Implementation of a Programmable Medication Reminder System

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ABSTRACT: It's Very Important For Patients As General And Specially Patients Who Must Have Their Medication Permanently (Diabetics And Hypertension Ect.) Sometimes They Need To Be Reminded ,This Frequent Observation Shows That People Give More Interest To Their Work And Other Stuff Than Taking Care Of Their Health . It Is Important To Design And Implement Low Cost Useful Programmable Reminding System To Help Those Patients .This System Has An Ability To Remind People About Dose Time , Dose Amount Of Medication And Sending SMS To Nursing Staff For More Accuracy And Reliability, A Matrix Keypad Is Used To Program The Respective Time Of The Medicine Based On RTC (Real Time Clock) Interfaced To The Microcontroller, Then The Programmed Time Is Displayed On The LCD In Conjunction With A Buzzer Sound To Alert The Patient . The System Has Successfully Overcome Quite A Few Shortcoming Of The Exciting System By Reducing Power And Providing Good Flexibility As Well As Using The A Wireless Communication Networks.

KEYWORDS: Medication Reminder System, RTC, GSM, Alarm System

I. INTRODUCTION
Modern Communities Are Suffering From Many Kinds Of Pressures Due To The Speedy Rhythm Of Daily Life, People Have Many Chronic Diseases. Which Need Special Care From Medical Staff To Remind The Patients To Have Their Medications In Time. Another Reason For Applying This System, The Difficulty Of Following Up The Big Numbers Of Patients By The Nursing Staff .Utilizing Of Communication Technology And Semiconductor, GSM Communication Module Can Be Integrated And Embedded Into Single Chip And Let GSM Be Carried Into Many Products To Increase The Added-Value Of Products. Merging Between GSM And Microcontroller Will Make System More Effective. Low Cost Communication System Can Be Carried Out.

The Smart Medicine Reminder System Is Designed For, Helping Patients To Take Their Medications On Time And Correct Amount Because Some Patients Are Occupied With Their Day-To-Day Activities That They Just Forget To Take Their Medications. This Is Particularly For Patients Who Have More Than One Medication At One Time In A Day. Furthermore Setting Alarm Clocks Is A Tedious Task Which Patients Are Too Lazy To Set Many Times.

The System Is Designed To Operate In Two Modes: The First Is Medications Reminding Mode, In Which The User Is Asked To Enter Medication Name, Dose Time. The Second Mode Is For The Amount And Number Of Doses Repeat Within Day As Well As Number Of Days, All These Parameters Are Then Saved And Used To Remind The Patient During Program Execution.

II. APPROACH
The Block Diagram Of The System Is Shown In Figure (1). It Explains The Useful Components Of The System And The Links Which Exist Between Them. The GSM Is Connected To User Via Wireless Mobile Networks And Directly To Microcontroller. Hence The System Provides The Real Time Transmitting Of Data. Microcontroller (Atmega16) Represents The Core Of The System While The Crystal Oscillator Is Used For Real Time Adjusting. The Program Is Written In BASCOM Language.
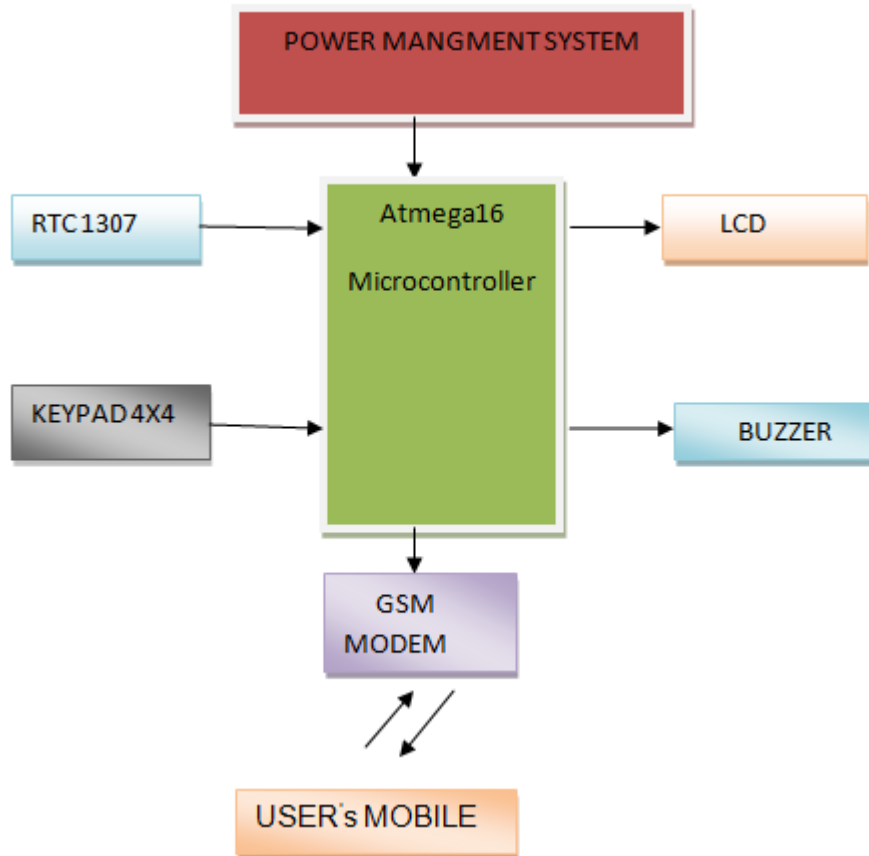
Figure -1 Block Diagram Of The System

III. SOFTWARE IMPLEMENTATION

The Software Design Is Written For The Main Controller (Atmega16) Which Is Connected To The Keyboard, RTC, LCD And GSM Using BASCOM Language.

BASCOM Is An Integrated Development Environment (IDE) That Support The 8051 Family Of Microcontroller As Well As Atmel AVR Microcontroller. Two Products Are Available For The Various Microcontrollers-BASCOM-8051 And BASCOM-AVR. In Microcontroller Project Need To Known The Hardware Base And Software Used. BASCOM Has A Powerful Set Of Instructions And Containing A Useful Simulation Capability.

Algorithm
Start:
    Put The System In Initial State.
-        Clear All Controlled Device.
-        Check For Real Time:
✓   If Medicine Time True, Continue Processing.
✓   If Not True, Delay Access And Wait For Medicine Dose Time.
Analyze:
-        If Real Time Is Equal To Stored Time Send SMS And Activate Buzzer.
-        If Real Time Is Not Equal To Stored Time Re Check The Real Time.
-        If Number Of Dose Finished ,End The Program
-        If Number Of Days Finished. End Reminding

IV. RESULT

Table No 1: Following The Results Obtained From The Implemented System:

Medicine No	Dose Time	Dose Amount	Real Time	Action	Sms
1	2 Hours	1 TAB(500mg)	<	No Action Taken	-
2	1 Hour	1 TAB(250mg)	=	Buzzer Is Active & SMS Sent	Medicine (250mg) 1Tab
3	8 Hours	2 TAB	<	No Action	-

V. CONCLUSION

The Design Of A Programmable Medication Reminder System Based On GSM And Microcontroller Are Achieved. The System Accepts The Input Parameters Via Keyboard And Compares These Parameters To Real Time One, And Then Send SMS To Nurse Explaining The Name Of Medication And Amount Of Dose In Exact Time.

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