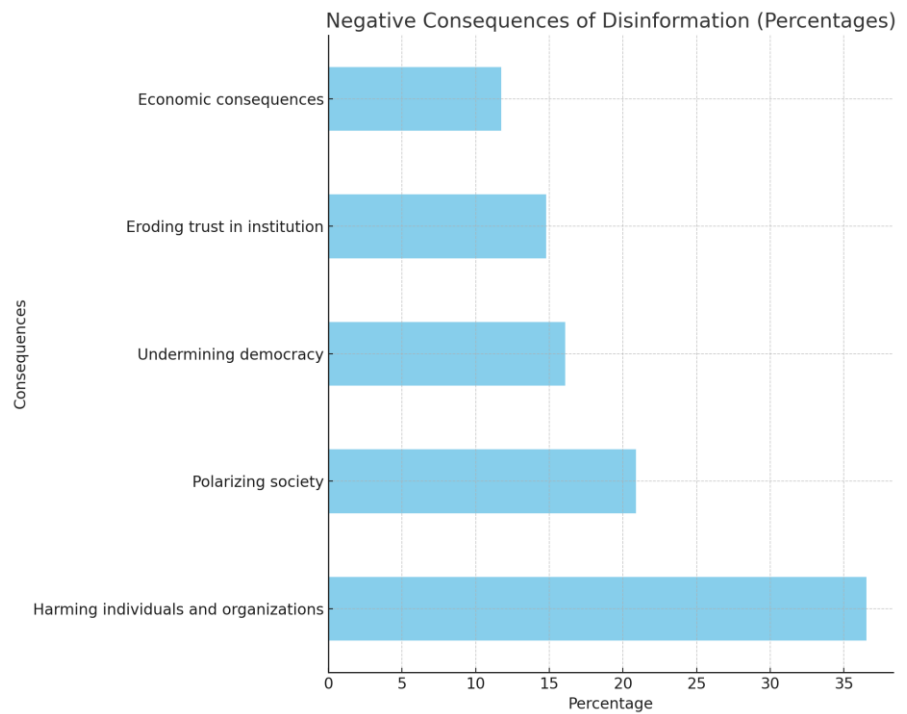
Figure 6. Negative consequences of disinformation in percentages.

Based on the data pictured, here is an analytical discussion:

Individuals and Organizations (Approx. 30%–35%): Professional reputations are destroyed with disinformation, credibility is lost, and personal harm is suffered by individuals and organizations. It can also lead to boycotts, share price slumps, and disappointed customers. Disinformation is substantially related to societal polarization (20%–25%). It may breed social chaos and prevent collective community action on issues by introducing or intensifying separations within communities and across groups. Disinformation subverts democracy (approximately 15%–20%) by misleading voters, making them decide erroneously and de-legitimizing their actions. Eroding Trust in Institutions (Approx. 10%–15%): Disinformation leads to the erosion of public trust in vital institutions. Non-participation and non-compliance with regulations and advisories may worsen public health crises when the latter is considered unreliable. Economic Consequences (Approx. 5%–10%): The economic fallout of disinformation is anything but minor. Market manipulation, investment decisions, and economic stability can be threatened by false information. Disinformation has impacts that are not mutually exclusive, and most often, they overlap, enhancing the adverse effects. Organizations must take proactive steps against disinformation to ensure their reputation and public trust, including transparent communication strategies and fact-checking mechanisms.

3.6. Logistic regression analysis test

Logistic regression is a probability model used for binary classification scenarios where the independent variable is binary with two possible values (yes/no, 0/1, true/false or pass/fail). The aim is to estimate the likelihood that an individual input is in a particular class. The objective of this article is to know which of them most leads to a high risk of severe outcomes.

Key concepts:
- Dependent Variable (Outcome): This is the binary variable of interest that we want to predict (whether or not a given consequence takes place or not; for instance, "Undermining Democracy").
- Independent Variables (Predictors): These are the features or factors that impact the result (the types of digital marketing tools and their efficiency in circulating disinformation).

Formula:

The logistic regression model estimates the probability that a given instance belongs to a particular class using the following formula:

$$P(Y = 1) = \frac{1}{1 + e^{-(\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_n X_n)}}$$

where:

P(Y=1) is the probability that the outcome YYY equals 1 (e.g., "Undermining Democracy").

β_0 is the intercept of the model.

$\beta_1, \beta_2, ..., \beta_n$ are the coefficients for each independent variable $X_1, X_2, ..., X_n$

e is the base of the natural logarithm.

Outcomes:
- Precision, Recall, F1-Score: The logistic regression model achieved a perfect score across all metrics (precision, recall, and F1-score) for both classes (0: No undermining democracy, 1: Undermining democracy) (See **Figure 7**).
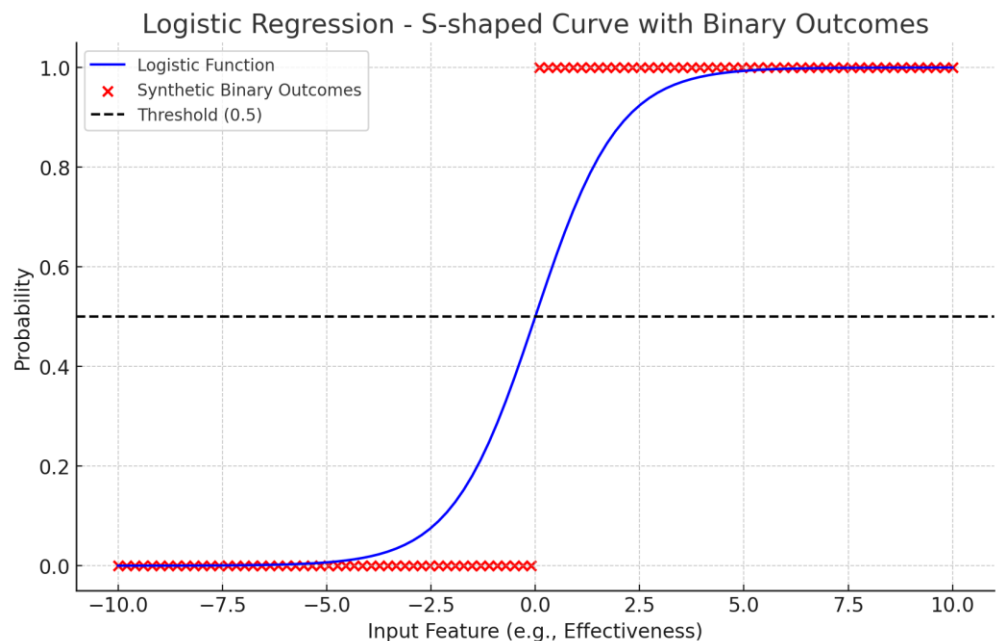- Accuracy: The model achieved 100% accuracy on the test data.

Figure 7. Logistic regression.

The logistic regression diagram is shown below. In this diagram the blue color curve represents the logistic function which describes the probability of the outcome. The red points show binary synthetic outcomes using a threshold of 0.5 illustrating

how this logistic function results in two classes of the input data. The horizontal black dashed line at 0.5 to the threshold that is assumed in logistic regression models for classifying outcomes. The results in the test dataset were very positive; this means that the features chosen that is Digital Marketing Tools and Effectiveness accurately predict whether the consequence of "Undermining Democracy" takes place. This result implies that tools and effectiveness ratings are critical for determining severe consequences, like destabilizing democracy.

4. Results

In a study, Mathew et al. (2022) explore various aspects of health disinformation on social media, highlighting how disinformation may substantially alter public opinion and behaviour. Similarly, Wang et al. (2022) and Clarke and Braun (2013) explore particular strategies employed in addressing the problems of disinformation, presenting strategies that may diminish its detrimental influence. All in all, these researches draw the picture of many approaches that may be used to defeat the lies, intentionally spread to stabilize public discourse, and minimize negative impacts caused by the propaganda of this kind.

Given the speed and breadth of coverage of information disseminated through digital channels, response systems in the digital space should be targeted and flexible, taking into account the extraordinary dangers of modern digital marketing tools.

The data obtained in the course of the study indicate that there is a hierarchy in the digital dissemination of disinformation. Social media management and social media marketing tools are the main sources of misinformation, while search engine optimization (SEO) rankings are in the lowest category in terms of popularity, although computer algorithms are important tools, which is obviously underestimated. The reason for this may be that SEO mainly works through improving visibility and increasing traffic, rather than through the more obvious rapid and virus-like spread of disinformation through social media. SEO provides more long-term, but delayed results, and is ineffective from the point of view of the concept of rapid transmission of misinformation.

Search engine optimization (SEO) is not just a content management system (CMS), but a powerful tool that allows you to optimize it for search engines, involving users. With the use of keywords and structured articles, SEO can promote the dissemination of any misleading information, but this usually happens more slowly than through social networks.

The analysis shows that there is a link between the speed with which platforms can spread information and the likelihood of misusing them for disinformation purposes. Social media platforms are particularly vulnerable to such campaigns because of their broad reach, deep penetration, and sophisticated targeting capabilities. The analysis also clearly indicates the need to pay close attention to digital advertising tools, particularly approaches to speeding up content delivery. In addition, both the Logistic Regression Analysis and the Chi-Square Test for Independence have also been used. The findings seem to support the hypothesis that there is a relationship between digital marketing tools, their effectiveness, and severe outcomes, as indicated by "Undermining Democracy. "These findings suggest that the effects of these tools

and tactics should be closely watched and controlled so as to prevent the negative impacts.

The tendency to capitalize on user behavior and preferences through digital tools is driving the creation of echo, radically increasing the virality and effectiveness of disinformation campaigns. Based on this, it is necessary to create mechanisms for monitoring and observing ethical principles that will prevent the spread of disinformation, thereby preserving the decency of the digital space and, at the same time, the possibility of public discourse.

We concluded that disinformation can damage an organization's image, operational stability, and financial standing. At the same time, we distinguish internal and external consequences. Internal consequences may include reduced employee morale and productivity due to disinformation about the organisation's future plans or policies they should follow, while external consequences may include reduced brand loyalty and consumer confidence (Gligor & Holcomb, 2019).

4.1. Mitigate disinformation according to the tools and tactics

To effectively mitigate disinformation according to the tools and tactics we identified, the following strategies can be implemented:

Strengthen Social Media Management: Due to the fact that Social Media Management Tools and Social Media Marketing platforms should enforce more strict content moderation policies and provide more transparency of algorithms to decrease the spread of disinformation. Also, the cooperation with fact-checking services might be useful to mark and eliminate the fake content.

Regulate Content Management Systems (CMS) and Content Marketing: In the context of CMS and Content Marketing it is of great importance to make sure that these systems are capable of promoting only the reliable sources and content. Applying more strict editorial policies and applying AI to identify and block fake content can also decrease the distribution of fake news.

Optimize Search Engine Optimization (SEO) Tactics: Considering that SEO tools and tactics are used to enhance the search engine experience it is recommended that search engines ensure that they promote the right information by penalizing fake news. Here are some measures which can be taken in order to stop the proliferation of fake news: The results should be checked periodically for credibility, and the standards used in ranking should also be checked.

Monitor Pay-Per-Click (PPC) Advertising: To counter disinformation campaigns, PPC advertising tools and tactics need to be monitored. Advertisers and platforms should enhance their ad policies, for instance, by verifying the advertisers' authenticity and preventing ads that contain false or misleading information.

Enhance Oversight of Influencer Marketing and Automation Tools: This means that even as we see the use of influencer marketing and marketing automation tools in spreading fake news. Establishing specific rules for influencers and how to hold them responsible, alongside monitoring the automated distribution of content, can go a long way in reversing this. Thus, specific measures can weaken the impact of disinformation campaigns and prevent organizations and the general public from the adverse effects of such activities. (See **Figure 8**) below.
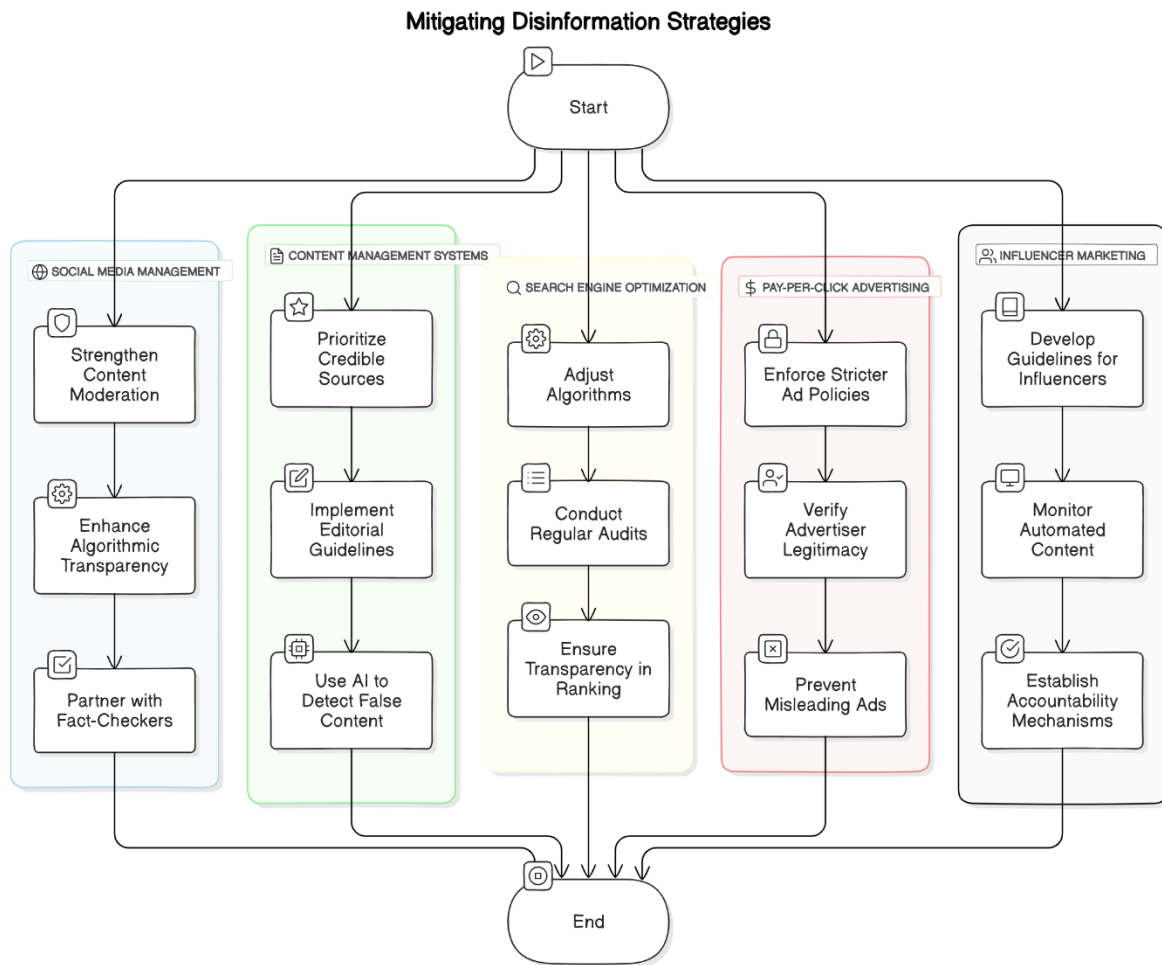
Figure 8. Mitigates disinformation according to the tools and tactics.

4.2. Mitigate disinformation from the government and organizational level

To counter the spread of disinformation from the government and organizational level, we believe it is necessary to embrace the following measures since the phenomenon has both technological and human causes. Here are some key strategies:

Enhancing Digital Literacy: It is crucial to teach the public and society, especially students, how to assess information critically. Digital literacy programs can teach people how to differentiate between reliable information and fake information so they won't become targets of fake content.

Implementing Stronger Fact-Checking Mechanisms: Therefore, organizations and platforms must enhance and incorporate fact-checking technology into their operations. These tools should be able to detect and quarantine disinformation to prevent its further dissemination.

Promoting Ethical Standards in Digital Marketing: Companies must enhance a clear ethical standard for using digital marketing platforms to avert the spread of disinformation. The trust of the masses should not be easily broken concerning advertising and content creation.

Cross-disciplinary collaboration means that researchers, policymakers, and

practitioners should collaborate and generate an integrated approach to identifying and preventing the causes of disinformation.

Strengthening Legal Frameworks: Governments should also consider strengthening or overhauling the laws that prevent the intentional dissemination of disinformation and, in the same way, prevent the restriction of freedom of speech. Integrating these approaches minimizes disinformation's effects on society and protects organizational reputation. (See **Figure 9**) below.
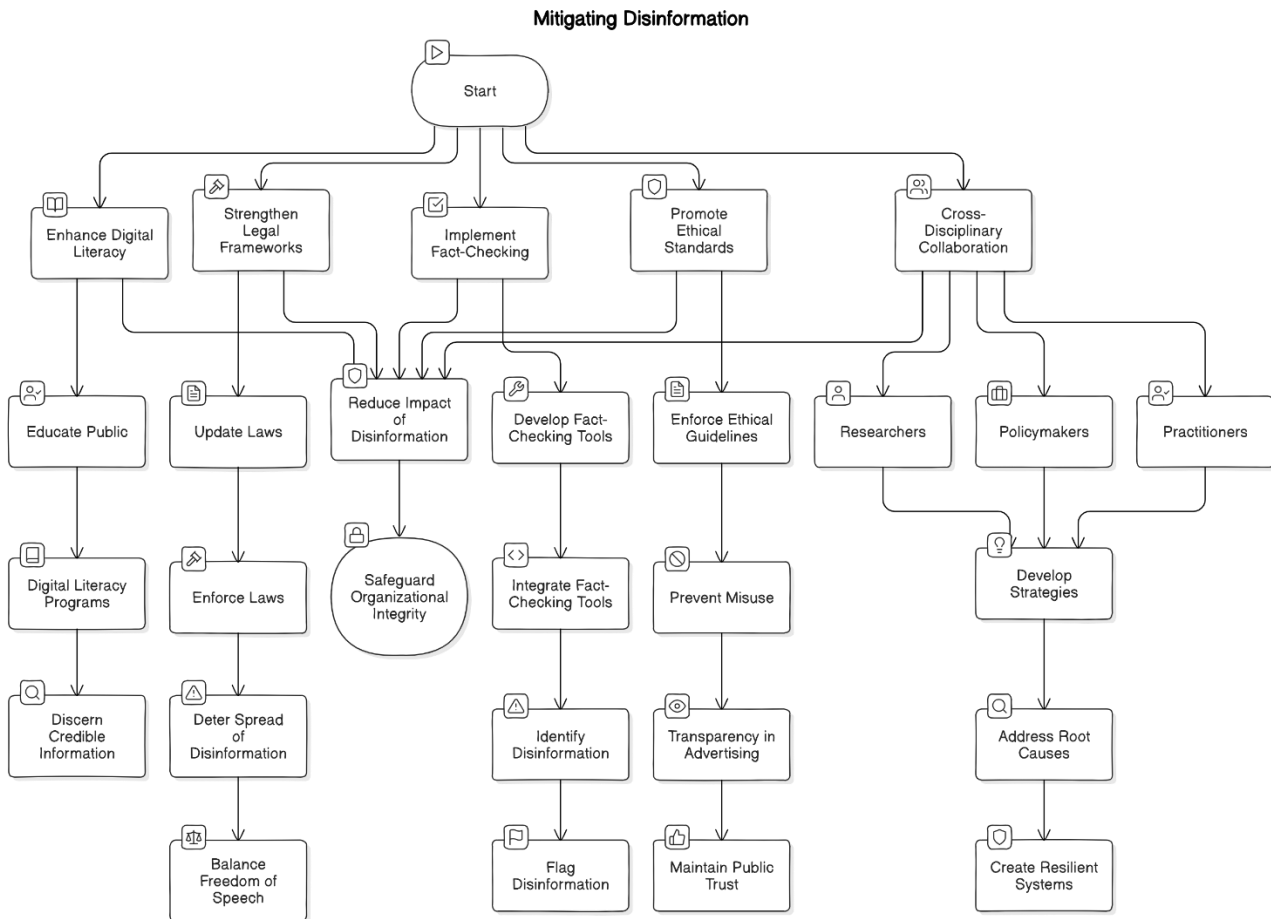

Figure 9. Mitigate disinformation from the government and organizational level.

5. Conclusion

Disinformation, digital marketing, and organizational reputation are analyzed in the article's conclusion systematically, which underlines the challenges and ethical dilemmas of the digital era. An exhaustive study of digital marketing tools and tactics shows how they can be abused to disseminate disinformation, hence exposing organizations to reputational harm. The digitized evolution of digital platforms continues to improve disinformation campaigns and, therefore, businesses need to ensure ethical vigilance and strategic vision. Strong digital literacy programs, enhanced fact-checking, and transparent communication are essential measures against disinformation. According to the study, researchers, practitioners, and policymakers need to develop cross-disciplinary measures that will address the

reasons and implications of disinformation in the digital marketing system. The article highlights the need for continuing research to fight disinformation, preserve digital marketing practices, and protect the image of organizations. In the face of the changing nature of digital threats, the credibility and trustworthiness of businesses will be preserved through embracing ethical standards and proactive measures. Thus, this initiative is not only good for separate organizations but it also makes the global digital landscape healthier and more resistant.

5.1. The study's limitations

The study's limitations relate to several important areas that might have produced bias or confounding. These can be enhanced in a way that would improve the validity and the implications of the findings. Here are the main points:

Selection bias: This is because the study focuses on some journals and uses a lot of literature to develop the findings and this might lead to some form of bias or missing out on other important information.

Confirmation bias: Some of the limitations of the study include the fact that the we may have focused on some aspects of disinformation such as digital marketing based on our Bias or the current trending literature. The work does not elaborate on how disinformation affects various forms of organizations (not-for-profit versus for-profit) and how the traditional media are affected.

5.2. Applicability of findings

The conclusions drawn in this study are somewhat relevant to the organizations that try to maintain their image in the time of social media. The study also shows how disinformation, particularly when disseminated through digital marketing, can badly harm organizational reputation and public confidence. The conceptual framework that has been worked out within the course of the study provides a valuable tool for recognizing the spread of disinformation and, thus, for its prevention. This is especially so for organizations that are in business, government or non-profit making organizations that use digital platforms in their communication.

5.3. Future study directions

The study identifies several areas for future research, including:

Effectiveness of Countermeasures: More studies are required to test and compare different counter-disinformation measures and their applicability in the dynamic social media environment.

Impact on Different Sectors: Studying the impact of disinformation on various organizations will help to define the most effective ways of minimizing the risks in relation to various types of organizations, such as non-profit and for-profit ones.

Technological Advancements: This is why the analysis of their potential for spreading and fighting disinformation should be continuous together with the development of digital marketing tools and social media platforms.

Supplementary materials: The file is a literature review spreadsheet that contains information about various studies related to the spread of disinformation through digital marketing. It includes details such as:

- Title of the study
- Authors and publication year
- Digital marketing tools and tactics used for spreading disinformation
- Effectiveness of these tools and tactics
- Negative consequences of disinformation
- Mitigation strategies suggested by authors
- Links to the original research article

Author contributions: Conceptualization, SA and TP; methodology, SA; software, SA; validation, SA and TP; formal analysis, SA and TP; investigation, SA and TP; resources, SA; data curation, SA; writing—original draft preparation, SA; writing—review and editing, TP; visualization, SA; supervision, TP; project administration, SA; funding acquisition, SA. All authors have read and agreed to the published version of the manuscript.

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