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A Survey on Detection and Diagnose of Malnutrition

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Abstract: ***In todays present day world, Globalization, demographic transition, lifestyles fashion modifications and nutritional meal patterns impacts people's nutrition. This painting tries to illustrate the evaluation of malnutrition primarily based totallyon meals intakes, wealthy index, age group, schooling level, occupation, etc. There is no decrease in number of patients with undernourishment or over nutrition illness. This form of sickness reasons extra of 5,00,000 instances in India each 12 months and is the principal basis for dying in India. The approach of this work is to use agent Technology and Data mining technology. Uncovering the relationships in data mining has a prospect which leads to malnutrition when provided large data sets. In the primary stage the variables from non-clustered facts have become correlated with malnutrition indices. Further on, the statistics became parts into clusters. This became completed with the aid of using the k-nearest set of rules and logistic regression. Subsequently every cluster became analyzed the usage of the software program and the correlation outcomes became compared. The end result of supervised information mining strategies in nutrition database affords the nutrition repute of kids age below five. Choosing a extra appropriate set of rules that quality represents malnutrition in India could as a consequence be very useful. This work is beneficial to enhance nutrition stage of public fitness with the assist of presidency fitness offerings to the people.***
Keywords: Malnutrition, Data Mining, Machine Learning Techniques, KNN, logistic regression, Nutrition

I. INTRODUCTION

Malnutrition is the inadequacy in a person's consumption of nutrients. Malnutrition is considered has pivotal health issue in the day-to-day life. Causes of malnutrition include poor feeding practice, inadequate breast feeding, inadequate nutritional knowledge and diseases. Malnutrition is divided into four categories: Wasting, Stunting, Underweight and Deficiency. Wasting is known as condition which has low weight for this specific height. Stunting refers to low height for age. Under weight is known has low weight for age. Deficiency refers to lack of sufficient nutrients in the body. Children with moderate wasting and stunting have a high probability of dying due to lack of nutrients. The main problem of malnutrition is majorly found in underdeveloped and developing countries. Underlying child mortality and morbidity is the main factor for the malnutrition in the children under 5years of age in different parts of the world. Data mining is a Technique to find correlations within a huge dataset to predict results. Since there is need for analytical methodology in detecting unknown and useful information data mining has been popular in health care field. Data mining techniques and machine learning techniques are interrelated to each other. Machine learning is a technique where the computers can learn without being programmed. It uses data and algorithms to learn like humans. In data science machine learning plays major role. Under machine learning we have various algorithms and techniques.

KNN is the most commonly used algorithm in machine learning. KNN is a supervised learning algorithm. This algorithmis easy to understand and implement. KNN classification begins with a dataset. Dataset is referred to as number of features. It includes two types. They are training set and testing set. Logistic Regression is a prediction analysis. It is used to explain the relationship between different variables. Logistic regression is a special case of regression analysis and is calculated when the dependent variable is nominally or ordinally scaled.

II. LITERATURE REVIEW

Subhash N. Ariyadasa, Lasanthika K.Munasinghe, Sanjeewanie H.D. Senanayake MGNAS Fernando [1] proposed Knowledge Extraction to Mitigate Child Malnutrition in Developing Countries. The aim of this study is to reduce the frequency of child malnutrition for the preschoolers. By using data mining tools and methods some hidden factors were extracted. The plan of the project is based on frame of reference which was assembled using the information gathered and it uses Entropy based gainratio concept and the data is limited. A decision tree method was used for rule generation. Malnutrition condition can be reduced with assistance of medical professionals.

Mithilesh P Shah, Pawan A Kamble, Satish B Agnihotri [2] notes that using information and communication technologies (ICT) an innovative approach was developed for all the health field workers. To test the possibility and suitability of ICT based approach a preliminary experiment was conducted. They used Scio-NIR sensor and regression method, but nutrients were estimated through percentage. The hindrance of Integrated Child Development Scheme (ICDS) is the standard and frequency of the tutoring given to Anganadwadi Workers, ASHA workers and their supervisors.

Avinash S. Vadiya, Goutham Makkena V, Srihari; MB Srinivas; Srinivas K Rao [3] proposed a result for covering undernourishment in children in the developing nations. Undernourishment in children is a major issue encyclopedically and is remarkable in developing countries. As per UNICEF reports, encyclopedically 101 million children under five years are light. Since India is a developing nation, ranks 2nd in child undernourishment cases. Child malnutrition has a damaging effect on the country's profitable growth. The Government of India has introduced numerous programs to attack the problem of under nourishment but the rate of malnutrition status is a grueling task. In this journal, they have used pipelined approach but the database is limited to small order and results which was developed to cover the growth in children in a cost-effective and easy way.

Bambang Lareno, Liliana Swatina, Husnul Maad Junaidi [4] projected IT Applications to map the potential of deficiency disease issues. The state government has created a strategy to deal with undernourishment problems through the institution of posyandu that beneath puskesmas coordinated. However, in reality, not many kids are discovered, and as a result, there are parents who don't benefit from posyandu. This journal gives light to seeking out a representation of IT applications that may be used for checking the potential of deficiency disease issues and therefore the rate of utilization of posyandu. As the result, the data model developed may be a net-based core system, with a mobile application web.

P. Kamakshi Priyaa, Dr. L. Arockiam [5] proposed a check on nutrition monitoring and salutary operation system. A well- balanced diet with Associate in Nursing estimated nutrient intake is significant for infants and kids that reduces the risks of deadly diseases namely cancer, diabetes, obesity and cardiovascular diseases. in contrast to adults, infants need some assistancein their food intake. The survey provides valuable insights regarding the varied advancements of IOT within the health care business and also the want for nutrition and dietary observation. A varied variety of nutrition observation systems for the estimation and prediction of calories are developed mistreatment various machine learning techniques and additionally with advanced deep learning primarily based techniques. A comparative read of the previous works of researchers within the recent times has been provided.

Kavya Priya M L, Chaitra, Ganavi M, Shreyasvini P, Prathibha B [6] proposed an innovative operation to predict malnutrition and Anemia using ML. The foremost thing of this proposed phenomenon in children lower than five times is suffering from a lack of nutrition. The problem of Malnutrition and anemia is majorly factory in underdeveloped and developing countries. To overcome this problem, we make use of various Machine knowledge and data processing approaches to predict the malnutrition condition ofa toddler lower than five times predicated on Various factors analogous as Gender, Age, HAZ, WAZ, etc … are pulled. Type ways used for malnutrition status prophecy.

Nair Akash Anilkumar, Deepa Gupta, Sangita Khare, Deepika Manippady, Gopalkrishna, Amalendu Jyotishi [7] state that in Sri Lanka there is a dearth of IT related projects in the medical management related to e-government initiatives. Post- independence in Sri Lanka malnutrition is considered a serious health sector as per the recent studies. This journal presents a multi-agent system to reduce malnutrition (MASRM) with its design and architecture. It is an easy way to detect undernourishment in children under five years of age and provide nutrition advice to them.

Xu Dezhi Upeksha Ganegoda [8] proposed Multi-Agent System to reduce Malnutrition (MASRM) in children. Overarching national policy is desirable to address the issue of malnutrition, if the root cause of malnutrition varies across various countries it may not be effective. The Indian States can be clustered on four anthropocentric specifications of malnutrition. If the clusters formed will explain different factors for malnutrition. For the analysis of Indian-DHS (Demographic Health Survey) data. In different clusters of states, the results obtained would help policymakers to have a targeted approach to malnutrition.

R.E. Kalu, K. D. Etim [9] planned Factors related to deficiency disease among below 5 kids in developing countries. deficiency disease may be a consequence of consumption of dietary nutrient either insufficiently or completely by particularly kids. The aim of this study was to hold out a review of malnutrition-dependent factors among under-five kids in developing countries. The study was applied by reviewing publications on researches on deficiency disease conducted in Africa and Asia with specific relevancy factors related to deficiency disease. it had been found that, of the 162 million kids below 5 years WHO were scrawny, three hundred and sixty-five days of them resided in Africa whereas fifty-six were found in Asia. The severity of childhood deficiency disease was determined to steady increase from St Martin's Day in 2003 to eighteen in 2013 for wasting; pure gold in 2003 to twenty ninth in 2013 for lean.

Jessica elation, Natasha Lelijveld, Andre Briend, Marko Kerac, Mark Manary, Marie McGrath, Zita Weise Prinzo [10] projected the use of middle higher arm circumference by novel community platforms to discover, diagnose and treat severe acute deficiency disease in youngsters. We explained here regarding 1072 records, chosen forty-three records for full-text screening, and known twenty-two studies that met our eligibility criteria. This paper created the study of design, strengths, and weaknesses; intervention. The treating of youngsters classified as severe acute deficiency disease supported low weight-for- height, instead of middle higher air circumference, at household level, isn't self-addressed during this review.

Vaibhav Sharma, Vishaka Sharma, Ayesha Khan, David J Wassmer [11] projected deficiency disease, health and role of machine learning in clinical setting. Nutrition maintains an important role in good health and rehabilitation. Inadequacy in nutrients will affect the evolution of varied disorderliness. Deficiency disease inspection apparatus within the medical setting stay mostly understudy. We tend to additionally test common and particular deficiency disease apparatus exploited in care backdrop. Hence, we conclude that with a mirrored image on enhancement, particularly ML based algorithms, will be unifiedinto medical record to produce support system to suppliers within the recognition and administration of patients at perilous of malnutrition.

M.Jubaidar Rahman, N.A.M Faisal Ahmed, Md. Menhazul Abedin, Benojir Ahammed [12] proposed Investigating the chance of acrobatics, and wasting, in a group of beneath 5 kids and its detection is predicated on machine learning approach. This analysis used machine learning (ML) algorithms to observe the possibility of deficiency disease likewise to their detection. Moreover, three metric capacity unit classifiers (support vector machine (SVM), random forest (RF), and LR) are enforced for detecting deficiency disease and their production. This analysis targeted the recognition and detection of major danger factors for acrobatics, grow week, and weedy mistreatment metric capacity unit algorithms.

Neha Kadam, Vaishali Dabhade, Rushikesh Baravkar, Vrushali Saravade, Prof Chaitanya Mankar [13] proposed Detect malnutrition in underage children by using the TensorFlow algorithm of AI. Malnutrition is one of the most important public hygiene problems in developing nations. The contribution of India is 1/3rd of the undernourished children in the globe, with a widespread presence of 29.4%. The aim of this work was to evaluate the consortium of malnutrition with the performance amongthe 8-to-12 age group, data to analyze the health records. This cross-sectional study was done among the 8-to- 12 age group, with sample child's photos with text input data, taking the prevalence as 50%, and precision as 10%.

Molly Elizabeth Brown, David sponsor, Trey asking, Peter White [14] given Empirical studies of factors related to kid malnutrition: highlight the proof regarding climate and conflict shocks. youngsters United Nations agency expertise poor nutrition throughout the primary one thousand days of life are more at risk of unwellness and death within the close to term and work capability and output as adults. Supported a search of an existing journal, we tend to know ninety works that used applied mathematics analyses to estimate relationships between potential aspects and crucial gauges of child malnutrition: acrobatics, wasting, and scrawny. Our review determined that wasting, a life of acute deficiency disease, is compared to the other indicators.We tend to summarize the proof regarding relationships between kid deficiency diseases. Our results determine solely choose relationships that are important, with compatible signs, over collective studies.

Rahamuddin Khan, Manish Ahirwar, Piyush Kumar Shukla [15] presented Predicting malnutrition disease using numerousmachine learning algorithms. Health support of every individual ought to be considered a really necessary in today's world as a result of rise in several health issues. There are many of us over the planet stricken by malnutrition disease solely because of lack of early detection of sickness, malnutrition disease may be a matter of nice concern and so several efforts area unit devoted in mostdeveloped countries to style of automatic system for police work this sickness based on IoT. In healthcare environment no such system presents that accurately prediction the entire knowledge of one patient to diagnose the sickness in an exceedingly short amount of your time. The previous systems take an excessive amount of time to find the disease that causes serious damage to thepatients. In previous models the patient first go through numerous medical checks and obtain reports of every test severally, then doctor of every field monitor or check the check report supported some parameters and take necessary call on the basis of the report. This method takes an excessive amount of time in police work the diseases in patients.

III. EXISTING SYSTEM

A child should get proper nutrition for its growth, development and survival in today's world. The system which is already existing has less accuracy and is based on the manual process of child analysis. This is not suitable for the malnutrition prediction. This system consists of number of tasks and is time consuming and also expensive. It has no automation for prediction of malnutrition in children. There was security issue to store the data as it contained the personal data and it mightlead to data loss. This method was developed for a certain city and was not agile which may lead in to the scalability issues. Many researches were conducted in the past years, out of which many were related to statistical approach. Demography and Health survey (DHS) was conducted every six years to collect huge information related to individuals.

The data collected was not analyzed to find hidden patterns. Data mining techniques were not used during this process. At the later stage data mining techniques like data modeling and analysis tools were used in order to extract hidden knowledge.

In medical field there were no system which would accurately predict the disease in short period of time so that the patients can get diagnosis in minimal time. Since the previous systems were time consuming it caused more harm to the patients. In previous system the patient had to undergo different medical tests and based upon the test result different reports were generated. Based on the parameter's reports were checked by different doctors and necessary advice was given to the patients. The existing systems were not accurate due to self-learning.

In Rule Based Algorithm there are several methods which may use to extract the rules from the info set. From the sequential covering algorithm rules are generated during a greedy fashion supported a particular evaluation measure. The algorithm extracts the principles one class at a time from the data set. The criterion for deciding which class should be generated first depends on factors like class prevalence or cost of misclassifying records from a given class.

In existing systems many algorithms such as RBF-SVM, Decision tree, K nearest neighbor, Random-forest, K-star were used. Random forest algorithm was efficient but its execution was slow. It didn't provide real time prediction. Many classification techniques like part rule induction, RF and Naïve Bayes were used to predict malnutrition. This method predicted malnutrition status of the child but the solution was not given on how to reduce malnutrition. Bayesian networks and multi-layer perceptron techniques were used, but the dataset considered was small and multi-layer perceptron resulted in redundancy and inefficiency.

IV. PROPOSED WORK

The approach here is to introduce a new set up which will diminish malnutrition in children by using Agent Technology and Datamining technique. With the help of disease data set we can detect malnutrition. Information gained can be used by the agents to propose their design to reduce malnutrition condition. We are developing this system to give nutritional advice to the under nourished children. The results of this study will help to shed light on the contribution of village heath committees in reduction of malnutrition.

V. CONCLUSION

Malnutrition is the condition that results from taking associate unbalanced diet within which bound nutrients are lacking, in excess (too high associate intake), or in the wrong proportions. This study targets on the condition of malnutrition. The system which we are going to propose will be able to reduce malnutrition in rural areas. Further, we can use the proposed system in hospital to keep track of the malnourished patients and it can also be implemented in child orphanages where they can keep track of the children growth and provide nutrition to them. Similar to health camp, we can also arrange malnutrition camp in particular areas where people can get free checkup and medical advises for the malnutrition diagnosis. This system creates an awareness regarding the importance of a balanced diet among children and their parents.

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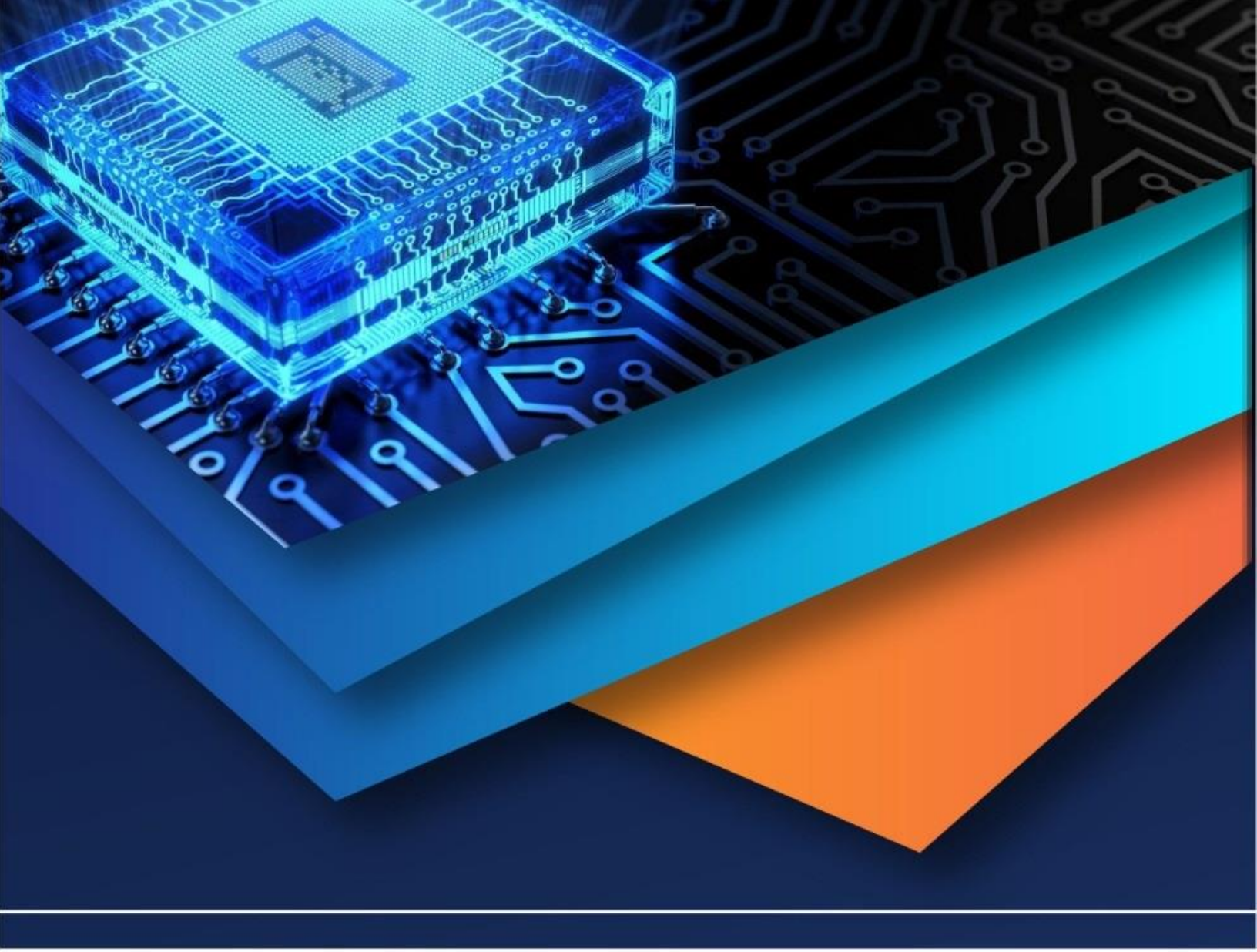

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