

A Survey Online self-diagnosis, drug and food recommendation system based on user symptoms

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Abstract-Throughout the evolution of the Internet and social networks, forums and online platforms have a vital role in sharing information, along with the creation and engagement of virtual communities. Such websites represent great resources, and they are the first step in the adoption of e-health services. When the persons are ill, many of them use search engines for self-diagnosis and gather possible treatment ideas before asking for a doctor's opinion. This takes a lot of time because the information is scattered across various forums and websites. In this project is presented an application that aims to provide an online self-diagnosis and drug recommendation tool and online delivery of drugs that are required and this project also helps the users in curing its disease by giving the list of fruits and herbs that the user should consume in order to get rid of its disease. Thus, the platform automates the search process, and provides the user with the most relevant information, eliminating the need for manual data interpretation. The results are ranked according to the confidence score obtained after the execution of the fuzzy search algorithm. The platform provides medical advice and fruits to recover, through online. Thus, it is intended for informational purposes only. The developed platform is not a substitute for professional medical advice, diagnosis, or treatment. Another feature of the platform is that it enables users to identify hospitals and clinics around them, so that they can receive professional healthcare service.

Keywords- E-health services, self-diagnosis, medical, healthcare, algorithm, forums.

1. INTRODUCTION

Throughout the evolution of the internet and social networks, forums and online platforms had a vital role in sharing information and creating engaging communities. These websites represent great resources, and they are the first step in the adoption of e-health services. People use forums so that they can freely ask questions about their health conditions and talk about possible treatments with

other users having similar experiences [1, 2]. Modern technology allows us to collect the information found on these platforms. This valuable information can be then used to create smart applications such as self-diagnosis systems, medicine recommender systems, e-Doctor websites, cloud-assisted drug recommendation services, and many others. Building a self-diagnosis system is a complicated task, and one should know that there are various challenges to overcome. One such problem is the accuracy of the system. Accurate diagnosis of a disease is a complicated process that must consider many factors. There were many attempts to build such a system. However, majority of them failed to be deployed for practical use. There are many approaches related to the idea of a self-diagnosis system. Some methods have the goal to altogether remove the intervention of the medical expert from the decision-making process, while others are considered support systems and only speed up the process by offering a valuable interpretation of the data for the human expert to analyse. In this paper, we propose to define the model of a web application for self-diagnosis and drug recommendation, which is based mainly on healthcare keywords.

This comes as an answer to the lack of medicine recommendation systems in online self-diagnosis applications. This system also allows the user to place order which will add the items to the user's cart and make payment for the same. The system also includes a module in which the user can search for the hospitals depending on the name of the disease that user enters. Thus, this system helps to get food products best suited for user health to a great extent. System can recommend some product to the user. A medicine delivery system is a solution designed specifically for users who want to order pharmacy products online and get them delivered to their home. A bit more details an online medicine delivery system is an online based web application that operates over the Internet and sends orders to customers through credit cards, shipping companies, or pay on

delivery systems. The problem is that doctors in our country provide handwritten prescriptions where it is really very hard to read them therefore sometimes wrong medicines are delivered to customers. This website is not user friendly and fast and it has been developed using normal word press. Customers have to wait for 4 - 24 hours to get their products.

This system also allows the user to place order which will add the items to the user's cart and make payment for the same. The system also includes a module in which the user can search for the hospitals depending on the name of the disease that it enters. Thus, this system helps to cure the user's disease to a great extent. System can recommend some product to the user. If different user buys other product, then this product should recommend to another active user.

II. LITERATURE REVIEW

[1] Luo, Gang & Thomas, Selena & Tang, Chunqiang. (2010). Automatic Home Medical Product Recommendation. *Journal of medical systems*. 36. 383-98. 10.1007/s10916-010-9483-2. Web-based personal health records (PHRs) are being widely deployed. To improve PHR's capability and usability, we proposed the concept of intelligent PHR (iPHR). In this paper, we use automatic home medical product recommendation as a concrete application to demonstrate the benefits of introducing intelligence into PHRs. In this new application domain, we develop several techniques to address the emerging challenges. Our approach uses treatment knowledge and nursing knowledge, and extends the language modeling method to (1) construct a topic-selection input interface for recommending home medical products, (2) produce a global ranking of Web pages retrieved by multiple queries, and (3) provide diverse search results. We demonstrate the effectiveness of our techniques using USMLE medical exam cases.

[2] Marin, Iuliana & Goga, Nicolae & Stanciu, Razvan-Constantin. (2019). Web application for self-diagnosis and drug recommendation based on user symptoms. *The Journal of Scientific and Engineering Research. Journal of Advances in Technology and Engineering Research*. 62-71. 10.20474/jater-5.2.1. Throughout the evolution of the Internet and social networks, forums and online platforms have a vital role in sharing information, along with the creation and engagement of virtual communities. Such websites represent great resources, and they are the first step in the adoption of e-health services. When the persons are ill, many of them use search engines for self-diagnosis and gather possible treatment

ideas before asking for a doctor's opinion. This takes a lot of time because the information is scattered across various forums and websites. In this paper is presented an application that aims to provide an online self-diagnosis and drug recommendation tool based on natural language processing of the symptoms described by the user. Over 2,200 medicines are stored in the database, each having a set of keywords according to their usage. Thus, the platform automates the search process, and provides the user with the most relevant information, eliminating the need for manual data interpretation. The results are ranked according to the confidence score obtained after the execution of the fuzzy search algorithm. The platform does not provide medical advice.

[3] Forde, Ciaran & Decker, Eric. (2022). The Importance of Food Processing and Eating Behavior in Promoting Healthy and Sustainable Diets. *Annual Review of Nutrition*. 42. 10.1146/annurev-nutr-062220-030123. Numerous association studies and findings from a controlled feeding trial have led to the suggestion that "processed" foods are bad for health. Processing technologies and food formulation are essential for food preservation and provide access to safe, nutritious, affordable, appealing and sustainable foods for millions globally. However, food processing at any level can also cause negative health consequences that result from thermal destruction of vitamins; formation of toxins such as acrylamide; or excessive intakes of salt, sugar, and fat.

[4] Zishan, Md & Mohamed, Mohamad A & Hossain, Chowdhury & Ahasan, Rabiul & Sharun, Siti. (2022). Design and Deployment of E-Health System Using Machine Learning in the Perspective of Developing Countries. *International Journal of Ambient Computing and Intelligence*. 13. 1-20. 10.4018/IJACI.293186. Machine learning is tightening its grasp on many sectors of modern life and medical sector is not an exception. In developing countries like Bangladesh, disease classification process mostly remains manual, time consuming and sometimes erroneous.

[5] Hickey, C & Cliver, S & Goldenberg, R & Kohatsu, J & Hoffman, Howard. (1993). Prenatal weight gain, term birth weight, and fetal growth retardation among high-risk multiparous black and white women. *Obstetrics and gynecology*. 81. 529-35. To examine the association of prenatal weight gain below, within, and above the Institute of Medicine guidelines with birth weight and fetal growth restriction (FGR) among low-income, high-risk black and white women. Eight hundred three black and 365 white

women were grouped by pregravid body mass index (BMI): low (below 19.8), normal (19.8-26), high (above 26-29), and very high (above 29). The impact of maternal weight gain on birth weight and race-specific FGR was determined while controlling for sociodemographic and reproductive variables and for time between last weight observation and delivery. One-third of both black and white women failed to achieve the Institute of Medicine minimum recommended gain for pregravid BMI.

[6] Putri, Ismira & Indra, Rani & Lita, Lita. (2022). Description of the Factors Behind the Choice Of Alternative Medicine In Breast Cancer Patient. JURNAL KESEHATAN SAMODRA ILMU. 13. 10.55426/jksi. V13i1.192. Introduction: Breast cancer is the number one cancer in Indonesia and number two in the world. One of the factors that influence the cancer mortality rate is the low number of visits by cancer patients to medical experts. Patients prefer alternative treatments that have not been proven that can have an impact on patient survival. Purpose: This study aimed to determine the factors behind the choice of alternative medicine in breast cancer patients. Methods: Descriptive research was conducted on 30 breast cancer patients in one of the government hospitals in the city of Pekanbaru taken by accidental sampling technique. data collection using a questionnaire and analyzed univariately using a frequency distribution table. Results: The results of the study for predisposing factors, found 63.3% of respondents aged > 46 years, good knowledge (100%), have a positive attitude (63.3%), high school education level (63.3%), and work status is working (56.7%). for enabling factors, 70% of respondents have easy access to health services and low economic status (86.7%). For driving factors, information related to cancer treatment was obtained from family/friends/neighbours (96.7%). Conclusion & Suggestion: It is hoped that health workers will be more aggressive in providing education about breast cancer treatment, and the public is expected to immediately check with health workers if they feel that there is something unusual in their breasts.

[7] Wan, Tian & Hong, Kun-Da & Lu, Si-Yu. (2022). Exercise Prescription Intervention Rehabilitation Suggestions for Fatty Liver Patients. Evidence-Based Complementary and Alternative Medicine. 2022. 1-5. 10.1155/2022/2506327. In this study, the exercise prescription intervention rehabilitation suggestions for fatty liver patients were summarized as follows: first, basic exercises (brisk walking and jogging.), sports (swimming, badminton, and cycling), traditional Chinese medicine exercises (Taichi boxing and eight-section

brocade), the aim of which is to improve overall physical strength and endurance of the body; second, exercise intensity, duration, and frequency; third, exercise precautions; and fourth, exercise prescription selection and suggestion.

[8] This chapter focuses on health care applications of a person. The paper begins with a brief history of health applications and discusses some of the models and the motivation behind the applications. Using DEA to develop quality frontiers in health services is offered as a new and promising direction. The paper concludes with an eight-step application procedure and list of Do's and Don'ts when applying DEA to health services. Chilingierian, Jon & Sherman, (2004). Health Care Applications. 10.1007/1-4020-7798-x_17. This chapter focuses on health care applications of DEA. The paper begins with a brief history of health applications and discusses some of the models and the motivation behind the applications. Using DEA to develop quality frontiers in health services is offered as a new and promising direction. The paper concludes with an eight-step application procedure and list of Do's and Don'ts when applying DEA to health services.

[9] Jasim, Mahdi & Hamid, Ahmed. (2022). Food recommendation system based on nutritional needs of human beings and user preferences. Nowadays the food types became so diverse and complicated, so human needs+ professional assistance to make his best choices especially after foods became global parameter. Food Recommendation System is a smart system that provides the best suggestions to the beneficiaries to know the best choices to their needs. Moreover, the human activities and lifestyle are affected by another types of dietaries in other foods. There is need for everybody to know what the nutrition is he/she needs. So, this research responding to these needs. The goal of the proposed system is to propose a system that provides recommendations for foods that are rich in nutritional components that people need in their daily lives based on computational model and expert preferences.

[10] Thongsri, Nattaporn & Warintarawej, Pattaraporn & Chotkaew, Santi & Saetang, Wanida. (2022). Implementation of a personalized food recommendation system based on collaborative filtering and knapsack method. International Journal of Electrical and Computer Engineering (IJECE). Food recommendation system is one of the most interesting recommendation problems since it provides data for decision-making to users on selection of foods that meets individual preference of each user. Personalized recommender system has

been used to recommend foods or menus to respond to requirements and restrictions of each user in a better way. This research study aimed to develop a personalized healthy food recommendation system based on collaborative filtering and knapsack method. Assessment results found that users were satisfied with the personalized healthy food recommendation system based on collaborative filtering and knapsack problem algorithm which included ability of operating system, screen design, and efficiency of operating system. The average satisfaction score overall was 4.20 implying that users had an excellent level of satisfaction.

[11] In this research, a novel food recommendation system is presented for recommending a proper calorie daily food for an overweighted person to gain a healthy body status by using his or her Body Mass Index (BMI), Basal Metabolic Rate (BMR), k-Nearest Neighbors (k-NN) algorithm, and a back-propagation neural network (BPNN). The system estimates the overweight status of a person by using the BMI value. By using the BMR value, the system calculates the Daily Needed Food calories (DNC) of a person. The k-NN algorithm selects a proper calorie daily food set from the food dataset by using the saturated value of the DNC as its test object. The system predicts the days required for a person to gain a healthy BMI status with the recommended food by using overweight and saturated DNC values. Finally, the system evaluates its user's satisfaction level based on the BPNN. The presented food recommendation system could be an effective way of propagating healthy weight awareness among common people.

[12] Bundasak, Supaporn & Yoksuriyan, Prasopchok & Kuntawee, Patipan & Kotama, Rahat. (2021). Food recommendation system for the elderly. 18. 152-167. When the elderly have any meal, they often have a hard time choosing proper healthy food. Normally, they often select food by themselves or have a caregiver help them find a menu or arrange the dishes they would like to eat. However, food arrangement for the elderly is different from those of other ages since it requires keen consideration about health and the proportion suited to their age. It also means that special care is very important. The objective of the invention of a food recommendation system for the elderly is to introduce nutritious menus and promote good health to elder people.

[13] Bianchini, Devis & De Antonellis, Valeria & Melchiori, Michele. (2015). A Food Recommendation System Based on Semantic Annotations and Reference Prescriptions. 134-143. 10.1007/978-3-319-25747-1_14. Food

recommendation, as well as searching for health-related information, presents particular characteristics unlike conventional recommender systems, since it often has educational purposes, to improve behavioural habits of users. In this paper, we present a menu generation system that uses a recipe dataset and annotations to recommend menus according to user's preferences. Moreover, reference prescription schemes are defined to guide our system for suggesting suitable choices. Firstly, relevant recipes are selected by content-based retrieval, based on comparisons among features used to annotate both users' profiles and recipes. Then, menus are generated using the selected recipes and are ranked taking into account also prescription schemes.

[14] Oh, Yoosoo & Choi, Ah & Woo, Woontack. (2010). u-BabSang: a context-aware food recommendation system. *The Journal of Supercomputing*. 54. 61-81. 10.1007/s11227-009-0314-5. In this paper, we propose a context-aware food recommendation system for well-being care applications. The proposed system, called u-BabSang, provides individualized food recommendation lists at the dining table, and is based dietary advice in the typical Korean medical text. Our proposed system receives a user's profile, physiological signals, and environmental information around the dining table in real time. To operate our system, we present a method for user specified analysis, and also describe time-division layered context integration which integrates the multiple contexts obtained from the sensors. Thus, our system recommends appropriate foods for each individual's health at the table in real time.

III. REVIEW FINDINGS

In reviewing a twenty-year window of the literature regarding self-care behaviour of health care providers, there was a paucity of studies about their responses to illness. The few studies found will be reviewed. Beatty (1991) studied locus-of-control, self-actualization and self-care agency among registered nurses (n=100). The self-care agency was measured by the Kearney and Fleischer Exercise of Self-Care Agency Scale (ESCA). This instrument generally focuses on the level of autonomy of the individual in health care decision-making as it pertains to health promotion. This study did not discuss the self-care behaviours of registered nurses regarding self-diagnosis and self-treatment of common illnesses.

Nonetheless, this sample of nurses did display statistically significant differences from the norm for self-actualization on the Sjostrom Personal Orientation Inventory. The locus-of-

control orientation was generally internalized, but statistically significant differences from the mean existed, compared with the norm group. The sample was at the norm for exercise of self-care agency with no significant statistical difference from the norm mean. Lade wig (1989) studied the relationships among locus-of-control, self-care agency and degree of autonomous decision-making about health care. The subjects (n=328) used were not health care providers. The six brief scenarios, with forced choices that measured the degree of autonomous decision-making about health care, presented situations in which a doctor had already made a diagnosis and presented a treatment plan. The possible replies measured the following constructs of decision-making: expert authority, social support, and seeking additional information about a condition. Lade wig's findings that locus-of-control and exercise of self-care agency as measured by the Multidimensional Health Locus of Control (MHLC) and ESCA were more related to health and not to decision-making about specific illness situations.

More importantly, lade wig stated that the assumption that the factors that influence decision making about health are the same as the factors that influence decision-making about illness, may be erroneous and limiting (p.115). She goes on to suggest that previous experience with a specific illness situation, whether personally or through others, may influence autonomous decision-making. Cockerham et al. (1980) surveyed a group of 375, predominantly male, physicians from a variety of specialties in 1976 regarding their illness behaviours. The purpose was to understand the "proper" behaviour toward illness using the physician as a role model. The instrument, developed for the study, asked about most recent self-care behaviours in personally experienced symptoms that would normally be self-limiting. Responses were categorized by whether the action was physician dependent. The physician-dependent responses included: "ordered diagnostic studies on myself", "sought care from other physician", and "treated myself with prescription drugs". The non-physician dependent actions were: "did nothing", "interrupted my normal daily routine", and "treated myself with over-the-counter drugs".

AREA OF PROBLEM

People now-a-days are taking less care of their health and easily being affected by different kinds of diseases.

Thus, they need to consult a doctor more frequently which might become a big problem. Sometimes customers are not aware of the medicine that is to be used to recover from the symptoms. So, this web

application helps the user to get a description and recommend medicine to use based on the symptoms one enters. People are also not aware of what food and fruits to take when they are unhealthy. This system also recommends the customer or the user with the good food to take.

IV. CONCLUSION

Technological innovations drastically changed and improved our quality of life. There are many domains which benefit from the evolution of technology but one of the most important fields is healthcare. Advances in healthcare are extremely important as there are many issues that require our attention. The field of medicine is a sensitive topic due to the fact that one mistake could lead to the loss of countless human lives. It was a long and difficult journey to reach the current state of medicine, but one thing is quite clear, technology was and will remain essential to the evolution of the healthcare system.

The urban lifestyle of the ordinary Bangladeshi is dramatic enough to be favorable for the medicine- on-the-go and home delivery models to grow at high rates. The ever-increasing population of crowded metro cities and longer travel times are drivers for the convenient, ready-to take medicine and cheaper options of having medicine delivered at your doorstep. For some people, buying prescription medicines online offers advantages not available from a local pharmacy.

V. REFERENCES

- [1] H. Sampathkumar, X.-W. Chen, and B. Luo, "Ontology-based visualization of healthcare data mined from online healthcare forums," in International Conference on Healthcare Informatics, Dallas, TX, 2015. Doi: <https://doi.org/10.1109/ichi.2015.46>
- [2] A. Al-Canaan and A. Khoumsi, "Towards designing high-performance restful multimedia web services on FPGA," Journal of Advances in Technology and Engineering Studies, vol. 4, no. 3, pp. 111-117, 2018. Doi: <https://doi.org/10.20474/jater-4.3.2>
- [3] C. Pasupathi and V. Kalavakonda, "Evidence based health care system using big data for disease diagnosis," in 2nd International Conference on Advances in Electrical, Electronics, Information, Communication and Bio-Informatics, Chennai, India, 2016. doi: <https://doi.org/10.1109/aeecib.2016.7538393>
- [4] S. D. S. F. Marino, E. and C. Vadala, "A web serverless architecture for buildings modeling," International Journal of Technology and

Engineering Studies, vol. 3, no. 3, pp. 93-100, 2017. doi: <https://doi.org/10.20469/ijtes.3.40001-3>

[5] K. Osei-Frimpong, A. Wilson, and F. Lemke, "Patient co-creation activities in healthcare service delivery at the micro level: The influence of online access to healthcare information," *Technological Forecasting and Social Change*, vol. 126, pp. 14-27, 2018. doi: <https://doi.org/10.1016/j.techfore.2016.04.009>

[6] P. Groves, B. Kayyali, D. Knott, and S. V. Kuiken, "The big data revolution in healthcare: Accelerating value and innovation," Center for US Health System Reform Business Technology Office, New York, NY, Tech. Rep., 2016.

[7] J. Chen, K. Li, H. Rong, K. Bilal, N. Yang, and K. Li, "A disease diagnosis and treatment recommendation system based on big data mining and cloud computing," *Information Sciences*, vol. 435, pp. 124-149, 2018. doi: <https://doi.org/10.1016/j.ins.2018.01.001>

[8] P.-J. Kwon, H. Kim, and U. Kim, "A study on the web-based intelligent self-diagnosis medical system," *Advances in Engineering Software*, vol. 40, no. 6, pp. 402-406, 2009. doi: <https://doi.org/10.1016/j.advengsoft.2008.07.004>

[9] M. A. Hasan, A. R. Chowdhury et al., "Human disease diagnosis using a fuzzy expert system," *Journal of Computing*, vol. 2, no. 6, pp. 66-70, 2010.

[10] A. Kampouraki, D. Vassis, P. Belsis, and C. Skourlas, "E-Doctor: A web-based support vector machine for automatic medical diagnosis," *Procedia-Social and Behavioral Sciences*, vol. 73, pp. 467-474, 2013. doi: <https://doi.org/10.1016/j.sbspro.2013.02.078>

[11] B. Savkovic, P. Kovac, I. Mankova, M. Gostimirovic, K. Rokosz, and D. Rodic, "Surface roughness modeling of semi solid aluminum milling by fuzzy logic," *Journal of Advances in Technology and Engineering Studies*, vol. 3, no. 2, pp. 51-63, 2017. doi: <https://doi.org/10.20474/jater-3.2.2>

[12] A. N. Noorzad. and T. Sato, "Multi-criteria fuzzy-based handover decision system for heterogeneous wireless networks," *International Journal of Technology and Engineering Studies*, vol. 3, no. 4, pp. 159-168, 2017. doi: <https://doi.org/10.20469/ijtes.3.40004-4>

[13] F. Ricci, L. Rokach, and B. Shapira, "Recommender systems: Introduction and challenges," in *Recommender Systems Handbook*. Boston, MA: Springer, 2015.

[14] G. Adomavicius and A. Tuzhilin, "Toward the next generation of recommender systems: A survey of the state-of-the-art and possible extensions," *IEEE Transactions on Knowledge & Data Engineering*, no. 6, pp. 734-749, 2005. doi: <https://doi.org/10.1109/tkde.2005.99>