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MACHINE LEARNING IMPLEMENTATION FOR PREDICTING AND AVOIDING OVER MEDICATION FOR THE PATIENTS

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ABSTRACT

Over medication can cause different sorts of issues to the patients in hospitals. Due to over medication we may lose our self control and self healing mechanisms and feel drowsy and some of the people used to cause the vomiting and other sort of issues wit over medication. We are implementing a machine learning mechanism to identify the procedure of avoiding over medication by the practitioners and help the patients to maintain the good health. The main criteria and motto of this article is to identify the paths based on the general readings considered by the gear items provided by the different organizations. The medical fitness applications and other medical applications which are being used for the patients health tracking will be analyzed in this article like a survey article. This survey article will work on different medical systems and their architecture and we prefer in the last one architecture which is best use for the societ.

KEYWORDS: Machine learning, Predictions, Healthcare, Analyze.

INTRODUCTION

Machine learning [1] can be most prominent role in the science and technology and we are having different kind of applications in medical domain using machine learning and IoT to identify the patient's health conditions and the challenges we may encounter in this scenario. Personalized health care applications are the new approached in which experts of the traditional healthcare system will work as the knowledge engineers and the prediction models which we need to design will be based on the knowledge we acquired from the knowledge engineers from the knowledge base.[1]

We focus on the implementation of the new data collection process using EHR and other IoT devices which are wearable and wireless devices and also mobile devices. The data is transferred using web based protocols and the PH will apply with AI and to identify the difference between different knowledge base and the implementations. In this article we are analyzing the clinical behaviors and the medical records based on which we can identify the over medication process identification. This over medication will be done by a mobile application or wearable devices which we use daily.

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EXISTING SYSTEM

There are different methodologies to identify the accuracy of the medication of the patient and some of the issues we are focusing is on medical crimes which is over medication which causes the low immunity of the patient.[2,3]

The existing system has containing different other methodologies which we can find in our daily life. We can see those in advertisements of the brands and other means of communication. The main purpose of utilizing the medical bands or different medical applications is to maintain contact with their doctors and also to maintain the health records digitally without managing any hard copy of the data. Here we are having some of the following issues which we can be avoided in our proposed application approach to avoid the over medication to the patients with different types of health issue.[4,5,6]

i. We cannot avoid the unwanted medication and also we cannot avoid the un-matching content.
ii. User content cannot we disclose with any other third party. But here in the present applications [7] if we speak anything in front of Samsung TV sets, it can have the capability recording our data and send that to the third party.
iii. The other disadvantage of using this kind of approached is to identify the means of over medicating and how the medication rules and data can be transferred also has to identify the user profile.[8,9,10]

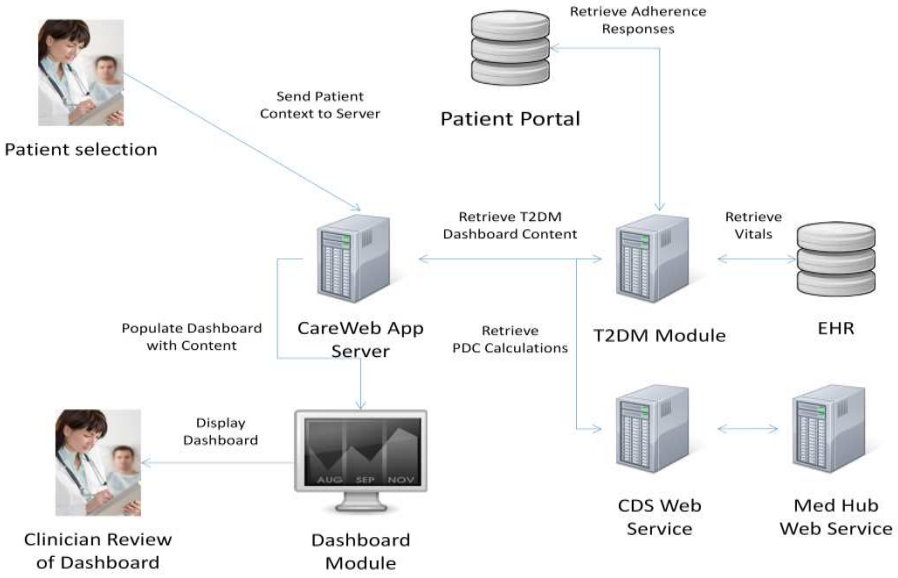

Figure 1.Electronic Health Records design

As per the figure 1 we have some of the basic EHR models which are connecting some to some of the basic medical system dashboards and based on our daily routine they will send the information to us to do some of the medications and take some of the exercises. But that is not the case in which we need to take good health management. This kind of applications is human generated without any prior knowledge on the information they are sharing with the people over the globe. So this kind of things has to be eliminated in which we cannot find any good way of getting heath information. In this regard we are implementing machine learning approaches to manage the health records and also we need to update our self in managing the advanced life ethics of technology which can change our life in a broad way. In the next section we are proposing a machine learning methodology for health care management for better understanding of

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medication from small EHR applications which are not up to the mark.[11,12,13]

PROPOSED APPROACH

In this proposed approach we are focusing on the main things of machine learning implementation of identifying the insights of the EHR data of different applications using machine learning methodology. Here we are managing this with one application which can be implemented in real time understand the human hand based writing to understand the medication to the patient. This section can completely explain the procedure of this application and machine learning implementations. [14,15,16]

DATA IDENTIFICATION

Many machine learning methodologies can be applied to the health care domain to identify the insights of the system but we understand the need of the human race. So we tried to implement one architecture which can work on the following basis.

- Step1: Take the prescription from the doctor
- Step 2: Logic with the Medico Application which we designed
- Step 3: Enter the basic information which it prompts to do
- Step 4: Scan the hand written prescription of the doctor
- Step 5: Click on analyze button.
- Step 6: The application will prompt the exact medication we have to follow for the specific patient based on their previous health and current health conditions [17, 18, 19]
- Step 7: It will try to share the same with doctor who gave medications
- Step 8: Takes approve from the doctor
- Step 9: Save the work

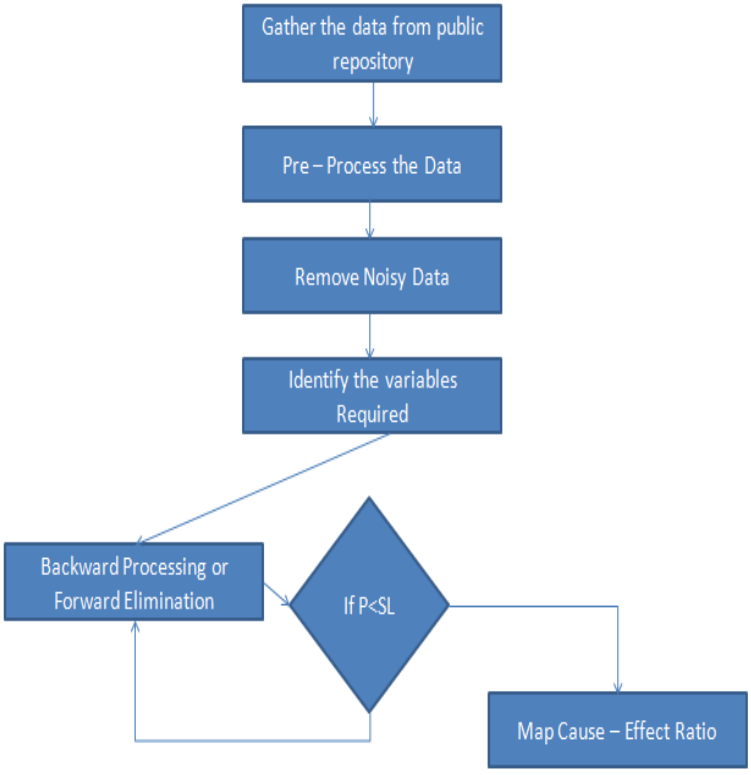

Figure 2.half one of the Propose design

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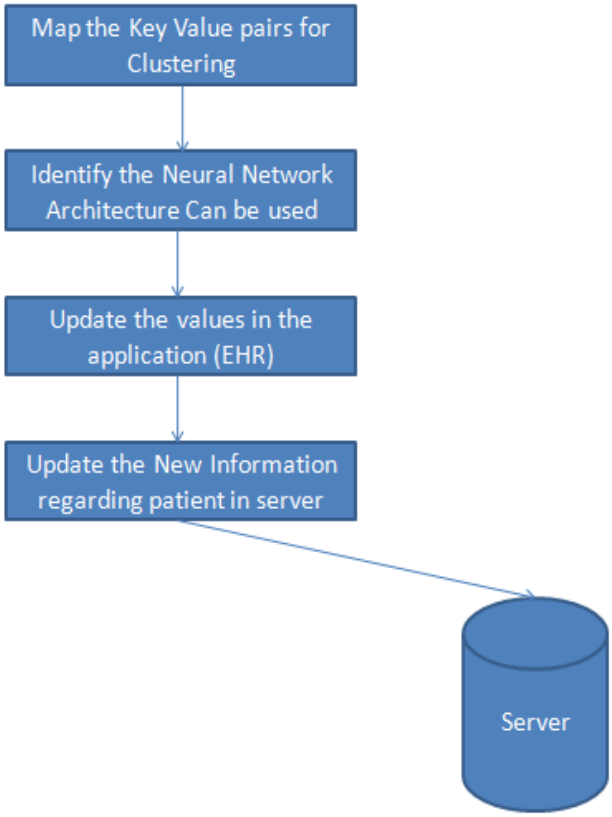

Figure 3.half a pair of the projected design

In this kind of applications we need to process the information using any platform and finally we need to understand the importance of the human generated information. We gathered information from no repository but we trained with some of the pre-defined repositories. The hand written information is scanned and understood by CNN which can be seen in the below figure 4.

Figure 3 and figure 4 are explaining the architecture of the process in which we are considering the raw data and performing some pre-processing. After that pre-processing we need to analyze the variables or features r enquired for our model. In this regard we need to analyze the information which we gave while registering. This can be done automatically.

CNN

Using CNN we need to understand the gap between the data and we need to plot them according to their belonging cluster to map the data. We need to process this insights information and we need to process this in such way that a matrix is formed and from that matrix we need to map the inputs in the hidden layer and finally we can get the information we required in the specific format. Figure 4 indicating the process of CNN implementation with the data given by the user of the application.

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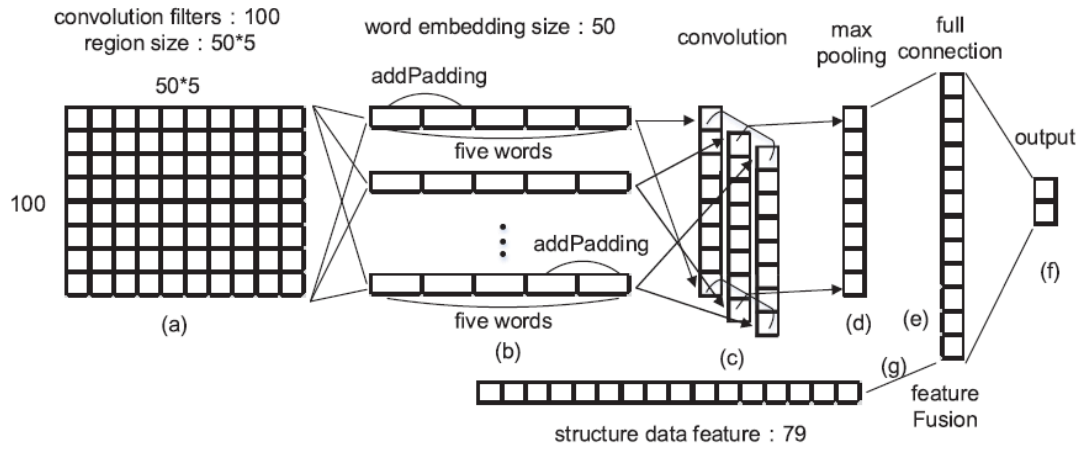

Figure 4.CNN design with Matrix format

Figure 5 we are implementing the process of text classification. The information which we have give in the application has to analyse with the process called text classification for which we need to understand the process of analysing the hand written content as shown below.

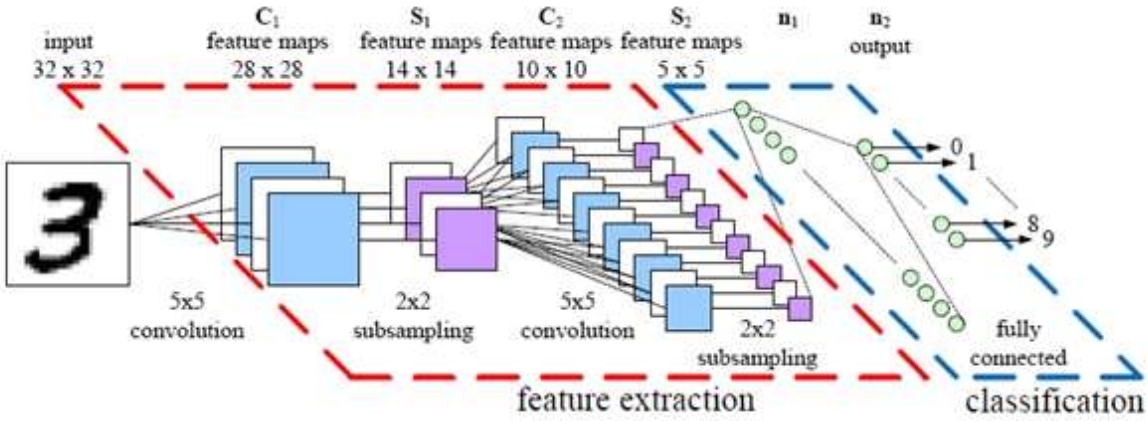

Figure 5.projected design of Text Classification

Algorithm 1 Stochastic Gradient Descent Algorithm

Input:

γ learning rate;
$\lambda_i, i = 1, 2$ regularization constant;
N the maximum number of iterations;
p_u^0 the initialization of P_u;
q_v^0 the initialization of q_v;

Output:

$\widehat{r}_{uv}$ real data;

1: $t := 0, n := 0, \widehat{r}_{uv}^0 = p_u^{0'} q_v^0, e_u v^0 = r_u v - \widehat{r}_{uv}^0$.
2: $t := t + 1, n := n + 1$.
3: Given the error $e_u v^{t-1} = r_{uv} - \widehat{r}_{uv}^{t-1}$ in the previous iteration.
4: Replace $p_u^t = p_u^{t-1} + \gamma(e_{uv}^{t-1} q_v^{t-1} - \lambda_1 p_u^{t-1}), q_v^t = q_v^{t-1} + \gamma(e_{uv}^{t-1} p_u^{t-1} - \gamma_2 q_v^{t-1}), \widehat{r}_{uv}^t = p_u^{t'} q_v^t$ and $e_{uv}^t = r_{uv} - \widehat{r}_{uv}^t$.
5: If e_{uv}^t approximately equals 0 or $n > N$, return $\widehat{r}_{uv} = \widehat{r}_{uv}^t$ for all possible (u, v); else, go to Step 2.

The above algorithm can help to understand the work and for the security reasons and with privacy issues we are not showing the page of our application. The algorithm mentioned above and the architecture of NLP mentioned in below image 6 can help to understand the work.

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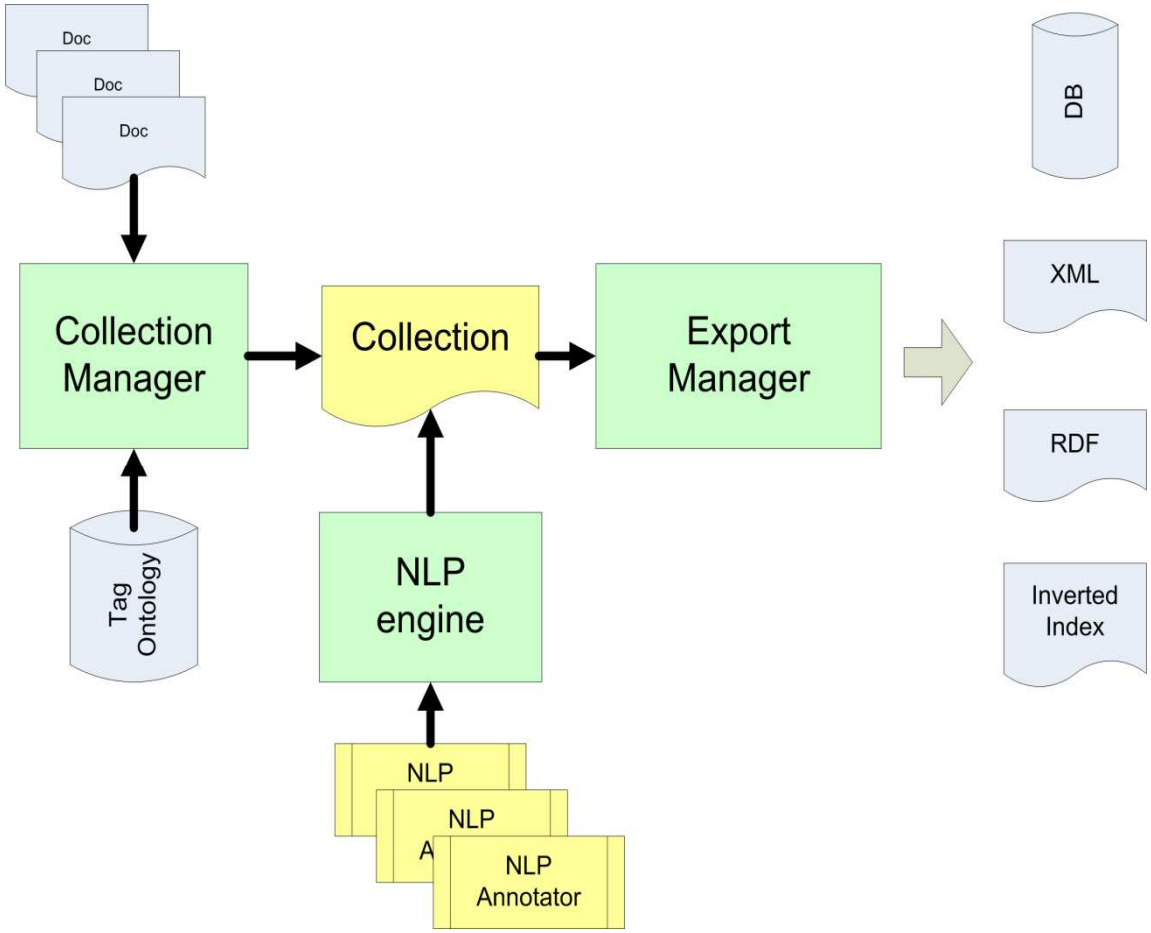

Figure 6.NLP design in Use

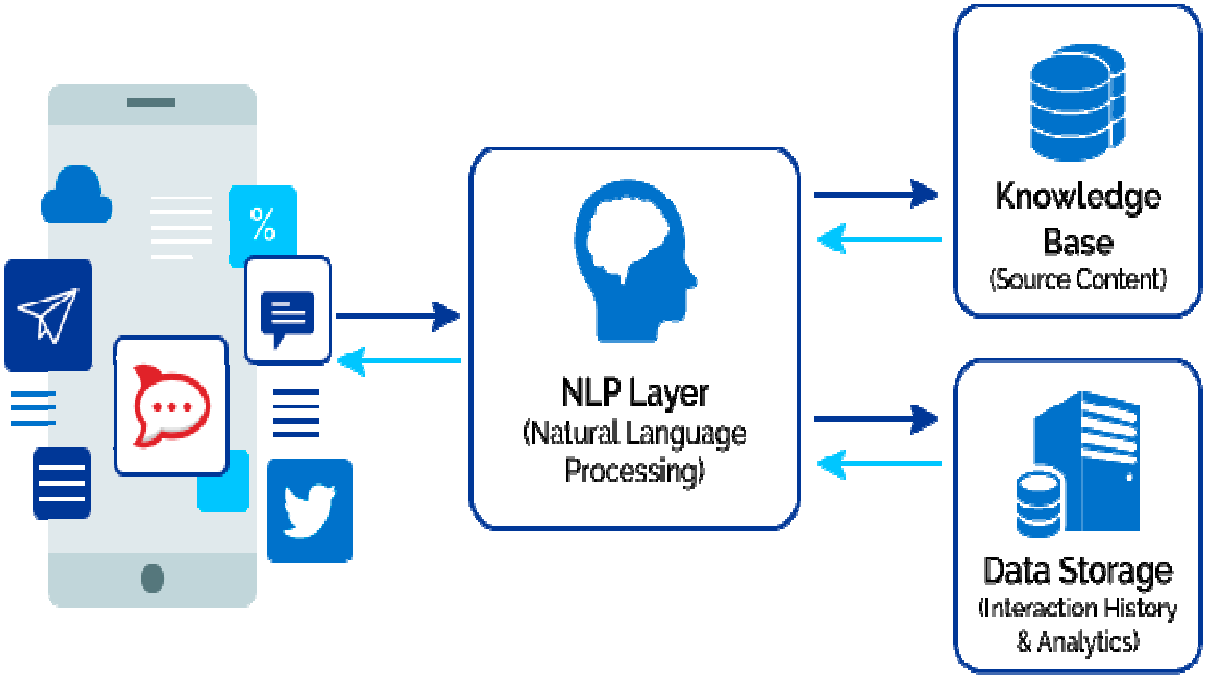

Figure 7.NLP design which is able to maintain the information from application to repository

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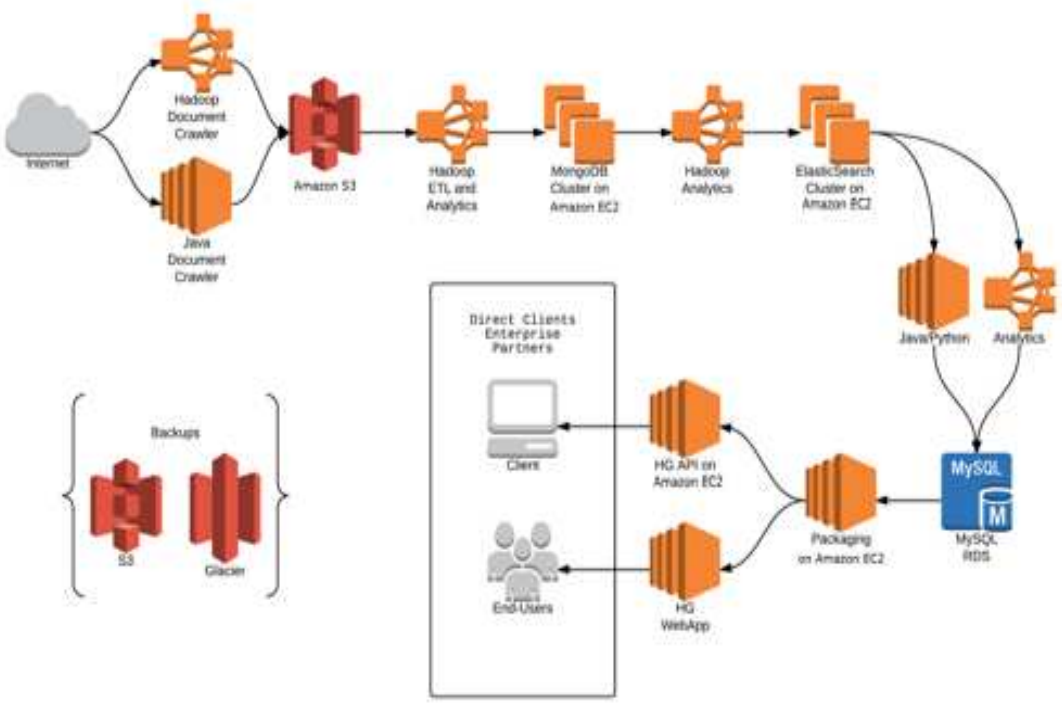

Figure 8.AWS design victimization for shopper aspect application

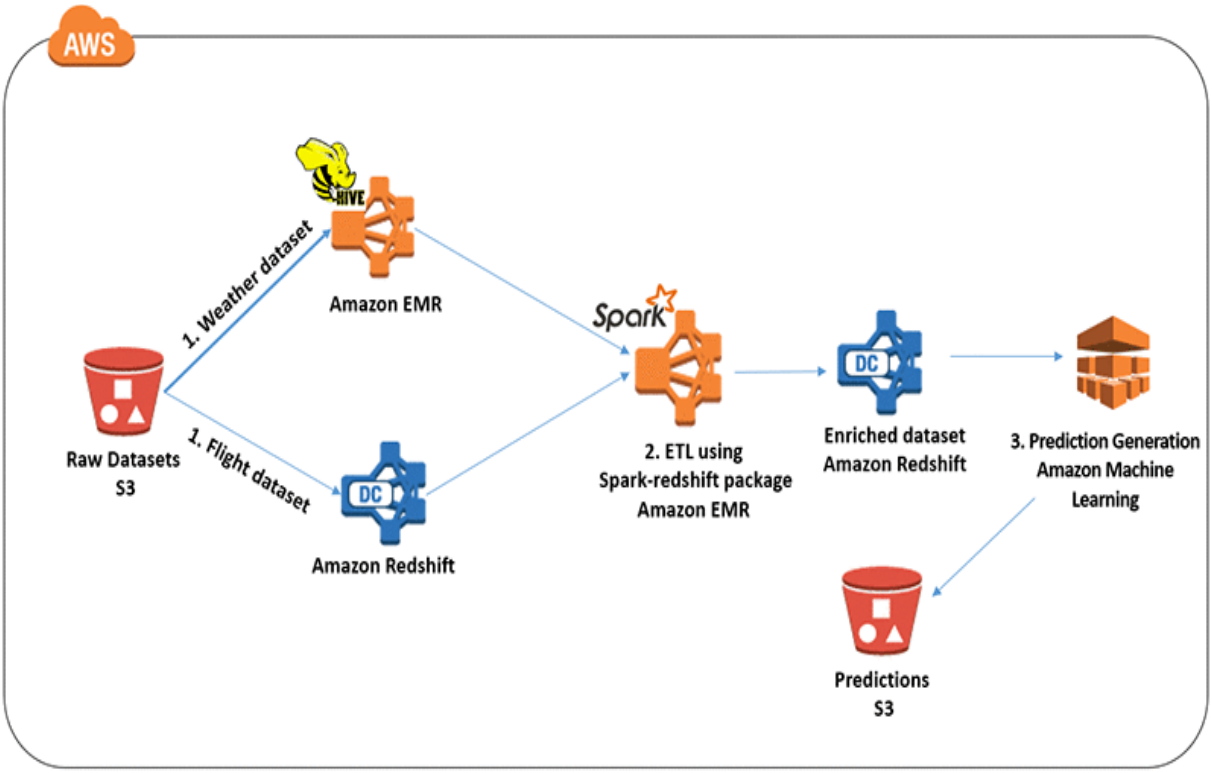

Figure 9.AWS design used from the server aspect with RedShift

This type of approaches can be helpful for implementing in multidisciplinary models. Like here we are implementing AWS for storing and accessing the information of the patient. Whenever the patient creates and account and login into application we need to store the information into the cloud servers. Whenever we required information we can get access from S3 buckets using EC2 instances which we are running for the patients. Using IAM we are maintaining security of the access management of the data. Every person cannot get entire

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information they need. The access in managed in an advanced level of implementation. Figure 7, figure 8 and figure 9 will explain the utilization of the AWS architectures with machine learning implementation. In the next big things which we need to perform is tokenization. This process is to identify the words and how many times they are repeating.

If the case if understanding how many days a medicine is asked to use. This is the most important thing. Here we need to understand the important things like handwritten and the duration of using some of the medicines.

Figure 10 will be explaining the tokenization format and in that way we are implementing the same process.

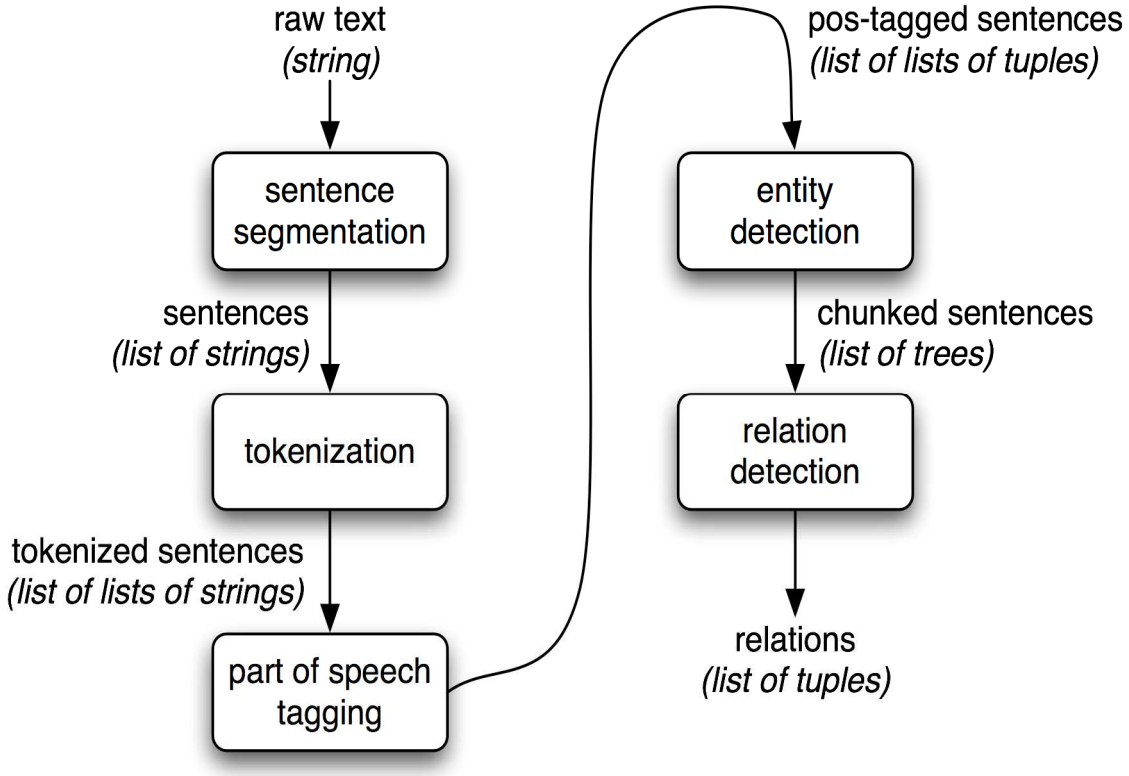

Figure 10.Text Classification design with Tokenization

RESULTS

In this section we'll discuss concerning the clusters we tend to fashioned and within the table we've got key worth pairs which are able to have the cluster of pairs. This may tell the medication limit of the patient supported the age, gender, weight, previous treatments, previous medication, and current state of affairs. The below is that the table which is able to offer the reason based identification of insights of the implementation of CNN and implementation of machine learning models.

This try can offer the warning to the doctor if her offer the high drug usage. These ar the few cluster results we tend to no heritable as mentioned below which is able to have the worth's of what number times a try of key value is being perennial.

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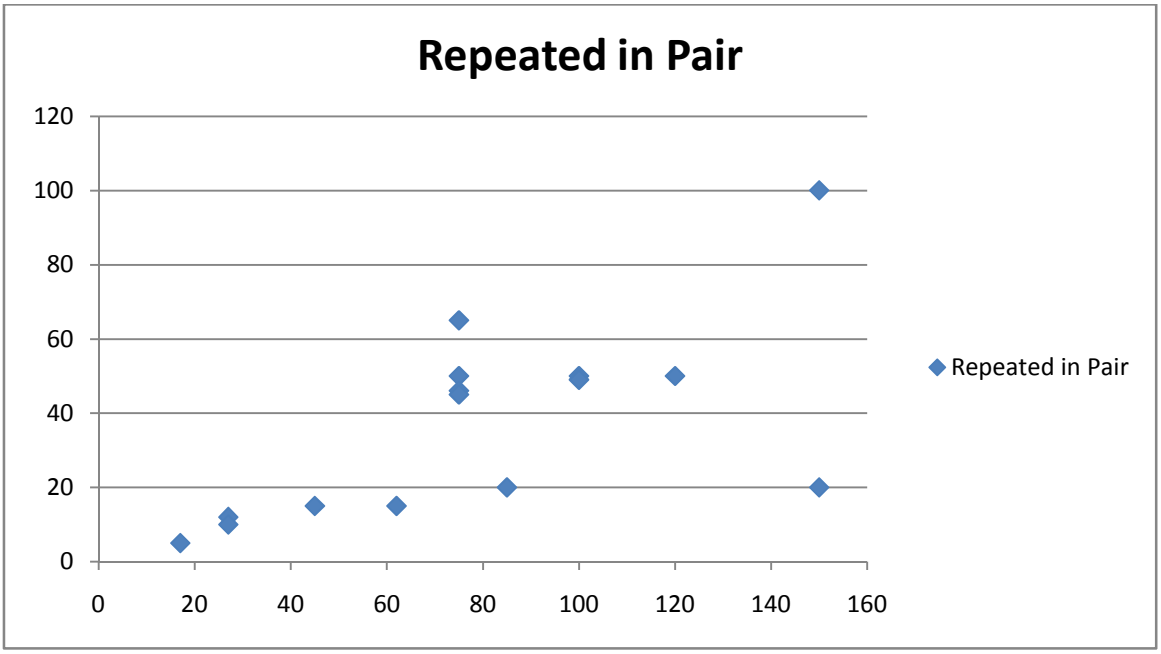

Figure 11.KeKey constrains. Understanding words and vectorizing those

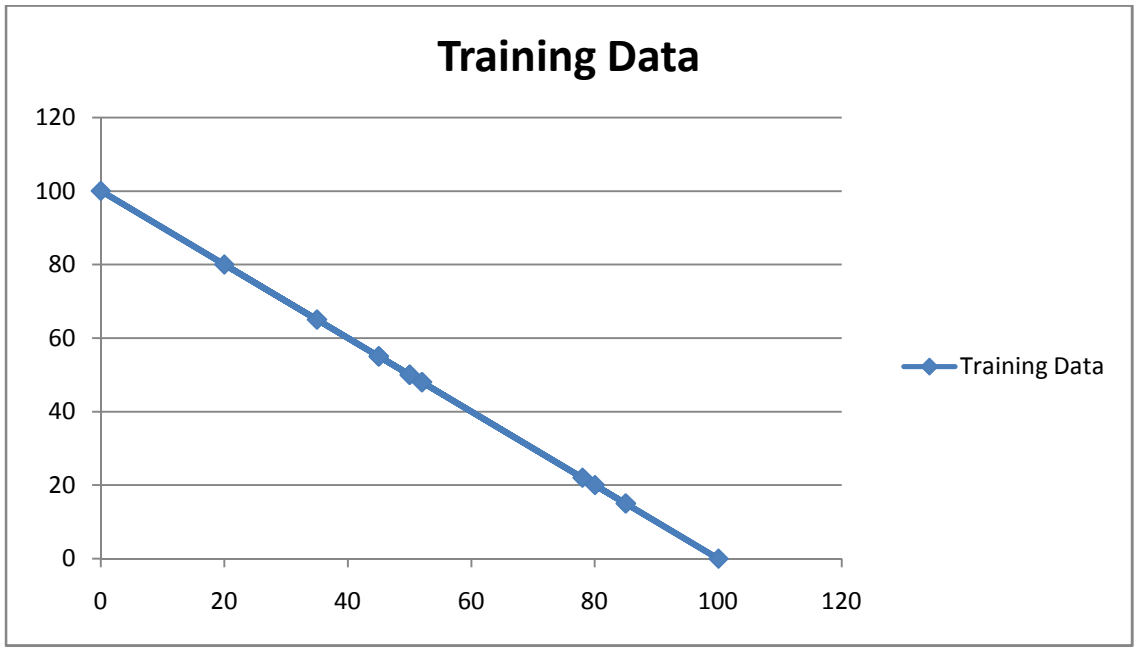

Figure 12.Training data visualization

The on top of graphs can justify the cases we tend to ar having best try of key worth pairs.

The below table can justify the list of variables we'll take into account for this type of key worth pairs.

CONCLUSION

By using machine learning in EHR applications to understand the hand written prescription and sending the feedback to the doctor who prescribed that can improve the patients health information in a broad way and this kind of applications are very rare and we are trying to implement the in a broad way that we can directly enter the information into the application and analysis that information by avoiding the prescription too. CNN is the best practice in implementations of machine learning clustering models and we can even

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perform using hierarchical clustering models and agloromative models which are advanced clustering models which are proceeds to the CNN.

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