

# Monitoring Diabetes Patients using Big Data Analytics

B. M. Shantabhushana<sup>1</sup>, Swati Salimath<sup>2</sup>, Madhavi M. Pawar<sup>3</sup>, Soumya T. Warad<sup>4</sup>,  
Amruta S. Ankaliki<sup>5</sup>

<sup>1</sup>Assistant Professor, Dept. of Computer Science and Engg., AGMR College of Engg. and Tech., Hubli, India

<sup>2,3,4,5</sup>Student, Dept. of Computer Science and Engg., AGMR College of Engg. and Tech., Hubli, India

**Abstract:** Diabetes mellitus is a disease with numerous complications. Operative control of diabetes depends on individual-monitoring and essence-care activities such as blood glucose monitoring, suitable diet and nutrition, exercise regimen and medication administration strategies.

**Keywords:** Diabetes mellitus, Regimen, NIDDM, IDDM, PHR

## 1. Introduction

Diabetes mellitus is a metabolic disease; it is the third leading cause of death in many developed countries. This metabolic disease is mainly divided into 2 types namely insulin – dependent diabetes mellitus (IDDM) and non-insulin dependent diabetes mellitus (NIDDM). IDDM is type-I diabetes, it is usually found in childhood especially between 12-15 years of age and this is about 10-20% of population. NIDDM also called type II-diabetes, it is usually found in adults especially above 35 years age and this is about 90% of population. NIDDM patients may have either normal or even increased insulin levels. This disease is mainly due to destruction of b-cells and hence leading to deficiency of insulin.

## 2. Methods and Material

### A. Related Work

Saravana Kumar et al. [1] paper discusses a project which deals with the study of diabetic treatment in healthcare industry using big data analytics and presents the Modernizing healthcare industry's move towards processing massive health records, and to access those for analysis. Based on the analysis, it provides an efficient way to cure and care the patients with better outcomes like affordability and availability. Due to the growing unstructured nature of Big Data from health industry, it is necessary to structure its size into nominal value with solution. Healthcare industry makes use to know the importance to develop the data analytics.

Enrique V. Carrera et al. [2] described to automatically classify the grade of non-proliferative diabetic retinopathy at any retinal image. For that, an initial image processing stage isolates blood vessel, micro aneurysms and hard exudates in order to extract features that can be used by a support vector machine to figure out the retinopathy grade of each retinal

image. It concludes that image processing of retinal images has the potential to play a major role in diagnosis of diabetic retinopathy.

S. Shyni et al. [3] discussed about Big data and advancement in analytics. Big Data has an incredible influence from global market to the day-today life. Big Data is the term used to describe the huge volume of both structured and unstructured data. Big Data Analytics is the use of advanced analytical techniques against very large and diverse data sets that include different types and sizes. Nothing is more important than healthy and peaceful life. Big Data Analytics improves health care system through the reduction run time and the optimal cost.

Jeff Unger [4] discusses on Current Strategies for Evaluating, Monitoring, and Treating Type 2 Diabetes Mellitus. Modern oral hypoglycemic agents may be used with or in place of traditional therapies. Analogue insulin, whose pharmacokinetic and pharmacodynamic properties allow patients improve their lifestyle compared with insulin. By intensifying therapy during the course of disease process. We need to use most effective therapy available for maintaining lowest and safest HbA1c level.

Lidongs Wang & Cheryl Ann Alexander [5] discussed on Medication development which plays an important role in fighting against chronic illness such as diabetes mellitus, asthma etc. Without proper testing and management of drug data, disease management would fail. Big data analytics(BDA) provides an excellent basis to examine and manage tera bytes of data that comprises drug data and manage all aspects of drug development. Improved data quality (DQ) in health organizations which improves the quality of decisions in health care.

### B. Contributions

With the aim of overcoming the disadvantages of the systems such as few paper involves digital processing of retinal images which causes blindness and few involves difficulty to predict patients diagnosis and related work. We proposed a new architecture in which firstly we take details of user which mainly says about whether he/she is Type-I or Type-II diabetic patient then on using cluster analysis, his health status and also using details of many patients which gives analyzed graph

describing percentage of diabetes patients in particular location in respective year.

### 3. Proposed Architecture

The main aim of this project is to develop a system that helps user's analysis of diabetic patients by using real data sets or range of values. We use cluster analysis method and output is given in the form of charts. Range of values helps to analyze percentage of diabetic patients over a location in particular year.

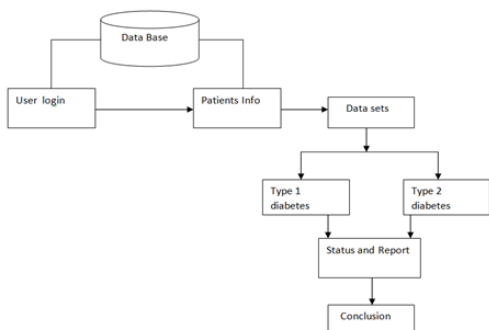


Fig. 1. Proposed architecture

#### A. Graph

Graph obtained from this project describes individual patient health status saying increase or decrease in his/her blood sugar level after following certain medications after analysis. This also gives total percentage of people suffering from diabetes mellitus over an area in respective year.

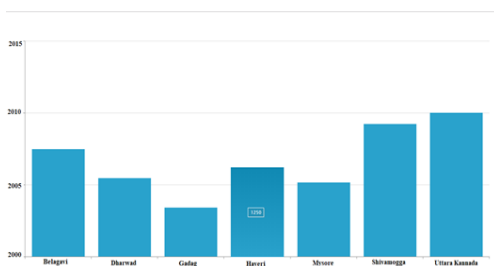


Fig. 2. Percentage of diabetic patients over few districts

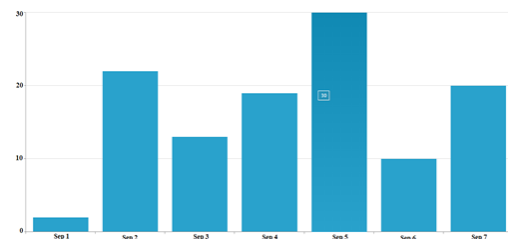


Fig. 3. Individual patient blood glucose level

### 4. Conclusion

This study has proposed a medical system that monitors diabetic patients health by giving precautions about daily food routine, exercise to be followed so that it helps to reduce blood glucose level of an individual and also analyses diabetic people over an area in respective year which helps medical institutes and few insurance companies for their economic growth and also benefits people.

### References

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