

User-Customized News Service by use of Social Network Analysis on Artificial Intelligence & Bigdata

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Abstract

Recently, there has been an active service that provides customized news to news subscribers. In this study, we intend to design a customized news service system through Deep Learning-based Social Network Service (SNS) activity analysis, applying real news and avoiding fake news. In other words, the core of this study is the study of delivery methods and delivery devices to provide customized news services based on analysis of users, SNS activities. First of all, this research method consists of a total of five steps. In the first stage, social network service site access records are received from user terminals, and in the second stage, SNS sites are searched based on SNS site access records received to obtain user profile information and user SNS activity information. In step 3, the user's propensity is analyzed based on user profile information and SNS activity information, and in step 4, user-tailored news is selected through news search based on user propensity analysis results. Finally, in step 5, custom news is sent to the user terminal. This study will be of great help to news service providers to increase the number of news subscribers.

Keywords: *Artificial Intelligence, Bigdata, Contents, Customized News, Fake News, Social Network Analysis*

1. INTRODUCTION

Recently, news recommendations have had a huge impact on the news media market as they are combined with Artificial Intelligence and data analysis technologies. In other words, personalized news recommendation services considering individual preferences in consuming news are rapidly spreading. Kakao provides a real-time user-reactive news recommendation service based on an Artificial Intelligence algorithm called "Rubics" through mobile Daum News, which forms cooperation based on users' news consumption, gender and age groups, and recommends articles that are similar to those read by users in a particular cooperative group. Naver is applying a personalized recommendation algorithm called AiRS (Artificial Intelligence Recommendation System) to parts of mobile news. The basic algorithm of AiRS is also cooperative filtering, in which groups of users with similar interests are created hour by hour, ranking them on the news that they read a lot.

As such, cooperation filters allow users to build a network of users with similar interests in real time, ranking and recommending news consumed by members within the cooperation group. However, this approach is difficult to recommend the latest newly created news because users recommend it based on past clicked news, and there is a limit to customized news recommendations specific to individuals' tendencies or lifestyles, primarily based on demographic analysis. Therefore, rather than machine learning that specifies patterns or features, this should be addressed by how algorithms design, accumulate, and analyze algorithms that represent features of data in a blank state.

2. RELATED WORKS

Research on fake news using Artificial Intelligence [1-4] and Bigdata [5-15] on Text Mining [16-23] techniques is still in its early stages. In this chapter, we would like to give a dictionary and social definition of fake news. Also, I would like to study the side effects of SNS on fake news identification.

2.1 Aspect of Fake News

Fake news also means all the news that claims that something that is not true is true. News that is not true is technically fraud. Fake news in a narrow sense means information or media that is not news for political purposes, but in a broad sense, it is a comprehensive term that includes misinformation, false information, rumors, wills, parodies, satire, etc. That's because, whether it's monetary or political, it's trying to benefit. Some journalists argue that it is a misinterpretation and argue that terms such as fraud news, deceit news, and false fabrication news. The yellow press had existed for a long time before. Then, as SNS spread rapidly after the 2010s, it was used to disseminate completely fabricated false information and disguise it as a media, and it began to name them fake news. Currently, it has become a product of the Post-Truth era, in which people do not try to confirm what the truth is, but simply blindly believe and accept what they want to believe as truth. The difference from the existing yellow media is that yellow media has a formal organization and personality as media outlets such as reporters and editorial departments, while fake news is manipulated by individuals or organizations unrelated to the media from the beginning and distributed only the form of articles disguised as existing media. The framework of fake news is so-called tabloid writing that frequently appears on Internet humor sites. Among these rumors, the logo of the existing media, the format of the article, and the reporter's name were often included in the contents to disguise it as if it were public trust. These types of writings spread further as SNS developed. The mix of political characteristics has led to fake news disguised as media articles to spread their claims and gain public confidence. In addition, the confirmation bias has worked, which has led to the re-creation and dissemination of fake news by trying to accept only the facts he wants to believe.

2.2 Misuse of Social Network Service

Social Network Service (SNS) refers to services or websites that build social networks on the web that allow people to share their opinions, thoughts, experiences, and perspectives with each other. The representative social media we can access include Facebook, Instagram, Twitter, Kakao Story, Band, Cyworld, etc. The term social media is more commonly used abroad than SNS. The basic functions of SNS are profile, message, timeline, user link, user search, survey, and community. SNS further strengthens the social relationship of offline that you already knew and helps you easily establish a new relationship online. SNS allows us to exchange information without time and place constraints, so we can deliver information faster than regular news. Because information can be delivered very quickly to a large number of users on a particular

issue, public opinion can be formed in real time to increase its ripple effect. However, personal information such as photographs and names can be indiscriminately disclosed and abused in crime. Also, SNS tends to post only happy and good things about yourself, so there is a possibility that you may become depressed or pessimistic about your situation compared to others. Also, anyone can post information on SNS without any verification, so it is very difficult to determine whether the information on SNS is correct or not.

A major side effect of SNS is the expansion of fake news or false rumors. As the speed of information sharing increases and the spread of information is widening through SNS, interest in side effects of SNS is also increasing. This is because it is impossible to guarantee how destructive the information will be if it is misplaced or intentionally distorted through SNS. In fact, this has proven that fake news and scaremongering, which are associated with various cases, have been proven through Internet witch hunts. In these cases, SNS users such as Twitter and Me-Today have helped distort information by spreading false information as if it were true. To make matters worse, some unconventional Internet journalists sweep the contents as they are, post them as articles, and wrap them up in a way that is causing controversy. Such fake news and scaremongering have many errors that appeal to emotions and have phrases that demand expanded reproduction among users. In recent years, it has appeared with graphics and statistics. Several statistics in fake news and scaremongering are accompanied by multiple factual errors and distortions, with no source or fabrication.

Until the 2020s, SNS has been used as a manufacturer of scaremongering, and there are countless people who believe and spread false information. The proliferation and ripple effects of distorted or exaggerated information are getting worse day by day. Rather, more and more people are not trusting the government or social phenomena, distrusting official statistics or sources and instead indulging in fake news or conspiracy theories about social media sources. Therefore, it would be most ideal for individuals who use SNS to use the service with responsibility as a source of information, but there are voices that the government should control the use of SNS at the government level as long as this is practically impossible. The irony is that people who expand and reproduce groundless information on SNS say that SNS censorship and that existing media such as TV, newspapers and Internet news are manipulated and should be critically accepted, which clearly violates freedom of speech.

3. THE MODEL FOR USER-CUSTOMIZED NEWS SERVICE ON SOCIAL NETWORK ANALYSIS

The purpose of this study is to provide customized news service methods specialized in individual life patterns. Another purpose is to provide customized news service devices specialized in individual life patterns. In addition to the information that you log in to a virtual space or social network, personal life is obtained through digital footprints of individuals who open their eyes to and move to a wearable device.

3.1 Architecture of the System

Figure 1 shows the architecture of our proposed model for user-customized news service on SNS. The model of the system consists of SNS, Web news, server, terminal, and analysis model of SNS user propensity.

This model has the steps of receiving SNS site access records from user terminals in a custom news service method based on the analysis of SNS activities performed on custom news service servers. This model is used to retrieve user profile information and user's SNS activity information based on SNS site access records

received at this stage. In addition, after having steps to analyze users' tendencies based on user profile information and SNS activity information, the system provides a custom news service method that includes selecting custom news through news search based on user propensity analysis results and sending custom news to the user's terminal. Here, the step of analyzing users' tendencies is to analyze users' internal tendencies through propensity analysis of posts posted or shared by users within SNS sites. Then, after the analysis, the step of analyzing users' external tendencies is carried out based on communication information with SNS acquaintances who have social relationships with users on SNS sites. The system then analyzes users' interests through analysis of their preferences on pages or groups within SNS sites, and derives user preferences that derive users' political, economic, or socio-cultural orientations based on analysis results. The user propensity elicitation phase is characterized by a separate weighting of news selection by internal, external, and interest. The step is to calculate the intimacy between users and SNS acquaintances based on the interaction information between users and SNS acquaintances, to derive SNS best friends who show a certain level of intimacy with users, and SNS best friends based on SNS activity information. It is characterized by the inclusion of steps to derive users' external tendencies by analyzing clusters based on the starting point of relationship formation and friends of SNS best friends. It also features at least one of the user's occupations, school ties, delays, hobbies, economic activities, and political activities through the starting point of relationship formation.

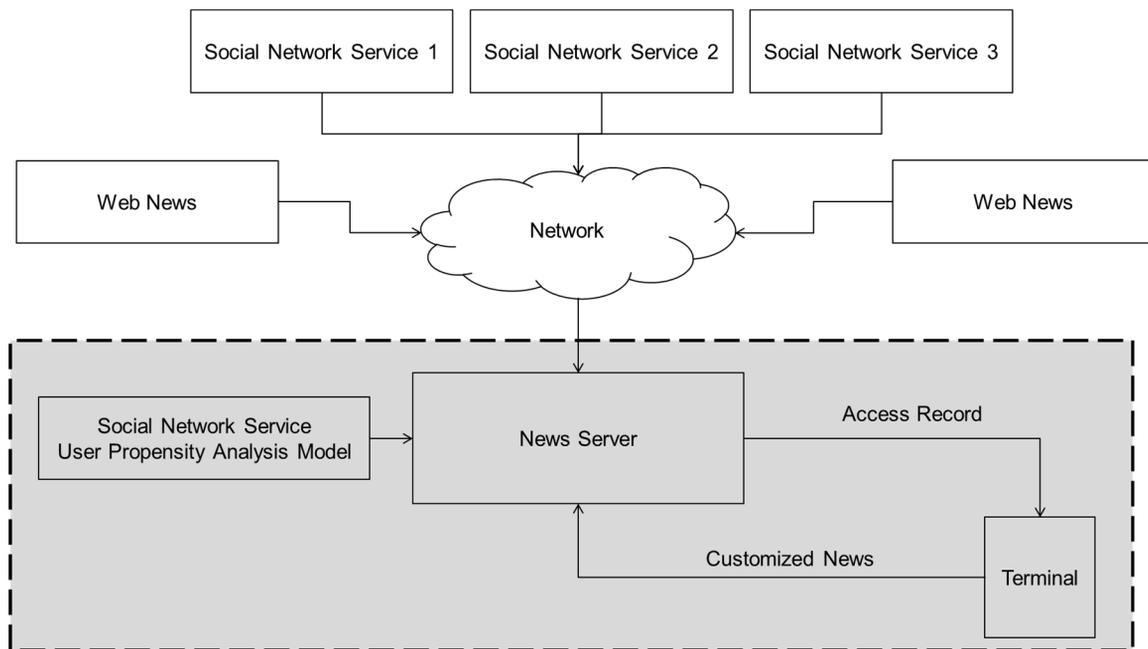


Figure 1. Architecture of the System

The step of selecting custom news is to analyze the news search logs received from the user's terminals chronologically to derive news delivery cycles and news topics, and to select custom news that corresponds to news topics by time zone according to the news delivery cycle and news topics. In addition, this step selects customized news through a news search based on user propensity analysis results, extracts check-in information from SNS activity in receiving the current location of the user's terminal using GPS of the user's terminal, and identifies a place of life that corresponds to the current location of the user's terminal based on

the check-in information It includes steps to deploy customized news based on the characteristics of a place of life, and includes at least one of home, work, transportation, and travel destinations. This information enables individuals to run Facebook or background apps (such as health apps for iPhone) that record strides and walks, and accumulate and analyze information through sensing information and semi-formal data that are logged in and recorded unexpectedly.

3.2 Notion of the Proposed System

In the user-tailored news service method performed on the user's terminal, the system extracts SNS site access records from the user's storage media, sends them to the news delivery server, and receives custom news selected based on SNS site access records from the news delivery server. It includes providing customized news through the screen of the user's terminal, which features a news server acquiring user's SNS activity information based on SNS site access records and a user's tendency analysis based on SNS activity information. Users can watch the news and at the same time send the news to their friends via messenger (check messenger activities or memory usage) or obtain information on the user's behavior through their favorite song playlist while reading the news. If the above information is likely to violate personal information, it shall be analyzed by alias/anonymizing it through unidentification technology.

This includes further steps to derive the current location of a user's terminal using GPS before providing custom news, extracting check-in information from SNS activity information, and identifying living places that correspond to the current location based on check-in information. The stage of providing customized news is characterized by placing custom news on the screen of the user's terminal based on the characteristics of the place of life and including at least one of home, work, transportation and travel destinations. In addition, user-tailored news analyzes the internal tendency of the news server through analysis of the tendency of articles posted or shared by users on SNS sites, and analyzes the external tendency of users based on communication information with SNS acquaintances who have social relationships with users on SNS sites. Furthermore, the news features analyzing users' interests through analysis of their preferences on pages or groups within SNS sites, and eliciting users' political, economic, or socio-cultural orientations based on analysis results. Furthermore, the external propensity analysis calculates the intimacy between users and SNS acquaintances based on the information of the user's interaction with SNS acquaintances and derives SNS best friends who represent a certain threshold or higher among SNS acquaintances. In addition, based on SNS activity information of SNS best friends, the starting point of relationship between users and SNS best friends and SNS best friends are derived, and based on this, users' external tendencies are analyzed by cluster analysis.

4. THE DESIGN OF USER-CUSTOMIZED NEWS SERVICE ON SOCIAL NETWORK ANALYSIS

To provide custom news service servers, the system consists of several parts: SNS Access Record Receipt Part that receives SNS site access records from user terminals in a customized news service server based on SNS activity analysis, SNS Activity Information Acquisition Part which retrieves users' SNS activity information by searching SNS sites based on the received SNS site access records, User Propensity Analysis Part that analyzes users' tendencies based on acquired SNS activity information, Customized News Selection Part to select customized news through news search based on user propensity analysis results, and Customized News Transmission Part to send customized news to user terminals.

4.1 Detailed Design of the Parts

In this case, the User Propensity Analysis Part consists of an internal propensity analysis module that analyzes users' internal propensity through a propensity analysis of posts posted or shared by users on SNS sites and an external propensity analysis module that analyzes users' external propensity based on communication information. This part also includes analyzing users' interests by analyzing the preferences of pages or groups within the SNS site and deriving user tendencies that derive users' political, economic, or socio-cultural tendencies based on the analysis results. Based on the user's interaction information with SNS acquaintances, the external propensity module calculates the user's affinity with SNS acquaintances, derives SNS best friends that show a certain level of affinity with users, SNS best friend's SNS activity information, and analyzes the user's external propensity.

Customized News Selection Part analyzes news search logs received from user terminals chronologically to derive news delivery cycles and news topics, and selects custom news that corresponds to news topics by time zone according to news delivery cycles and news topics. This part includes a customized news selection module that selects customized news through a news search based on user propensity analysis results and a terminal location reception module that uses GPS on the user's terminal to receive the current location of the user's terminal. It also includes a living place identification module that extracts check-in information from SNS activity information, identifies the living place corresponding to the current location of the user's terminal based on check-in information, and a custom news placement module that places customized news on the nature of the living place. Here, a living place is characterized by at least one of home, work, transportation, and travel destinations.

A user terminal that provides customized news based on activity analysis has an Access Record Transmission Part that extracts SNS site access records from usage logs recorded on storage media and sends them to news delivery servers. In addition, user terminals include Customized News Receipt Part, which receives customized news selected based on SNS site access records from news delivery servers. In addition, this includes the User Customized News Service Part, which provides user-tailored news received through the screen on the user terminal. However, customized news provides a user terminal characterized by the news server obtaining users' SNS activity information based on SNS site access records and analyzing users' tendencies based on SNS activity information.

Here, it further includes a location-deriving unit that uses GPS to derive the current location of the terminal, and a place-of-living unit that extracts check-in information from the user's SNS activity information, and acquires a living place corresponding to the current location based on the check-in information. The User Customized News Service Part places customized news on the screen based on the characteristics of the place of life, and includes at least one of home, work, transportation, and travel destinations. In addition, custom news analyzes the internal tendency of the news server through analysis of the user's posted or shared articles on SNS sites, analyzes the user's external tendency based on social relationship information, analyzes the user's interests on SNS sites, and derives the user's political, economic, or socio-cultural orientation based on analysis results.

External propensity analysis is characterized by the news service server calculating the user's intimacy with SNS friends based on the user's interaction information with SNS acquaintances, deriving SNS best friendship between users and SNS best friends, and analyzing users' external propensity based on SNS best friends. Various algorithms such as the K-mean method can be applied as clustering techniques used at this time. This can be applied differently depending on the network configuration or characteristics of SNS.

4.2 Detailed Design of the Specifications

Figure 1 is a conceptual diagram that illustrates the configuration of a custom news service system. A custom news service system is a custom news service system based on SNS activity analysis and consists of custom news service servers and user terminals that provide users with SNS access records and custom news. In addition, each configuration of a custom news service system can be described as follows:

The custom news service server can receive users' SNS access records from user terminals connected through the network and collect users' SNS activity information by searching SNS sites based on SNS access records. Custom news service servers can use the collected SNS activity information to analyze users' propensity (e.g., political, economic, socio-cultural, etc.) to provide customized news to users' terminals. The user terminal can extract the user's SNS access history from the user log recorded on the terminal and provide it to the user through the screen of the user's terminal when the user receives the selected custom news based on the SNS access history from the user's news service server. In addition, the user terminal can use GPS or IP addresses to derive the current location of the user's terminal (i.e., where the user is located), identify the location that corresponds to the current location (e.g., home, work, school, shopping mall, subway, etc.), and provide customized news for the user's current location. Whether the location corresponds to the current location is home or work can be determined through the check-in records of SNS' timeline. The user can record the user's location and location through SNS check-in and record what the user is doing at the location and for what purpose he/she visited. This allows us to determine whether the location is a user's home or workplace. At this point, user terminals can include a variety of computing devices, including smartphones, tablet PCs, laptop computers, desktop computers, and PDAs.

Custom news service servers are configured to provide customized news through SNS activity analysis, including SNS Access Record Reception Part, SNS Activity Information Acquisition Part, User Propensity Analysis Part, Customized News Selection Part, and Customized News Transmission Part. When the SNS Access Record Receipt Part receives the SNS site access records from the user's terminal, the SNS Activity Information Acquisition Part can retrieve the user's SNS activity information by searching the SNS site based on the received SNS site access records. At this time, the user's SNS activity information may include information about the user's activities on the timeline, information about the user's SNS acquaintances, information about the user's postings or shared articles, and information about the pages or groups that the user displays preferences. The User Propensity Analysis Part can analyze users' tendencies based on acquired SNS activity information. Users' political, economic, or socio-cultural tendencies can be derived through internal, external, and preference analysis. Customized News Selection Part selects customized news through news searches based on user propensity analysis results and sends customized news to the user's terminals through the Customized News Transmission Part. Custom news selection can be used to rank and select news content consumed by user-like groups of users among existing news content. On the other hand, newly generated news content can be provided through issue-driven analysis to recommend news content that addresses issues appropriate to user orientation. Alternatively, the user's current location or time zone can be identified to select specifically the news that will be of interest to the user at the current location (home, workplace, travel destination, etc.) or at the current time.

The User Customized News Selection Part may include customized news selection modules, terminal location reception modules, living place identification modules, and custom news placement modules. Based on the user propensity analysis results of the User Propensity Analysis Part, the custom news selection module can select custom news by extracting news that is appropriate for users through news search. In addition, news search logs received from user terminals can be analyzed time-by-time to derive news delivery cycles and news topics, and custom news can be selected to correspond to news topics by time-by-time depending on news delivery cycles and news topics. The terminal location receiving module can receive the current location of the user's terminal using GPS of the user's terminal. The living place identification module can extract check-in information from SNS activity information and identify living places corresponding to the current location of the user's terminal based on check-in information. For example, if a physical location derived from a terminal location receiving module is derived, a conceptual location corresponding to the current location

can be identified through SNS check-in information. The SNS check-in information may record the address and purpose of the visit. This can be used to determine whether the address is home, work, business trip, or friend's house. Or, if you are at a subway station or cafe, you can judge that a user is on the move or meeting someone. Tailored news placement modules can derive characteristics from different places of life and deploy custom news based on those characteristics. For example, if a user is at work, he or she can place news at the top that contains the information needed for his or her job, or if he or she is outdoors, he or she can place news related to the weather or traffic conditions at the front. Alternatively, if you are in a cafe or at a friend's house, you can provide a story by selecting and placing news related to real-time search terms at the front or top level.

The custom news service method consists of providing customized news through SNS activity analysis and may include the stage of receiving SNS access records, the stage of obtaining SNS activity information, the stage of user propensity analysis, the stage of custom news selection, and the stage of sending custom news. In addition, each process of custom news service methods can be described as follows. When the SNS access record receiving step receives the SNS site access record from the user's terminal, it is possible to obtain the user's SNS activity information by searching the SNS site based on the received SNS site access record. At this time, the user's SNS activity information may include information about the user's activities on the timeline, information about the user's SNS acquaintances, information about the user's postings or shared articles, and information about the pages or groups that the user displays preferences. It may also include information about the user's SNS acquaintance. The user propensity analysis stage can analyze the user's propensity based on the acquired SNS activity information. Users' tendencies can derive their political, economic, or socio-cultural tendencies through internal, external, and preference analysis. The custom news selection phase can select customized news through news search based on user propensity analysis results and send custom news to the user terminal.

The user propensity analysis phase may include an internal propensity analysis phase, an external propensity analysis phase, an interest analysis phase, and a user propensity derivation phase. The internal propensity analysis stage can analyze users' internal propensity through the propensity analysis of articles posted or shared by users within SNS sites. The internal tendency of users through posts or shared articles can be analyzed by applying SNS user propensity analysis models. The SNS user propensity analysis model may be an analysis of users' propensity by analyzing SNS users' posts or shared posts in Bigdata. The user's ideas or views on socio-cultural, political, and economic issues or events can be derived through the user's post or shared article analysis, which can identify the user's political, economic, and socio-cultural tendencies. For example, a user may express a supportive position or response to news articles or events of his or her own, and a critical position, comment, or critical response to news articles of his or her own different nature. Since it is a known technology that analyzes users' postings or shared articles through Bigdata analysis, detailed explanations are omitted. The external tendency analysis stage can analyze users' external tendencies based on communication information with SNS acquaintances who have social relationships with users on SNS sites.

The external propensity analysis phase may include the calculation phase of SNS acquaintance friendship, SNS best friend development phase, SNS best friend development phase, SNS best friend relationship development phase, and external propensity development phase. The step of calculating social media acquaintance intimacy can be a step of calculating the intimacy between users and social media acquaintances based on information on interaction between users and social media acquaintances. In other words, SNS acquaintances can be derived through users' SNS profiles, but SNS acquaintances that do not communicate with users at all can exist in the profile due to the nature of SNS that transcends time and space. In addition, profile information alone makes it difficult to understand the common ground or relationship between users and SNS acquaintances, and the user's position within a vast human network. Therefore, for valid propensity analysis, it is recommended to analyze based on communication information with SNS acquaintances who have no communication at all or those who have lost communication a long time ago. To do this, it is necessary to derive information on interactions in recent years with users' SNS acquaintances. In other words, the degree of closeness can be calculated by analyzing information sharing, comments, and likability indications between users and SNS acquaintances. This step allows SNS best friends to be derived from social media acquaintances who show intimacy with users above a certain threshold. In other words, based on the degree of intimacy

derived earlier, SNS acquaintances that show intimacy above a certain threshold can be derived from SNS best friends. Here, based on SNS activity information of SNS best friends, the starting point of relationship between users and SNS best friends can be derived, and their relationship can be derived. In other words, based on SNS activity information of SNS best friends, the starting point of relationship between users and SNS best friends, i.e., the reason or common ground can be derived. For example, SNS best friends' activities information can lead to jobs, hobbies, and areas of interest of SNS acquaintances. Based on this, the starting point of the relationship between users and SNS best friends can be found (e.g., the reason for relationship formation, commonalities, etc.). In addition, best friends of SNS can be derived and relationships can be identified through their activity information. Here, a relationship can mean a relationship formed through occupation, school ties, delays, hobbies, economic activities, political activities, etc. Based on the relationship information derived earlier, the cluster analysis, which includes users' SNS best friends and SNS best friends, can identify users' SNS positions (e.g., occupational characteristics, hobbies, economic positions, cultural positions, interests, political positions, etc.), and analyze users' externalities.

The interest analysis step allows users to analyze their interests by analyzing the propensity of pages or groups in which users display preferences within SNS sites. The page may be a page operated by various organizations or organizations, and the user's preference can be determined by analyzing the activities of the organization or organizations. Furthermore, a closed group is a form in which the user directly participates and acts, which can be an important clue to the user's taste or inclination. However, it is recommended that pages or groups without activity, or pages or groups with little user participation, be weighted according to the user's activities, except in the analysis. The user orientation phase can derive users' political, economic or socio-cultural orientations based on analysis results. The results of a user's internal propensity analysis can derive a user's political orientation or position on social issues, primarily through the user's writings or shared writings. Therefore, it can give weight to news choices in political or social sectors. Since the user's external tendency is determined through the user's communication information within SNS, it is easy to identify the user's occupation, personality, or area of interest. Consequently, users' external propensity analysis results may give weight to news choices related to sports, real estate, stocks and culture and arts. The user's interest is an analysis of the tendency of pages or active groups that the user expressed favorability for, and, like external tendencies, it is easy to identify the user's occupation, personality, or interests. Consequently, the analysis results of users' interests may also add weight to their choice of news related to sports, real estate, stocks and culture and arts.

The custom news selection phase may include the custom news selection phase, the terminal location reception phase, the living place identification phase, and the custom news placement phase. Based on the results of user propensity analysis, the custom news selection stage can be selected by extracting news that fits the user through news search. In addition, news search logs received from user terminals can be analyzed time-by-time to derive news delivery cycles and news topics, and custom news can be selected to correspond to news topics by time-by-time depending on news delivery cycles and news topics. The terminal location receiving stage can receive the current location of the user's terminal using the GPS of the user's terminal. For example, the physical location of a user's terminal can be derived using GPS or IP address of the user's terminal. The living place identification stage extracts check-in information from SNS activity information and identifies living places corresponding to the current location of the user's terminal based on check-in information. The SNS check-in information may record the address and purpose of the visit. This can be used to determine whether the address is home, work, business trip, or friend's house. Or, if you are at a subway station or cafe, you can judge that a user is on the move or meeting someone. The custom news placement phase can derive characteristics from different places of life and deploy custom news based on those characteristics. For example, if a user is at work, he/she can place news front that contains the information needed for his/her job, or if he/she is out or outdoors, news related to the weather or traffic conditions can be placed front. Or, if you're in a cafe or at a friend's house, you can place news related to real-time search terms at the front to provide a story.

The user terminal for custom news services is configured to receive custom news from the server based on user propensity analysis through SNS activity analysis and may include SNS Access Record Transmission Part, Customized News Receipt Part, Terminal Position Diction Part, Living Place Acquisition Part, and

Customized News Service Part. Furthermore, a more detailed configuration of user terminals for providing customized news can be described as follows. The SNS Access Record Transmission Part can extract SNS site access records from usage logs recorded on storage media and send them to news delivery servers. Customized News Reception Part can receive customized news selected based on SNS site access records from news delivery servers. At this time, the customized news may have been selected as a result of the news service server obtaining information about users' SNS activities based on SNS site access records and analyzing users' tendencies based on them. Terminal Position Deduction Part can derive the current location of the terminal using GPS. Living Place Acquisition Part can extract check-in information from users' SNS activities received from the server and obtain living places corresponding to their current location based on check-in information. The SNS check-in information may record the address and purpose of the visit. This can be used to determine whether the address is home, work, business trip, or friend's house. Or, if you are at a subway station or cafe, you can judge that a user is on the move or meeting someone.

The method of providing customized news through user terminals is configured to provide users with customized news based on user propensity analysis through user SNS activity analysis, including SNS access record transmission phase, terminal location acquisition phase, living place acquisition phase, and custom news provision phase. In addition, the steps in the custom news service method can be described as follows. The SNS access record transmission stage can extract the SNS site access records from the use logs recorded on the user's storage media and send them to the news delivery server. The customized news receiving stage can receive customized news selected based on SNS site access records from the news provider server. At this time, the customized news may have been selected as a result of the news service server obtaining information about users' SNS activities based on SNS site access records and analyzing users' tendencies based on them. The current location of the terminal can be derived using GPS. The stage of obtaining a place of living can extract check-in information from the user's SNS activity received from the server and obtain a place of living corresponding to the current location based on the check-in information. The SNS check-in information may record the address and purpose of the visit. This can be used to determine whether the address is home, work, business trip, or friend's house. Or, if you are at a subway station or cafe, you can judge that a user is on the move or meeting someone. The custom news provision step provides the received custom news through the screen of the user's terminal, but can be placed on the screen of the terminal based on the characteristics of the living place. In other words, characteristics can be derived according to the place of living and tailored news can be arranged based on those characteristics.

5. CONCLUSIONS

This study concerns a customized news service system, more specifically a Deep Learning-based news service system based on SNS activity analysis. In addition to social analysis based on network theory, SNS activity analysis includes data-based service systems that have learned the context and patterns of users by themselves through Deep Learning. When using customized news service methods and devices based on Deep Learning-based SNS activity analysis, users can derive social, cultural, and political personalized news based on SNS activity records stored on their terminals. Rather than just analyzing graphs, densities, and directions between nodes and edges covered by social network analysis, we can Deep Learning the overall information that is logged in and active to provide news based on more personalized and advanced information. In addition, through log analysis of user terminals, news would be certainly selected according to the user's interests by time and place, so it is possible to provide news specific to the user's lifestyle.

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