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# Study on Diabetes Management using METABO on ICT

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## ABSTRACT

One of the most analysis and business challenges for contemporary care systems is that the combined demand for higher treatment quality and reduced prices. this text presents a customized care Pathway (PHP) thought that aims to satisfy the prevailing characteristics, within the type of associate ICT system for polygenic disorder disease management developed within the METABO" analysis framework. The project was started with the aim of providing physical and virtual areas to handle the wants of health practitioners to implement simpler care provision, and empower patients to become co-producers of their own health care. The METABO platform was deployed in four hospitals, and was then tested at intervals the framework of a clinical wildcat study to assess its potential. Customized care Pathway (PHP) has been developed for polygenic disorder disease management associated integrated into an information and Communication Technology system to create a patient-centred care from organization-centred care. A small-scale wildcat study was conducted to check the platform. Preliminary results are bestowed that shed lightweight on however the PHP influences system usage and performance outcomes.

**Keywords :** METABO Platform, Patient-Centred, Disease Management, Customized Care Pathway, ICT System

## I. INTRODUCTION

Big data is an evolving technology that deals with a large volume of unstructured data , structured, semi-structured and that can be mined for information and used in machine learning projects and other advanced analytics applications.. As the term indicates it consists of large volume of raw data.Theoretically big data is characterized by three V's. The extreme volume, the wide variety and the velocity of data .. Traditional searching, sorting and processing algorithms would not scale to handle the data in this range, and that too most of them are unstructured . The Big data processing technologies includes machine learning algorithms, natural language processing algorithms, predictive modeling and other artificial based techniques.

concepts of personalized healthcare. Personalized patient-centered healthcare services, with increased individualized treatment, through the utilization of standard clinical protocols, may represent a solution, especially for chronic diseases. The[1] METABO platform was deployed in four hospitals, and was then tested at intervals the framework of a clinical wildcat study to assess its potential. Advances in [2]information and communication technology (ICT) make possible the continuous development and improvement of telemedicine platforms and decision support systems (DSS) for diagnosis, treatment, and management of different illnesses. [3]eHealth solutions can provide the foundation for the deployment of efficient and innovative healthcare means and procedures in which health is viewed as a continuous process where the patient's role, as well as the corresponding expected.

**A. Big Data In Healthcare .**

The other businesses have been successful by integrating and analyzing large amount of data's. Health care is just popped up into the market. In the health care domain, the big data is widely used for analyzing and predicting the diseases by us ing the diagnostic results of the human. The amount of data that is collected comes in many forms such as from patient's insurance claims to physician notes. The medical record images such as scan report of the patient, discussions about health in social media, information from wearable's and monitoring devices like pressure monitor and sugar testing devices. Some of the collecting agents are the employers the blood banks. Testing labs, health centers, awareness programs and in social media. The National institute of Health recently launched the knowledge initiative to activate the research community of bio medical industry in order to better access, manage and to use the datas. Some of the earlier works is conducted through National Patient Research Network[4]. The educational organizations, medical systems, life science organization and members from other organizations had a collaborative work with Optimum research labs.

## II. RELATED WORK

C. Lee andM.Wan's project[5] a fuzzy expert system for diabetes decision support application,. This paper presents a new fuzzy expert system for diabetes decision support application. This consists of a five-layer fuzzy ontology, including a fuzzy personal relation layer, fuzzy group domain layer, fuzzy group relation layer, fuzzy knowledge layer,and fuzzy personal domain layer, is developed in the fuzzy expert system to describe knowledge with uncertainty. By applying the new fuzzy ontology to the diabetes domain, the structure of the fuzzy diabetes ontology (FDO) is defined to generate the diabetes knowledge. Additionally, knowledge construction mechanism, a semantic decision support agent (SDSA), and semantic fuzzy decision making mechanism, is also developed.

D. Alexandrou, I. Skitsas and G. Mentzas[6] a holistic environment for the design and execution of self-adaptive clinical pathways, one of the main challenges to the modern health care is to increase treatment quality by personalization of treatment. The treatment personalization requires the continuous reconfiguration and adaptation of the selected treatment schemes according to the "current" clinical status of patient and circumstances inside a health care organization that keeps on changing, along with the updated medical knowledge.here an integrated solution concerning the adaptation of health care processes (clinical pathways) during execution time. The software consists a health care process execution engine aided by a semantic infrastructure for reconfiguring the clinical pathways.

M. Harris and J. Habetha[7]my heart project: A framework for personal health care applications,This project aimed at developing intelligent systems for monitoring of cardiovascular status. Early identification and diagnosis of heart disease could save millions annually, along with improving patient quality of life. The approach is use wearable technology to monitor Vital Body Signs (VBS), and uses the measured data and to give the user recommended treatment from the system. four concepts addressing cardiac health have been developed

S. Adeyemi, E. Demir, and T. Chaussalet [8]:This Study has two objectives First, we aim at advancing our knowledge with regard to the application of modelling techniques to patient pathways. Second, .to introduce a random effects continuation-ratio logit model, suitable for detecting stage wise transitions, to patient pathways modelling We study individual clinical pathways of chronic obstructive pulmonary disease (COPD) patients. Data on COPD patients were extracted from the national English

Hospital Episodes Statistics dataset upto more than four readmissions are captured. We notice that as patients are frequently readmitted, males are in high risk than females. Furthermore, the number of previous readmissions has a direct impact on a chance of a further readmission. This model is very useful cases with many readmissions. Our method could hep in decision support to determine disease specific probabilities of multiple readmissions. Therefore, this could be a valuable tool for clinicians.

D. Ria˜no, F. Real, J. A. L´opez-Vallverd´u, F. Campana, S. Ercolani, P. Mecocci, R. Annicchiarico, and C. Caltagirone project [9]An ontology-based personalization of health-care knowledge to support clinical decisions for chronically ill patients. In this paper,we have two personalization processes. The first personalization process adapts the contents of the ontology to the particularities observed in patient, automatically providing a personalized ontology containing only the information that is relevant for that patient. The second plan uses the personalized ontology of a patient to automatically transform intervention plans describing general treatments into individual treatment plans. For comorbid patients,this integrated several individual plans into a single personalized plan. Finally, the ontology is also used as the knowledge base of a decision support tool.

## III. METHODOLOGY

### A.Loading the Dataset

This is the first module in our project after running the mian.java in our project we are supposed to load the DATASET on which we are going to do our Exploratory Study, For this requirement we had taken 500 patients details of a well known hospital and prepare those details as a dataset so that we can load that dataset in our protocol.

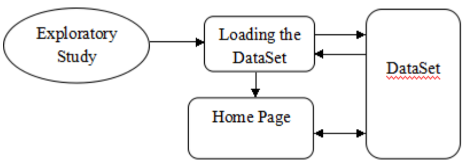


Fig.1 Loading Data

### B. Calculating BMI value

Lifetime diabetes risk at 18 years of age is increased in men from 7.6 to 70.3% from underweight and very **obese.** and in women the statistics are from 12.2 to 74.4%.At old age the lifetime risk difference is low. At 65 years of age, compared with normal-weight male subjects, lifetime risk differences increased in overweight and obese men from 3.7 to 23.9 and for women the statistics are 8.7 to 26.7. The impact of BMI on diabetes duration also decreased with age. So in this module we are calculating the BMI value for both men and women basing on the available data, results are shown with the help of graphical representation.

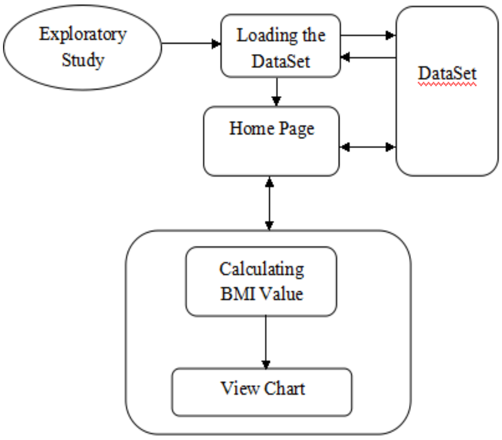


Fig.2 calculating BMI Value

### C.Algo for calculating Fat Test

People who are obese are at much greater risk than others for type 2 diabetes. Recently, research has proved that it's not just weight that increases health risk it's where that weight is located in our body. So we are using a heuristic algo to calculate the fat test and determine the results

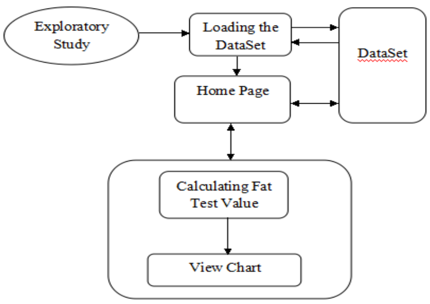


Fig.3 Calculating Fat test value

### D. Calculating Value of HBA1C

The term HbA1c refers to glycated hemoglobin. By measuring glycated hemoglobin (HbA1c), clinicians are able get what our average blood sugar levels have been for a period of weeks/months.This is important because as the higher the HbA1c, the greater the risk of developing diabetes-related complications increases. HbA1c is also known as **hemoglobin A1c** or simply **A1c**. This will be calculated by our project and results are displayed in the form og graphical representation.

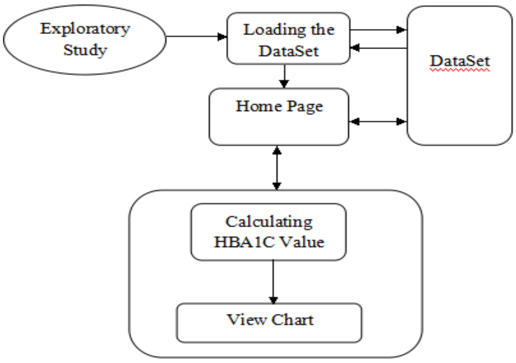


Fig.4 Calculating HBA1C Value

## IV. RESULTS AND DISCUSSION

This project is implements like web application using corejava and the Server process is maintained using the socket & serversocket and the design part is played by Cascading Style Sheet. It includes the various results of the different tests along with the patient's test details and the complete graph for each test too that indicates the differentiations and the variations for the overall individual test that completes a small scale exploratory study of the patients for the diabetes disease.

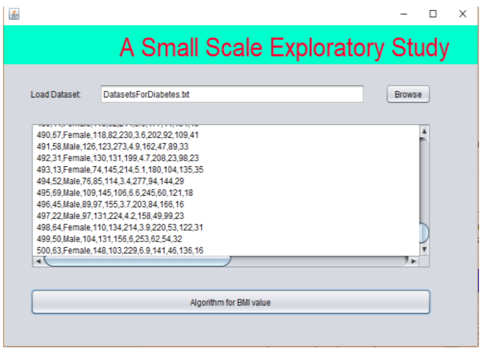


Fig.5 Loading Data

algorithm for calculating BMI value ,fat test,and HBA1C individual patent data comparing with normal persons values with the abnormal ones or the patients

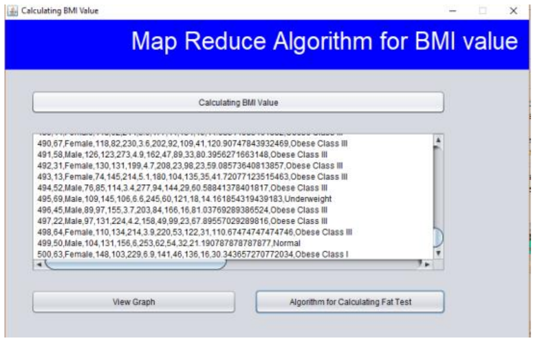


Fig.6 Analyzing BMI data

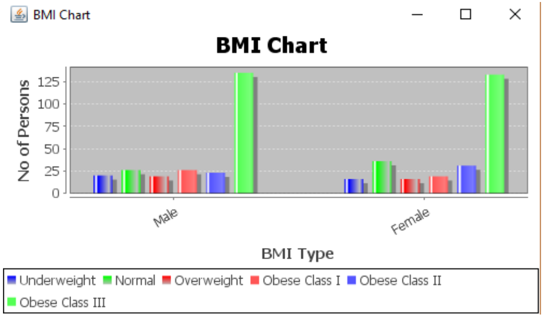


Fig.7 BMI graph

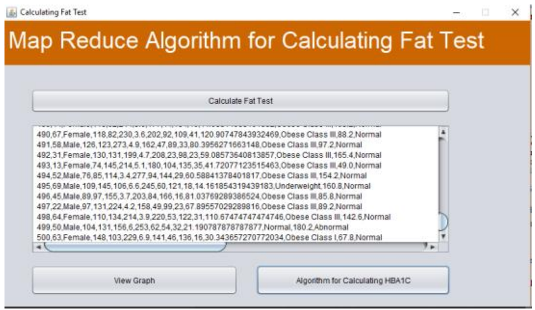


Fig.8 Calculating Fat Test

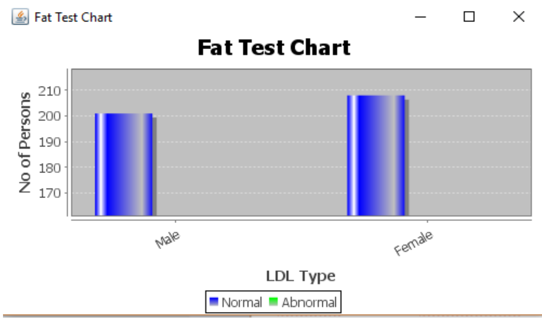


Fig.9 Fat Test Graph

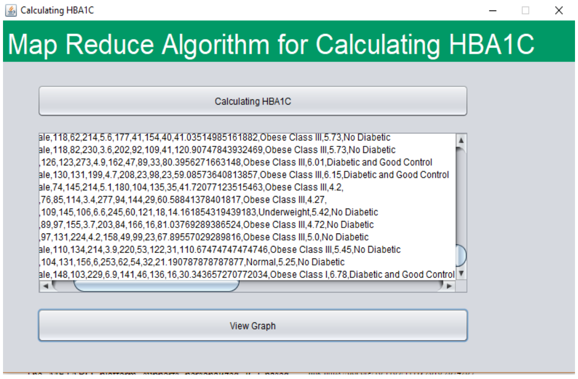


Fig.10 Calculating HBA1C

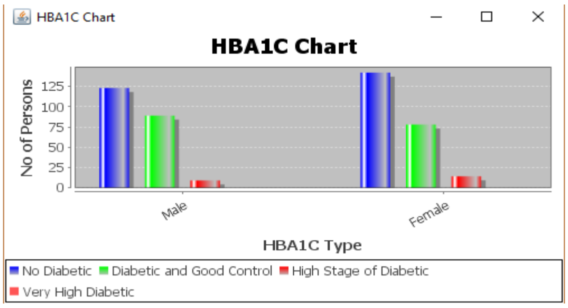


Fig.11 HBA1C Graph

## V. CONCLUSION AND FUTURE SCOPE

The METABO platform supports personalized ICT-based health management of diabetic patients in their living environments. The preliminary test results indicate the feasibility, acceptance, and potential effectiveness of this platform. The PHP had an influence on how the CP was designed and on the rules used to create the different DSS components. Personalization, customization, and constancy of the care process have been assessed. This ICT platform has proven to be both useful and usable, as rated by users, and has allowed us to draw clear representations of users' behaviors. Learning has had the effect of decreasing the number of interactions and usage time with the progression of the pilot. Review and assessment of the results obtained from the different tests carried out with both TP and diabetic patients, allow us to conclude that, in general, the designed system substantially fulfills the beneficial characteristics expected

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