Refereed Original Paper

Historical Media Discourses of Search Engine Rankings in Japan

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Abstract

　The ranking of search engine results is commonly encountered media in daily life. However, most users are unaware of how search engines rank websites or even that the results are ranked, and trust that search engines arrange results appropriately. The purpose of this study is to clarify the history of the discourse on media (i.e., search engines) used to find webpages in Japan by analyzing articles in major Japanese personal computer magazines published during the Web 1.0 era. Consequently, this study clarifies that (1) the World Wide Web was originally considered as a "plaything" before becoming a tool for content searching, (2) tools for searching websites altered from semantic directories to computational rankings, and (3) discourse explaining computational technology gradually decreased resulting from a change in the search engine environment from over-competition to monopolization. Through this historical process, search engine rankings have become the major media for finding websites. This suggests that search engine rankings as media have become black-boxed, and implicit trust in the rankings was constructed. This study contributes to understanding how digital platforms affect daily communications by applying a media studies perspective.

1. Introduction

Ranking is one of the most popular formats in today's media. Among the different ranking types, search engine rankings are one of the most frequently used (Battelle, 2005). In search engines, webpages judged to relate to the query are presented in the format of a ranking. Many users consequently check for their desired content by accessing the top result before moving to those underneath, and lower-ranked webpages are unlikely to be selected and viewed. In that sense, the rankings are not just a format but also function as media that construct communication (Udagawa, 2019). This concept of media is based on socio-media studies undertaken by Mizukoshi (1999; 2014).

It is common for search engine users to consider only top-ranked content, and it seems the order of the search results is undiscerningly trusted as a "black box." Occasionally, issues arise, and one example is the "curation media" incident known as "DeNA's WELQ," which was widely discussed in Japan in 2016. WELQ, a popular healthcare-focused website owned by the Japanese company DeNA, was found to have posted incorrect medical information and inaccurate quotes, but was attracting many visitors as it was highly ranked on search engines using a technique called "search engine optimization." This incident was considered a kind of "fake news" in Japan (Fujishiro, 2017). According to a DeNA Third Party Committee (2017) report, DeNA's main business goal was to acquire a high number of daily visitors, known as "daily active users." Acquiring the top position in the search engine rankings was DeNA's only priority, and its content's veracity and quality were disregarded.

This event indicates the necessity of researching search engine rankings as media as they mediate how users select information. To tackle this issue, this study focuses on the historical texts of computer magazines as they reflect the general interests of Internet users over time. This study aims to clarify the history of discourse related to how search engine rankings became a major format of media in Japan by analyzing texts about search engines in major Japanese personal computer (PC) magazines published during the Web 1.0 era.

2. Previous Studies

Previous studies on rankings have mainly centered on the field of the "sociology of valuation and evaluation" (Lamont, 2012). In these studies, scholars have primarily focused on how rankings can change the political-based perceptions of social organizations, such as universities, companies, and governments. For example, Espeland and Sauder (2007) analyzed the rankings of American law schools from the viewpoint of how "public measures" of ranking can reconstruct social reality. They found that rankings represent a common effort to control institutions that are in the public eye and make them more accessible to outsiders. They also demonstrated that the interaction between institutions and society causes two effects: 1) The "reactivity" of rankings, which is shaped by "self-fulfilling prophecies" (Merton, 1948); and 2) the "commensuration" of rankings, which transforms social recognition into measuring various objects on a single scale (Espeland & Sauder, 2007).

These studies provide a useful perspective of public organizations' political theories regarding rankings and constitute functional analyses of

rankings in an "audit culture" (Espeland & Sauder, 2007). However, they largely treated rankings as subordinate to social statistics and focused on the rankings of organizations. In other words, they regarded rankings as tools for evaluating organizations. Therefore, these studies omitted other forms of rankings, such as search engine rankings and the fact that the ranking form itself constructs various forms of communication.

Another area related to the social construction of search engine rankings is the study of the information society. There are many discourses regarding search engines and related platforms. For instance, Gillespie (2010) highlighted that the word "platform" has a political meaning, indicating that platform providers hold a neutral stance. In these studies, the role of ranking is not discussed; the researchers instead focus on the power held by platforms such as Google. These standpoints overlap with the concept of code as architecture (Lessig, 2006). Lessig (2006) pointed out that "code" functioned as the power that regulates people. These are also referred to as "societies of control" and can be considered as the power to bypass recognition of people and regulate living environments directly (Azuma, 2007; Deleuze, 1990).

Manovich (2001) notes that "new media" supported by digital technology are fundamentally different from previous media due to a mediating layer called "software." Manovich's (2001) new media concept focuses on the disconnection of media technology before and after digitization. However, formats of media like rankings appear commonly before and after digitization. It is important to consider a history of media before and after digitization as continual change. The present study aims to clarify the history of

ranking as media rather than mere technology.

Regarding the Japanese context, some studies have investigated Japanese Internet culture. Hamano (2008) analyzed the Japanese Internet's ecosystem in terms of its structure using Lessig's (2006) architecture concept. He analyzed "2channel," a popular textboard in Japan, and pointed out that compared to blogs, it has a lower control of architecture. Barbora (2014) also highlighted the importance of 2channel and blogs in Japanese Internet culture. These studies focus on the Japanese Internet culture's uniqueness, but there are few discussions about search engine rankings themselves and Google's penetration in Japan.

Conversely, the present study uses an analytical perspective on the morphological history of media, distancing them from politics and power, and avoiding technological determinism. This position is consistent with Hamano (2008), in that he does not attempt to "resist powers" but focuses on the analysis of "design structure" to discover its diverse possibilities. This viewpoint overlaps with Innis' (1951) and McLuhan's (1964) media studies and Mizukoshi's (1993; 1999) socio-media studies.

Mizukoshi (1999) points out that media are present in society with multiple layers. In this study, "media" is defined as a multilayered concept that includes "format" as a model, which refers to how communication is organized as well as being "an object which mediates communication" (Mizukoshi, 2014). The extension of this concept of media is close to that of "communication media" by Luhmann (1968).

Therefore, in this study, the term "Rankings as media" emphasizes the aspect that the format level of rankings generates communications such as "top-ranked items are important." The present

study aims to overcome the simple understanding that "search engine is power" and considers why search engine rankings are historically and socially adaptive by regarding search engine rankings as media.

From this perspective, Udagawa (2019) demonstrated the importance of researching "rankings as media" by analyzing text on major PC magazines in the U.S. and clarified how search engine rankings became "black-boxed." However, this is only a discussion of discourse in the U.S. The present study focuses on illustrating how search engine rankings are constructed in Japan by analyzing the history of discourse on major PC magazines in Japan, where no previous studies have been conducted. By comparing this to previous analyses on U.S.-based magazines (Udagawa, 2019), the role of search engine rankings in society, regarding both their global ubiquity and local differences, can be illustrated. This analysis is also expected to clarify how rankings became major and "trusted" media for finding websites in Japan, both historically and socially.

As a theoretical framework for this historical study, Mizukoshi's (1999, 2014) generalized "historical supplementary lines of socio-media studies" is referenced. This focuses on the historical construction processes of forms of media, considering the interaction between technology and society. According to Mizukoshi (1999), when media establish institutional and industrial positions in society, possible alternatives are forgotten. Here, "Possible alternatives" refer to the variety of social applications that were previously imagined or existed but later abandoned or forgotten. Further, Mizukoshi (1999) argued that media are regarded as "playthings" when they are recognized as new

things, but as users gradually abandon possible alternatives, the chosen media become tools.

3. Methodology and Data

In this study, articles on search engines and the WWW published in popular general Japanese PC magazines were analyzed. General PC magazines were examined because the changing discourse in these magazines represents the general interests of Internet users over time.

This study is a qualitative analysis as it describes the history of search engine rankings by tracing the discourse on the WWW and search engines in articles discussing changes in search engine technology. Unlike strict discourse analysis, the methodological viewpoint of this study focuses not only on the texts but also on the historical and social setting of technology. In this case, it is impossible to cover all of the related historical materials completely, and it is difficult to guarantee perfect objectivity of the description of history. Based on Hojo's (2015) methodology, the argument in this study is a hypothesis proposal by abduction as an inference method for determining possible causes from specific results (Hojo, 2015). As Hojo (2015) highlighted, limiting historical analysis sources to specific texts during a specific time can increase the objectivity of the selection of historical materials to a level that is reasonably acceptable by guaranteeing the coverage in a certain range.

A 13-year period was examined in this study: from 1993, when Mosaic (the browser that popularized the WWW) appeared, to 2005, when the discourse on Web 2.0 (O'Reilly, 2005) emerged. For this study, this era is labeled "Web 1.0."

Two Japanese magazines, *Nikkei Paso-com*

("paso-com" means "PC") and *Asahi Paso-com*, were examined, which have a large circulation in Japan and represent common Internet-related discourse of the era. In order to trace the history of ways to search and find webpages, all of the titles of the articles were reviewed and the articles that included the phrase "*kensaku* (search)" or "*kensaku engine* (search engine)" were chosen for analysis, excluding advertisements and flash news. Additionally, articles including the terms "Google," "Yahoo," or other search engine names were used as supplementary materials.

Nikkei Paso-com was launched in 1983 by Nikkei Business Publications, Inc. Despite being sold through direct sales and not by general bookstores, it maintains the largest circulation among general PC magazines in Japan consistently. The magazine provides a wide range of product comparisons and usage guides concerning the Internet, mainly relating to the business sector.

Asahi Paso-com was launched in 1988 by the Asahi Shimbun Company. From its inception, it has focused on personal computer use. This includes product introductions and usage guides for personal or hobby use of PCs and the Internet. It also contains articles or essays related to the information society.

Major readers of these two magazines are different: *Nikkei Paso-com* is mainly for business users, while *Asahi Paso-com* is for personal users. Considering the above, this study attempts to cover the general representation of the Internet in Japan by analyzing both type of the two most circulated magazines of the era.

4. Results

4.1. The WWW as a "Plaything" (1993-1995)

According to socio-media studies, new media appear as "playthings" when first introduced (Mizukoshi, 1999). Accordingly, when the WWW was first presented to the public, it was not regarded as a tool for finding information but as a consummatory "plaything."

In 1993, the Internet became a primary topic in Japan's PC magazines. Initially, these articles centered on the trends of advanced countries, introducing newly developed technologies from the U.S. For example, the September 15, 1993, issue of *Asahi Paso-com* (pp. 104-109) discussed U.S. Vice President Al Gore's "information superhighway" concept. The author of the article, Yasuki Hamano, introduced the U.S. Internet at that time as follows:

This series of movements shows that personal computers are no longer independent from politics. The first politician to understand this was Gore. Personal computers are about to be connected through both network cables and politics, and we cannot return to the "hobbyist" era. (p. 105)

In 1993, Japan's Internet penetration rate was only 0.4%, and that of PCs was 9.2% (Computer Industry Almanac & eTForecasts, 2012). The article written by the "advanced" author regarded "personal" computers as devices for hobbyists, individuals similar to hackers or geeks in the U.S. (Levy, 1984; Nishigaki, 1997)

In early 1994, articles instructing ordinary readers on how to connect to the Internet appeared in Japan's PC magazines. In *Asahi Paso-com*'s March 15, 1994, issue (pp. 118-119), Kenji Muro described his experience of connecting to the Internet in the U.S. and how to access

Japanese-language content.

In October 1994, the monthly *INTERNET Magazine* was newly launched and featured the article "Gopher, WWW (World Wide Web)"; this article stated that "on the Internet, many sites provide information. Gopher and WWW are systems that efficiently search for such information" (*INTERNET Magazine*, October 1994, p. 48). Further, the WWW was described as "an information search system compatible with multimedia." Here, "information search" did not necessarily mean a keyword search, and in the same article, it was paraphrased with the term "surfing," implying that simply tracing hyperlinks and finding content constituted "searching." At that time, "surfing" and "searching" were considered identical in Japan, as in the U.S. (Udagawa, 2019).

In *Nikkei Paso-com*'s September 26, 1994, issue (pp. 174-176), the article "Using Mosaic to Ride the Wave of the Internet" also described the WWW as "searching." In this article, there was also a complaint regarding using the browser Mosaic as a search tool:

> The Internet is a maze of chaotic information, depending on how you use an interface like Mosaic, you can either find something useful or trashy. (p. 175)

At this point, there was already an implicit assumption that a search that only involved following a link in a browser was insufficient for discovering useful information. The development of this social expectation can be considered a starting point for considering the function of rankings as media. It implies the pure pleasure of surfing the WWW itself would be gradually lost when users attempted to avoid encountering unexpected content.

Another aspect of the WWW's popularity at this stage was that users could publish their own websites. In *Asahi Paso-com*'s March 1, 1995, issue (pp. 130-131), Muro described this situation in the U.S. in the column "Create a WWW Server."

> The important thing is that anyone can start publishing, broadcasting, or start a business using it. Japan still seems passionate about browsing the WWW server using Mosaic, but in America, the conditions for creating new WWW servers are in place. You can become a sender. (p. 130)

Muro described how individuals could create a WWW server. As Muro highlighted, one of the main factors behind WWW enthusiasm was that everyone could become a sender; in other words, the enjoyment of "playing on" the Internet was considered as similar to becoming a sender while surfing.

As in the U.S., an individual home page boom soon arrived in Japan. A *Nikkei Paso-com* special issue, published on October 9, 1995 (pp. 186-197), declared "the user-centered era has arrived."

> Using search software such as Mosaic and Netscape Navigator, a user can get bored "surfing the web," which involved searching the WWW. The most interesting thing about the Internet is that you can easily send information to the world using home pages. (pp. 194-195)

The article then explained how to write HTML code; furthermore, it presented several websites published by individuals. It also described that empowering everyone to become a "sender" represents the Internet's attractiveness.

> Having a home page makes it possible for you to become the lord of your own nation in the Internet world. A home page for introducing

other individual users' home pages has also appeared. It resembles a phone book that can easily search unique, individual home pages so you can easily find personal home pages you did not know existed. (p. 191)

The WWW during this era was characterized by many websites that introduced other websites through mutual links, called "link collections." Although these can be considered prototypes of web directories, they also connected individual websites to create a network. Unlike web directories, however, at this point, the purpose of link collections was not to sort or rank content but to expand connections and communications.

As the above discourse shows, at this time, the WWW was considered a "plaything" where users surfed and published websites to enjoy mutual communication, and its role as a tool for effectively finding information was secondary.

4.2. From Semantic to Computational Searching (1996-1997)

When media are in the process of expanding their role in society, there are many possible alternatives. This occurred when media changes from being a plaything to a tool (Mizukoshi, 1999).

The WWW's ability to allow everyone to become a sender in addition to enjoying surfing resulted in an information explosion through website creation. Globally, since the mid-1990s, the number of Internet-connected servers has doubled annually (Internet Systems Consortium, 2018). Consequently, with the resultant flood of information, it became important to distinguish necessary and unnecessary information.

In response, WWW searching transformed into a screening of unwanted websites; further, beyond the link collection of individual websites,

web directories such as Yahoo! became popular. This contributed to transforming the chaotic Internet environment (Dreyfus, 2001) into a hierarchical, orderly network.

However, this semantic approach gradually became more difficult as the WWW space expanded, and the information amount increased. This meant that surfing by relying solely on a network of hyperlinks occasionally resulted in a failure to obtain useful information. Paradoxically, this inefficiency led to the diminishing pleasure of surfing the Internet: if Internet users could only find unwanted information, they became unsatisfied.

This situation was described in PC magazines in 1996. For example, in *Nikkei Paso-com*'s September 22, 1996, issue (pp. 145-153), the phrase "from surfing to searching" was coined. The article introduction reads as follows:

It is said that 10 million computers are now connected. Making the best use of this worldwide database is dependent on your skill level. Let's introduce how to go one step further: to "net search," which involves finding information, differing from "net surfing," which involves viewing a home page as is. (p. 145)

Here, searching used as a tool is expressed as an advanced-level skill. The article's focus was comparing various search engines, and it coincided with the emergence of query-based search engines, which were called "robots." As Udagawa (2019) highlighted, articles comparing several search engines were popular in U.S. magazines at that time, and similar interests existed in Japan. However, many local search engines could be used as possible alternatives in Japan, and major interest in search technologies focused on how well Japanese-language

webpages were indexed. Indeed, U.S. search engines, such as AltaVista, Lycos, and Excite, had weak technology for the processing of natural languages other than English, and in Japan, these were evaluated lower than local search engines.

PC magazines evaluated these local search engines based on their indexing of webpages in Japanese; specifically, the number of indexes of Japanese pages was represented as the major differentiator. In Japan, there were search engines operated by companies such as NTT and also various search engines developed by individuals and universities, such as Senri-gan, ODIN, and TITAN. However, these local search engines did not index webpages outside of Japan. Therefore, users were forced to use both global (U.S.-origin) and local search engines, depending on the language of the content for which they were searching. In Japan, search engines were diversified by the spaces or languages they indexed, a much more complex situation than in the U.S. The abovementioned article compared both Japanese and U.S. search engines in terms of differences in the variety of webpages and sizes of the indexes returned.

Furthermore, users were required to understand the differences between the webpage groups indexed by each search engine and the user interfaces for searching. This meant users were forced to independently determine which search engines, or even which webpages, most closely matched their objectives by comparing multiple search results. Thus, users did not depend on a single ranking of webpages provided by each search engine; in other words, users ranked webpages semantically by referring to multiple rankings of computational search engine results. There were still many possible

alternatives to rank webpages, and users were aware of the technological differences among them.

4.3. The Portal Era (1998-1999)

In 1998, the "portal" concept was created; "portal" means "gate" or "door," and implies a single entrance to a large enclosed space. In the portal era of the Internet, users seemed to stop "playing" on the WWW and considered it more as a tool for finding information efficiently; it was the beginning of uniting an interface and eliminating the possible alternatives.

The August 15, 1999, issue of *Asahi Paso-com* featured the article "How to Utilize Portal Sites" that began with the following:

> Portal means "main gate" or "front gate." When launching the Internet, the portal site is often considered to be "the page displayed at the beginning." Many sites, including search engines, aim to become "portals," providing services such as free e-mail. (p. 102)

The article mentioned improvements in the "search functionalities" of portal sites, stating, "they make it much easier to find desired or valuable information" (p. 103).

Portals could be set as entrances, removing the necessity of directly accessing websites separately. This implies that by this time, comparing multiple sources of information had become frustrating in terms of tool efficiency. Users had become receivers by ceasing to publish information independently (as senders), and the WWW had begun to be regarded as a digital version of mass media. Mizukoshi (1999) highlighted that these portal sites had become digital versions of newspapers, indicating that the WWW had changed from media as networking "playthings" to media as broadcasting tools.

In the U.S. at that time, Tim Berners-Lee, the inventor of the WWW, expressed concerns that portals would limit the possibility to access any content easily (Berners-Lee, 1999). In Japan, PC-magazine readers voiced similar concerns. One article quoted responses to a questionnaire on this topic, reporting that some users had created their own portals through link collections to avoid depending on commercial portal sites.

These discourses implied that the ideal portal should be an interface that can be accessed at any time and provide all available content. In reality, however, many existing portal sites at that time were suspected of editing the results arbitrarily and guiding users to specific content because of commercial intentions, such as for advertisement purposes. Consequently, the neutrality of portal sites was distrusted. This resulted in users preferring websites where there was no room for commercial-influenced semantic editing that instead operated a computational process where replicability was guaranteed. This fostered the social expectation that portals could be replaced by computational programs or algorithms.

4.4. Google's Penetration in Japan (1999-)

Suspicion of the arbitrariness of portals fostered the demand for a unified and computational website-selection tool that afforded more trust. Consequently, through the mutual interaction between this social demand and the arrival of a technical innovation called "Google PageRank" (Page, Brin, Motwani, & Winograd, 1999), ranking became a primary means of selecting websites and a substitute for portals. Starting in 1999, media came to be fixed to a single ranking, and the previous possible alternatives disappeared, meaning users came to depend on one medium and were unaware of other technological options.

After the creation of its beta version service in 1998, Google gained the attention of U.S. PC magazines, and from 1999, Japanese PC magazines began to introduce Google as a new search engine. In particular, after Google commenced a Japanese-language service in 2000, it began to be compared with search engines for Japanese websites. For example, *Nikkei Paso-com*'s special issue for New Year 2001 (pp. 91-115) featured the article "How to Utilize Search Engines" and specifically explained Google's PageRank technology in "Google Gathering Attention and Stimulating Competitors."

This article stated, "traditional search engines judge relevancy based on the contents of web pages […] Google judges relevancy based on the information contained in the links." A detailed illustration of PageRank technology was also presented, explaining that Google's high-level search power was based on this PageRank technology.

In the U.S., the relevancy of rankings became the most important factor for choosing search engines (Udagawa, 2019). Conversely, in Japan, it was more important that search engines be able to process the Japanese language precisely and to index all Japanese websites. This meant that ranking relevancy was evaluated based on search results for Japanese queries. At this time, Google was not very advanced in this regard, compared to traditional Japanese search engines.

In the same article of *Nikkei Paso-com*, the test results involving Japanese queries were reported, and the number of search results was compared. Google processed Japanese queries, but the number of results was lower than those provided by "goo," a popular Japanese search engine

operated by NTT Resonant.

At this point, although PageRank's technological merits had been widely described in detail, goo was still evaluated higher in terms of Japanese-language processing and coverage of Japanese websites. This implies that the websites Japanese users searched for were limited to those in the Japanese language and that coverage of Japanese websites was a primary factor regarding ranking relevancy. In a survey of search engine usage in Japan, included in the 2001 edition of the Internet White Paper, goo (31.9%) was placed second, after Yahoo! (61.6%); Google was ranked 11th (4.9%) (Internet Association Japan, 2001). However, by 2003, Google surpassed goo and was in second place (46.2%); it then continued to increase its number of users rapidly (Internet Association Japan, 2003). Given that Google's index guarantees a complete search of Japanese sites, its high relevancy of ranking centralized its ability to operate as a portal.

In the August 12, 2003 edition of *Nikkei Paso-com* (pp. 84-87), the article "How to Utilize a Search Site" introduced a basic method of using Google and methods of obtaining more specific results. The article only referred to Google as a "search site" and mentioned no other search engines; further, there was only a brief mention of Google's technology, in contrast to the detailed explanations of PageRank that were provided when Google had not been dominant.

Once Google demonstrated that it covered virtually all of the websites in Japan, it rapidly became the center of the WWW for Japanese users, as in the U.S. Consequently, other search engines, or possible alternatives including web directories and portals became marginal. Google became the single interface for ordering all webpages. Further, because it distinguished natural rankings from advertisements, Google's algorithm argued that its computational reproductive process excluded any semantic arbitrariness, such as commercial intervention. As a result, trust in Google increased, and users began to depend only on Google's rankings and stopped comparing the results from multiple search engines.

When Google became the sole search engine (or, at least, the primary option), the interests of users moved away from the technology toward how to utilize Google fully. Consequently, technology-based discourse decreased. This also meant possible alternatives were forgotten, and ranking as media became a tool. Google did not set out to be a black box, but users came to treat Google as a black box on their own. This was because many users who were searching for content relevant to their interests had little desire to understand the technology or even to compare multiple search results. Simply ranking websites at an acceptable level of relevancy was satisfactory.

Users now generally check ranked webpages in order, from top to bottom. This behavior is supported by a belief that the algorithm processes develop searches computationally and consistently, despite there being no guarantee that the algorithm is invariant, and this typifies black-boxed ranking.

5. Conclusion

The media history of search engines and rankings described in this study can be considered from two viewpoints: 1) The WWW transformed from a consummatory "plaything" to a tool for finding content, and 2) the major

media for finding websites changed from semantic links to computational ranking.

The research question of this article focused on clarifying the history of discourse related to how rankings became major media used to find webpages in Japan. Originally, search engine rankings were not necessarily considered major media; surfing was how webpages were normally found during the Internet's early years, which could be considered more akin to playing rather than systematic information hunting. As the number of webpages increased, users began to demand an efficient tool for finding the information they wanted. At this time (around 1996), as the use of various search engines was still the norm, comparisons of search engine technologies were common in PC magazines. In other words, when the plurality of this new media meant searching was somewhat chaotic, or when users had more control over media selection, media forms and technologies were heavily discussed. As Mizukoshi (1993, p. 280) highlighted, "tremors in media can awaken media theory[1]"; the fluctuation of search engines as new media might have raised interest in the forms or the technologies of the media.

However, shortly after its creation, Google demonstrated its ability to provide sufficiently high relevance and coverage of Japanese webpages to allow it to dominate all of the other search engines. Technically, a major factor is that Google built a system that enhanced its self-compliance accuracy by converting ranking from an internal to an external factor. However, more importantly, it suitably matched the social expectations of search engines at that time. The users desired a single interface that covered the almost infinite space of the Internet and that ordered results through a computational,

reproducible ranking process.

When Google established its position as a unified gateway to the Internet and replaced portals, possible alternatives in the form of other portals, including search engines, were forgotten. Coupled with this, discourse on media forms was also abandoned, and today, most people use Google as their sole search engine and only consider its first few listings. As the media forms were fixed and it became unnecessary to distinguish Google from other search engines, it was unnecessary for users to be conscious of other media forms.

Further, trust in the ranking diminished the necessity to confirm the validity of Google's algorithms. This trust represents a social act of taking risks by over-utilizing available information, as Luhmann (1968) discussed. By abandoning the confirmation of the efficiency of rankings, trust became black-boxed, and users began to accept the rankings undiscerningly.

This process in Japan was almost the same as in the U.S. (Udagawa, 2019). Throughout the period studied in this research, much of the discourse regarding search engines and rankings that appeared in U.S. PC magazines was also found in Japanese PC magazines. Indeed, many Japanese articles referred to U.S. PC magazine articles, and the development of search engines in Japan was directly influenced by U.S. events historically. This represents one unique aspect of the Internet as digital media that can be expanded, regardless of geopolitical borders. It contrasts with the fact that pre-Internet media, such as newspapers, radio, and television, were not expanded in this way.

It cannot be concluded that the history of search engine rankings as media has been identical in the U.S. and Japan, and cultural

differences can be observed in Internet content. In Japan, portals or search engines were evaluated based on the coverage of local-language webpages and many unique search engines that differed from U.S. search engines were developed. In contrast, after Google was able to cover Japanese-language content, its position on the Internet became centralized.

This study clarifies that PC magazine discourse shifted from a technological comparison of various search engines to how to utilize Google. This implies that Google's search engine algorithm became a black box and that most users trust its rankings with no awareness of the algorithm. In this regard, again, the process in Japan is almost identical to that in the U.S. Google has fixed its position as a media that regulates the behavior of both users and senders, and the mechanism itself has been forgotten despite its importance in modern media environments.

This study's findings focus on search engines and rankings as media in Japan, which has not been discussed in previous research and presents an important viewpoint of the complication of digital media. It represents a first step in understanding the construction of digital platforms by reconsidering the black-boxing of search engines and rankings from the perspective of media studies.

Note

1. This translation refers to a work by Zahlten (Steinberg & Zahlten, 2017)

Acknowledgement

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