



INTERNATIONAL JOURNAL OF ADVANCE RESEARCH, IDEAS AND INNOVATIONS IN TECHNOLOGY

ISSN: 2454-132X

Impact factor: 4.295

(Volume 5, Issue 2)

Available online at: www.ijariit.com

Any time medical assistance and medicine vending machine using machine learning

Sivasubramaniyan S.

sivasubramaniyans1@gmail.com

Sri Venkateswara College of Engineering,
Sriperumbudur, Tamil Nadu

Srivarshini M.

varshinimanjula@gmail.com

Sri Venkateswara College of Engineering,
Sriperumbudur, Tamil Nadu

Deepthi P. S.

sweetymanian@gmail.com

Sri Venkateswara College of Engineering,
Sriperumbudur, Tamil Nadu

Dr. Janarthanan P.

janap@svce.ac.in

Sri Venkateswara College of Engineering,
Sriperumbudur, Tamil Nadu

ABSTRACT

This research aims to bring one step solution to the people for their medical treatment which includes online diagnosis, online consultation with medical experts and providing generic medicines. The major advantage is that people can access this ATMAMVM in public places available 24x7. This project provides basic medical treatment facilities within the reach of the people not benefited so far due to their location and also in concern of physically challenged and aged people. It is mainly focused to treat minor health ailments and to provide first aids.

Keywords— Medical equipment, Patients, Drugs/medicines

1. INTRODUCTION

Medical technology has improved tremendously in the last few decades. India's development in the medical field is almost on par with those of developed countries. It is excruciating mentally to know that this medical advancement is available only to metropolitan cities and towns. This vast development did not reach all the tribes and remote villages. It is a convenient, faster and safest withdrawal at any time and anyplace [1].

The problem arises when there is need of some medicine in urgent and either when drug stores are not open or drug is not available in stock, especially during night time, also they cannot take first-aid medicine on their own here we have doctors to treat them immediately with the first-aid medicine [4]. Caring of the aged and physically challenged persons are a serious concern in the developing countries. Family members are responsible for the care and management of them. In the modern age, it is difficult for family members to be available all the time to support them. Today in our society most families are nuclear. Elderly would prefer to remain independent and their desire for independence is natural, but it is a worry for their children. Any Time Medical Assistance and Medicine

Vending Machine is one such approach to help them take their medicines efficiently. Telecommunication technologies are found to be effective tools for connecting remote sites. By opening up new channels for communication, telemedicine connects rural and remote sites with health-care professionals around the world, overcoming geographical barriers[3]. This can be implemented everywhere such as shopping malls. It can be implemented on National Highways. It can be installed in Railway stations and bus stand also.

2. PROBLEM STATEMENT

Medical facilities available in metropolitan cities and towns are much reachable by the people compared to the people in the rural areas and villages. Due to insufficient transport facilities in many places people are not easily approachable to the hospitals. Senior citizens and physically challenged person find difficult to travel and also feel exhausted to wait in the queue for a long time to consult a doctor.

3. RELATED WORKS

3.1 Automatic medicine vending machine

Sarika Oundhakar has presented to his knowledge about the machinery and technology involved in the most common vending machines present all over the world. It helps to increase efficiency by lowering dependence on manpower. The desired outcome is achieved as per the user's requirements in the form of medicines dispensed by the machine. How easier it would make people obtain medicines from vending machines rather than waiting in queues for long hours. We also learned about the functioning of various instruments [5].

3.2 ATM (All Time Medicine) counter for medicine

Malashree.G1et al. proposed the system, in that users may be able to get basic Over-The-Counter (OTC) medicine at any time (24x7). Minor illnesses have a strange way of inviting people in the middle of the night when pharmacies are already closed. Over-the-counter (OTC) drugs are a class of medicines sold

directly to a consumer without a prescription from a health care professional, as compared to prescription drugs, which may be sold only to consumers possessing a valid prescription. People will be able to access the medicine with the help of this machine even at the night time. With this, first aid can be provided in time to the user. Medicines sold or supplied from a vending machine should satisfy the condition laid down by the Medical Council of India. Medicines which these restrictions apply are mainly aspirin and paracetamol. Products containing these substances should not exceed 16 tablets in a package for sale [2].

3.3 Data Mining and warehousing algorithms and its application in medical science

A Survey Smitha Thankachan, Suchithra proposed a process in which a raw data is being prepared and structured such that valuable information can be extracted from it is called Data analysis. The process of organizing and thinking about data is a way too accepting what the data does and does not contain. Data Analysis is a process of inspecting, cleaning, transforming, and modelling data. The objective of data analysis is to highlight useful information, providing conclusions, and help in decision making. Data analysis consists of multiple steps and approaches, including diverse techniques under an array of names, in a different business, science, and social science domains.

Data mining functions:

- Clustering,
- Classification,
- Prediction, and
- Associations [6].

3.4 A Survey Paper on Data mining Techniques and Challenges in Distributed DICOM

P. Haripriya, R. Porkodi proposed that the objective of implementing Data mining is to discover the interesting, meaningful and actionable patterns hidden in large DICOM datasets. Thus Data mining helps healthcare organizations, health informatics, patient care, Patient assistive technology, big data image analysis to extract critical data and automatic identification of unknown classes for further research and knowledge discovery. Treatment quality and the survival rate are also getting increased by applying Data Mining Techniques. Data mining evolution helps the identification of grouping the patients related to several criteria and helps researchers to deploy new standards [7].

3.5 Classification algorithms for data mining

Raj Kumar, Dr Rajesh Verma proposed that Naive Bayes is important for several reasons. It is very easy to construct, not needing any complicated iterative parameter estimation schemes. This means it may be readily applied to huge data sets. It is easy to interpret, so users unskilled in classifier technology can understand why it is making the classification it makes. And finally, it often does surprisingly well it may not Probabilistic approaches to classification typically involve modelling the conditional probability distribution $P(C|D)$, where C ranges over classes and D over descriptions, in some language, of objects to be classified. Given a description d of a particular object, we assign the class $\text{argmax}_C P(C = c|D = d)$. A Bayesian approach splits this posterior distribution into a prior distribution $P(C)$ and likelihood $P(D|C)$ [8].

4. PROPOSED SYSTEM

The patient can enter the ATMAMVM machine and can select a category, for example, Cardiology, Ophthalmology, Psychology, Neurology, and General Care which are available

in the system. The doctors who are in online may give consultation to the patient and if the doctor recommends taking the test and the patient may wish to have a checkup, he can use the available test mentioned below. The doctor prescribes medicine by giving command directly to the vending machine. The patient can pay the amount either in cash/card to withdraw his medicines from the outlet.

4.1 Algorithm

Naive Bayes algorithm has been used to classify the data according to the need. A naive Bayes classifier uses probability theory to classify the data. It is not a single algorithm, but a family of machine learning algorithms that make use of statistical independence.

Input: Training dataset T

Output: A class of training dataset

Step:

- Reading the training dataset T.
- Calculate the mean and standard deviation of the systolic and diastolic in each class.
- Repeat the same for the Glucose value of body contents.
- Calculate the probability of f_i using the gauss density equation in each class until the probability of all predictor variables ($f_1, f_2, \text{ and } f_3 \dots f_n$).
- Calculate the likelihood of each class
- Get the greatest likelihood.

4.1.1 System Design Elements: In the integrated machine there are few instruments attached to provide basic medical treatment for the patients. The ATMAMVM is a single integrated machine of medical equipment such as Blood Pressure testing equipment, Blood Glucose testing equipment, Auto-refractor equipment, Pulse detecting equipment, ECG testing equipment and Temperature testing equipment (Thermometer). And this system is interlinked with a vending machine, where medicines are stored on an inventory basis manually by the respective. The instruments are namely,

(a) Blood Pressure Checker: It is the pressure exerted by the blood on the walls of blood vessels especially the arteries. It varies with the age of the person's blood viscosity and by the heart muscle contraction and also by various other causes. Average BP of humans is 120/80 mm Hg. It is read as systolic pressure (contraction) / diastolic pressure (relaxation). It is usually measured on the right or the left of the upper limb. Or it can also be measured at the lower limb. This is measured by the instrument Sphygmomanometer. "Heart failure is common in patients with high blood pressure".

(b) Sugar Analysis: Glucose is carried through the bloodstream to provide energy to all cells in the body. Cells cannot use glucose without the help of insulin. When this glucose level goes too high it leads to a disease called Diabetes. Normal blood sugar levels are between 4.0 to 5.4 mmol/L (72 to 99 mg/dL) when fasting. Up to 7.8 mmol/L (140 mg/dL) 2 hours after eating. Low sugar leads to hypoglycemia and High sugar level leads to hyperglycemia. This is measured by the instrument Glucometer.

(c) ECG Analysis: Electrocardiogram (ECG) is the process of recording the electrical activity of the heart over a period of time using electrodes placed over the skin which reads and displays a sinus waveform in the monitor. When this wave becomes a straight line it means heartbeat is stopped (i.e.) the person has died. It is used for checking the heart rhythm, body flow to heart muscles etc and is very common to detect cardiac

problems. Normally it ranges between 60-100 beats per minute (specifically 82 BPM).

(d) **Pulse Oximeter:** Pulse oximetry can be used for at-home monitoring of your oxygen level and pulse for conditions such as chronic obstructive pulmonary disease (COPD), asthma, Congestive Heart Failure (CHF) and others.

(e) **Thermometer:** A person's normal body temperature is 98.6 degrees Fahrenheit or 37 degrees Celsius. When the temperature increases it leads to fever. It is measured by Thermometer.

(f) **Oxygen Mask:** It is used to deliver oxygen to people who don't otherwise get enough of it. There are commonly used to provide relief to people with respiratory disorders.

(g) **Defibrillator:** Defibrillation is a technique used in emergency medicine to terminate ventricular fibrillation or pulseless ventricular tachycardia. It uses an electrical shock to reset the electrical state of the heart.

The proposed system is shown in figure 1 with the detailed function of how it actually works.

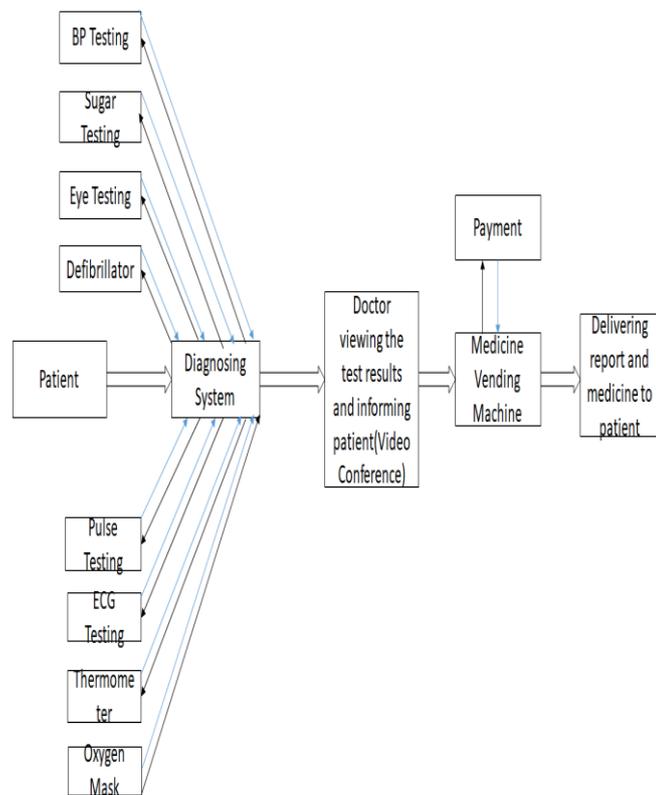


Fig. 1: Integrated Diagnosis System

4.1.2 Health Graph

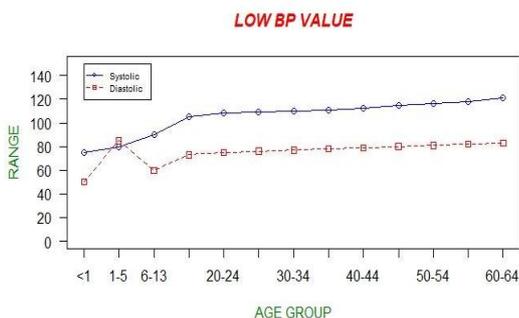


Fig. 2: Low BP value

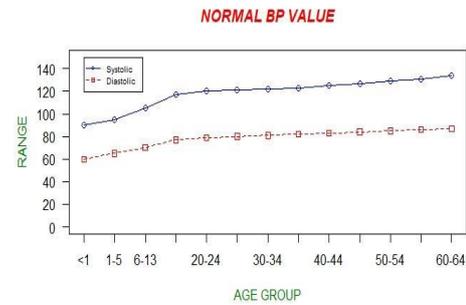


Fig. 3: Normal BP value

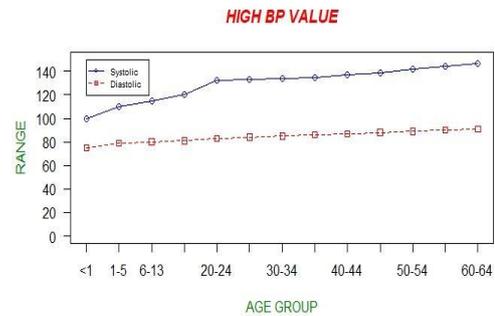


Fig. 4: High BP value

The above fig 2, 3 and 4 represent the level (Low, Normal, High) of Blood Pressure in different age groups. The systolic values are represented in blue line and the diastolic values are denoted in red lines.

5. PERFORMANCE OF ATMAMVM

Life can be easier with an innovative any time medical assistance and medicine vending machine idea. This can enhance an efficient way to get immediate treatment for minor issues, people can use this integrated machine 24/7 compared with previously developed system. Video conferencing with the specialist is available. It also used for emergency first aid cases. It can be operated independently. Its main application area is the healthcare system. It links doctor all over the world and provides the best Solutions for patients.

6. CONCLUSION

This ATMAMVM ensures that basic medical facilities are provided to all the cities of our country irrespective of their location disadvantage. First Aid can be available easily due to the availability of ATMAMVM in the public place. People can easily consult the doctors online, get timely treatment and also get generic medicine at low cost on the spot. Senior citizen need not travel too far for basic medical treatment.

7. REFERENCES

[1] M.Sangeetha, T V Janardhana Rao and Ch S Rama Gowri, "Automatic Medicine Vending System-Medical ATM", International Journal of Science and Engineering Development Research, PN:14-17, Vol. 1, Issue 10, 2016.

[2] Malashree.G et al., "ATM (All Time Medicine) Counter For Medicine Self-Dispensing", International Journal of Latest Technology in Engineering, Management and Applied Science, PN: 40-41, Issue 1, Vol. 4, May 2017 | ISSN 2278-2540.

[3] Mrs K.S.Sujatha et al., "Cloud Computing based E-Vending Machine for Rural Areas", Imperial Journal of Interdisciplinary Research, PN:1384-1391, Vol.2, Issue 6, 2016.

- [4] Piyush Goel, Sanjay Bansal, "Health ATM Any Time Medical-Help ", PN:105-108, Vol.3, 2011, International Conference on Life Science and Technology.
- [5] Sarika Oundhakar, "Automatic Medicine Vending Machine ", Journal of Engineering Technology Science and Research, PN: 1150-1154, Vol. 4, Issue 12, December 2017.
- [6] Sumitha Thankachan, Suchithra, " Data Mining and Warehousing Algorithms and its Application in Medical Science - A Survey", International Journal of Computer Science and Mobile Computing, PN:160-168, Vol. 6, Issue 3, March 2017 | ISSN 2320-088X
- [7] P. Haripriya, R. Porkodi, "A Survey Paper on Data mining Techniques and Challenges in Distributed DICOM ", International Journal of Advanced Research in Computer and Communication Engineering, PN:741-747, Vol.5, Issue 3, March 2016.
- [8] Raj Kumar, Dr Rajesh Verma, "Classification Algorithms for Data Mining", International Journal of Innovations in Engineering and Technology (IJJET), Vol. 1 Issue 2 August 2012 |ISSN:2319 – 1058.