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HEALTH POLICY
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An automatic key medical information generating model

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Abstract

Present-day society shows keen interest in the field of medical treatment, and the diagnostic mode is now developing toward doctor–patient shared decision-making. Therefore, a patient's source of medical information is quite important, with that source needing to be reliable, accurate, and easily accessible. Ensuring that informational sources meet these requirements becomes a challenge with the development of the informational network, which causes the amount of material available online to steadily increase and the general public to become more aware of health- and medical-treatment-related information. Therefore, focusing on the medical information seeker, this paper will discuss two user identities: patients and healthcare professionals. For patients, online medical articles are a major source of medical information; patients with concerns about diseases often search for their symptoms on the Internet and look for related medical information. However, online medical articles are usually long, so patients sometimes self-diagnose their disease or determine the severity of their condition based on only part of an article or on limited, incomplete, or even inaccurate information in several articles related to the symptoms searched out. Consequently, patients may misdiagnose their condition or underestimate the severity or seriousness of the condition and delay treatment. In addition, present medical technology advances rapidly, so physicians and other healthcare professionals must obtain the latest medical information from the Internet. However, searching for and reading professional in-depth medical articles to find required, critical information online is time-consuming, creating a time-management challenge.

To address these aforementioned problems, this paper develops an Automatic Key Medical Information Generating model, uses medical articles as the basis of analysis, and develops and designs a medical article key-information-generating methodology applicable to medical article retrieval and reading. The word segmentation is implemented for the articles according to the Chinese Knowledge and Information Processing (CKIP) of Academia Sinica, and the medical articles are then distributed to various clusters by the clustering technology of this model, so that the medical information seeker can conduct a rapid search for the required medical article information. When the medical information seeker finds the target medical article, the article's key statements are screened out by the keywords rule base created in this paper, and the key statement scores are calculated. The medical article key information is sequenced according to

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the key statements so as to generate the medical article key information table. In addition, a web-based key-medical-information-generating system will be built based on the proposed model, and the effectiveness and feasibility of the model and technology will be evaluated using a real-world case.

In summary, this paper presents a model to analyze the keywords and key statements of medical articles to generate a medical article key information table. This model can help the medical information seeker look for the required health information rapidly and accurately on the Internet, shortening the time for screening medical information and increasing the probability of obtaining the required information.

Introduction

Most people seek the help of healthcare professionals (e.g., physicians) if they feel sick. However, since doctors are busy and time available for patients' questions is limited, patients need to obtain medical information from other sources. Before the widespread use of the Internet, books were the best resource for obtaining required information, but medical books may have been written a long time ago, and the content may be outdated, no longer matching current medical knowledge, with the result that patients may receive incorrect medical information. With the rapid development of the Internet, searching for data is now more convenient, so most people obtain medical information chiefly from the medical articles on the Internet. In Taiwan, the updated medical information can be obtained from the medical article websites KingNet WebHospital (www.king net.com.tw), Health99 Education Website (health99.hpa. gov.tw) and Taiwan Medical Network (www.tmn.idv.tw). When people can access medical-treatment-related informa tion more easily and directly, their knowledge pertaining to medical treatment can be enhanced.

The present medical diagnostic system is gradually developing toward the diagnostic mode of doctor–patient shared decision making. Therefore, patients' acquisition of medical knowledge and recommendations from doctors to patients based on professional medical knowledge are important to the diagnostic mode of shared decision-making. However, doctors are busy providing medical treatment, and they have limited time for searching for information. As professional medical articles are rich in content, doctors have to spend a significant amount of time reading such articles. Though the medical information is accessible on the Internet, it is too extensive, resulting in patients' not knowing where to search to find the most accurate, reliable information. Consequently, they may even obtain incorrect or outdated medical information. Fig. 1.1 shows the existing operation model (AS-IS Model).

In view of this, in order to assist those searching for specific medical information to look up medical articles quickly and to rapidly identify the articles' key points, this paper uses a technique to create clusters of medical articles by article tags, so that the medical articles can be searched for quickly. Then, the keywords and key statements are extracted from the medical articles according to the keywords rule base, and the key statements' scores are

calculated so as to generate the medical article key information table. The key information is displayed in the table so that those searching for medical information can quickly understand the medical articles. Fig. 1.2 shows the expected operation model (TO-BE model).

To sum up, to facilitate the access of information and acquisition of knowledge quickly and effectively, this paper proposes an Automatic Key Medical Information Generating model and system applicable to the Internet environment. The proposed model and system can reduce the time searching for medical articles and solve the problems associated with searching for articles on medical information websites. Medical information seekers can thus search for medical-treatment-related articles specific to their health concerns and their need for medical knowledge.

Literature review

The topics of this paper include "medical data analysis technology" and "public medical behavior analysis." Related literature is discussed in the following sections.
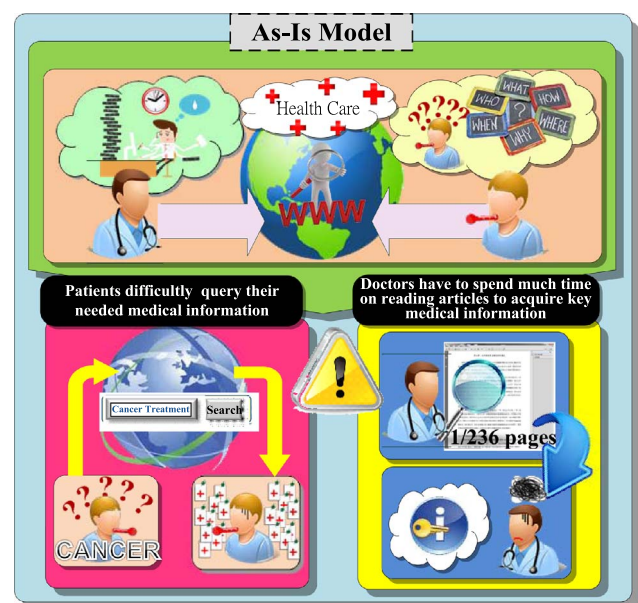

Fig. 1.1 AS-IS Model.