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Health Data and Information Services

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Session A

Moderator: Ji Hei Kang, Dongduk Women's University

A Comparative Study of Health Scientists' Data Sharing and Reuse Behaviors

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The main purpose of this comparative study is to examine how health scientists' attitudinal, social, and resource factors affect their data sharing and reuse behaviors. The proposed research models were developed considering institutional theory and theory of planned behavior. Additionally, resource utilization measures were also combined into the research model. Using a national researcher pool, Community of Scientists' Scholar Database, the analysis included a total of 207 survey responses for the data sharing study and a total of 161 survey responses for the data reuse study. The health scientists' data sharing and reuse research models were validated by using Partial Least Squares (PLS) based Structural Equation Modeling (SEM) technique. With regards to the data sharing study, findings suggest that regulative pressure by journal publishers and the availability of data repositories were found to be significantly related to data sharing behavior. Three motivational factors, perceived career benefit, perceived career risk, and perceived effort, were also found to have a significant influence on attitude toward data sharing, which has a significant relationship with data sharing behavior. With regards to the data reuse study, analysis of the results showed that health scientists' data reuse intentions are driven by attitude toward data reuse, community norms of data reuse, disciplinary research climate, and organizational support factors. This research also found that both the perceived usefulness of data reuse and the perceived concern involved in data reuse have a significant influence on health scientists' attitude toward data reuse. This research suggested that diverse strategies need to be utilized to promote health scientists' data sharing and reuse behaviors in the contexts of health science research communities, academic institutions, and libraries.

A Treatment Engine by Predicting Next-Period Prescriptions

Bo Jin

Dalian University of Technology

Recent years have witnessed an opportunity for improving healthcare efficiency and quality by mining Electronic Medical Records (EMRs). This paper is aimed at developing a treatment engine, which learns from historical EMR data and provides a patient with nextperiod prescriptions based on disease conditions, laboratory results, and treatment records of the patient. Importantly, the engine takes consideration of both treatment records and physical examination sequences which are not only heterogeneous and temporal in nature but also often with different record frequencies and lengths. Moreover, the engine also combines static information (e.g., demographics) with the temporal sequences to provide personalized treatment prescriptions to patients. In this regard, a novel Long Short-Term Memory (LSTM) learning framework is proposed to model inter-correlations of different types of medical sequences by connections between hidden neurons. With this framework, we develop three multifaceted LSTM models: Fully Connected Heterogeneous LSTM, Partially Connected Heterogeneous LSTM, and Decomposed Heterogeneous LSTM. The experiments are conducted on two datasets: one is the public MIMIC-III ICU data, and the other comes from several Chinese hospitals. Experimental results reveal the effectiveness of the framework and the three models. The work is deemed important and meaningful for both academia and practitioners in the realm of medical treatment and prediction, as well as in other fields of applications where intelligent decision support becomes pervasive.

Medical Services in Japan's Public Libraries during the Last Quarter Century

Hikaru Nakano

Senri & Osaka International Schools of Kwanse GaKuin

In Japan, a concentrated effort to provide health and medical information in public libraries has become more active, and the movement has spread out nationwide. The Regional Comprehensive Care System Concept presented by the Ministry of Health, Labor and Welfare aims to build a comprehensive support and service provision system in the community so that people can continue to live independently in areas where they are familiar for as long as possible. Reliable information enables patients and their families to make informed decisions and live a more peaceful life while remaining within their chosen community. It is critical to provide citizens with access to current health care information. For public libraries that deal with a wide range of subjects, the healthcare field is not particularly new in the sense that it has always been a part of a collection. Public libraries have traditionally treated the health care field in the same way as other fields, so for example, titles will be kept beyond 5 years and may not contain current information. On the other hand, there are active libraries that have begun outreach services, which deliver resources to hospitals, nursing homes, welfare facilities, etc. for citizens who find it difficult to visit the library. These activities are an outcome from the report on problem-solving practice of public libraries published in 2005 by the advisory group appointed by the government. Thus, this presentation will cover trends and issues in the past quarter century concerning the provision of healthcare information and outreach services in Japanese public libraries.

Utilizing Electronic Medical Records in Psychiatric Clinical Research

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Current standard evaluation process for psychiatric disorders takes at least several hours by well-trained clinical professionals. Electronic medical records (EMR) provide a unique opportunity to conduct large-scale clinical investigations in psychiatry. Previous studies utilize EMR data to define subjects' clinical diagnoses, treatment response and clinical subtype with different clinical outcomes. In addition to comprehensive EMR system, department of psychiatry in Samsung medical center (SMC) has a standardized psychological evaluation process, which confirms subject's formal diagnoses and symptom severity. Results of the psychological evaluation process are stored in standardized methods, which enables clinical researchers to download massive data easily. Using the data, we observed transdiagnostic features exist in various psychiatric disease. In addition, we were able to integrate the test results with other laboratory test results to determine biomarkers of psychological symptoms. If we are able to integrate clinical notes to the currently available cross-sectional data, we could do various types of clinical investigations to explore neurobiological underpinning of psychiatric illnesses. Close collaboration between clinical researchers and bio-informatics specialists are warranted.

Understanding the User's Perspectives through Mining Health-Related Questions on Social Q&A Platforms

Yue Hua Zhao
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Social question and answer (Q&A) platforms offer a new way for identifying information needs of people with certain diseases. Taking Quora as an example, we examine which health topics are of interest to autistic people and how these topics evolve over time. Experimental results reveal increasingly heavy and diverse attention to the condition, from diagnosis and treatment of autism itself to extended issues like social challenges, parenting, and education issues. We find that users tend to post clinical concerns about autism on Quora although traditionally such social Q&A platforms encourage more social and awareness-level questions. New concerns have appeared recently about autism's relations to other diseases like attention deficit hyperactivity disorder (ADHD) and obsessive–compulsive disorder (OCD). This study is beneficial for tracking and responding to autistic patients' and caregivers' information needs.

Activities of Dementia-Related Services of Japanese Public Libraries in Super-Aging Era

Yoko Hirose NAGAO
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This presentation will cover some activities of some Japanese public libraries which is regarded as "flagship libraries" focusing on dementia-related services. Japan is facing the super-aging society ahead of the world. It is estimated that the number of people with dementia is about 4.26 million; in other words, 1 in 7 people have dementia and it's predicted that the number will be 1 in 5 people by 2025. This background knowledge has led to various actions in the Japanese library world. In 2017, the Association for Age-Friendly Libraries released the first edition of "Guidelines for Dementia Friendly Library". Yamato City, in Kanagawa prefecture, took action and prepared a guideline for citizens, "Prepare for the age of 10,000 people with dementia". Based on this guide, the Yamato City Library installed a section called "Healthy City Library" which provides not only current health-care information but also consultation services on health. Also, the Tottori Prefectural Library supported the health and longevity of the citizens and is implementing a model project called "Orange Network Tottori Model", that is actively cooperating with government agencies as well as elderly-community facilities. The library hosts a range of activities to share current health information such as a read-aloud class, a dementia-themed forum, and a dementia supporter training, etc. In the Setouchi City Library, a mobile library visits welfare facilities and conduct events using reminiscence therapy in addition to book lending services. Through sharing information about many of Japan's library initiatives, hopefully libraries can better support the super aging population.

A Constrained Transformer Network for ECG Signal Processing and Heart Disease Diagnosis

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Dalian University

The electrocardiogram (ECG) signal reflects cardiac conditions and it is important to explore useful information from the ECG signals to diagnose heart disease. The high-precision diagnostic identification of ECG can save clinicians and cardiologists a considerable amount of time, while helping in reducing the possibility of misdiagnosis at the same time. However, existing approaches are found unsatisfactory in terms of the recognition accuracy and usually require a manually feature selection preprocess that is labor intensive. In this work, we propose an end-to-end deep learning framework with an improved Transformer network, which also holds the strength of Convolution Neural Networks(CNNs) in feature extraction, for addressing the ECG sequence categorizing problem. Specifically, given a window with a duration of 6 seconds, the ECG data is split into different segments and then sequentially fed to a CNN for feature extraction. Moreover, link constraints are designed to enhance the embedding during the learning process. To evaluate the proposed method, we conducted extensive experiments based on real-world data. Our model outperformed state-of-the-art methods and achieve a F1 score of 78.6%. We hope that our model can be applied in clinical diagnosis and help cardiologists conduct effective diagnosis quickly in the case of emergency.

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Session B

Moderator: Jeong-Mee Lee, Seoul Women's University

The Effects of User Competitions on Sustained Use of M-Health Applications

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Smartphone applications have drawn attention as a potential intervention to promote physical fitness, but they face a great challenge due to low retention. In this study, we examine whether participation in user contests is associated with sustained use of a fitness app even after the contest ends. Using data from 8,204 users of a fitness app that counts the daily walking steps, we identified user retention levels with two unsupervised clustering methods: dynamic time warping (DTW) and k-means clustering. With the clustering results, we employed propensity score matching to examine the effects of contest participation and retention levels during the contest on sustained use. Our results show that contests have significant effects on post-contest customer retention. However, the effect is significant only when users are highly compliant during the contest, highlighting that it is important to design contests that encourages users to be more compliant during the contests.

A Model for Customized Mobile Curation Services in Academic Libraries

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Advances in the 4th industrial revolution and ICT (Information and Communications Technologies) have dramatically increased the amount of information, which in turn have aggravated information problems. To cope with the problem of information overflow, the present study focused on information curation services to efficiently meet user needs by helping them make better choices rather than providing them with more choices. Above all, to ensure access to such services, the study aimed to develop a mobile curation service application for academic library users. To conduct the study, the researchers analyzed user needs, and developed prototypes based on previous studies, and lastly, conducted usability testing to investigate user satisfaction with the mobile curation service. The usability testing indicated that users were satisfied with the four core services, including Curation Services recommending user-tailored information, Live Chat improving communication between providers and users, and My Page and My Log enabling personalized information services. The present study contributes to extending the literature that addresses information problems, and furthermore, provides practical insights into quality academic library services by suggesting mobile curation services.

Effects of Self-Stigma on Health Information Behavior of Dementia Caregivers

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As society ages, the prevalence of dementia is increasing. In order to manage dementia, active health information behaviors are needed, and due to the clinical nature of dementia, this role will be passed on to dementia caregivers. However, dementia caregivers tend to be affected as much as they spend a lot of time on dementia patients, a typical example of self-stigma. Because patients with high levels of self-stigma are often adversely affected by health information behavior, research on health information behavior of dementia caregivers is necessary, but it is not actively conducted. Thus, this study studied the effects of self-stigma levels of dementia caregivers on health information behavior. According to the analysis, self-stigma level had a significant effect on health information behavior, but only a minor effect.

Information Seeking Behavior Using Mobile Applications
in the Stages of Change of Smoking-Cessation

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The study aimed at investigating the use and effects of health apps as aids and as information sources to health behavior change. For this purpose, Transtheoretical Model or Stages of Change was employed as a theoretical framework. The researchers interviewed 16 college students satisfying the action and maintenance stages of smoking cessation for seven months, during which participants were required to use smoking related health apps. The findings of the study indicated that the information behavior of each stage in using health apps mostly corresponded to the behavior of the users observed in other information sources. Participants were mostly encouraged to maintain change through obtaining visualized information of smoking cessation such as the duration of abstinence, improvement in health status. On the other hand, several were negative about the necessity of using apps after a certain period and expressed concerns about the quality of the information. Nevertheless, health apps influenced various processes of change including the reinforcement of positive self-statement, increase of willpower and self-efficacy, development of helping relationships through its community function. However, there was lack of information supporting the processes related to environmental reevaluation, social liberation, and dramatic relief. The study provides practical insights to designing the contents of smoking cessation apps to better reflect the information needs of the attempters.

Development of a Real-Time SNS Suicidality Monitoring Tower

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This study is aimed at developing real-time SNS suicide monitoring center. Nowadays, suicide is one of the most serious worldwide problems. In Korea, several institutions and the Korean government have attempted to detect suicide signals and take preventive action. However, they did not use Social Network Service (SNS) to track suicidal people. Therefore, the study focused on detecting suicide-related posts in 'Twitter' for providing meaningful information to them. The research planned to make machine-learning based models to detect suicide signals and use 'django' to make the Web framework of monitoring center with not only past, but also real-time data. The study contributes to provide the meaningful information to prevent suicide.

Consumer Health Literacy, Health Information Behavior, and Cultural Characteristics of Immigrants

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Health disparity is one of the biggest issues of inequity between minorities and native people in South Korea. The present study aims to measure the health literacy abilities of immigrants and to examine the associations between those abilities and their health information behavior, in other words, information-seeking, evaluation and use. Furthermore, the study attempts to identify the cultural characteristics that affect immigrants' health information behavior, and the barriers that influence their health information poverty. The study will assess the immigrants' health literacy skills, and conduct surveys with them (N= 300) approximately for 20 minutes to investigate their health information behavior in the two immigrant concentration districts. As a follow-up, the researcher will conduct semi-structured intensive interviews with the study participants approximately for 30 minutes. The present study will contribute to the extension of the literature by examining the relationship between consumer health literacy and health information behavior and discussing health information behavior in diverse cultural contexts. The understanding of dynamics between health information behavior and culture of immigrants can provide insights on developing policies that mitigate the health inequity or disparity that immigrants experience, which will also contribute to the sound settlement of multiculturalism, which is essential for the formation of communities for immigrants and indigenous peoples to coexist.

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Session C

The Effects of Library Anxiety on Health Information Seeking Behaviors of the 50+

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As life expectancy increases in modern society, the need to provide health information for the elderly is increasing. However, the elderly are less likely to use public libraries due to vague fears and anxiety in terms of library use and service use. Public libraries are regional information centers and should provide health information services by identifying elderly library anxiety factors. Therefore, the purpose of this study is to measure library anxiety factors that have an important effect on the process of using health information service by measuring library anxiety for the elderly. For this purpose, this study aims to survey the elderly with the theoretical concept of library anxiety and the Korean Library Anxiety Scale(K-LAS) through literature research.

Exploring PubMed through Theory of Planned Behavior:
The Cases of Nursing Students

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Literature review is one of the important parts to successfully write dissertations or theses for graduate students. Especially, for Nursing graduate students, PubMed is one of the essential online medical databases they could search related medical articles supporting their literature review. PubMed, developed by National Library of Medicine(NLM) of National Institutes of Health(NIH), comprises more than 30 million citations for biomedical literature from MEDLINE, life science journals, and online books. However, Nursing graduate students in the first or second semester are not familiar with PubMed. Therefore, the purpose of this study is to explore use of PubMed. First, this study investigates types of motivation for using PubMed. Secondly, based on theory of planned behavior, we analyze how attitude, social norm, and perceived behavioral control regarding using of PubMed influence people's using behavior of PubMed. Also, we will examine how the social norms to PubMed is affected to the use behavior of Nursing graduate students. For this, this study sets the attitudes, social norms, and perceived behavioral control regarding PubMed usage as independent variables, and the frequency of PubMed usage as a dependent variable.

Factors Affecting Adults' Health Literacy:
A Comparison between Elderly Group and Other Age Groups

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Purposes of this study are to investigate the factors affecting the health literacy by age groups and to suggest age-appropriate method to improve health literacy. Andersen's behavioral model is used as the theoretical framework. The following variables were selected based on Andersen's health behavior model: predisposing factors, enabling factors, and need factors. A survey will be conducted on people who are over 20 years old. The collected data will be analyzed by SPSS using frequency analysis, validity analysis, reliability analysis, regression analysis, and ANOVA.

The Impacts of Social Media Influencers and Communities
on Health Behaviors of Social Media Users

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Social media had been a new field of sharing knowledges instead of the traditional method such as experts shown on television or news media. In the Republic of Korea, for instance, influencers post the negative effect of vaccination on the social media and social media communities shared this information and thus the anti-vaccine movement was collectively formed. In accordance of preceding researches on social media influencers and communities on the health behaviors of social media users and the *information acquiring and sharing* and *collective action* theories, the research purposes are to verify the effects of social media influencers in health behavior of the users and community and to define the impacts of social media community as an agent of collective action on uninvestigated health information. In this research, the health-related posts generated by the influencers and shared by the social media users will be collected. And the survey to social media users will be conducted. The research data will draw the relationship of the users' behavior in community and the collective action on the social media. As a conclusion, this research is expected to prove the research hypothesis; the social media influencers and communities will impact the health behaviors of individuals as the agents of the collective action.

A Study on the User Satisfaction of Mobile Applications in an Academic Library

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Academic libraries provide users with various and convenient ways to use library services through mobile application services dedicated to academic libraries. While the growing number of smartphone users is also expanding mobile services in libraries, it is necessary to find out if there is a level of service that meets the needs of users. There are also not many studies on post-acceptance in this regard, even though it has been a long time since the launch of the academic library's mobile application services. After accepting mobile applications, we want to apply a post-acceptance model to users to identify the perceived usefulness, expected matches, post-use satisfaction and ongoing usage impact of mobile applications. This study will conduct an online survey of 120 students who have experience using mobile applications provided by academic libraries, and data analysis will analyze the relationship between variables by analyzing structural equation models. I want to find out user satisfaction level and suggest direction for improvement and activation of an academic library applications.

The Effects of Information Poverty of North Korean Refugees on Adjustment in South Korea

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Currently, more than 30,000 North Korean refugees live in South Korea. Korean government is constantly helping North Korean refugees settle down as members of Korean society. However, the issue of North Korean refugees' social maladjustment has been raised steadily. This study is intended to analyze the social maladjustment of North Korean refugees from the perspective of information science. Therefore, this study looked into information poverty, a concept proposed by Elfreda Chatman, of North Korean refugees and the effects on adjustment to Korean society. In order to conduct the research, the information poverty of North Korean refugees was identified based on four concepts of information poverty theory. And their economic and social adjustment, cultural adjustment, and psychological adjustment were investigated to identify the impact of their information poverty on adjustment in South Korea.

How to Reflect on Japanese Military "Comfort Women" Problem?:
With the View of Ecofeminism

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It is well known that many Asian women were exploited as Japanese military sexual slavery, "comfort women" in the world war 2. But an official apology has not been made yet. How do we reflect on this problem? In this study I want to do through ecofeminism and ecofeminist, the highest Priest of Donghak Choi Si-hyung's education and communication. Ecofeminist theory asserts that many women and nature are suffered under patriarchal, hierarchical, militaristic, and industrial culture system. In order to ask Japanese soldiers' sacrifice, many illusions were made from patriarchal and hierarchical ideology in Japan. So Japanese military soldiers did assault and rape many women and destroy nature without any guilty conscience. But Choi Si-hyung taught and wrote in *Naesudomun, Naechik* that we, all living creature should respect for and love each other, because we have God, the *hanwool* internally.

Collaborative Information Seeking in Korean Online Community of Low-Carb, High-Fat Diet (LCHF): Roles of Collaborative Information Seeking According to Structural Network Position.

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The purpose of this study is to find the relationship between the network structural position and the collaborative information seeking in the online community. Participants in the LCHF online community have a strong belief in the LCHF method. And participants share, evaluate, and coordinate information about LCHF methods, recipes, and opinions through posts and comments within the online community. This behavior is characterized by collaborative information seeking through information sharing and collaborative understanding with others. Prekop' model of collaborative information seeking suggested a role (Manager, Administrator, Indexer/Abstractor, Instigator, Verifier, Gatherer, Referrer) and patterns (Information seeking by recommendation, Direct questioning, Advertising information paths) in the context of collaborative information seeking. And these roles and patterns are expected to be explained by the network structural position (degree, closeness, betweenness centrality) in the network composed by the information exchange of participants. This study will examine the characteristics of participants' networks using content analysis and social network analysis methods based on posts and comments of LCHF online community in Korea, and analyze the roles and activities of collaborative information seeking of participants according to the structural position in the network.

Consumer Health Information Behavior of Immigrants in South Korea

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The study explores immigrants' health information behavior and their perception of their health literacy skills in South Korea. As a follow-up of a quantitative study, the researcher will conduct semi-structured intensive interviews with the study participants approximately for 30 minutes. Twenty interviewees will be selected from survey respondents based on ethnicity, gender, levels of education, and age. The understanding of dynamics between health information behavior and culture of immigrants can provide insights on developing policies that mitigate the health inequity or disparity that immigrants experience.

The Effects of Innovation Resistance of Users on Intention to Use Mobile Health Applications

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The study aimed at identifying the causes of the high level of health application but the low level of use. In other words, the effects of user's innovation resistance (use barrier, value barrier, risk barrier, traditional barrier, image barrier, etc.) were examined. For this study, 378 valid responses were analyzed by surveying college students familiar with health applications. As a result, the higher the level of image barrier of the user, the higher the degree of innovation resistance for the health application, and the higher the degree of innovation resistance, the lower the degree of continuous use intention and recommendation will. In addition, the use of health application users is less than one month after use, but once habitual, it is used for a long time more than one year. In addition, the level of use barrier, value barrier and traditional barrier did not have a significant effect on the degree of innovation resistance, suggesting that users familiar with smartphones have low resistance to health applications. The study deepens the academic debate about the acceptance and continuous use of new technologies by explaining the use of health applications in the theory of innovation resistance. The results of this study provide the practical implication that lowering the image barriers rather than the usage barriers, value barriers and traditional barriers will be effective for the acceptance and continuous use of health applications.

A Study on the Continuous Use of Mobile Applications in Hospital Information Seeking

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As mobile applications are widely used for information seeking, people have used them to find hospital information. The purpose of the present study was to identify factors influencing users' continuous use of the hospital information seeking applications, and to explain this employing the Post Acceptance Model. The study collected 125 data by surveying the laypeople and analyzed the data by Structural Equation Model. The findings indicated that the expectation and satisfaction of hospital information seeking of users had significant effects on the user's continuous use intention, but the perceived usefulness did not have significant effects on the intention of continuous use.

Personalized Health Information Services Employing Monitoring-Blunting Coping Styles

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In providing health information, it is very important to consider the characteristics of the individual. This is because user information needs vary depending on individual characteristics. In particular, health information for patients should carefully reflect these characteristics. According to Miller's Monitoring and Blunting (M&B) theory, when faced with a threatening situation, individuals cope either by seeking out information (monitoring) or by distracting themselves (blunting). Some people want very detailed information, while others prefer scant information. Miller Behavioral Style Scale (MBSS) is used to measure individual coping styles. MBSS consists of four short stress-inducing scenarios. There are four types of coping styles: high monitors, low monitors, high blunters, and low blunters. This study is designed to assess factors affect emotional satisfaction with health information services that take into account personal coping styles. Participants first respond to MBSS. And then participants respond to a satisfaction survey of the health information provided. At this time, the health information provided to the participant has a different format according to the coping style. After analyzing the results, we propose a personalized health information service that reflects factors that affect service satisfaction.

A Study on the Effects of Multilingual Customized Services on User Satisfaction of Chinese Students in Academic Libraries

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The number of international students who choose to study abroad in Korea is increasing every year, and accordingly, research on international students is also increasing. Studies on the stresses of studying abroad have found that international students are most stressed in their studies, which comes from cultural and language differences. An academic library is one of the largest sources of information for international students to obtain learning resources, which have great impacts on their studies. However, most academic libraries currently do not provide sufficient multilingual support except English, which makes it difficult for international students whose mother language is not English to acquire academic resources. Accordingly, the present study selected service factors that can be provided in multiple languages among academic library services as customized ones for international students, and examined the effect on the satisfaction of academic library services. Furthermore, the purpose of this study was to find out the effects of the customized services by comparing international students' satisfaction with an academic library- one that provides excellent customized services for international students with the other that does not. The findings of the study suggest practical insights on improving customized services for international students.

Investigating Depression-Related Contents through Text Mining Tweets in Korea

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Nowadays, depression is one of the most popular worldwide metal illness. Likewise, many Koreans are suffering from depression. Although they get depression, they don't want to get help from psychiatry specialists because of social stigma. However, they show a tendency to express their status, emotions and thoughts in Social Network Service (SNS). They want to communicate with other users in SNS for sympathy, support, information and etc. The study is aimed at investigating depression through collecting depression-related posts in Twitter, which is one of the most used SNS platforms in Korea. The study collected data which have the term 'Depression' from April, 2018 to March, 2019. Total 100,789 tweets were collected and were written by 35,525 users. The research analyzed the data via 'Latent Dirichlet Allocation (LDA) Topic modelling' and 'word2vec', which are used mostly for text analysis. From the results of two analysis methods, the study explored the discussed topics and keywords about depression among SNS users. The study can provide deeper insights about depression to researchers.

Adolescents' Information Seeking Behavior for Gender Identity in a Community-Driven Knowledge Site

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This study attempted to observe their information search behavior based on questions and answers about adolescents' gender identity in the knowledge retrieval community. To this end, analyzed to answers from Naver Knowledge-iN a representative knowledge search community in Korea. The data to be analyzed are total of 358 data sets consisting of adoption and non-adopted answers from January 2016 to December 2018. As a result, adolescents with concerns about gender identity demanded information about definition or confusion about gender identity. In the responses adopted by the users, the factors that gave empathy and positive feelings were higher than those that were not adopted, whereas the negative responses were higher in the unaccepted answers. This study is meaningful in that it analyzes the information needs and information search behaviors of adolescents with no established gender identity and confirms cognitive and emotional models for information evaluation. Also, this study proposes practical implications for effective information services on gender identity that social media should provide to young people.

The Influences of Cognitive Authority of Online Information Sources on Information Quality Evaluation

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The purpose of the present study is to examine the perception of the cognitive authority of online information sources used by college students to carry out their academic tasks, and to determine whether such perceptions affect the quality assessment of information sources, such as webpages, e-journals, and Wikipedia. Specifically, we measured how cognitive authority, which were formed by the author, the surface, and the content of an information source influenced its accuracy, usefulness, completeness, and expertise. Findings indicated that all the characteristics that formed the cognitive authority of an information source had significant impacts on its accuracy, usefulness, completeness, and expertise. The study suggests academic implications that confirm the associations between cognitive authority and credibility of information in the context of online information sources. Furthermore, the study provides practical implications that system developers or operators of information sources need to consider diverse factors that affect their cognitive authority to promote users' trust on the information that they deliver.

A Study on the Motivation and User Satisfaction of Medical Students Using Academic Search Engines

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The study aimed to investigate the motivation and user satisfaction of medical school graduate students using specific academic information sites, and examines the effect of usage motivation factors on user satisfaction. This study was conducted from September 10 to 21, 2018 by a large medical school graduate student in Seoul, and analyzed 135 valid responses. According to the analysis, the degree of reliability and interactivity of PubMed is higher than that of Google Scholar in medical school graduate students' use of academic information sites. It was found to have a significant effect on user satisfaction of academic information sites. In particular, convenience has the greatest influence on users' choice of academic information sites. The results of the study are of theoretical implications in that the discussion of academic information services through web sites is explained in terms of use and satisfaction in the context of medical information. On the other hand, specific research results provide practical implications for improving the services of medical-related academic search engines.

Hospital Readmission for Heart Disease Patients:
A Prediction Model Based on Deep Learning Methods

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Chronic disease is a life-threatening disease that is high in mortality and incurable. It usually requires repeated hospitalization during treatment, which consumes large amount of medical resources and negatively impact the healthcare system. Predicting the readmission rate can alleviate the financial and medical consequences. Most related studies select patients' structural features (such as demographic features or administrative features) or textual features for modeling analysis, which offer an incomplete picture of the patients. Based on structured data (including demographic data, clinical data, administrative data) and medical record text, this paper uses deep learning methods to construct an optimal model for hospital readmission prediction. The model was tested on a dataset of 2500 heart disease patients' 30-day readmission. The results show that the deep learning model performed much better than the Naïve Bayes model and the Support Vector Machine model when only structured data or the text is used. After combining structured data and the text, the deep learning model had the best performance, and the F1-score increased by 13.1% and 1.3%, respectively, compared to the model using only structured data or the text. It indicates that the combination of structured data and the text contributes significantly to hospital readmission prediction.

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