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Using Google Trends as a Big Data Tool in Digital Journalism

Dijital Habercilikte Büyük Veri Aracı Olarak Google Trends Kullanımı

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ABSTRACT

Big data refers to large volume data sets that emerge with the rapid development of digital technologies today. This data, produced through the internet, social media platforms, mobile devices and other digital sources, accumulates in various formats and at high speed. On the other hand, digital journalism refers to a field in which all processes from news production to distribution are digitalized, which emerged with the adaptation of traditional media to digital platforms. Today, the relationship between big data and digital journalism has become even more evident as news production processes are moved to the digital environment. In this context, the aim of the study is to provide a framework to understand how digital journalism practice changes with the transition from traditional structures to digital technologies and the role of big data in this change. The purpose of the study is to discuss the importance of the use of big data in the field of digital journalism and especially how Google Trends can be evaluated as a big data tool in journalism practice, news reporting and editing process. In line with the purposes of the study, after evaluating the concept of big data, its relationship with search engine-oriented journalism and the aims of Google company, the data presented by Google Trends will be examined within the framework of digital journalism practices. In the context of the information and opinions conveyed, a conclusion emerges that today digital journalism practices cannot be carried out effectively without resorting to big data applications.

Keywords: Information technologies, big data, digital journalism, google trends

ÖZ

Büyük veri, günümüzde dijital teknolojilerin hızla gelişmesiyle ortaya çıkan büyük hacimli veri setlerini ifade etmektedir. İnternet, sosyal medya platformları, mobil cihazlar ve diğer dijital kaynaklar aracılığıyla üretilen bu veriler, çeşitli formatlarda ve yüksek hızda birikmektedir. Dijital habercilik ise geleneksel medyanın dijital platformlara uyarlanmasıyla ortaya çıkan, haber üretiminden dağıtımına kadar tüm süreçlerin dijitalleştiği bir alanı ifade etmektedir. Günümüzde haber üretim süreçlerinin dijital ortama taşınmasıyla birlikte büyük veri ile dijital habercilik arasındaki ilişki daha da belirgin hale gelmiştir. Bu bağlamda çalışmanın amacı, geleneksel yapılardan dijital teknolojilere geçişle birlikte dijital habercilik pratiklerinin nasıl değiştiğini ve bu değişimde büyük verinin rolünü anlamak için bir çerçeve sunmaktır. Çalışmanın bir diğer amacı ise dijital habercilik alanında büyük veri kullanımının önemini ve özellikle Google Trends'in haber oluşturma ve düzenleme sürecinde büyük veri aracı olarak nasıl değerlendirilebileceğini tartışmaktır. Çalışmanın amaçları doğrultusunda büyük veri kavramı, arama motoru odaklı habercilik ile ilişkisi ve Google şirketinin amaçları değerlendirildikten sonra Google Trends'in sunduğu veriler dijital habercilik uygulamaları çerçevesinde incelenecektir. Aktarılan bilgi ve görüşler bağlamında, günümüzde dijital habercilik pratiklerinin büyük veri uygulamalarına başvurmadan etkin bir şekilde yürütülemeyeceği sonucu ortaya çıkmaktadır.

Anahtar Kelimeler: Bilgi teknolojileri, büyük veri, dijital habercilik, google trends

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Genişletilmiş Özet

Dijitalleşme; iletişim, bilgi akışı ve sosyal etkileşimde köklü değişikliklere neden olmuştur. İnternetin yaygınlaşması, sosyal medya platformlarının yükselişi ve dijital teknolojilerin gelişimi haber üretiminde meydana gelen dönüşümün temelini oluşturmaktadır. Bu dönüşüm geleneksel medya anlayışını yeniden şekillendirirken, aynı zamanda dijital gazetecilik gibi yeni bir alanın ortaya çıkmasına da neden olmuştur. Bu bağlamda dijitalleşme ve büyük veri kavramları günümüz modern gazetecilik pratiklerinin kilit unsurları haline gelmiştir. Geleneksel gazetecilik anlayışı, basılı gazete ya da televizyon haberlerinin tek taraflı iletişim araçları olarak algılanması ve yönetilmesi ile tanımlanırken; dijital gazetecilik çağında haber üretimi ve tüketimi daha interaktif ve katılımcı hale gelmiştir. Sosyal medya platformlarının yükselişi, vatandaş gazeteciliğinin gelişimi ve haber algoritması tarafından belirlenen kişiselleştirilmiş içerik akışları geleneksel haber kaynaklarının yanı sıra yeni haber kaynaklarının da ortaya çıkmasına neden olmuştur.

İletişim ve enformasyon teknolojilerindeki gelişmelerle birlikte yaşanan dönüşümün merkezinde yer alan büyük veri kavramı, dijital dünyada üretilen devasa miktardaki veriyi ifade etmektedir. İnternet kullanıcılarının bıraktığı izler, sosyal medya paylaşımları, arama motoru sorguları ve online alışveriş gibi dijital aktiviteler milyarlarca veri yığınının oluşmasına yol açmaktadır. Diğer taraftan büyük veri analitiği ise bu veri yığınlarının incelenerek anlamlı bilgilerin çıkarılmasını sağlamaktadır. Haber medyası sektörü için bu veri yığınları, haber içeriklerinin oluşturulmasında, dağıtılmasında ve tüketici tepkilerinin analiz edilmesinde önemli bir kaynak oluşturmaktadır. Tüm bunların yanı sıra büyük veri uygulamaları çerçevesinde arama motoru odaklı habercilik, haber sitelerinin ya da içerik üreticilerinin içeriklerine uygun anahtar kelimeleri ve arama motorlarının sıralama algoritmalarını göz önünde bulundurarak oluşturdukları içerik stratejilerini ifade etmektedir. Bu bağlamda arama motoru odaklı haberciliğin temel amacı, web sayfalarının (haber sitelerinin) arama motorlarındaki otoritelerinin yükseltilerek tıklanma oranlarının ve reklam gelirlerinin artırılmasıdır.

Dijitalleşmenin gazetecilik pratikleri üzerindeki etkileri, bu sektörde faaliyet gösteren profesyonellerin yenilikçi yaklaşımlar benimsemesini zorunlu hale getirmiştir. Yeni iletişim ve bilişim teknolojileri çerçevesinde Arama Motoru Optimizasyonu (SEO) ve sosyal medya haberciliği gibi uzmanlık alanlarının ortaya çıkmasıyla birlikte haber, sadece önemli konuları aktarmanın ötesinde, sayısal verilerle optimize edilmiş matematiksel bir süreç haline gelmiştir. Dolayısıyla dijital gazetecilik pratiklerinde temel bileşenleri sosyal medya, veri analizi ve SEO olguları oluşturmaktadır.

Aktarılan görüşler çerçevesinde büyük veri, günümüzde dijital teknolojilerin hızla gelişmesiyle ortaya çıkan büyük hacimli veri setlerini ifade etmektedir. İnternet, sosyal medya platformları, mobil cihazlar ve diğer dijital kaynaklar aracılığıyla üretilen bu veriler, çeşitli formatlarda ve yüksek hızda birikmektedir. Dijital gazetecilik ise geleneksel medyanın dijital platformlara adaptasyonu ile ortaya çıkan, haber

üretiminden dağıtımına kadar tüm süreçlerin dijitalleştiği bir alanı ifade etmektedir. Günümüzde haber üretim süreçlerinin dijital ortama taşınmasıyla birlikte büyük veri ve dijital gazetecilik arasındaki ilişki daha da belirgin hale gelmiştir. Bu bağlamda çalışmanın amacı, geleneksel yapılardan dijital teknolojilere geçişle birlikte dijital gazetecilik pratiğinin nasıl değiştiğini ve büyük verinin bu değişimdeki rolünü anlamaya yönelik bir çerçeve sunmaktır. Diğer taraftan, dijital gazetecilik alanında büyük veri kullanımının önemini ve özellikle Google Trends'in gazetecilik pratiklerinin içerik yönetimi sürecinde bir büyük veri aracı olarak nasıl değerlendirilebileceğini tartışmaktır. Buraya kadar aktarılan bilgiler ve çalışmanın amaçları doğrultusunda büyük veri kavramı, arama motoru odaklı gazetecilik ve Google şirketinin amaçları bağlamında değerlendirildikten sonra Google Trends'in kullanıcı arama trendlerine yönelik sunduğu veriler çerçevesinde incelenecektir.

Introduction

Digitalization has caused radical changes in communication, information flow and social interaction. The spread of the Internet, the rise of social media platforms and the development of digital technologies have transformed the basis of the news flow. While this transformation has reshaped the understanding of traditional media, it has also led to the emergence of a new field such as digital journalism. In this context, the concepts of digitalization and big data have become key elements of today's modern journalism practice.

The digitalization process has caused significant changes at every stage, from news production to consumption. While the traditional understanding of journalism is defined by the perception and management of printed newspapers or television news as one-sided communication tools; in the digital journalism era, news production and consumption have become more interactive and participatory. The rise of social media platforms, the development of citizen journalism, and personalized content flows determined by the news algorithm have led to the emergence of new news sources alongside traditional news sources (Pavlik, 2013).

The concept of big data, which is at the center of this transformation, refers to the huge amount of data produced in the digital world. Digital activities such as traces left by internet users, social media posts, search engine queries and online shopping have led to the creation of billions of data piles (Schönberger & Cukier, 2014). On the other hand, big data analytics enables the extraction of meaningful information by examining these data stacks. For the news media industry, these masses of data constitute an important resource in creating and distributing news content and analyzing consumer reactions.

When the digitalization process is considered in the context of journalism practices; Nowadays, making news visible on the internet by search engines and therefore by readers constitutes one of the most important challenges for media organizations. At this point, SEO practices, referred to as Search Engine Optimization, become the most important element of digital journalism practices. SEO is a set of strategies that enable a website or its content to appear higher in search engines with certain keywords. The biggest contribution of SEO applications to digital journalism practices is that they increase the visibility of news online, allowing them to reach larger audiences. Today, news editors aim to rank higher in search engines by choosing certain keywords correctly when preparing their news and optimizing their content in accordance with these keywords. This increases the interaction by ensuring that the news is read and shared by more people. However, it is important to note that SEO in digital journalism is not limited to just content optimization. In addition, technical factors such as making the technical infrastructure of news sites better understandable by search engines and optimizing site speed are also part of SEO. In this respect, it can be stated that SEO in digital journalism is closely related not only to content strategies but also to technical infrastructure and user experience. This element reveals the importance of evaluating

SEO practices as a whole in the context of content strategies and technical infrastructure in digital journalism practices. This allows journalists to function as professionals who not only produce content but also create it, who can access large data sets and analyze them through various data services provided by search engines.

In this context, digital tools such as search engines and social media platforms are integrated into news production and consumption processes, offering journalists the opportunity to access and evaluate big data. In particular, tools such as Google Trends, Google Analytics or Google Search Console play an important role in determining the news agenda by analyzing users' search trends and interests. Using these tools, journalists can identify topics of public interest, optimize news headlines, and develop content strategies.

This article will focus on the use of big data in digital journalism and especially how Google Trends can be evaluated as a big data tool. However, before moving on to this topic, it is necessary to understand the effects of the digitalization process on the news media in more detail and to evaluate the role of the concept of big data in journalism practice. First of all, the study will examine the effects of the digitalization process at all stages from news production to consumption. Then, the concept of big data will be discussed and its role and importance in digital journalism will be emphasized. In this context, the potential of search engines and especially Google Trends in news production will be analyzed, and in the conclusion, how these tools can be integrated into journalistic practice will be discussed.

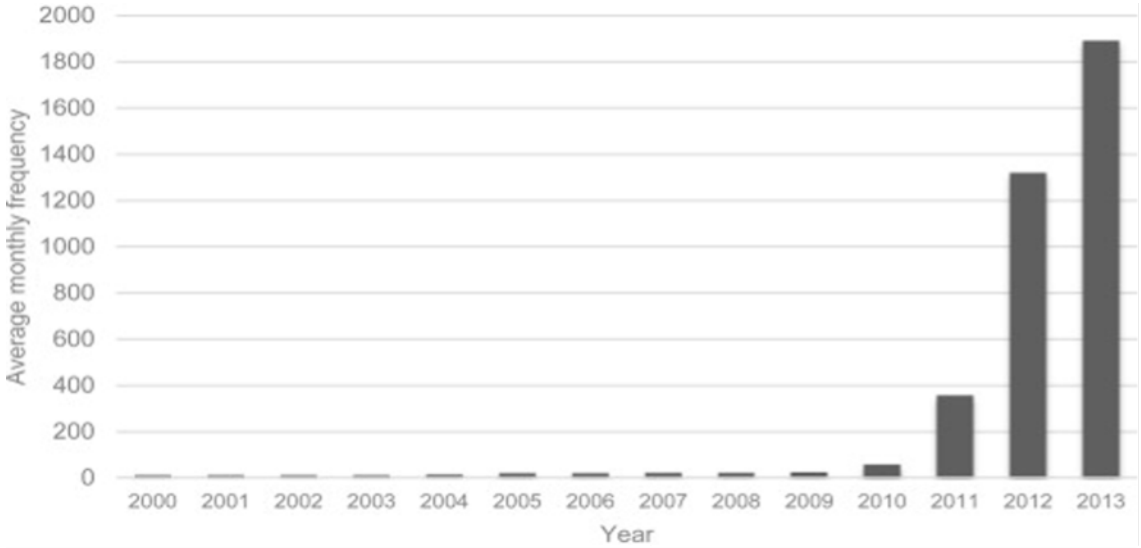
Big Data

Advances in information technologies have brought about many changes in social, cultural and economic spheres. Developments in communication technologies and systems and the emergence of new tools have led to an increase in access and information density. This situation has revealed the concept of big data, which has a high density of information, has no meaning on its own, and can be used after being structured. In addition, devices such as mobile phones, tablets and computers which can easily be connected to the Internet have become an integral part of our lives; Applications used on these devices, such as search engines, e-commerce platforms and social media applications, turn individuals and companies that want to implement marketing strategies into producers and consumers of data.

Big data, which represents complex data sets obtained from various sources and has an increasing volume every day, is at a level that a single server cannot store (Taylor, 2023; Schroer et. al., 2022). Big data analysis means the discovery of information obtained from raw data. Furthermore, 'large' does not represent a definitive hypothesis; The amount of data may vary depending on conditions and time (Alkoc & Sütcü, 2019, p. 84; Smith, 2013). According to 2024 data provided by

We Are Social (Datareportal), the number of internet users worldwide increased by 1.8% compared to 2023, reaching 5.35 billion, and the number of social media users increased by 5.6%, reaching 5.04 billion (Kemp, 2024). In this context, with the continuous increase in the number of users, it can be stated that big data is an important tool as the primary source of information for the internet and social media applications.

Schönberger and Cukier (2014, pp. 20-21) state that digitalization makes the analysis and processing processes of data more effective. While big data is important as a source of economic value and innovation, it represents three important capabilities that change the way society understands, evaluates and organizes. These capabilities include the ability to analyze large amounts of data, the ability to examine data clutter and the ability to detect correlations between large amounts of variable data.



Graph 1. Frequency of Use of Documents Containing the Expression "Big Data" in ProQuest Research Library

The term big data was coined by American economist Francis X. Diebold at the "8th World Econometrics Congress" held in Seattle in 2000. Diebold is known for his work in financial econometrics and macro econometrics, and he used this term in his presentation "Big Data Dynamic Factor Models for Macroeconomic Measurements and Forecasting" (Gürsakal, 2014; Narin et al., 2017, p. 218). In another study Diebold (2012, p. 3), stated that the term big data was first used by retired scientist John Mashey from SGI (Silicon Graphics) in the mid-1990s. In addition, according to the frequency distribution of documents containing the phrase "big data" in the documents in the ProQuest Research Library (Graph 1), it is seen that the use of this term accelerated in 2011 (Gandomi & Haider, 2014, p. 139).

Advances in Internet technologies expand the boundaries and processing capacities of data sets in database systems. Therefore, companies invest in various software systems to analyze and evaluate unstructured data. According to Boyd and Crawford (2012, p. 663), big data which is defined as a social, cultural and

technological phenomenon, is affected by three elements called technology, analysis and myth:

- **Technology:** Leveraging the power of computers, calculations, and algorithms to access, analyze and compare data.
- **Analysis:** Using data sets to make technical, economic and social claims.
- **Mythology:** The belief that data sets offer objectivity, power, high intelligence, and accurate information.

The most important feature of big data is its ability to be used interactively with different disciplines. In this context, big data can be considered more than just a concept, but also a path leading to an important support for scientific research particularly in interdisciplinary studies. The main reason for this important situation is that today, under the influence of advances in communication and information technologies, information systems, algorithms and data sets are expanding, creating new disciplines and the development of cooperation between these disciplines. Diebold (2012, p. 4) considers the existence of big data as an 'interdisciplinary victory' in an environment full of many unsuccessful attempts at interdisciplinary collaboration.

Advances in Internet technologies make it difficult to collect and analyze unstructured data, which is the main reason for the increase in the amount of data. According to data presented by the US-based data company IDC (International Data Corporation), digital data, which was approximately 35 zettabytes in 2018, is expected to reach 160 zettabytes in 2025 (Reinsel et. al., 2018). Therefore, in order to measure ever-expanding data sets, new measurement units that make use of higher byte values are used (Table 1), in addition to traditional standard values such as KB (kilobyte) and MB (Megabyte) (Boz Eravcı, 2020, p. 94).

ABBREVIATION	SYMBOL	BYTE VALUE	BINARY EQUIVALENT
KB	Kilobayt	10^3	$2^{10}=1024^1$
MB	Megabayt	10^6	$2^{20}=1024^2$
GB	Gigabayt	10^9	$2^{30}=1024^3$
TB	Terabayt	10^{12}	$2^{40}=1024^4$
PB	Petabayt	10^{15}	$2^{50}=1024^5$
EB	Exabayt	10^{18}	$2^{60}=1024^6$
ZB	Zettabayt	10^{21}	$2^{70}=1024^7$
YB	Yottabayt	10^{24}	$2^{80}=1024^8$

Table 1. Byte Values and Binary Equivalents for Data Measurement (Source: Boz Eravcı, 2020)

Information technology-based media companies such as Alphabet Inc. (Google, YouTube), Meta (Facebook, WhatsApp, Instagram), Twitter, Amazon (The Washington Post) Netflix etc. analyze individuals' search intentions in online environments using various algorithms and take the advantage of the data they obtain

to develop marketing strategies and set the agenda on topics with higher advertising returns. This situation makes online platforms, especially social media networks, the main source of data for those IT companies today.

Advances in digital systems increase both the amount and types of data. In this context, it has become inevitable to develop software strategies so that the resulting unstructured data sets can form a meaningful whole, be analyzed effectively and made usable. In this context, data mining functions as an important method in detecting, understanding, modeling, and evaluating data masses in digital environments. In this context, data mining stands out as an important technique to help companies accelerate and facilitate their operations, develop correct marketing and sales strategies, and increase their investments (Berry & Linoff, 2000; Campos, 2022).

Today, an effective method widely used in data mining applications is a standard model (figure 1) known as CRISP-DM (Cross-Industry Standard Process for Data Mining). This data mining method can be easily customized to company strategies and aims to transform vague patterns in complex data sets into value-generating structures. The CRISP-DM model consists of the following stages, which serve as a road map in the process of accessing meaningful information from databases (Hotz, 2023; Campos, 2022; IBM, 2021):

Figure 1. Stages of Data Mining (CRISP-DM Method) (Source: Hotz, 2023)

- **Business Understanding:** The first stage of the model is the process of determining what companies want to achieve from the data mining project.
- **Data Understanding:** This is the stage where data begins to be collected, stored and problems in the collected data are identified.
- **Data Preparation:** This is the phase applied to determine the appropriate data set, where inappropriate and duplicates are removed from the collect-

ed data.

- **Modeling:** Algorithms, artificial intelligence, and machine learning are used to correlate and categorize the obtained data.
- **Evaluation:** The findings obtained are evaluated to answer the target question determined in the first stage.
- **Deployment:** All results are brought together as a whole and presented to stakeholders to reach a consensus on the right strategies.

The growth in data volume is an important consequence of the computerization of societies and the rapid development of powerful data collection and storage tools. For example, web searches, digital medical records or social networking supported by search engines such as Google and Yandex process thousands of petabytes of data every day. At the same time, individuals play an active role in data production through various networks such as social media, digital images, videos, blogs, and web pages. This rapidly growing and accessible mass of data makes the current period a 'data age' (Han et al., 2012, p. 2). Data mining is an important tool for the services offered, allowing the determination of the right strategies, revealing problems, and achieving consistent results. In addition, consistent findings obtained during the analysis of the data mining process contribute to the evaluation of future possibilities and the development of systematic plans by detecting potential problems in advance.

Search Engine Oriented Journalism: The Relationship Between Big Data, Social Media and Journalism

Digitalization, which is a process in which the transition from physical environments to digital environments increases because of advances in information and communication technologies, refers to a period in which accessible information is transferred to digital environments in a readable form by information systems (Dijk, 2018; Castells, 2010). This transformation brings about a series of changes in social, cultural, political, economic, and environmental factors, causing transformations in a wide area of influence.

In the perspective of digitalization, the journalism profession is undergoing a radical transformation with changes in social/cultural, political, economic, and environmental factors. Traditional journalism practices are evolving under the influence of new communication and information technologies, leading to significant changes in a wide range of processes, from news production to distribution and consumption. When analyzing the effects of the digitalization process on the journalism profession, it can be stated that a reductionist approach makes it difficult to understand this complex transformation. While digitalization allows news to be produced faster, it provides journalists with in-depth and fast analysis resources by providing easy access to online data. In addition, social media platforms provide rapid news dissemination, but also carry the risk of being used as a manipula-

tive information tool, causing disinformation and misinformation. However, social media platforms, which have become the main source of information for individuals today with the increasing number of users, can be considered "mass media" (in sense of crowdsourcing opportunity) when used correctly and systematically by journalists.

The effects of digitalization on journalism practices have made it necessary for professionals operating in this sector to adopt innovative approaches. With the emergence of areas of expertise such as Search Engine (SEO) and social media journalism within the framework of new communication and information technologies, news has become a mathematical process optimized with numerical data, beyond just conveying important issues. Therefore, in order to achieve success in digital journalism practices today, professionals in the sector need to have a good understanding of the mathematical aspect. In this context, the basic components are created by the social media, data analysis and SEO journalism phenomena. In this context, it would be remarkable here to talk about the relationship between big data, search engine-oriented journalism and social media.

Social media journalism is considered an important element of data journalism and refers to the use of social media platforms (Facebook, Twitter, Instagram and YouTube, etc.) for news production, distribution and consumption by journalists and general users (Wilson, 2019; Adornato, 2021, p. 3). Social media platforms, combined with multimedia features, provide journalists and users with quick access to information, easy follow-up of important events and the opportunity to contribute to the news (Dijk, 2018, p. 21; Kırık, 2017, p. 35). In this context, social media helps journalists reach the masses more quickly and effectively. In this context, social media platforms have become the primary source of information, especially during emergencies or social events.

As examples of the information and opinions conveyed; the first images of the earthquake, which was centered in the Elbistan district of Kahramanmaraş province, Turkey on February 6, 2023 and caused great destruction in many provinces, were spread through posts made by journalists and users on social media. During this process, mainstream media organizations also made uninterrupted live broadcasts via their social media accounts. Based on this example, it is possible to say that social media is an important tool in the context of crisis and disaster reporting today. For example, Turkish journalist Cüneyt Özdemir has over 1 million subscribers on YouTube, over 7 million followers on Twitter, and over 600 thousand followers on Instagram. Özdemir quickly conveys news and discussions to his followers in the face of natural disasters, social and political problems, through posts on his personal social media accounts or live broadcasts.

According to Knight & Cook (2013), the process of digitalization has created pressure on journalistic practices to reveal good stories and features. On the other hand, the purpose of commercial journalism is to present the news effectively through storytelling in order to increase advertising opportunities and meet the

information needs of individuals (Markova & Sukhoviy, 2020, p. 361). With the changes created by new communication and information technologies in journalism practices, it is not enough today to simply convey information to individuals within the framework of traditional journalistic ethical principles. The most important reason for this situation is the existence of emerging social media platforms, which have an increasing number of users every day and are based on the digital marketing / advertising strategies of those platforms. Another important reason for the integration of journalism and social media is the impact of algorithms. Posts systematically shared on social media from journalists' personal accounts or by mainstream media organizations are forwarded to other users with high interest in the subject by social media algorithms (Petrie, 2022). This is another indicator of rapid data production, distribution, and consumption processes in the context of big data and social media relationship.

The digitalization process has led to changes in all developments in journalism practices. According to Bossio (2017), there are only two dynamics that do not change with the integration of journalism and social media; The first is the durability of journalism as a profession, and the other is its uncertainty. In addition, the atmosphere on social media has changed dramatically since 2018 due to the influence of factors such as fake news, virtual fraud, filter bubbles, censorship, or algorithms. This shows that the mobile/social media-focused publishing process will not be easy (Zhong, 2021; Hill & Bradshaw, 2018).

Within the framework of this information, the main advantages that social media platforms offer to journalists and media companies can be listed as follows (Knight, 2012; Duman 2019, p. 1640):

Access to Information: Journalists provide fast and comprehensive access to information.

- **Tracking Audience Interest:** It provides the opportunity to determine content strategies by monitoring user interest in news content.
- **Providing Interaction:** Provides the opportunity to directly interact with users and receive feedback.
- **Networking:** It strengthens communication between news agencies and journalists and helps in networking.
- **Achieving Digital Marketing Goals:** Provides support to the digital marketing strategies of media companies.

Singaporean journalist Jeniffer Alejandro (2010) included a survey on the use of social media by editors working in different regions of the world in her study titled "Journalism in the Age of Social Media" published by the "Reuters Institute for the Study of Journalism". 5 out of the 6 editors who participated in the survey stated that the most helpful aspect of social media in getting news is the speed. This makes the element of "speed" in one of the most important components of big data. The study also highlights that newsrooms use social media extensively for

branding, driving organic traffic, networking, and keeping up with breaking news.

In addition to all these, search engine-oriented journalism within the framework of big data applications refers to the content strategies created by news sites or content producers by considering the news headlines, keywords appropriate to their content and the ranking algorithms of search engines. Its main purpose is to increase the click rates and advertising revenues of web pages by increasing the authority in search engines.

In journalism practices that change with digitalization, SEO forms the basis of content (Vermeire, 2017). However, today, readers who follow the news through search engines or social media accounts can often be disappointed if the content does not meet their expectations when they click on a promising headline. This is commonly known as "clickbait journalism". This method can be used even for topics with limited or no content, except for content containing sensational headlines such as news of natural disasters or terrorist attacks (Frampton, 2015). For example, the title "10 facts you need to know about cancer" may be interesting, but it may turn out that the content does not contain scientific and up-to-date information. According to Search Engine Journal (SEJ), phrases such as "X reasons", "What is it", "This is it" are among the phrases that generate the most clicks in search engines. For this reason, the use of such expressions by mainstream media organizations can make the content more interesting (Lita, 2022). In this context, readers who follow current news through search engines may not be able to access the information they want through the content they click on. However, since the main purpose of clickbait journalism is to increase advertising revenues per click rather than the content contributing to readers, the importance of the content providing real information may be secondary.

Google's Big Data Techniques

Google was founded as a private company in 1998 by Stanford University doctoral students Larry Page and Sergey Brin. Google offers a wide range of services such as Internet searches, online information distribution, digital advertising technologies, artificial intelligence, and computer software. Google went public in 2004, and with the holding company established in 2015 under the name Alphabet Inc, Google and other subsidiaries have been combined under one roof (Google, n.d.).

By meticulously examining millions of web pages with different web browsers and big data techniques, Google can provide appropriate answers to individuals' search intentions within seconds. The main reason why it can perform these complex operations quickly and effectively is that it is based on big data analytics. The basis of Google's success in this process is the information it obtains from big data to understand and evaluate individuals' search intentions within the framework of various dynamics. Various factors such as search history, trends, locations, etc. allow Google to analyze this data and filter results according to individuals'

search intentions through algorithms (Google Privacy & Terms, n.d.). At this point, it can be stated that Google's main goal is to develop a system that can always think like a human and understand the logic of search queries. Towards this goal, Google uses various techniques to understand user preferences through complex processes. These techniques can be listed as follows (Marr, 2021; Arora, 2023):

- **Indexed pages:** Refers to web pages that are stored to deliver accurate search results. This indexing technique involves algorithms reviewing millions of web pages for inclusion in Google's search index. At the same time, appropriate keywords are added to web pages to create appropriate rankings for users' search queries on Google, which completes the indexing process (Google Search Console Help, n.d.).
- **Real-time data sources:** Google has become the hub for measurable real-time data streams, such as weather reports, exchange rates, stock information and shopping recommendations, found in a web page index (Google Analytics Help, n.d.).
- **Ranking tools:** Big data plays a vital role by Google in understanding users' search queries and offering rankings that meet their expectations. Therefore, Google algorithms identify the topics users are searching for and match them with data on all web pages containing those topics. Thus, it understands whether the user is looking for current news, weather forecast, or statistics related to a search and lists the appropriate results on the search engine results page known as SERP (Search Engine Results Page (Google Search, n.d.).
- **Knowledge Graph:** Knowledge Graph, which contains billions of information in its database, is an infrastructure that allows Google to instantly answer questions such as "How many meters is the Eiffel Tower" or "Where were the 2016 Summer Olympics held?" This information is obtained from various sources that compile factual data (Google Knowledge Panel Help, n.d.).
- **Tracking cookies:** Using cookies, Google keeps track of how often users visit other web pages after they are logged in to Google, their location, and the data they download. With this method, various data about users' tendencies, likes and needs are collected (Google The Keyword, n.d.).
- **Google Ads:** It is an advertising service offered by Google for users and companies. This platform is offered for small or large-scale businesses to understand their customers' purchasing preferences and control their income structures (Ali, 2023).

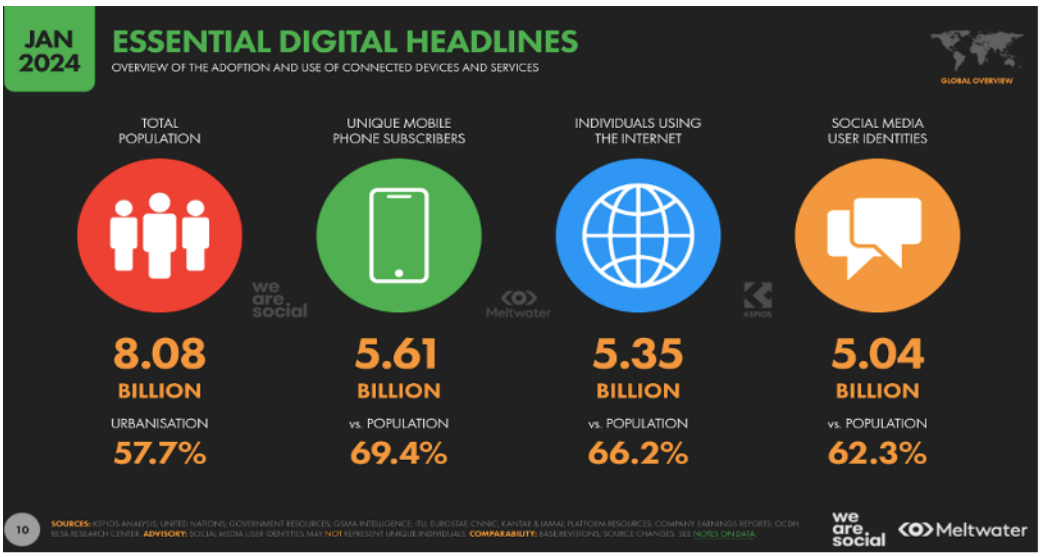


Figure 2. Mobile Phone, Internet and Social Media Usage in the World (Kemp, 2024)

Google's big data strategies, collection, evaluation, and presentation processes can stand out as an important result of its financial investments in data-oriented products and services and the systematic infrastructure created. In this context, big data supports Google's efforts to improve user experience, create effective digital advertising strategies and develop new products. At Google, big data is at the center of all activities and new data evaluation methods are constantly being researched to improve services (Timothy, 2022).

According to the information and opinions conveyed, it can be said that in the digitalized world, Google plays an important role in the advertising and optimization efforts of companies. However, despite criticism that Google exploits individuals (Fuchs, 2020; Morozov, 2014), it can be stated that these approaches are insufficient to ensure that individuals understand the digital world and exist effectively in this environment. For example, according to We Are Social's 2024 data, 5.35 billion of the 8.08 billion population worldwide use the internet (Kemp, 2024). These data are important to provide a rational response for journalists to reach individuals who follow news in digital environments or for entrepreneurs operating in different fields of industry and commerce to determine appropriate strategies to reach potential customers. As a result, it is important to take up seriously an interactionist approach so that individuals and companies can continue their lives in the face of the innovations brought by digitalization.

Aim and Methodology

Within the scope of the study, the descriptive analysis method, which is among the qualitative research techniques, will be used. Descriptive analysis method refers to the process of interpreting documents and information obtained through observation or interview by transforming them into structured data (Zehir Topkaya, 2006; Yıldırım & Şimşek, 2013). With the descriptive analysis method, it is

aimed to identify approaches and trends related to the field examined and to guide future studies by other researchers (Ültay et al., 2021). According to Sandelowski (2000), descriptive analysis involves the depiction of data in a way that is both comprehensive and contextually meaningful. This method does not seek to draw inferences or predict outcomes; rather, it focuses on providing a clear and accessible picture of the data at hand.

Therefore, it can be stated that descriptive analysis is a method used to summarize and describe the main features of a data set. In the context of digital journalism, descriptive analysis helps understand trends, patterns, and behavior in large data sets, such as those obtained from tools such as Google Trends.

In the research, an exploratory research design was used to discuss how to use the data provided by Google Trends more effectively in digital journalism applications. The literature review method was used to access the sources examined within the scope of the study. In this context, publications related to the field of study were accessed through platforms such as DergiPark, ResearchGate and Academia. On the other hand, for the section where the data provided by Google Trends was examined in the study, the data in the "explore" and "trends" sections on the Google Trends web page were used. On the other hand, for the section where the data provided by Google Trends was examined in the study, the data in the "explore" and "trends" sections on the Google Trends web page were used. Within the scope of the descriptive analysis method, the data provided by Google Trends (with images taken from the data service and added to the study) were categorized and evaluated.

In this context, the two most important aims of the study within the framework of the method to be used are as follows: The first is to reveal the relationship between big data, search engine optimization and journalism. The second is to evaluate the contributions of data obtained from Google Trends, which is among the most frequently used data services in digital journalism practice and applications.

In line with the purpose of the study, it is aimed to answer the questions below:

- How can unstructured, semi-structured and structured data provided by the Google Trends data service be transferred to digital journalism processes?
- What are the contributions of using Google Trends as a big data tool in digital journalism applications to news sites?

As stated above, this study focuses on Google Trends, which is among Google data services, in order to evaluate the use of big data in digital journalism practices within the framework of concrete information. The main reason for this is that, as research clearly shows (Pavlik, 2023), Google stands out as the search engine with the highest number of users on a global scale. In this context, one of the most important limitations of the study is the limited resources for the Google Trends data service. In this context, one of the most important limitations of the

study is the scarcity of resources for the Google Trends data service. Therefore, the study is limited to the data on the Google Trends web page and the information/articles on the web pages containing expert opinions about Google Trends.

In addition to all this, analyzing the data sets provided by Google Trends will provide a better understanding of public interests and trends and will contribute to strategic decision-making in creating news content. In this context, the research emphasizes the importance of using big data in digital journalism by providing a scientific basis for media organizations to develop more effective news strategies on the Google search engine.

Findings: Google Trends as a Big Data Tool in Digital Journalism

Google Trends is a free data service that analyzes the popularity of concepts or topics related to users' Google search intent with real-time data. In this context, Google Trends shows user search behaviors in the context of time, season, and location factors to contribute to companies' marketing strategies (Lyons, 2022).

Google Trends is created based on searches that occur trillions of times a year and the data obtained from these searches. This makes Google Trends one of the largest real-time data sets in the world (Koz & Işık, 2022, p. 27). Additionally, Google Trends includes filterable data, providing more detailed information than other Google services (Rogers, 2016). However, Google Trends data is calculated using the sampling method and therefore, daily changes in the ranking of results can be observed (Choi & Varian, 2012, p. 3).

Google Trends is a data service that makes significant contributions to the analysis of big data in the field of digital journalism. Editors working on news sites can use Google Trends to evaluate real-time data based on the search frequency of current news topics. This platform helps complete the news optimization process in accordance with SEO criteria by showing the value of certain keywords, users' regional search intentions and the changes in these searches over time (Google News Initiative, n.d.).

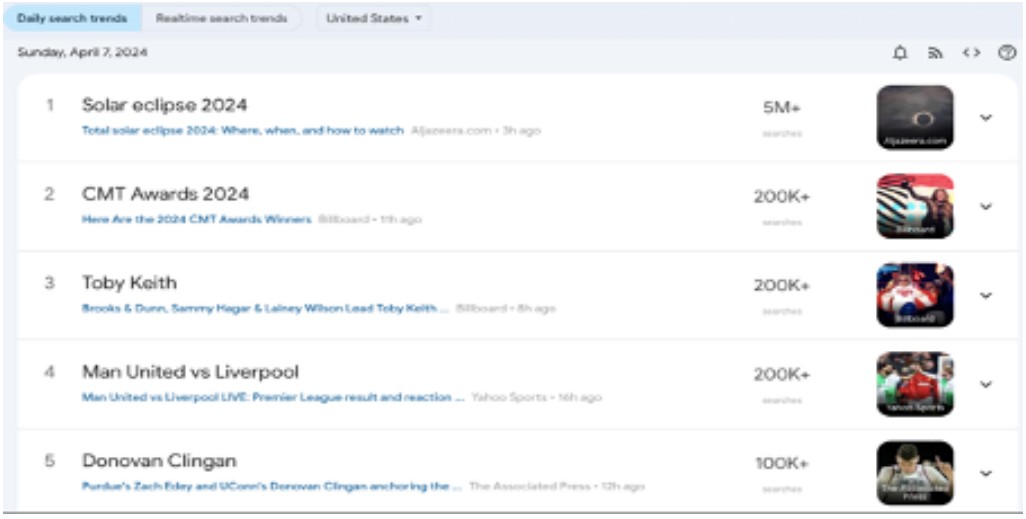


Image 1. Google Trends: Daily Search Trends

Google Trends is offered in two different ways: daily search trends and real-time search trends. Daily search trends show the top 20 most popular topics and their search volume for each day. At the same time, data of the last 30 days can be analyzed through daily search trends.

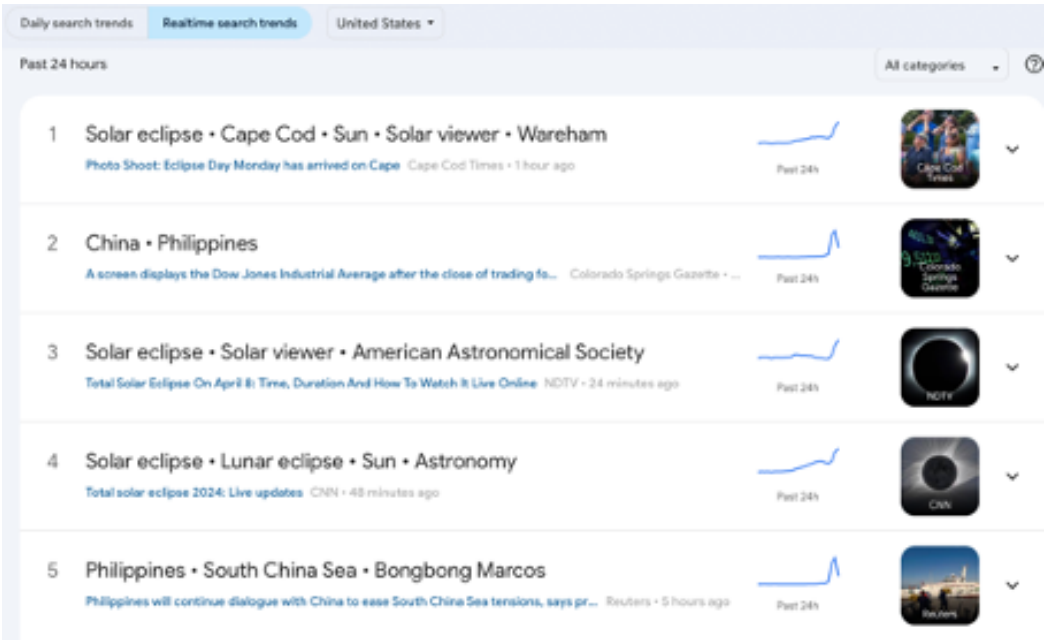
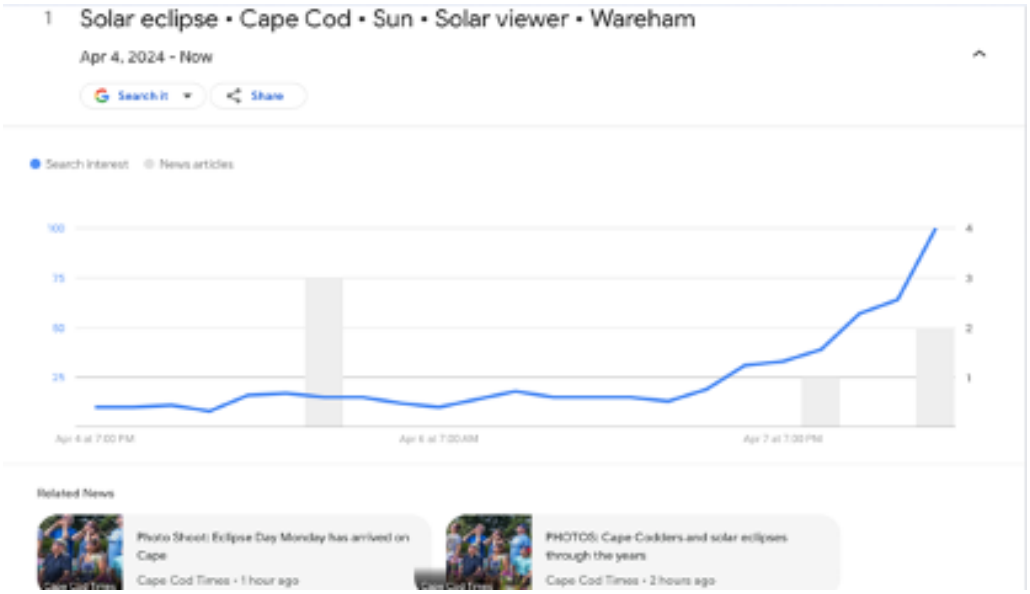


Image 2. Google Trends: Real-Time Search Trends



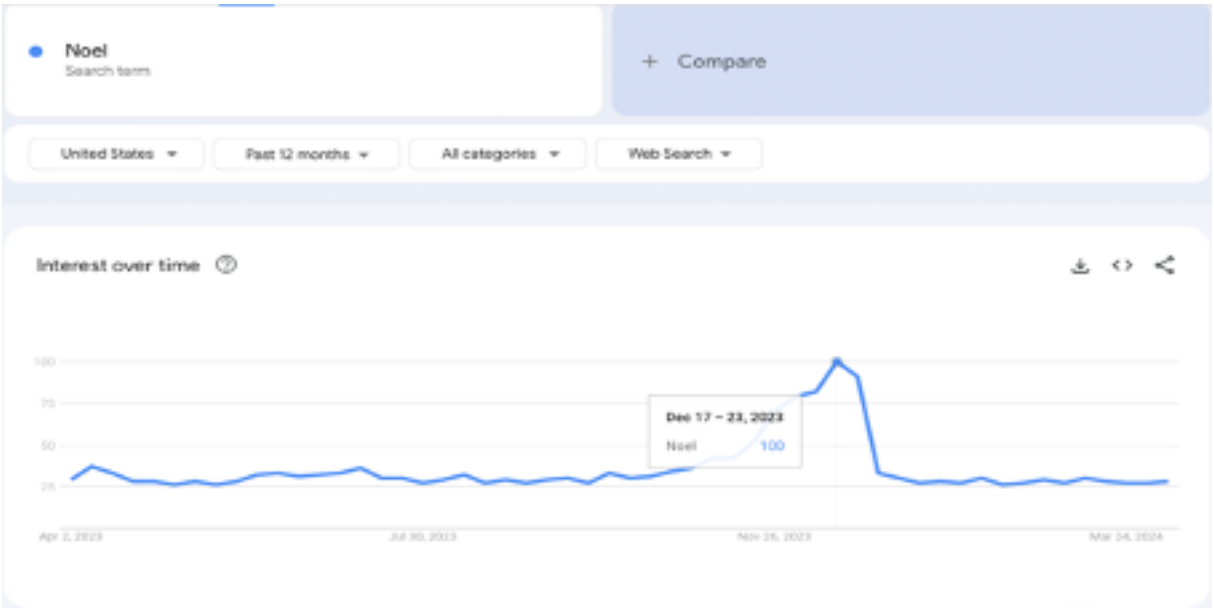
Graph 2. Google Trends: Real-Time Search Trends (Search Volume and Related Topics)

Real-time search trends show the top topics in the last 24 hours with current traffic and search volumes. These instant data, such as topic and traffic volume, can be considered an important source of data mining used in digital journalism applications. When users click on the topics on the real-time search trends page,

they are directed to a page containing news and similar queries, along with a graph focusing on search trends and news articles related to the topic (Graph 2). This application not only makes it easier for editors working on news sites to analyze the agenda and crowdsourcing, but also makes it easier for them to understand the strategies of rival news sources.

Google Trends' explore feature presents the popularity values of keywords over time, as well as the topics and queries associated with these words. Searches have filtering options such as country, time (hour, week, day, year, and a specific date range), category (shopping, health, science, sports, entertainment, etc.) and Google Web Search (Google News, Google Shopping and YouTube Search) (Google Trends Explore, n.d.).

Users prefer Google Search to find the information they are looking for, learn about the topics they are interested in, and make important decisions. However, 15% of these users search for queries that have not been searched on Google before (Google Search, n.d.). In light of this data, it can be seen that a significant portion of the searches made on Google are previously performed queries. In this context, in digital journalism practices (and in digital content production in general), content created according to users' increasing search intentions in certain periods is called "cornerstone content" and plays an important role by editors (Walden, 2023). At this point, Google Trends' explore feature serves as an important data source.



Graph 3. Google Trends Explore Query: Search Term Interest Graph

As an example of data related to the discover feature of Google Trends; as the end of December approaches, it is observed that searches related to the Christmas period increase. This is important as it shows that the Christmas period is an important cornerstone content issue. Therefore, Google Trends' explore feature is a critical source of data for editors working on a news site. For example, searching for the keyword "Christmas" in the Explore section of Google Trends

reveals a chart showing data on relevance over time. Additionally, in this graph, the popularity value of the search term is usually evaluated out of 100.

At the same time, the term “Christmas” can be compared with 5 separate keywords, related or unrelated, through the “+ compare” section. When the data analysis continues on the same search term, data for the regions where "Christmas" searches are intense are included after the search term interest graph.

Image 3. Google Trends Explore Query: Interest by Sub-Regions

In the last section of the page, it is seen that relevant topics and queries for the searched keyword are included. It can be stated that this section can provide important data for cornerstone content prepared by editors within the framework of users' periodic search intentions, especially since it contains suggestions for different keywords.

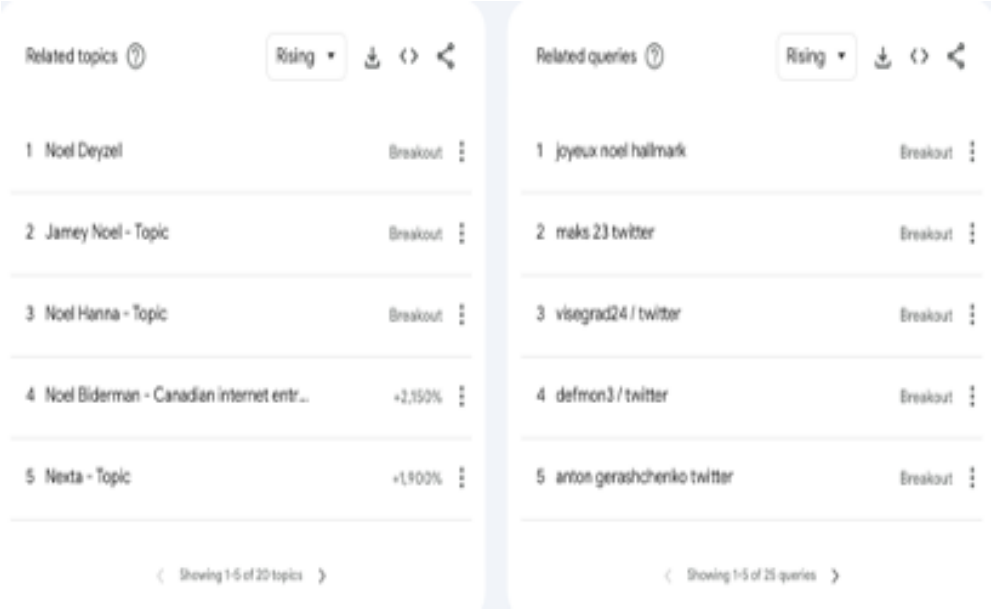


Image 4. Google Trends Explore Query: Related Topics and Queries

The use of Google Trends in digital journalism is of paramount importance due to its ability to provide comprehensive insights into public interest and behavior. As a tool that aggregates and analyzes search data from Google, it enables journalists to identify what topics are currently trending, which is essential for creating relevant and timely content. In an era where the news cycle is rapid and ever-evolving, having access to real-time data allows journalists to stay ahead of the curve, reporting on issues that are of immediate concern to the public. At this point, it can be stated that Google Trends is among the most important data services that provide real-time data to journalists.

One of the most significant advantages of using Google Trends is its capacity to offer data-driven insights. This empowers journalists to base their stories on empirical evidence rather than conjecture. For instance, by examining search trends, journalists can uncover emerging stories or shifts in public opinion that may not yet be apparent through traditional reporting methods. This proactive approach ensures that journalism is not only responsive but also anticipatory, addressing the interests and needs of the audience before they become widely recognized.

Conclusion

With the developments in new communication and information technologies, digital platforms, as well as traditional media organizations, began to play an important role in news production and distribution processes. The transformation experienced with the digitalization process makes the use of big data the most important element. Big data refers to large data sets created and stored in digital environments, and the analysis of these data plays an important role in information extraction and decision-making processes.

In this context, search engine-oriented journalism stands out as an important strategy. Internet users' habits of accessing information using search engines draw the attention of news producers to Search Engine Optimization (SEO). Tools like Google Trends help journalists set the news agenda by analyzing users' search trends. This enables news producers to identify topics of interest to the public, develop content strategies and optimize news headlines. However, the use of big data in digital journalism should not only be focused on SEO, but also should be expanded to areas such as social media analytics, data journalism and, artificial intelligence (having experienced the recent developments in the sphere, the latter would obviously be considered as a real game-changer in near future). In this way, news producers can produce more comprehensive and accurate news by synthesizing the information they obtain from various data sources. In addition, this data-driven approach contributes to the creation of a continuous news flow by ensuring that news reaches wider audiences.

Within the framework of the information and opinions conveyed, this article carried out an analysis on the use of big data in digital journalism and specifically

examined how Google Trends can be evaluated as a big data tool. In addition, the importance of the concept of Big Data, its relationship with search engine-oriented journalism and the role of Google Trends in digital journalism were discussed.

In order to use big data effectively, journalists and media organizations need to invest in digital technologies and data analytics. In addition, to further develop the practice of digital journalism, closer cooperation between educational institutions and the media industry is required and academic research in this field should be supported.

As a result, the analysis and suggestions presented in this article offer a new perspective on the use of big data to academics, journalists and media managers working in the field of digital journalism. As the practice of digital journalism develops further in the future with the developments in new communication technologies, the role and importance of big data will increase even more. Therefore, it is expected that the issues discussed in this article will guide new academic studies in the future.

Google Trends data service provides various forms of data -unstructured, semi-structured, and structured- that can be seamlessly integrated into digital journalism processes. Unstructured data, such as raw search queries, can be analyzed to identify emerging trends and public interests. Semi-structured data, like search volumes over time, can be visualized using graphs and charts to show changes in public attention. Structured data, which includes categorized search terms and demographic information, can be directly used to segment audiences and tailor content to specific groups. By leveraging these different types of data, journalists can create more relevant and timely stories, enhance audience engagement, and make data-driven editorial decisions.

Using Google Trends as a big data tool in digital journalism applications contributes significantly to news sites in several ways. Firstly, it enables journalists to identify and respond to emerging trends quickly, ensuring that their content is timely and relevant. This can lead to increased traffic and engagement as readers seek out the latest information on popular topics. Secondly, the data from Google Trends can help news sites optimize their search engine rankings by targeting keywords and phrases that are currently in high demand. Additionally, it provides insights into audience behavior and preferences, allowing news sites to adapt their content to meet the needs and interests of their readers more effectively.

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