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Automatic Integration of Drug Indications from Multiple Health Resources

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ABSTRACT: There are lots of major issues in assessing the safety of the drugs. One of the major issues is Automatic Integration of Drug Indications. The adverse effects of the drugs are not found immediately after prescribed dosage to the patients. They are found only after some duration of usage. The reaction of the high usage of drugs has to be found immediately in a very short period of time. But this is impossible in the medical field. Many doctors research on this area also. This paper researches on a program for analysing the patient's medical history using the detection of PAMM (Probabilistic Aspect Mining Model) Algorithm.

KEYWORDS: Data Mining, Evaluation, PAMM.

I. INTRODUCTION

Now-a-days people are very much interested in disclosing their personal information in the internet. As of that we find many social websites for the same. As people show interests over giving public information, they don't show the same attitude towards the case of medical history. Medical histories of patients are not disclosed in websites. In this paper we propose a concept known as PAMM. PAMM is a concept where patients are able to share their medical experiences personally over a medium. These experiences can be achieved only after the usage of prescribed drugs by the Doctors. Once they use the medicines, patients can feel internally and provide some comments or feedbacks that are viewed globally. Based upon the comments, upcoming doctors can also prescribe the same or change the drugs and its usage to the other patients. Also the patients by themselves can get a clear idea about the medicines available.

Previous studies of opinion mining model are dealt using Frequency based approach, Relation based approach, Supervised learning, Topic modelling and finally Opinion mining model. The above mentioned model gives a valuable and acceptable level of results. As many patients are concerned only with diseases that gives many side effects and chronic diseases. New patients can get a clear idea from the previous patients and also can share their experiences. There are lots of aspects that have to be dealt with drugs. But we have limited the aspects to a minimal number. The above cited models may not be applicable for drug reviews since the aspects are mentioned implicitly. The aspects are not explicit by author and description of side effects and people experience are diverse. As there are many websites for drug reviews with equipped with rating functions, despite a model for identifying a set of aspects we propose drug reviews using PAMM.

II. RELATED WORK

Our work is related with [1] Minqing Hu and Bing Liu's work on Mining and Summarizing Customer Reviews. It is all about extracting and summarizing the customer reviews for a certain product. There may be numerous number of reviews for a branded product and it is difficult for any customer to take decisions. So they worked for the process in three steps. 1) Mining the features of the product. 2) Opinion sentences are reviewed as either negative or positive. 3) Optimizing the results. Text mining and Sentimental classification are the techniques used in this paper. These techniques provide efficient output and experimental results on various products sold online.

It is also related with [2] Ana-Maria Popeescu and Oren Etzioni's work on Extracting Product Features and Opinions from Reviews. This paper deals with lots of online reviews for any products. Customers are requested to provide



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comments based on the products they purchase. In this paper, the technique used is known as OPINE. It is a kind of unsupervised extraction of information system which finds reviews based on the particular product features.

This paper work [3] by Chenghua Lin and Yulan He on Joint Sentiment/ Topic model for Sentiment Analysis uses automated tools for detecting the subject information such as opinions and attitudes that are expressed in the text. The technique that is being used in this paper is based on a framework known as Latent Dirichlet Allocation (LDA), known as Joint Sentiment/ Topic Model (JST). This technique has given the promising results on different sets of opinions.

This paper work [4] by Ranganatha. S, Pooja Raj. H. R, Anusha. C and Vinay. S. K on Medical Data Mining and Analysis for Heart Disease Dataset using Classification Techniques discusses about the medical information stored on the database. They worked on patient data who come for admission for heart complaints and stores the medical information. Then the Naïve Bayesian algorithm will generate user understandable words and graphs.

Another paper work [5] by Lamia Abed Noor Muhammed on Using Data Mining technique to diagnosis heart disease also relates our paper work. Here a predictive model is being built using a Naïve Bayes technique for artificial diagnosis of the heart disease. It is then compared with the previously measured datasets by the individuals.

Another paper on [6] Using Data Mining Techniques for diagnosis and Prognosis of Cancer Disease by Shweta Kharya also related with our concept. This paper works on Breast Cancer. Different kinds of data mining techniques are involved in diagnosis and prognosis of the disease. Decision tree and Naïve Bayes algorithm are involved in this paper.

III. EXISTING SYSTEM

Systematic methods for the detection of suspected safety problems from spontaneous reports have been studied and practically implemented. Various other methods such as proportional reporting ratios, empirical Bays screening, and reporting odds ratios have been used in the spontaneous reporting centers of other nations .And junior doctor not submitting database because not supporting junior doctor reports and whatever the feedback information not submitting. These methods have shown better performance than traditional methods. However, the performance of these techniques could be highly situation dependent due to the weaknesses and potential biases inherent in spontaneous reporting.

The drawbacks found in the existing system are as follows:

- Even though premarketing clinical trials are required for all new drugs before they are approved for marketing.
- The drug is applied suitable and non- suitable peoples also.

In existing system to use Opinion mining algorithm it's not supported to add junior doctor data (reports information).

IV. PROPOSED SYSTEM

In Proposed System, Furthermore, people tend to solicit opinions from medical professionals rather than patients. Nevertheless, recent studies have shown that patient generated contents are useful and important especially for chronic diseases and drugs with afflicting side effects. Many patients hope to get more information from other patients with similar conditions. They can also share their experience and propose practical ways to alleviate symptoms and side effects of drugs. Unlike general products or services, drugs have a very limited number of kinds of aspects: price, ease of use, dosages, effectiveness, side effects and people's experiences. There are other more technical aspects such as chemical or molecular aspects, but they are almost not mentioned in drug reviews. A difficulty in dealing with drug reviews is that the wording in describing effectiveness, side effects and people's experiences are very diverse. In particular, side effects are drug dependent: a set of side effect symptoms for a drug is very unlikely applicable to another drug.

V. DRUG REVIEW

The Drugs are the medicines that are prescribed by the Doctors. These drugs are being used by the patients. Once they use it, they will be logging into our website. They have a separate page where the user (the patient) can answer to the set of questions. As they provide answers, based on it, a pre evaluation is made. This evaluation is based on a factor of



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some keywords. The Medicaid Drug Utilization Review (DUR) Program promotes patient safety through state-administered utilization management tools and systems that interface with CMS' Medicaid Management Information Systems (MMIS). Medicaid DUR is a two-phase process that is conducted by the Medicaid state agencies. In the first phase (prospective DUR) the state's Medicaid agency's electronic monitoring system screens prescription drug claims to identify problems such as therapeutic duplication, drug-disease contraindications, incorrect dosage or duration of treatment, drug allergy and clinical misuse or abuse.

Algorithm: Probabilistic Aspect Mining Model (PAMM)

- 1: Compute the empirical mean for $\{(x_n)\}_N$
 $n=1$ (i.e. μ).
- 2: Center the data by $x_n \leftarrow (x_n - \mu)$ for $n = 1, \dots, N$,
- 3: Initialize the entries of W randomly to small positive numbers.
- 4: repeat
- 5: {E-step}
- 6: for $n = 1$ to N do
- 7: Calculate $z^* n$ using (17)
- 8: end for
- 9: {M-step}
- 10: for $i = 1$ to M do
- 11: Update W_i , using (21)
- 12: end for
- 13: until Change of $_W_Frob$ in consecutive EM iterations $< \delta$
- 14: return W

VI. RESULT ANALYSIS

In a hospital management we have (i) Doctors, (ii) Patients and (iii) Admin (the management). The initial process is that doctor has to login. If the doctor is new then he/she has to register. Meanwhile the patient has to register to provide his medical complaints. Once the patient details are provided, as the doctor enters the site, he will receive as new messages about the patient. Once the patient has logged in he/she has to provide the type of admission either in-patient or out-patient. The patient has to provide his disease and its symptoms. Once it has been submitted it will be sent to the doctor's screen where he can prescribe drugs and will be sent to the patient window.

In our system, not only the senior doctor can prescribe drugs. All the junior doctors can also prescribe the drugs. If the junior doctor prescribed medicines have a very good positive result than the senior doctor, then it will be stored to the centralized database. The centralized database grants permission to access to anyone. The patient can give feedback once the disease has been treated. Patient will go to a feedback form. Based on his feedback an evaluation is made. The evaluation is based upon certain keywords that are mentioned in the table below.

Great	Work Great	Result	Self
Feel Great	Less	Wonderful	Person
Very	Happy	Well	Recommend
Work	No Side	Better	Good
Without	Years	Effect	Depressed
Panic	Medication	Gain	Swing
Noticed	Lot		

Table 1. Satisfactory Positive Results



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Table 1 describes about the satisfactory positive results that can used in the feedback form given by the patient.

Worse	Stopped	Suicidal	Headache
Get Worse	Stop Taking	More Depression	No Sex
Sick	Can't	Heart	Sleep
Wake	Medication	Time	Muscle
All Time	Cause	No	Felt
Faint	Constantly	Night	Doctor
Bad	Attack		

Table 2. Dissatisfactory Negative Results

Table 2 describes about the satisfactory positive results that can used in the feedback form given by the patient.

Based on the above mentioned table, an evaluation is made which is once again stored to the centralized database. The feedback provided can be only viewed by the admin. The admin should login first to see the feedbacks. It is viewed by entering a drug name. Once it is entered it shows the table containing the entire details about the patient, doctor, drugs and the feedback given by the patients. The evaluation starts from zero. If it is a positive then it increases from 0 to 1, 2... If it is negative then it decreases from 0 to -1, -2... Our main aim is to display only the positive results. So the negative evaluation values are removed from the database by the Admin.

VII. CONCLUSION AND FUTURE WORK

Nowadays, online reviews, blogs and discussion forums for different kinds of products and services are pervasive. Extracting information from these substantial bodies of texts is useful and challenging. In particular, it is helpful to identify the aspects of a product that people are happy to with or finding the aspects that may anger customers. As human lifespan becomes longer and our living environment becomes increasingly polluted, medical domain data mining becomes one of the focused research areas. In this paper, we propose PAMM for mining aspects relating to specified labels or groupings of drug reviews. The future work, it is interesting to apply the model to find aspects relating to different segmentation of data such as different age groups or other attributes. It is also useful to work with aspect interpretation as aspects are now represented by a list of keywords. If a few sentences can be extracted or generated automatically to summarize the keywords, interpretation and understanding will be greatly improved.

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