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# Patient Medicine Assistance Bot Using RPA

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**ABSTRACT:** Robotic process automation RPA is a software technology that makes it easy to build, deploy and manage software robots that emulate human actions interacting with digital systems and software just like people. Software robots can do things like understand what's on a screen, complete the right keystrokes, navigate systems, identify and extract data and perform a wide range of defined actions. Our project aims to design a bot using RPA that automatically aids to assist the medicines to the patients taking medicines regularly as well as maintaining the stock of medicines that is available to the patients. The timely medicine delivery is very important for the health of the patient in case of some of ailments e.g., bp, sugar, cholesterol where one cannot miss the medicine for even one day. As the senior citizens do not keep track of their medicine stock and if they do not have someone to take care of them nearby then they easily forget to take the medicine on time. The following bot will aid in getting the medicines assisted on time so that the sufficient stock of medicine is always available for the patient.

**KEYWORDS:** Robotic process automation, software robots, timely medicine delivery, getting the medicines assisted, sufficient stock of medicine.

## I. INTRODUCTION

The technology behind software tools that automate human work is called Robotic Process Automation. It automates manual, rule-based, or repetitive tasks. These RPA software bots never sleep and make no mistakes and can interact with internal applications, websites, user portals and other applications. They can log into applications, enter data, open emails, and attachments, calculate tasks, and complete them before logging out.

Instead of people, software robots take over routine, low-value jobs like logging into programs and systems and transferring files and folders in place of people. Advanced robots can perform data extraction, data copying, data insertion, routine analysis, report completion and even cognitive tasks like reading literature, participating in discussions, analysing unstructured data, and using complex machine learning models to make difficult decisions.



The timely medicine delivery is very important for the health of the patient. Taking medications helps lower your risk for heart attack, stroke, and kidney damage by managing blood glucose, blood pressure and cholesterol levels in your body. By taking care of your drug regimen, you can reduce your risk of developing more illnesses, visiting hospitals, and even passing away in case of some of ailments, e.g., sugar, cholesterol where one cannot miss the medicine for even one day.

Sadly, the people do not keep track of their medicine stock and if they do not have someone to take care of them nearby, then they can easily forget to get the medicines on time. So, the bot will aid in getting the medicines assisted on time so that the sufficient stock of medicine is always available for the patient.

The bot will get the list of medicines and current stock of the patient and, also the nearest pharmacy number and the patient's kin who can be reached for the patient. Then, it updates details in the medicine stocking sheet. If the medicine stock is less than the specified threshold limit, then the reminder will be sent to the nearby pharmacy or the order will be placed on the online website like Pharmeasy. Next, the reminder will be sent to the patient's kin. Once the medicines get delivered, the patient/kin replies through SMS on receiving the medicines. By this bot gets triggered on confirming the medicine delivery and updates the stocking sheet for the patient.

## II. RELATED WORK

### **Fundamental Research on Medication Reminder System Aishwarya Chawariya<sup>1</sup>, Prajakta Chavan<sup>2</sup>, Akanksha Agnihotri:**

The medication dispenser and reminder device features 28 slide-able plate sections that support the delivery of medications grouped in rows and columns with four daily alerts. For people with complex prescription regimens, the med center medication reminder keeps track of a month's worth of medication. feature contains voice prompts and the concept of color-coding. The correct pillbox and pre-separated med time must be used to store the drugs. This product consists of a rotating disc with multiple compartments, each of which is divided into a separate compartment and holds pills. It also features a timer and alarm system that can play sound at designated intervals. For the overall operation, the dosages must be put separately in the compartments that call for assistance.

### **Mohammed Abdul Kader<sup>2018</sup> 2<sup>nd</sup> Int. Conf on Innovation in Science, Engineering and Technology (ICISSET) 27-28 October 2018, Chittogang, Bangladesh:**

The main objective of this project is to develop a smart medicine box that will prompt hospital patients or elderly patients to take their pills at the correct time and dosage according to the doctor's instructions. by placing medication in twenty-one airtight chambers for three daily doses, the gadget has twenty-one compartments.

A nurse or patient attendant might make a weekly schedule for unused medications. A text file with the times for each compartment's meds can be loaded onto an SD card by the attendant or manually adjusted by the attendant. The gadgets allow you to read the time. genuine timer. The device plays a sound in the speaker to give information about the quantity of medicine and blinks the led of the specific compartment where medicine is kept for that time when the clock matches the predetermined time. The gadget can ensure medication safety, proper medication dosage, and the avoidance of older persons abusing drugs by informing the patient whether to take their medication before or after meals. The primary goal of this project is to create a smart medicine box to remind hospital patients or elderly patients to take the recommended dose of medication at the time advised by the doctor. To store the medication, the device contains twenty-one airtight chambers. A patient's attendant or nurse can create a weekly plan of medicine remainder by keeping medication in 21 compartments for three doses per day. The attendant can manually set the time of taking medication or load a text file into an SD card that specifies the time for taking medication of each compartment. The device features a real-time clock to display the time. When the time matches the pre-set time, a sound is played through the speaker to share the quantity of medicine and the led of the specific compartment containing the medicine blinks. The gadget can ensure medication safety, proper medication dosage, and the avoidance of older persons abusing drugs by informing the patient whether to take their medication before or after meals.

### **Medicine Remainder Application: Deepti Ameta, Palak Patel, Kalpana Mudaliar (2 June 2015):**

Patients do no longer need to keep in mind when to take their meds because, they could set an alarm for unique intervals while specific medications and timings, which includes dates, times, and treatment descriptions, are overlooked. This android-primarily based software program focuses the relationship among the doctor and the affected

person. Sufferers can search medical doctors via sickness and acquire the touch statistics of available healthcare carriers after they get hold of an alert via email or a message inside the machine, ideally one they pick out.

**Existing System:**

From the findings that has been made, the medicine reminder machine is designed for folks who forgets to take the medicines often. The schedule or a time may be given as a input. The system runs 24/7 and tests if it’s a correct time for the affected person to take the medicine. If sure, then it notifies the patient otherwise the bot maintains to run until the scheduled time. This procedure repeats for every and each day.

**III. METHODOLOGY**

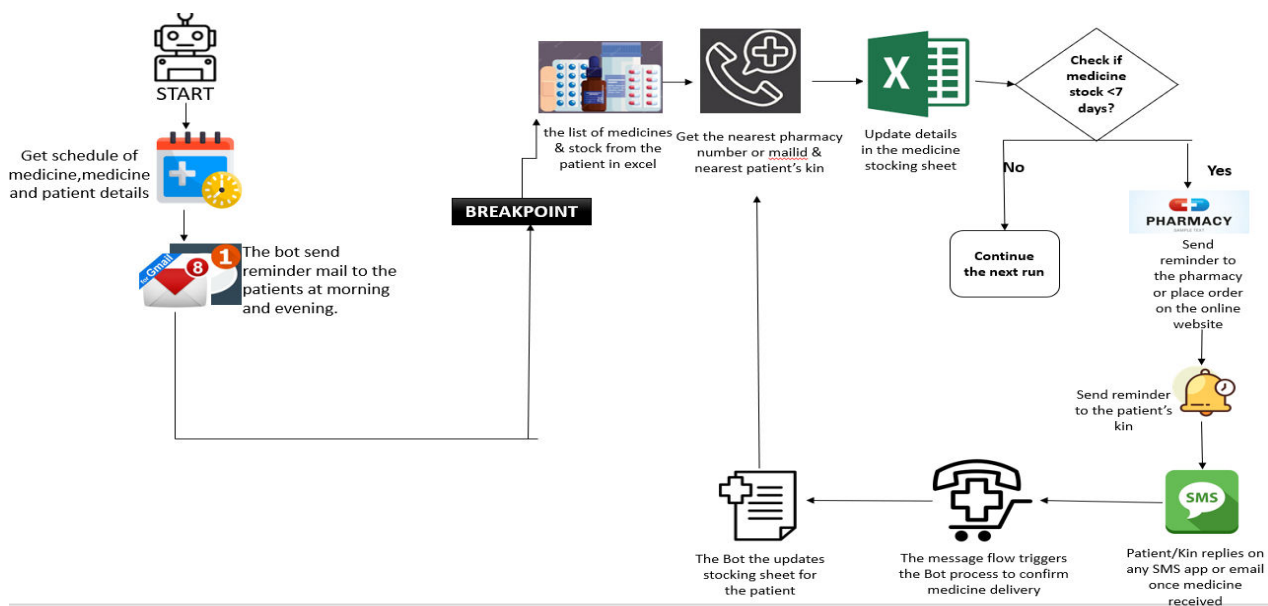


Fig 3.1: Workflow

There are two Bots:

**Patient Medicine Reminder Bot (Bot 1):**

By alerting the patient, it prompts them to take their medication on a regular basis.

The subsequent steps will be followed.

1. The bot will initially take as input the schedule for taking the medicine.
2. The bot continuously monitors the appropriate moment to take the medicine. If so, the patient is informed. If not, it waits for the appropriate moment.
3. After the breakpoint, the second bot (Patient Medicine Assistance Bot) is activated as the procedure progresses.

**Patient Medicine Assistance Bot (Bot 2):**

The following steps will be used. The first two steps need to be done one time or in case there is any change in the medicines for the patient.

Once the patient visits the hospital for treatment and gets the prescription, the patient’s data and their medications info will be stored in the excel sheet.

1. The bot will get the list of medicines and current stock of the patient.
2. The bot will find the nearest pharmacy number and the patient’s kin who can be reached for the patient (e.g., the children for the senior citizens in our case).
3. The bot will update the details of the medicines per patient in the stocking sheet.
4. The bot will be scheduled to run every day and check if the patient has sufficient stock of medicines for the next 7 days (configurable).





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5. In case the stock of medicines is less than 7 days, the bot will send the medicine delivery reminder to the nearest pharmacy number (that was taken in step 2) or add it to the cart for the online website (e.g., Pharmeasy).
6. The bot will also send a reminder for this to the patient's kin.
7. Once the medicine has been delivered, the patient will reply on the SMS confirming that medicine has been received.
8. The SMS flow will notify the workflow regarding the medicine received.
9. The process will then update the stocking sheet regarding the medicines.

Thus, the chance of missing the medicines is been avoided and patient's medical requirements are satisfied on time.

#### IV. EXPERIMENTAL RESULTS

After the implementation as per the methodology that we designed, the following are the snapshot of the outputs.

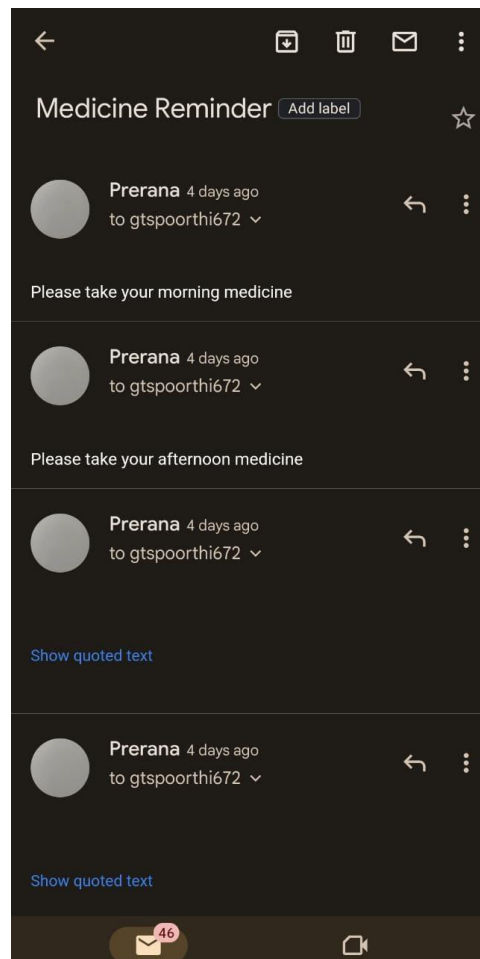


Fig 4.1: Medicine Reminder being sent to the patient daily to avoid the chance of missing the medicine



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PATIENT ID	PATIENT NAME	AGE	GENDER	Address	DISEASES	MEDICATIONS	TIMINGS	DATE OF START	Count	Mailid	Subject	Body
DM101	Prajwal	21 M		Ram & Co Circle, Davangere	Diabetes	Tolbutamide	10:00 AM	16-04-2023	10	<a href="mailto:prajwalbs312@gmail.com">prajwalbs312@gmail.com</a>	Medicine Reminder	Please take your morning medicine
DM102	Prerana	40 F		SS Layout, Davangere	Cholesterol	Fluvastatin	10:30 AM	16-04-2023	10	<a href="mailto:preranacpdvg@gmail.com">preranacpdvg@gmail.com</a>	Medicine Reminder	Please take your morning medicine
DM103	Spoorthi	56 F		Vidyanagar, Davangere	Hypertension	Lisinopril	10:00 AM	16-04-2023	10	<a href="mailto:gtspoorthi672@gmail.com">gtspoorthi672@gmail.com</a>	Medicine Reminder	Please take your morning medicine
DM104	Thrupthi	27 F		Shivakumaraswamy Badavane, Davange	Hypertension	Doxazosin	10:30 AM	16-04-2023	10	<a href="mailto:thrupthishekar613@gmail.com">thrupthishekar613@gmail.com</a>	Medicine Reminder	Please take your morning medicine
DM105	Nandeesh	60 M		BIET Road, Davangere	Diabetes	Glimepiride	11:00 AM	16-04-2023	10	<a href="mailto:nandeeshreval77@gmail.com">nandeeshreval77@gmail.com</a>	Medicine Reminder	Please take your morning medicine
DM106	Soundarya	19 F		M.C.C Block, Davangere	Diabetes	Glipizide	10:15 AM	16-04-2023	10	<a href="mailto:soundaryap504@gmail.com">soundaryap504@gmail.com</a>	Medicine Reminder	Please take your morning medicine
DM107	Kusuma	30 F		Saraswathi Layout, Davangere	Hypertension	Amlodipine	11:15 AM	15-04-2023	10	<a href="mailto:kusumakusu2629@gmail.com">kusumakusu2629@gmail.com</a>	Medicine Reminder	Please take your morning medicine

Fig 4.2:Initial count of patient’s medicine stock

PATIENT ID	PATIENT NAME	AGE	GENDER	Address	DISEASES	MEDICATIONS	TIMINGS	DATE OF START	Count	Mailid	Subject	Body
DM101	Prajwal	21 M		Ram & Co Circle, Davangere	Diabetes	Tolbutamide	10:00 AM	16-04-2023	9	<a href="mailto:prajwalbs312@gmail.com">prajwalbs312@gmail.com</a>	Medicine Reminder	Please take your morning medicine
DM102	Prerana	40 F		SS Layout, Davangere	Cholesterol	Fluvastatin	10:30 AM	16-04-2023	9	<a href="mailto:preranacpdvg@gmail.com">preranacpdvg@gmail.com</a>	Medicine Reminder	Please take your morning medicine
DM103	Spoorthi	56 F		Vidyanagar, Davangere	Hypertension	Lisinopril	10:00 AM	16-04-2023	9	<a href="mailto:gtspoorthi672@gmail.com">gtspoorthi672@gmail.com</a>	Medicine Reminder	Please take your morning medicine
DM104	Thrupthi	27 F		Shivakumaraswamy Badavane, Davange	Hypertension	Doxazosin	10:30 AM	16-04-2023	9	<a href="mailto:thrupthishekar613@gmail.com">thrupthishekar613@gmail.com</a>	Medicine Reminder	Please take your morning medicine
DM105	Nandeesh	60 M		BIET Road, Davangere	Diabetes	Glimepiride	11:00 AM	16-04-2023	9	<a href="mailto:nandeeshreval77@gmail.com">nandeeshreval77@gmail.com</a>	Medicine Reminder	Please take your morning medicine
DM106	Soundarya	19 F		M.C.C Block, Davangere	Diabetes	Glipizide	10:15 AM	16-04-2023	9	<a href="mailto:soundaryap504@gmail.com">soundaryap504@gmail.com</a>	Medicine Reminder	Please take your morning medicine
DM107	Kusuma	30 F		Saraswathi Layout, Davangere	Hypertension	Amlodipine	11:15 AM	15-04-2023	9	<a href="mailto:kusumakusu2629@gmail.com">kusumakusu2629@gmail.com</a>	Medicine Reminder	Please take your morning medicine

Fig 4.3:Count of patient’s medicine stock after consuming the medicine

PATIENT ID	PATIENT NAME	NEAREST PHARMACY MAILID	Patient Mailid	Patient Response regarding Medicine Delivery
DM101	Prajwal	<a href="mailto:apollooram&amp;co@gmail.com">apollooram&amp;co@gmail.com</a>	<a href="mailto:prajwalbs312@gmail.com">prajwalbs312@gmail.com</a>	Yes
DM102	Prerana	<a href="mailto:apollosl@gmail.com">apollosl@gmail.com</a>	<a href="mailto:preranacpdvg@gmail.com">preranacpdvg@gmail.com</a>	No
DM103	Spoorthi	<a href="mailto:apollovidyanagar@gmail.com">apollovidyanagar@gmail.com</a>	<a href="mailto:gtspoorthi672@gmail.com">gtspoorthi672@gmail.com</a>	Yes
DM104	Thrupthi	<a href="mailto:apolloshivakumara@gmail.com">apolloshivakumara@gmail.com</a>	<a href="mailto:thrupthishekar613@gmail.com">thrupthishekar613@gmail.com</a>	Yes
DM105	Nandeesh	<a href="mailto:apollobiet@gmail.com">apollobiet@gmail.com</a>	<a href="mailto:nandeeshreval77@gmail.com">nandeeshreval77@gmail.com</a>	No
DM106	Soundarya	<a href="mailto:apollomcc@gmail.com">apollomcc@gmail.com</a>	<a href="mailto:soundaryap504@gmail.com">soundaryap504@gmail.com</a>	No
DM107	Kusuma	<a href="mailto:apollosaraswathilo@gmail.com">apollosaraswathilo@gmail.com</a>	<a href="mailto:kusumakusu2629@gmail.com">kusumakusu2629@gmail.com</a>	Yes

Fig 4.4: Patient’s confirmation of medicine delivery through google forms

PATIENT ID	PATIENT NAME	AGE	GENDER	Address	DISEASES	MEDICATIONS	TIMINGS	DATE OF START	Count	Mailid	Subject	Body
DM101	Prajwal	21 M		Ram & Co Circle, Davangere	Diabetes	Tolbutamide	10:00 AM	16-04-2023	21	<a href="mailto:prajwalbs312@gmail.com">prajwalbs312@gmail.com</a>	Medicine Reminder	Please take your morning medicine
DM102	Prerana	40 F		SS Layout, Davangere	Cholesterol	Fluvastatin	10:30 AM	16-04-2023	9	<a href="mailto:preranacpdvg@gmail.com">preranacpdvg@gmail.com</a>	Medicine Reminder	Please take your morning medicine
DM103	Spoorthi	56 F		Vidyanagar, Davangere	Hypertension	Lisinopril	10:00 AM	16-04-2023	21	<a href="mailto:gtspoorthi672@gmail.com">gtspoorthi672@gmail.com</a>	Medicine Reminder	Please take your morning medicine
DM104	Thrupthi	27 F		Shivakumaraswamy Badavane, Davange	Hypertension	Doxazosin	10:30 AM	16-04-2023	21	<a href="mailto:thrupthishekar613@gmail.com">thrupthishekar613@gmail.com</a>	Medicine Reminder	Please take your morning medicine
DM105	Nandeesh	60 M		BIET Road, Davangere	Diabetes	Glimepiride	11:00 AM	16-04-2023	9	<a href="mailto:nandeeshreval77@gmail.com">nandeeshreval77@gmail.com</a>	Medicine Reminder	Please take your morning medicine
DM106	Soundarya	19 F		M.C.C Block, Davangere	Diabetes	Glipizide	10:15 AM	16-04-2023	9	<a href="mailto:soundaryap504@gmail.com">soundaryap504@gmail.com</a>	Medicine Reminder	Please take your morning medicine
DM107	Kusuma	30 F		Saraswathi Layout, Davangere	Hypertension	Amlodipine	11:15 AM	15-04-2023	21	<a href="mailto:kusumakusu2629@gmail.com">kusumakusu2629@gmail.com</a>	Medicine Reminder	Please take your morning medicine

Fig 3.1: Patients medicine stock after updating the stocking sheet once the medicine is delivered



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## **V. CONCLUSION**

The bot facilitates inside the healthcare zone by automating all the repetitive and lower-degree tasks that a consultant would do. It sends every day reminders and instructions regarding the availability of the medicines and thereby it can decrease the hazard of different medical situations, health center visits and even loss of life. When treating conditions like high blood pressure, diabetes, or cholesterol where the medication must be taken every day it is essential. This bot will ensure that the manual modifications of lacking the drug treatments is avoided and the affected persons medical necessities are constantly fulfilled on time. This can be specifically beneficial to senior residents and provide respite to their children.

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