

A review on personalized medicine technique using cognitive computing

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Abstract

Personalized Medicine is an important strategy for disease diagnosis and pre-care. This approach considers his/her personal data, circumstances, and genes to cure the disease. This method allows physicians and researchers to prognosticate the medication and prevent policies for appropriate viruses. The concept of cognitive computing works like a human brain to analyze and process the data. This method includes an automated system for using natural language processing, pattern recognition, and data mining to simulate how the human brain works. In this review, the synthesized overview of the current status of research on personalized medicine and how to address personalized medicine, using cognitive computing, are discussed. In addition, the national and international status of the research and issues, regarding personalized medicine, are presented.

Keywords: Personalized Medicine; Traditional Medicine; Healthcare; Cognitive Computing.

1. Introduction

Preventing is every time more beneficial than cure. National Institutes of Health (NIH) defines Personalized Medicine is "Personalized Medicine is an important strategy for disease diagnosis and pre-care. This approach considers he/she personal data, circumstances and genes to cure the disease"[1-4]. This method allows physicians and researchers to prognosticate specifically what medicine and preventing policies for an appropriate virus to individually. This paper is in contradiction to a "one-size-fits-all" method, in that illness therapy and preventing processes are improved to the average person, with limited concern for the variations among people. While the word "Personalized Medicine" is almost recently introduced, past decade the thought is part of health care. For instance, in the emergency, we can transfer the blood only from donor to injured person based some matching criteria unlinked randomly. These matching criteria will reduce the risk of difficulties. We can find such examples in many fields of healthcare; the function of Personalized Medicine in daily life healthcare is nearly less. But, many researchers are trying increasing this approach almost all area in healthcare in coming years.

A person cells' nuclei contain Human DNA. This DNA includes nearly twenty thousand genes. Each gene is a represented by a compound identifier, this type of kind design for proteids and additional materials required for life. Human Cells produce the particles based on ancestral pans. Human's total design is the equal, this design built from three billion "letters" of identifiers, every letter relating to a synthetic subpart of the DNA fragment. However, complex modifications of one percent human DNA — usually the outcome of only a separate compound letter holding various — given person identifications. Behind natural occurrence, genes point to different chemistries in various parts of the human parts. Before-mentioned exceptions seldom teach individuals to a particular illness, and any dramatically change the direc-

tion a person will react to therapeutic. Physicians are finding disease and provide treatment based on personal differences, this idea usually mentioned to as "Personalized Medicine" [5-8]. The core idea of Personalized Medicine about treats the patients individually by combining genetic information with the personal health records, unlike trial and error method. Finally, Personalized Medicine will change the future medicine based on person proteids and biochemical effects.

In [9] Lawrence Lesko, U.S. Food and Drug Administration says "Personalized Medicine," is the new path to reach optimized individual healthcare decisions like disease diagnosis, disease prevention, and treatment. Previously, personalized medicine applies only limited places for specific. Modifications of a gene associated with breast cancer, for example, can predict a woman's true sensitivity to growing or bearing the illness, a significant design for practicing defensive actions. In some cases of breast cancer, the result of a special proteid indicates a further dynamic model of the virus that force be further efficiently compared with the medication Herceptin. However, many hurdles continue in the search for a general operative arrangement of Personalized Medicine. People will be directed by the collaboration works of researcher from various systems, from geneticist to medical specialist to engineer.

Information technology (IT) enables significant transmutations in various enterprises, giving effortless way to data of various forms in a quasi-instantaneous and omnipresent way [10]. Those modifications require the regeneration of high -built systems and necessitate different types, about both possible results and person anticipations. Biomedicine is an important privilege. Nearly two decades later the original study was written by Powsner and Tufte [11] including graphical representation of a particular patients' state. Notwithstanding significant progress in biological science, image processing, and treatments the area has still to completely profit from the IT change to combine medical and biomarker information of different species for research, or to use "Bigdata" in a new work situation [12-15]. The reasons for the suspension are

numerous and cover the free world of healing sub-systems; the center of EHRs preferences on agreement and billing rather than clinical research; a paucity of prospectively ascertained. Intensely interrogated patient cohorts to support decision analysis; and a failure to standardize recording of charging results, neuro imaging stands or normal lab conditions. As e-health and IT are redefined to reach to medical devices and research information, the common use of illness-based taxonomy itself is holding collected into a problem. Unique events are designed to tailor the system of dose to individual cases soon than to rely only on testimony from various populations who take a simple diagnosis [16, 23].

2. Traditional medicine versus personalized medicine

In traditional medicine, as shown in Fig 1, the doctor uses trail and based method. The doctor suggests same medicine with equal dosage based on the assumptions. This type of treatment sometimes works and many times may not work. So, one size does not fit all. Strategies that benefit any victims are weak for others and the corresponding injection may produce surface results in only some cases.

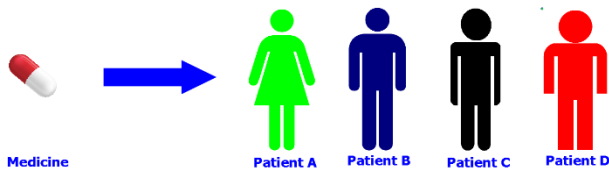


Fig. 1: Traditional Medicine Approach.

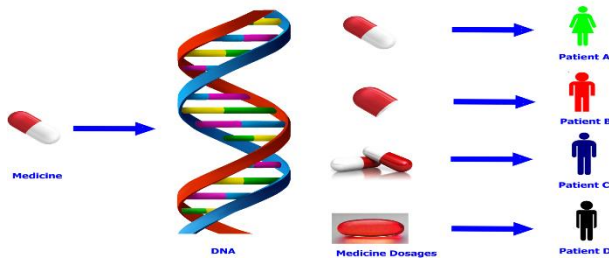


Fig. 2: Personalized Medicine Approach.

Personalized medicine is the orienting of clinical strategy to the particular characteristics of the individual patient. The method depends on accurate findings in our knowledge of how a patient’s unique little and transmitted outline gives them sensitive to some conditions. The corresponding analysis is improving our knowledge to divine which therapeutic directions be reliable and valid for any case, and which people wish negative be. As shown in figure 2, the doctor suggests medicine and dosage based on person DNA and personal health information.

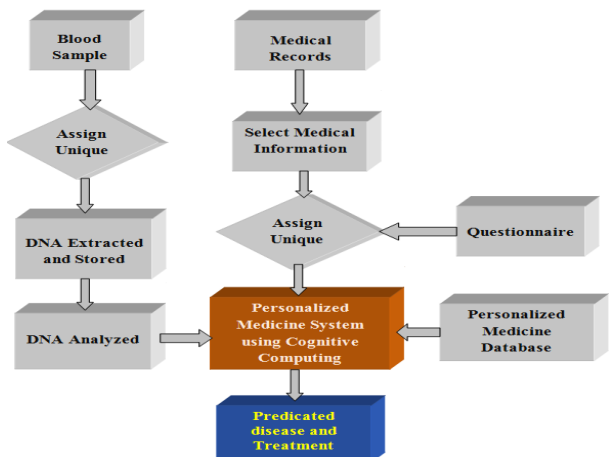


Fig. 3: Data Flow Diagram for Personalized Medicine Approach Using Cognitive Computing.

While current uses are limited, pharmacogenomics has the potential to offer multiple advantages on a larger system inside the following various times. Amazing of the complete important interests cover:

- **Guaranteed medicine collection:** Each year, several people die and much more hospitalized due to different effects of drugs. While medications support accurate reports and trial rules before people are allowed for business, there is usually no system to foretell how a particular person will respond to a particular cause. Also if a medicine seems harmless for maximum personalities, any victims may encounter a deadly effect because of differences in their genes. Pharmacogenomic may be ready to divine the you are expected to produce a serious response to a medication before people always get it and the who will be expected to return strongly.
- **Reliable dosing choices:** Following FDA support and medical examination conditions, the size of medicine based on traditional medicine like one-size-fits-all dose or important organs like liver or kidney operate, mass, and lifetime. Those considerations force not be enough, but. A regular size may show deadly to one human and not different because of genetic change. Using pharmacogenetics, physicians bypass this difficulty by foretelling the optimal treatment to work, not exactly which medicine is best for a particular case.

Advances in drug reinforcement: Pharmaceutical organizations necessity usually use times leading the study on and medical experiments of a different medicine before it moves to business. Symptomatic and design firms, simultaneously with pharmaceutical companies, typically hold to examine a result in several patients to assure that it is secure and efficient. Pharmaceutical may support those organizations adjust their trial. For instance, if a corporation understands first of the season that someone has a hereditary change that will make an opposing response to a medication or that will make a medication weak; the cases can be dismissed from the clinical trial. That may further up the clinical examination method and target the particular group that can be supported by each one medication.

3. Personalized medicine approach using cognitive computing

Cognitive Computing (CC) is the model of individual assessment methods in an electronic design. It includes self-learning methods that use Natural Language Processing (NLP), data mining and pattern recognition to simulate the process the personal mind acts. The purpose of this approach is to build automated IT operations that are able of doing obstacles externally needing person support. These systems utilize computer training algorithms. Before-mentioned systems constantly get information from the data supplied by them by opening information for knowledge. The methods improve the process people watch for models and as well as the means both means information, so people become capable of anticipating new problems and modeling possible answers. The computing is done in various Artificial Intelligence (AI) uses, including able methods, NLP, virtual reality, neural networks, robotics and robotics. The word cognitive computing is intimately connected with IBM’s cognitive computer system, Watson. As shown in Fig. 3, the data flow diagram to predict disease using cognitive computing. This system collects the all the personal health data and analyzes the information using cognitive computing using personalized data base.

4. Personalized medicine impact on nationally and internationally

In India, Personalized medicine is a young but quickly developing area of healthcare that is notified by person's different medical, transmitted, genomic, and environmental data. The article declares that incurable illnesses are the head case of being in India as people consider for 16% of all deaths yearly shooting longer than 5 million personalities each year. Those conditions it includes several diseases in the model of diabetes, box, cardiovascular disorders, cerebral form disease, cancers, and chronic lung illnesses will cost India throughout two hundred eighty trillion from 2012 to 2030 in words of industrial producing. The story was written through the ship of a global partnership for the City of Government of Chronic Environment between the All India Institute of Medical Sciences, Emory University, the London School of Hygiene & Tropical Medicine, and the PHF [17]. The largest investor in personalized medicine now is the UK (approximately 200 million pounds). To improve research in the field, UK is stretching out to researchers in India as well. As part of a committee of British Prime Minister Theresa May, delegates from attending universities and medical organizations in the UK came down to Chennai, India for a 'first ever workshop' on personalized medicine.

In rest of India, as per the World Health Organization (WHO), non-communicable conditions or prolonged illnesses like cancer, diabetes heart sicknesses, respiratory illnesses and diabetes, kill thirty-eight million people annually [18]. In spring 2015, President Obama stated a study work concentrating on producing personalized medicine to various features of health care. The Presidents statement for the financial year 2016 included \$216 million dollars in funding for the force for the investigation in the field of personalized medicine to NIH.

5. Conclusion

In this review, we presented personalized approach using cognitive computing survey and current progressed. We contributed a case study to explain how traditional medicine is different from personalized medicine. The Data flow diagram for Personalized Medicine Approach using Cognitive Computing explains how personalized medicine predicts the disease based on various parameters. Finally, we also discussed research issues and impact of personalized in India as well rest of the foreign countries.

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