||Jai Sri Gurudev||

BGS Institute of Technology

BG Nagara – 571448

Department of Electronics and Communication Engineering

Process for Identification of projects and allocation methods

2018-19

The Project coordinatoris nominated by the head of the department, which plays a vital role in identification of projects and allocation methodology for faculty and students. The process is as follows as shown in figure 1.

- The students are instructed to do the project based on their interest.
- The students are allowed to form group/batch consisting of 2 to 4 members as per the university norms.
- Projects list of previous years are displayed on notice board to avoid duplication of projects.
- Students are informed to submit the proposed project title to project coordinator.
- Once the project is submitted the project coordinator with the help of HOD identifies the project based on areas like application, research, communication, networking and software.
- Allotments of project guides are made by the HOD and the project coordinators based on the students interest, Project Domain and the faculty specialization.
- Evaluation of project work is done in three phase according to the rubrics.
- Based on the evaluation of different phases final marks will be awarded to the students.
- The project committee consists of HOD, guide and project coordinator.

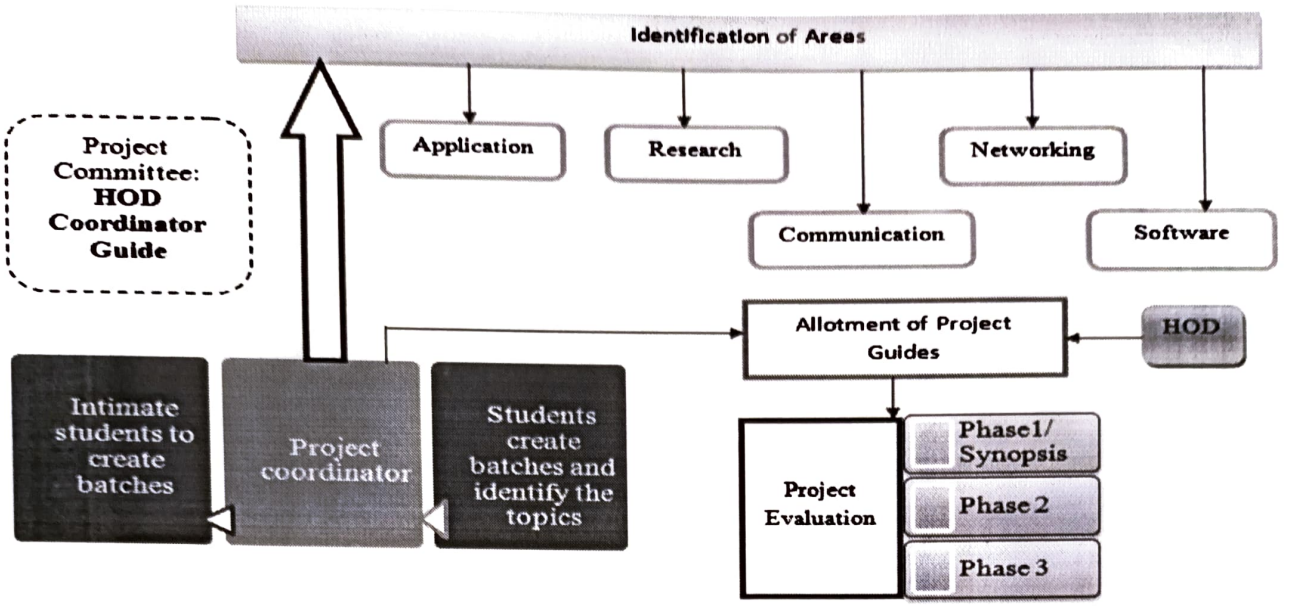

Figure 1: Process to Identification of projects

Monitoring the quality of student project is measured according to the process followed as shown in the figure 2.

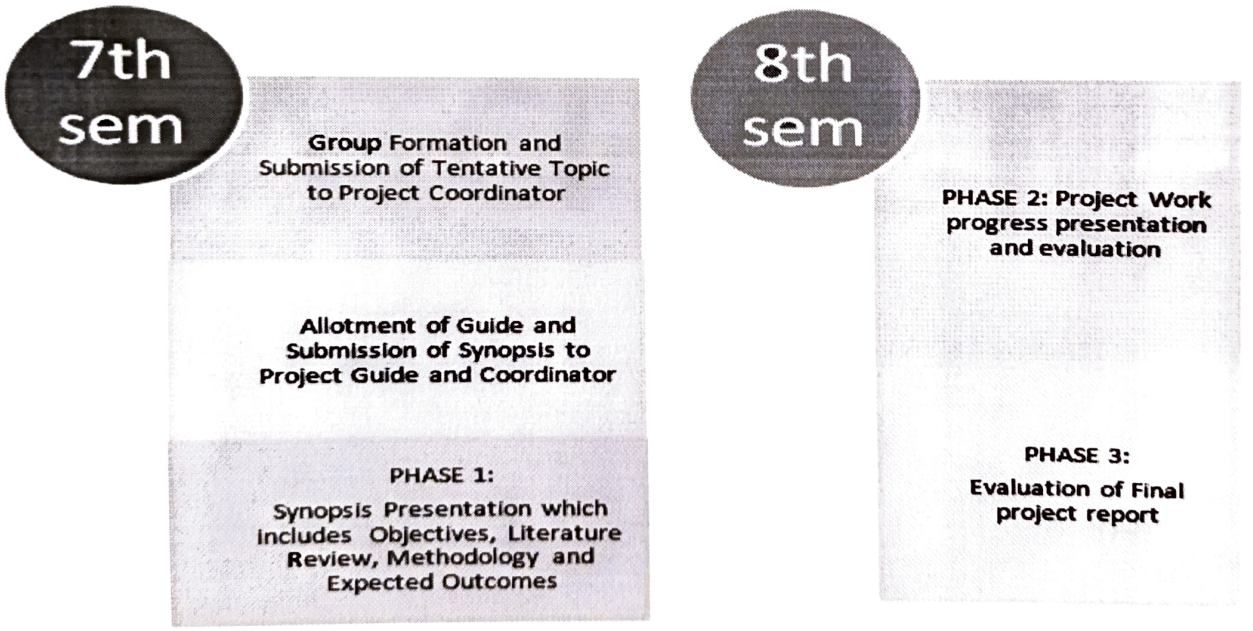

Figure 2: Process to monitor Quality of student projects

Signature of Project Coordinator

Signature of HOD

Professor & HOD
Dept. of Electronics & Communication Engg.
BGS Institute of Technology
BG Nagara - 571 448
Mandya District

||Jai Sri Gurudev||

BGS Institute of Technology

BG Nagara – 571448

Department of Electronics and Communication Engineering

Project Process flow chart

HOD nominates the Project Coordinator

↓

Identification of projects and allocation methodology for Students and Faculty

↓

Students are

- Allowed to form group/batch consisting of 2 to 4 members
- Instructed to do the Projects based on their interest
- Advised from Project guides to avoid duplication of projects
- Informed to submit the proposed project title to project coordinator

Faculties

- Help the students to form group/batch consisting of 2 to 4 members
- Instructs the students to do projects based on their interest
- Advice the students to avoid duplication of projects
- Help their project batch students to submit the proposed project title to project coordinator

↓

Project coordinator and HOD identifies the project based on areas

↓

The HOD and the project coordinator allot project guides based on the student's interest, Project Domain and the faculty specialization

↓

Evaluation of project work in three phases according to the rubrics

↓

The project committee consists of HOD, guide and project coordinator awards final marks to the students based on the evaluation of project in different phases

Signature of Project Coordinator

Signature of HOD

||Jai Sri Gurudev||

BGS Institute of Technology

BG Nagara – 571448

Dept. of Electronics and Communication Engg,.

Process for Monitoring and Evaluation for the year 2018-19

I. Continuous Monitoring

Project coordinator constituted by the HOD is accountable for planning, scheduling and execution of all the activities related to the student project work. Seminar is also planned by the respective coordinator. The process for continuous monitoring is shown in table 1.

Table 1: Continuous Monitoring and Implementation of the project

Timeline	Task	Particulars
	7th Semester	
September	**Call for Project batch Formation and Guide allotment**	• Students are informed to Create their batch and get it registered with the project coordinator • The Proposed synopsis is submitted by the students and gets verified by the project coordinator constituted by HOD. • Allotment of Guide is done based on student interest, Project Domain and faculty specialization.
November	**Synopsis Submission &** **Phase 1 presentation**	• The phase 1 presentation is carried out and evaluated according to the rubrics. • Final Synopsis is Submitted to Project coordinator
	8th Semester	
March	**Phase 2 Presentation**	• Students are instructed to submit objectives implementation, Design document, and interim results of the project. • Students need to give a PowerPoint presentation For the phase 2. This is evaluated by the guide and faculty according to the rubrics.
April	**Phase 3 Presentation**	• Students are instructed to submit complete project report with university fulfillment and give a PowerPoint presentation for the project including Demo of the model developed for evaluation.
May	**Project Internal Marks Announcement**	• The evaluation marks for the project work is announced and processed according to the university regulations.

II. ProjectEvaluation

Internal project evaluation is done based on the different phases as per the university norms.The final project evaluation marks considered by taking the sum of phase-2 & phase-3 evaluation marks. The detailed marks distributions for different phases1, Phase2 and Phase 3 are shown in below table 2 (a), 2 (b) and 2 (c).

Table 2 (a): Phase-1 of the Project

Sl. No.	Evaluation scheme	Marks
1.	Significance and Relevance of work	15
2.	Problem Identification and Definition	10
3.	Presentation and Planning	50
4.	Synopsis Report	25
	Total	**100**

Table 2 (b): Phase-2 of the Project

Sl. No.	Evaluation scheme	Marks
1.	PPT flow and Presentation	15
2.	Progress of Work	10
3.	Plan Execution	15
	Total	**40**

Table 2 (c): Phase-3 of the Project

Sl. No.	Evaluation scheme	Marks
1.	PPT flow and Presentation	20
2.	Objective Implementation	20
3.	Results and Conclusion	10
4.	Report	10
	Total	**60**

Signature of Project Coordinator

Signature of HOD

Professor & HOD
Dept. of Electronics & Communication Engg.
BGS Institute of Technology
BG Nagara - 571 448
Mandya District

||JAI SRI GURUDEV||

BGS Institute of Technology

BG Nagara, Nagamangala Taluk, Mandya District

Dept. of Electronics and communication Engineering

Date: 30/11/2018

Subject: Project Work Phase-1+ Project Work Seminar
Subject Code: 15ECP78

SYNOPSIS PRESENTATION

Sl. No.	Project Title	USN	Name	Guide Details	Components / Criteria of Evaluation				Total (100)	Sign
					1	2	3	4		
1	Autonomous all time Medicine counter for Medicine self dispensing.	4BW15EC036	Kavya C	Ms. Srividya C N	14	10	45	25	94	
		4BW15EC056	Munisahana M		13	10	46	25	94	
		4BW15EC058	Navyashree N S		14	10	46	25	95	
		4BW15EC059	Nikhil Gowda T K		13	10	46	25	94	
2										

Project Guide

Project Coordinator

HOD

1	Significance and Relevance of work	15 Marks	3	Presentation and Planning	50 Marks
2	Problem Identification and Definition	10 Marks	4	Synopsis Report	25 Marks

||JAI SRI GURUDEV||

BGS Institute of Technology

BG Nagara, Nagamangala Taluk, Mandya District

Dept. of Electronics and communication Engineering

Date: 22/03/2019

Sub: Project Work Code: 15ECP85

SEMESTER END EVALUATION- PHASE 2

Sl. No.	Project Title	USN	Name	Guide Details	Components / Criteria of Evaluation			Total (40)	Sign
					1	2	3		
1	Autonomous all time Medicine counter for Medicine self dispensing.	4BW15EC036	Kavya C	Ms. Srividya C N	13	10	14	37	
		4BW15EC056	Munisahana M		14	10	15	39	
		4BW15EC058	Navyashree N S		14	10	15	39	
		4BW15EC059	Nikhil Gowda T K		13	09	13	35	
2									

Project Guide

Project Coordinator

HOD

1	PPT flow and Presentation	15 Marks	2	Progress of work	10 Marks	3	Plan execution	15 Marks

||JAI SRI GURUDEV||

BGS Institute of Technology

BG Nagara, Nagamangala Taluk, Mandya District

Dept. of Electronics and communication Engineering

Date: 03/05/2019

Subject: PROJECT WORK

Subject Code: 15ECP85

SEMESTER END EVALUATION-PHASE 3

Sl. No.	Project Title	USN	Name	Guide Details	Components / Criteria of Evaluation				Total (60)	Sign
					1	2	3	4		
1	Autonomous all time Medicine counter for Medicine self dispensing.	4BW15EC036	Kavya C	Ms. Srividya C N	18	20	10	10	58	Srividya
		4BW15EC056	Munisahana M		19	20	10	10	59	
		4BW15EC058	Navyashree N S		19	20	10	10	59	
		4BW15EC059	Nikhil Gowda T K		17	18	10	10	55	
2										

Srividya
Project Guide

Project Coordinator

HOD

1	PPT flow and Presentation	20 Marks	3	Results and Conclusion	10 Marks
2	Objective Implementation	20 Marks	4	Report & Publications	10 Marks

||JAI SRI GURUDEV||

BGS Institute of Technology

BG Nagara, Nagamangala Taluk, Mandya District

Dept. of Electronics and communication Engineering

Subject: Project Work

Subject code: 15ECP85

SEMESTER END EVALUATION

Sl. No.	Project Title	USN	Name	Guide Details	PHASE 2 (40)	PHASE 3 (60)	Total (100)	Sign
1	Autonomous all time Medicine counter for Medicine self dispensing.	4BW15EC036	Kavya C	Ms. Srividya C N	37	58	95	Srividya
		4BW15EC056	Munisahana M		39	59	98	
		4BW15EC058	Navyashree N S		39	59	98	
		4BW15EC059	Nikhil Gowda T K		35	55	90	
2								

Srividya
Project Guide

Project Coordinator

HOD

VISVESVARAYA TECHNOLOGICAL UNIVERSITY

"Jnana Sangama", Belagavi-590 014

A DISSERTATION ON

"AUTONOMOUS ALL TIME MEDICINE COUNTER FOR MEDICINE SELF DISPENSING"

Submitted in partial fulfillment for the award of degree of

BACHELOR OF ENGINEERING
IN
"ELECTRONICS & COMMUNICATION ENGINEERING"

BY

NAME	USN
KAVYA C	4BW15EC036
MUNISAHANA M	4BW15EC056
NAVYASHREE N S	4BW15EC058
NIKHIL GOWDA T K	4BW15EC059

Under the Guidance of
Ms. SRIVIDYA C N, B.E, M.Tech
Assistant Professor
Dept. of ECE
BGSIT

Department of Electronics and Communication Engineering
BGS INSTITUTE OF TECHNOLOGY
BG Nagara, Mandya - 571448

2018-2019

VISVESVARAYA TECHNOLOGICAL UNIVERSITY

"Jnana Sangama", Belagavi-590 014

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BGS INSTITUTE OF TECHNOLOGY
BG Nagara, Mandya - 571448

2018-2019

BGS INSTITUTE OF TECHNOLOGY

(Affiliated to Visvesvaraya Technological University, Belagavi.)

Department of Electronics and Communication Engineering

CERTIFICATE

Certified that the project work entitled "AUTONOMOUS ALL TIME MEDICINE COUNTER FOR MEDICINE SELF DISPENSING" carried out by **KAVYA C (4BW15EC036), MUNISAHANA M (4BW15EC056), NAVYASHREE N S (4BW15EC058), NIKHIL GOWDA T K (4BW15EC059)** a bonafide students of **BGS INSTITUTE OF TECHNOLOGY, BG NAGARA** in partial fulfillment for the award of BACHELOR OF ENGINEERING IN ELECTRONICS & COMMUNICATION ENGINEERING of the VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI during the year **2018-19**. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in the department library. The project report has been approved as it satisfies the academic requirements in respect of project work prescribed for the said degree.

SIGNATURE OF GUIDE	SIGNATURE OF HOD	SIGNATURE OF PRINCIPAL
Ms. SRIVIDYA C N	DR. M B ANANDRAJU	DR. B K NARENDRA
Asst. Prof, Dept of ECE	Prof & HOD, Dept of ECE	Principal
BGSIT, BG Nagara	BGSIT, BG Nagara	BGSIT, BG Nagara

EXTERNAL VIVA

Name of the examiners	Signature with date
1. RAVIKIRAN HK	1. 12.6.19
2. Dr. Naveen.K.B	2. 12/6/19

BGS INSTITUTE OF TECHNOLOGY

(Affiliated to Visvesvaraya Technological University, Belagavi.)

Department of Electronics and Communication Engineering
2018-2019

DECLARATION

KAVYA C(4BW15EC056), MUNISAHANA M(4BW15EC101), NAVYASHREE N S(4BW15EC058), NIKHIL GOWDA T K(4BW15EC059), hereby declare that this project work entitled "AUTONOMOUS ALL TIME MEDICINE COUNTER FOR MEDICINE SELF DISPENSING" was independently carried out by us under the guidance and supervision of Ms. SRIVIDYA C N, **BGS INSTITUTE OF TECHNOLOGY, BG NAGARA.** This project work is submitted to VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI in partial fulfillment of the requirement for the award of bachelor of degree in Electronics and Communication during the academic year **2018-2019**.

Place: BG Nagar

Date:

Kavya c	**(4BW15EC036)**
Munisahana M	**(4BW15EC056)**
Navyashree N S	**(4BW15EC058)**
Nikhil Gowda T K	**(4BW15EC059)**

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At first, we would like to thank the Divine Soul **PADMABHUSHAN SRI SRI SRI DR. BALAGANGADARANATHA MAHASWAMIJI**, Founder President, Sri Adichunchanagiri Math and his holiness **SRI SRI SRI DR. NIRMALANANDANATHA MAHASWAMIJI**, President, Adichunchanagiri Shikshana Trust, for providing us with such excellent facilities and Lectures, without which, this project work could not have acquired the shape it has now done.

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We extend our immense pleasure in thanking **DR. M B ANANDARAJU, Head of the Department**, Electronics and Communication Engineering, BGS Institute of Technology, BG Nagara, Mandya for providing us invaluable guidance for the project.

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We would like our sincere thanks to our guide **Ms. SRIVIDYA C N,** Assistant Professor, Department of Electronics and Communication Engineering, BGSIT, BG Nagara, Mandya for regular assistance and guidance throughout this project.

We take this opportunity to extend our full hearted thanks, **gratitude** and to our **parents, lecturers** and all our **friends**, for giving us valuable advices and support at all the times in all possible ways.

Thanks & Regards

KAVYA C	**(4BW15EC036)**
MUNISAHANA M	**(4BW15EC056)**
NAVYASHREE NS	**(4BW15EC058)**
NIKHILGOWDA TK	**(4BW15EC059)**

ABSTRACT

Vaccination is assumed to be a pivotal part in looking after wellbeing, averting sickness, overseeing, constant conditions and curing ailment. All Time Medicine(ATM) is a machine which delivers the medicine in emergency cases and ensure availability of drugs 24x7 and hence the name "All Time Medicine". ATM will be very useful in saving life in case of an accident on highways, remote areas, rural areas and places where medical stores are not within the reach in case of emergency. At least first aid can be made easily accessible with the help of this system. This project consists of Advanced RISC Machine (ARM) processor which controls the other sub systems such as RFID Reader, medicine dispenser, inventory control. RFID tag identifies the specific user. Medicine dispenser is the storage part of the machine which stores the medicine.

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CHAPTER 1

PREAMBLE

The growing modern age has also brought with it the dawn of the age of numerous types of diseases. The use of medicine to maintain and regain physical and mental health has been growing at a rapid pace. The doctors prescribe different type of medicine for one particular type of illness. Today it has become common for a person to take at least one type of pill at regular interval each day. A statistical survey shows that about 21% patients never follow their prescription and 6% patients are not capable of identifying their own medicines. In extreme cases, between 12 and 20% take medicines of other patients. But in case of the elderly people the scenario is awful. They take numerous numbers of pills at one particular time of the day to maintain their health. Therefore, confusion can arise both concerning the schedule and whether or not the medication has been taken.

This problem has been addressed by a number of personal pill dispensing machines in related art. Wherein the dispenser in preloaded with the medicine to be taken and is programmed to dispense the medication at a particular time of the day and alert the user to take the pills. Sometime, improper loading of the medication can cause some dosage issues. Improper medication is reported to be the most common reason why some patients do not respond properly to medical treatment Patients prescribed dosage. It becomes difficult to remember when to take the medication when different types of pills are required to be taken at different times. Elderly people frequently do not have sufficient mental alertness to keep track of the frequencies and dosages of their various medicines over a sustained period of time.

Not only elderly people but also the people who go to work have this problem due to external factor like work pressure. It is not possible for them to carry a medicine dispenser with them. Even if they carry all the medicine strips with them, there is good chance that they might forget which pill to take at the particular time.

1.1 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.

1.2 OBJECTIVE

The objective of the project is to develop a system to deliver medicine 24x7 to the people. The machine can deliver mainly Over the Counter (OTC) drugs, pain killer, first-aid products etc., so it will be very useful to the society. Medicine dispensing process is done in four steps.

1. Authentication of registered user.
2. Selection of required medicine.
3. Payment.
4. Collection of requested medicine.

First the user needs to register in a particular authorized center with prescribed drugs. Then user will be provided with RFID Tag and password. During transaction user must first swipe the card and enter the Personal Identification Number (PIN), so that only authorized person can use the machine. Request for the required medicine should be made by the user by scrolling through the menu displayed on the screen. The machine will search for the requested medicine in dispenser. If the medicine is present in the machine then the payment has to be made for the requested/available quantity of the medicine. Finally the medicine is collected.

1.3 LITERATURE SURVEY

[1]. “Med-e-lert Medication Pill Box Reminder Dispenser”

There are a large variety of medication administration assistance devices for non-professional users. Most of them are manual, providing multiple compartments called pill trays. The pill receptacle encompasses a range of compartments that may be full of medication. Each compartment will hold totally different sizes and combination of medicines. The user is required

to take the medicine from each tray each day for a maximum of 28 days. It doesn't offer any alarm to point the time of taking the medication.

[2]. International Journal of Technical Research and Applications e-ISSN: 2320-8163, www.ijtra.com Volume 4, Issue 3 (May-June, 2016), PP. 73-76.

It is necessary to provide medication to the aged person in time. Automatic pills vending machine is designed specifically for users who take medications without close professional supervision. It relieves the user of the error-prone tasks of administering wrong medicine at wrong time. The major components of this medication dispenser are a microcontroller interfaced with a Motor Controller, an Alarm system, a multiple pill dispenser. The major objective is to stay the device straightforward and value economical. The software used is reliable and stable. Elderly population will like this device because it avoids overpriced in home treatment.

[3]. Smart Medication Dispenser: Design, Architecture and Implementation- Pei-Hsuan Tsai, Tsung-Yen Chen, Chi-Ren Yu, Chi-Sheng Shih, Member, IEEE, and Jane W. S. Liu, Fellow, IEEE.

This paper presents the design associated implementation of an automatic medication dispenser specifically for users UN agency take medications while not shut skilled management. By relieving the users from the erring tasks of deciphering medication directions and administrating medications consequently, The device will improve rigor in compliance and forestall serious medication errors. By taking advantage of programming flexibility provided by medication directions, the device makes the user's medication schedule straightforward to stick and tolerant to timing whenever potential. This work is done collaborative by the medication scheduler and dispenser controller in an action-oriented manner. An advantage of the action-oriented interface between the components is extensibility, as new functions can be added and existing ones removed with little or no need to modify the dispenser control structure. The paper first describes the action oriented design, major components and hardware and software structures of the smart device. It then provides an overview of the heuristic algorithms used by the medication scheduler and their relative merits.

[4]. DeClaris, J.-W.; D-ATM, a working example of healthcare interoperability: From dirt path to Implications, Engineering Management, IEEE Transactions on, Volume: 46, Issue: 3, Year: 2009, Page(s): 4643 – 4645.

Medicines are a vital half in taking care of prosperity, averting upset overseeing, endless condition and natural process illness. Unsurpassed Medicine (ATM) is a machine which conveys the medication in crisis cases and guarantee accessibility of medications 24x7 and thus the name "Record-breaking Medicine". ATM will be extremely valuable in sparing life if there should arise an occurrence of a mischance on parkways, remote ranges, provincial territories and spots where therapeutic stores are not within the event of crisis. In any event first help can be made effectively open with the assistance of this framework. This venture includes of Advanced Architecture Machine(ARM) processor that control the opposite sub framework , for example, RFID Reader, Global System for Mobile correspondence (GSM), pharmaceutical allocator, and stock control. RFID tag identifies the specific client. GSM sends the message to the stock management once the solution ought to be refill. Pharmaceutical authority is that capability a part of the machine that stores the prescription.

[5]. Dhanush j.Nair, Sunny nahar, " ATM transaction : A new time based approach research paper ", International journal of science, engineering, and technology research(IJSETR),volume 4,issue,6,june 2015, ISSN:2278-7798.

The purpose of this analysis paper is to introduce a replacement thought of OTP (one time counter sign) and providing details of the close to by ATM and therefore the quantity of money currently available in the nearby ATM machine if there is a shortage of money in ATM we are currently using for ATM transactions .There is a limitation on the amount of money being withdrawn from the ATM machine. As you all know there is a limit of Rs.25000 being withdrawn at a time that is being counted united group action. This analysis permits United States to withdraw an outsized quantity of cash among a time period of 5 minute exploitation OTP that is counted united group action and therefore the user utilize this services for services for giant quantity of cash being withdrawn per day different bank has totally{different |completely different} per day group action limit.

[6]. JamesLim 2014, Programmable automatic pill dispenser, United States Patent, *1*(12).

A device that can be loaded with appropriate pills and programmed to automatically dispense the proper amount(s) and proper type(s) of pill(s) at the proper time(s) each day. The device also includes a system for alerting the pill taker that pills have been dispensed and need to

be taken, a system for providing voice messages to coach the pill taker to use the device and consume the pills, a system for alerting an off-site caregiver when the pill taker has not responded as required or when there is a problem with the operation of the device, and a system for the efficient and accurate loading of pills into the device. Major components of the device include a pill storage wheel (100), a cabinet (102), a pill release gate (110), a pill loading indicator template (118), a programmable timer (130), a power spring (134), an index wheel (138), a double ended pawl assembly (144), a solenoid assembly (146), a battery (500), an one shot timing and solenoid driving circuit (504), a blinking LED and buzzer driver circuit (506), a voice message record and playback system (514), and an automatic telephone dialer system (510).This invention relates to automatic pill dispensers, particularly to methods and devices which may be programmed to automatically dispense predetermined quantities and preselected types of pills at preset times. An enhanced embodiment provides a programmable automatic pill dispenser for use by people, such as senior citizens, who have problems in remembering to take pills properly but could otherwise still live independently. This embodiment can enable these people to take the proper pill(s) in the proper amount(s) at the proper time(s) without an on-site caregiver to administer the pill(s).

[7]. Boquete L, Rodriguez Ascariz JM, ArtachoI, Cantos Frontela J, Peixoto N 2010 Dynamically programmable electronic pill dispenser system, Journal of Medical Systems.34,357–366

An automatic pill dispenser for dispensing medical pills having different prescribed administration schedules includes a plurality of pill storage compartments each capable of holding more than one pill, an automatic release mechanism for dispensing pills at predetermined time intervals corresponding with their respective administration schedules, and a pill receptacle coupled to a pill detector such that a pill dispensed from the pill dispenser and received by the receptacle causes the pill dispenser to generate a signal to alert the patient to take the dispensed medicine. Twelve storage compartments, arranged in a ring about a vertically rotating wheel, are preloaded by a patient with all pills prescribed to be taken during a 24-hour period. The patient loads pills into individual storage compartments according to a loading code corresponding to the respective administration schedules of the pills. The pill dispenser then automatically sequentially rotates the storage compartments over a trapdoor which operates to empty each

compartment positioned there over. A photoelectric detector, having a light beam traveling vertically through a cup into which pills are dispensed, detects pills therein and responds by alerting the patient with an audible or visual signal. The light source also serves as a night light. A preloadable pill storage canister is also disclosed which may be preloaded by a pharmacist and simply inserted into the pill dispenser by the patient for automatic pill dispensing. A method of dispensing medical pills having different prescribed administration schedules is also described.

[8]. Balasubramanian et al 2012, Apparatus for counting and dispensing pill using multi-stage ills ingulation, united States Patent.

An automatic medicine vending machine with a self-contained on-site pill dispensing mechanism and a storage facility for the plurality of pills that can be dispensed based on the user requirement. Major components of the machine are, a scanner to take the input from user, a system that includes servo motors for dispensing the medication, large storage space to store the pills, sensors to detect the motion of pills, an inventory monitoring system to keep track of the storage, an industrial standard vertical foam fill machine to pack the medication separately and a non-contact laser inkjet printer to print the description which includes the time at which the medicine must be taken. The inventory monitoring system also keeps track of the expiry date of each batch of medicine and sends alert to refill the storage when the pills run out. It also holds an inbuilt system to receive money from the user for the drugs that are dispensed. All these systems are monitored by a central microprocessor, which is programmed to receive input from the user via the scanner and to actuate and control all the necessary components required to dispense the medication requested by the user. The machine can be viewed as an automated pharmacy placed on a commercial scale so that infinite number of user will be able to access it anytime. The present invention relates to automatic medicine vending machine, in particular to a machine that has the capability to dynamically receive input for the user and then dispense the required type of medicine. The input, here means, the prescription by the physician to the user. The system features a machine that is capable of handling a complete range of prescription.

1.4 PROPOSED SYSTEM

The users may 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 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.

1.5 ORGANIZATAION OF REPORT

Chapter 1: Introduction

Chapter 2: Introduction to proposed system

Chapter 3: System design description

Chapter 4: Experimental Result Analysis

Chapter 5: Advantages and Application

CHAPTER 2

INTRODUCTION TO PROPOSED SYSTEM

Several folks in India die thanks to lack of designation in initial place and non accessibility of medication on time. Problem arise when need of some medicine is urgent and drug-stores are not open or drug is not available in stock, especially during night time. In remote areas, rural areas and places where public turnover is less, the availability of medicines within the patient's reach is a critical issue. These are some of the main problems that are being faced by the society in present scenario. ATM will help in solving these problems by providing the medicines 24x7.

ATM-Any Time Medicine, where the device can send out medicines. Device can fetch out the medicines automatically for the basic common symptoms and the medicines provided by the machine are only for the timely relief and in emergency case where person should meet the doctor additional. People at rural places cannot get access to medicines that are providing to them freely by the government. The aim of this project is that people would be able to access the drugs via patient kiosks in public places such as drug stores, malls, bus / railway stations, on highways, areas where medical stores are limited. The device is intended taking below concern, like lack of poorness and illiteracy in India.

2.1 SYSTEM REQUIREMENT

Hardware Requirements

- Microprocessor – ARM LPC2148
- 4*4 Key pad
- LCD - 16 x 2
- RFID Reader
- Medicine Dispenser
- Motor
- L293D Driver
- 7812/ 7805 voltage regulators for power supply
- Power supply circuit
- LM317

- Relay
- IR Sensor

Software Requirements

- Embedded c
- Kiel-c compiler
- Flash magic burner software

Technical Specification

- Operating voltage of embedded circuitry is 3.3vdc.
- Current consumption of device in active mode 200mill amp.
- Operating frequency of device is 20 to 60MHZ

2.2 FLOW DIAGRAM

Step 1: The user should swipe the card which is given by hospital.

Step 2: If the card is valid" enter the password message" will be displayed on the LCD.

Step 3: If the card is invalid buzzer will turn on and" invalid card" message will be displayed on LCD.

Step 4: If the password is correct "medicines available are: tablet, ointment "message will be displayed in LCD.

Step 5: If the password is incorrect buzzer will turn on.

Step 6: Required medicine is selected using hexa keypad.

Step7: There are two payment types one is" cash" and other is "card" we can select the required type using keypad.

Step 8: LCD displays "payment successful" message after the completion of payment, if any problem happens buzzer will turn on.

Step 9: Once the payment is done the medicine will be dispensed through dispenser.

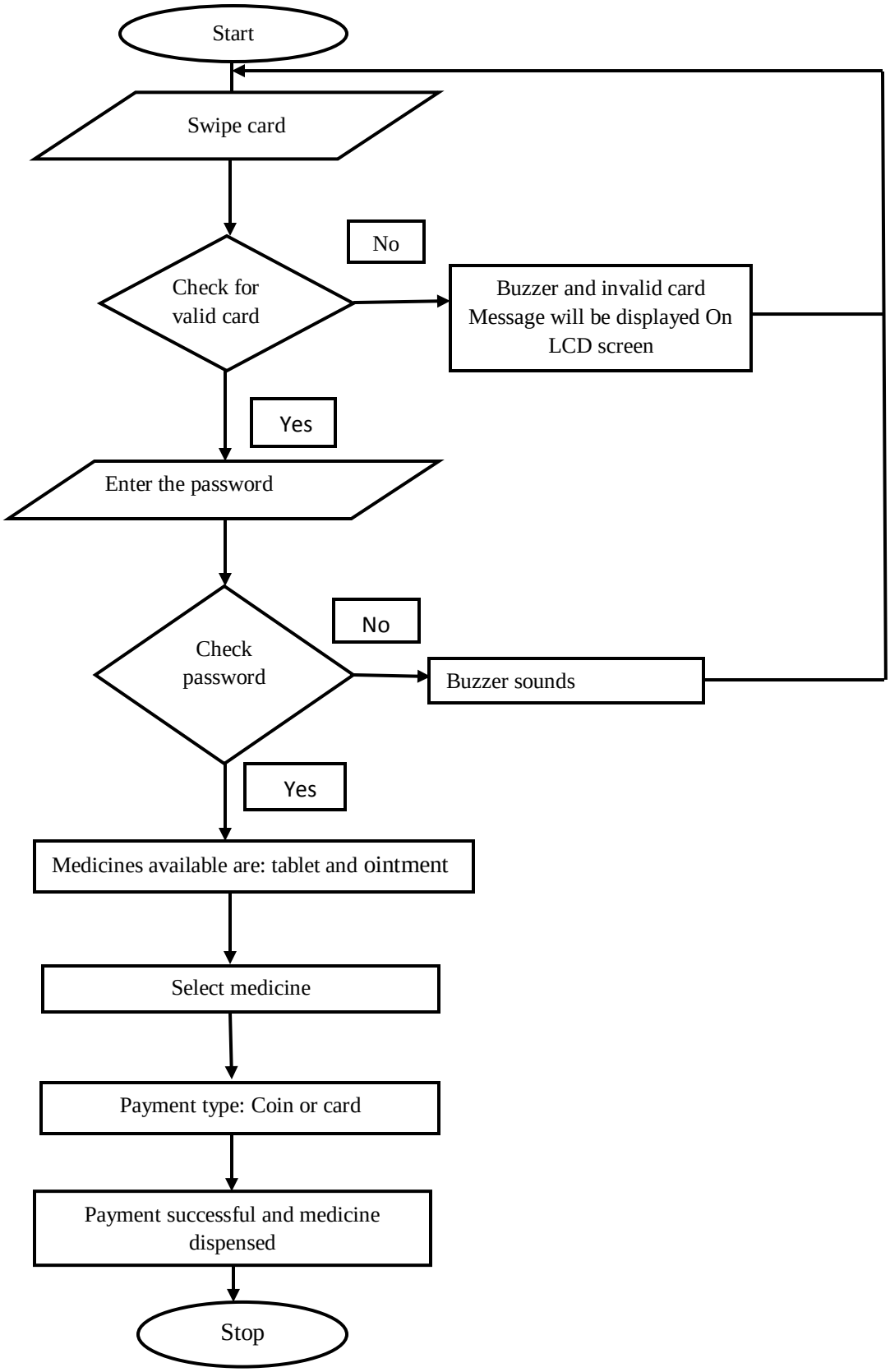

Fig 2.1 Flow Chart

CHAPTER 3

SYSTEM MODEL DISCRIPTION

3.1 BLOCK DIAGRAM

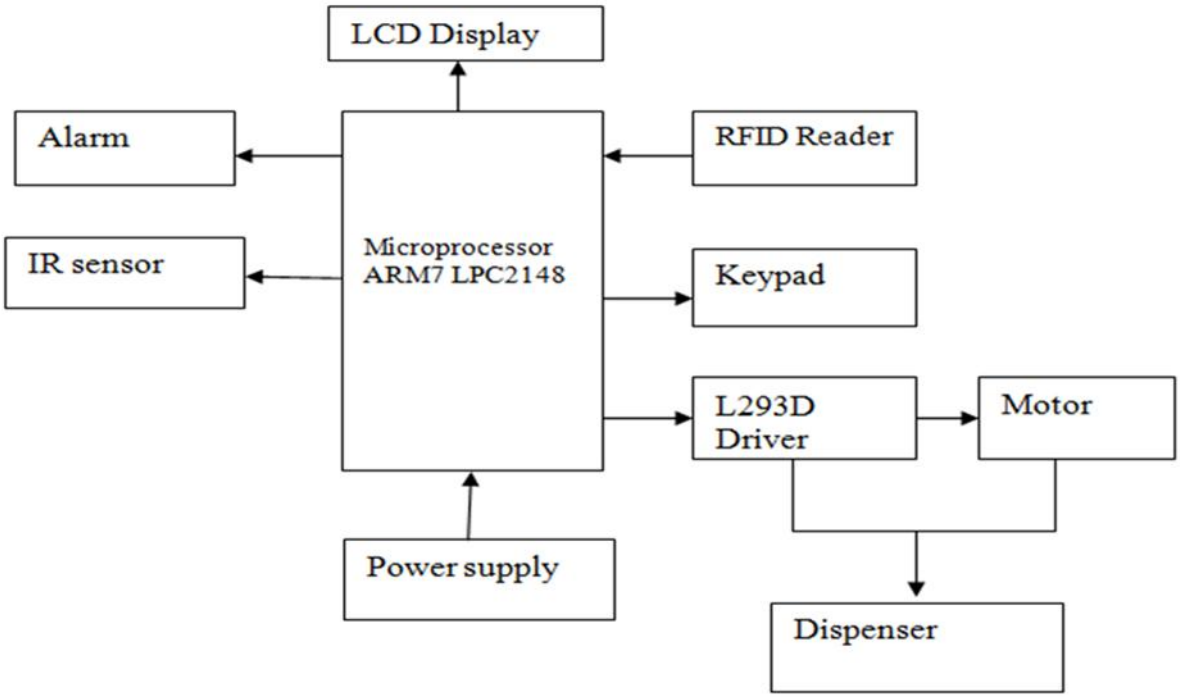

Fig 3.1: Block diagram of autonomous all time medicine counter for medicine self dispensing

The block diagram of All Time Medicine is as shown in the above Figure. ARM is the main part of the system. It controls other subsystems like display, dispenser and inventory control. When the medicine becomes less than some quantity GSM will send message to the inventory controller.

1. ARM: It is the main part of the system where the other components will be controlled by it.
2. Display and keypad: The main function of the display is to show the registered medicines Available in the ATM machine and with the help of keypad the customer can enter the name of the required medicine.

3. Inventory Control: Controlling the inventory of drugs is critical to the functioning of ATM. The inventory controller continuously monitors the level of each medicine.

4. Cash Unit: If the prepaid balance of the user is less, then they can buy the medicine through paying the money.

5. Medicine Dispenser: It is the storage part of the machine which stores all the medicines. It consists of series of springs in which the medicines are placed.

6. The data base relevant to all the general diseases will be stored in the data base and the user has to select the required medicine using Keypad.

3.2 LPC2148 ARM 7 MICROCONTROLLER

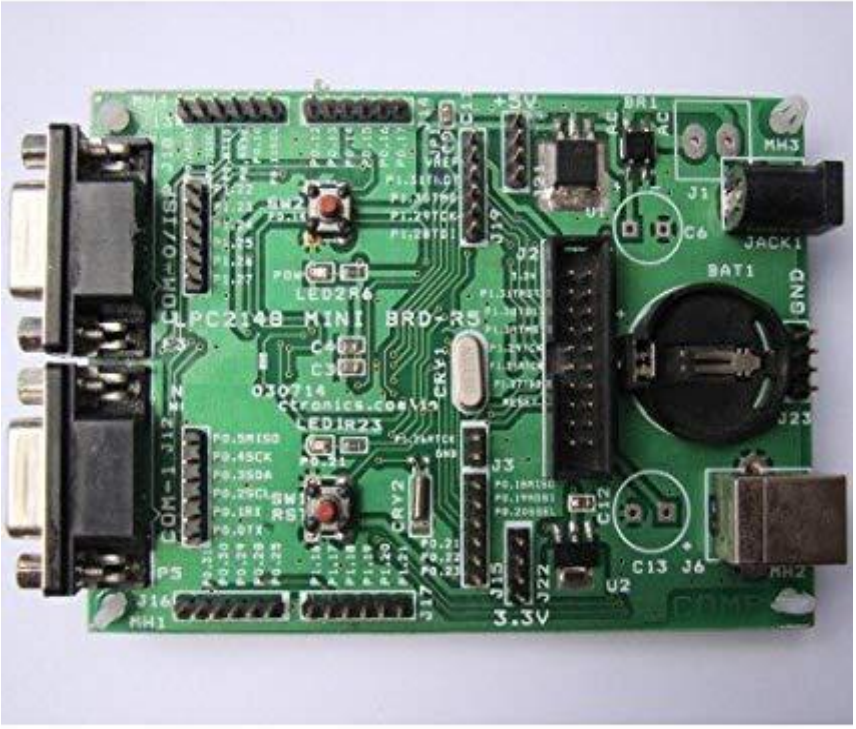

Fig 3.2: LPC2148 ARM 7 Microcontroller

The LPC2141/42/44/46/48 microcontrollers are based on a 16-bit/32-bit ARM7TDMI-S CPU with real-time emulation and embedded trace support, that combine the microcontroller with embedded high-speed flash memory ranging from 32 kB to 512 kB. A 128-bit wide memory interface and unique accelerator architecture enable 32-bit code execution at the maximum clock rate. For critical code size applications, the alternative 16-bit Thumb mode reduces code by more than 30 % with minimal performance penalty.

Due to their tiny size and low power consumption, LPC2141/42/44/46/48 are ideal for applications where miniaturization is a key requirement, such as access control and point-of-sale. Serial communications interfaces ranging from a USB 2.0 Full-speed device, multiple UARTs, SPI, SSP to I2C-bus and on-chip SRAM of 8 kB up to 40 kB, make these devices very well suited for communication gateways and protocol converters, soft modems, voice recognition and low end imaging, providing both large buffer size and high processing power. Various 32-bit timers, single or dual 10-bit ADC(s), 10-bit DAC, PWM channels and 45 fast GPIO lines with up to nine edge or level sensitive external interrupt pins make these microcontrollers suitable for industrial control and medical systems.

3.2.1 FEATURES

- 16-bit/32-bit ARM7TDMI-S microcontroller in a tiny LQFP64 package.
- 8 kB to 40 kB of on-chip static RAM and 32 kB to 512 kB of on-chip flash memory 128-bit wide interface/accelerator enables high-speed 60 MHz operation.
- In-System Programming/In-Application Programming (ISP/IAP) via on-chip boot loader software. Single flash sector or full chip erase in 400 ms and programming of256 B in 1 ms.
- Embedded ICE RT and Embedded Trace interfaces offer real-time debugging with the on-chip Real Monitor software and high-speed tracing of instruction execution.
- USB 2.0 Full-speed compliant device controller with 2 kB of endpoint RAM. In addition, the LPC2146/48 provides 8 kB of on-chip RAM accessible to USB by DMA.
- One or two (LPC2141/42 vs. LPC2144/46/48) 10-bit ADCs provide a total of 6/14analog inputs, with conversion times as low as 2.44 s per channel.
- Single 10-bit DAC provides variable analog output (LPC2142/44/46/48 only).

- Two 32-bit timers/external event counters (with four capture and four compare channels each), PWM unit (six outputs) and watchdog.
- Low power Real-Time Clock (RTC) with independent power and 32 kHz clock input.
- Multiple serial interfaces including two UARTs (16C550), two Fast I2C-bus (400 kbit/s) SPI and SSP with buffering and variable data length capabilities.
- Vectored Interrupt Controller (VIC) with configurable priorities and vector addresses.
- Up to 45 of 5 V tolerant fast general purpose I/O pins in a tiny LQFP64 package.
- Up to 21 external interrupt pins available.
- 60 MHz maximum CPU clock available from programmable on-chip PLL with settling time of 100 s.
- On-chip integrated oscillator operates with an external crystal from 1 MHz to 25 MHz.
- Power saving modes include idle and Power-down.
- Individual enable/disable of peripheral functions as well as peripheral clock scaling for additional power optimization.
- Processor wake-up from Power-down mode via external interrupt or BOD.
- Single power supply chip with POR and BOD circuits:
- CPU operating voltage range of 3.0 V to 3.6 V (3.3 V, 10 %) with 5 V tolerant I/O.

3.2.2 ARCHITECTURE OF LPC 2148 ARM 7 MICROCONTROLLER

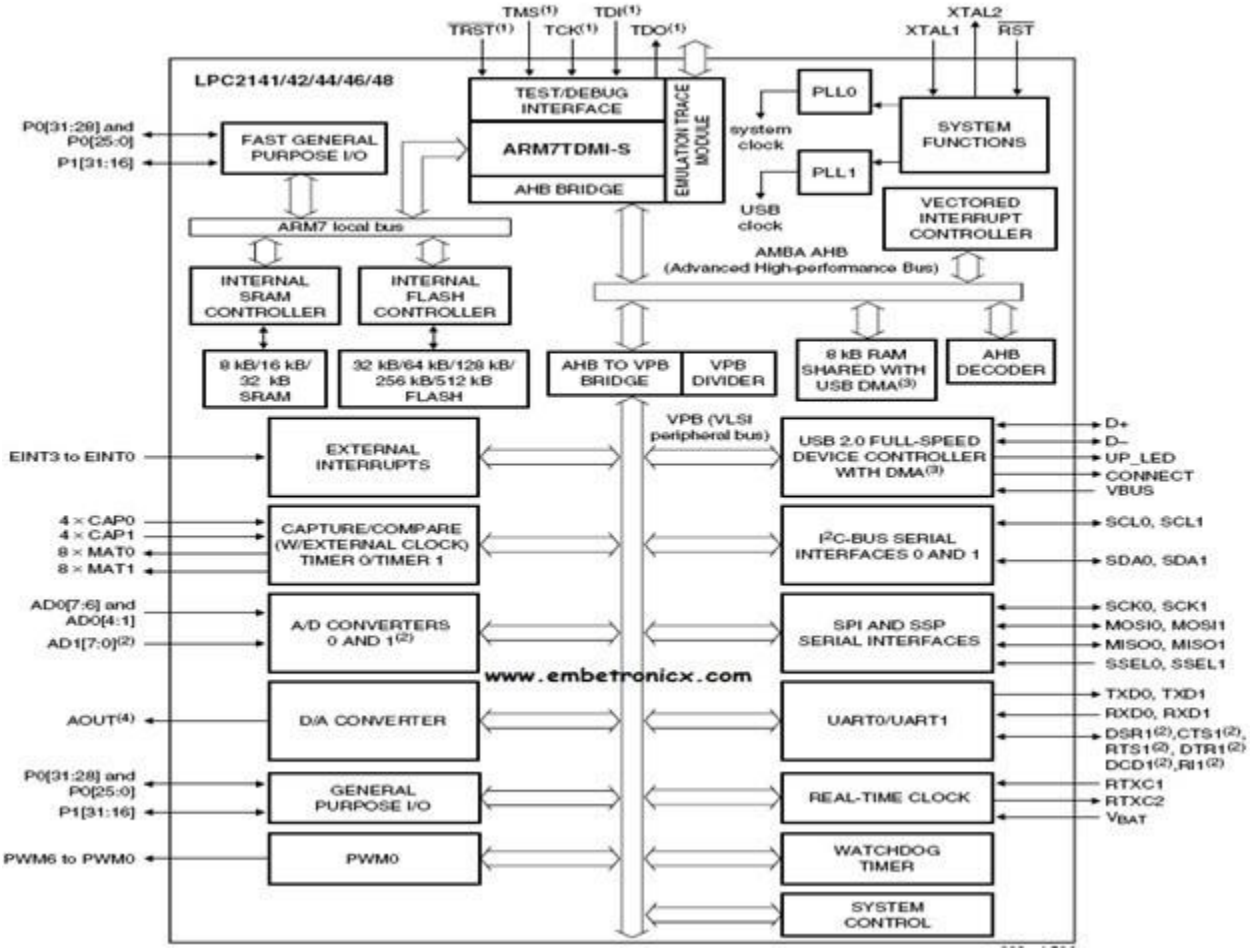

Fig 3.3: LPC 2148 ARM 7 architecture

The ARM7TDMI-S is a general purpose 32-bit microprocessor, which offers high performance and very low power consumption. The ARM architecture is based on Reduced Instruction Set Computer (RISC) principles, and the instruction set and related decode mechanism are much simpler than those of micro programmed Complex Instruction Set Computers (CISC). This simplicity results in a high instruction throughput and impressive real-time interrupt response from a small and cost-effective processor core.

Pipeline techniques are employed so that all parts of the processing and memory systems can operate continuously. Typically, while one instruction is being executed, its successor is being decoded, and a third instruction is being fetched from memory.

The ARM7TDMI-S processor also employs a unique architectural strategy known as Thumb, which makes it ideally suited to high-volume applications with memory restrictions, or applications where code density is an issue

The key idea behind Thumb is that of a super-reduced instruction set. Essentially, the ARM7TDMI-S processor has two instruction sets:

- The standard 32-bit ARM set.
- A 16-bit Thumb set.

The Thumb set's 16-bit instruction length allows it to approach twice the density of standard ARM code while retaining most of the ARM's performance advantage over a traditional 16-bit processor using 16-bit registers. This is possible because Thumb code operates on the same 32-bit register set as ARM code.

Thumb code is able to provide up to 65 % of the code size of ARM, and 160 % of the performance of an equivalent ARM processor connected to a 16-bit memory system.

The particular flash implementation in the LPC2141/42/44/46/48 allows for full speed execution also in ARM mode. It is recommended to program performance critical and short code sections (such as interrupt service routines and DSP algorithms) in ARM mode. The impact on the overall code size will be minimal but the speed can be increased by 30 % over Thumb mode.

3.3 4*4 HEX KEYPAD

Fig 3.4: 4*4 Hexa keypad

A 4x4 matrix keypad requiring eight Input / Output ports for interfacing issued as an example. Rows are connected to Peripheral Input / Output (PIO) pins configured as output. Columns are connected to PIO pins configured as input with interrupts. In this configuration, four pull-up resistors must be added in order to apply a high level on the corresponding input pins.

3.3.1 Features

- Contact debouncing.
- Easy to interface.
- Interfaces to any microcontroller or microprocessor.
- Data valid output signal for interrupt activation.

This Application Note describes programming techniques implemented on the AT91 ARM-based microcontroller for scanning a 4x4 Keyboard matrix usually found in both consumer and industrial applications for numeric data entry. AT91 Keyboard interface in this application, a 4x4 matrix keypad requiring eight Input / Output ports for interfacing is used as an example. Rows are connected to Peripheral Input / Output (PIO) pins configured as output. Columns are connected to PIO pins configured as input with interrupts. In this configuration, four pull-up resistors must be added in order to apply a high level on the corresponding input pins as shown in figure 3.4. The corresponding hexadecimal value of the pressed key is sent on four LEDs.

3.4 DC MOTOR

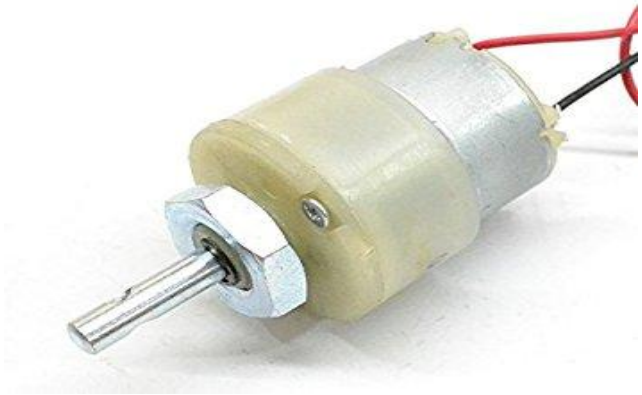

Fig 3.5: DC Motor

Many applications call for a high start-up torque. The D.C. motor, by its very nature, has a high torque vs. falling speed characteristic and this enables it to deal with high starting torques and to absorb sudden rises in load easily. The speed of the motor adjusts to the load. Furthermore, the D.C. motor is an ideal way of achieving the miniaturization designers are constantly seeking because the efficiency it gives is high compared with other designs.

This motor follows linear laws of operation and because of this it is easier to fully exploit its characteristics compared to synchronous or asynchronous motors.

The stator is formed by a metal carcass and one or more magnets that create a permanent magnetic field inside the stator. At the rear of the stator are the brush mountings and the brush gear which provide electrical contact with the rotor. The rotor is itself formed by a metal carcass carrying coils which are interconnected at the commutator at the rear of the rotor. The commutator and brush assembly then select the coil through which the electric current passes in the opposite direction.

3.4.1 Types of DC Motor

There are 4 main types of DC motors:

a) Permanent Magnet DC Motor

The permanent magnet motor uses a permanent magnet to create field flux. This type of DC motor provides great starting torque and has good speed regulation, but torque is limited so they are typically found on low horsepower applications.

b) Series DC Motor

In a series DC motor, the field is wound with a few turns of a large wire carrying the full armature current. Typically, series DC motors create a large amount of starting torque, but cannot regulate speed and can even be damaged by running with no load. These limitations mean that they are not a good option for variable speed drive applications.

c) Shunt DC Motor

In shunt DC motors the field is connected in parallel (shunt) with the armature windings. These motors offer great speed regulation due to the fact that the shunt field can be excited separately from the armature windings, which also offers simplified reversing controls.

d) Compound DC Motor

Compound DC motors, like shunt DC motors, have a separately excited shunt field. Compound DC motors have good starting torque but may experience control problems in variable speed drive applications.

Between the 4 types of DC motors, the potential applications are numerous. Each type of DC motor has its strengths and weaknesses. Understanding these can help you understand which types may be good for your application.

3.5 LCD DISPLAY

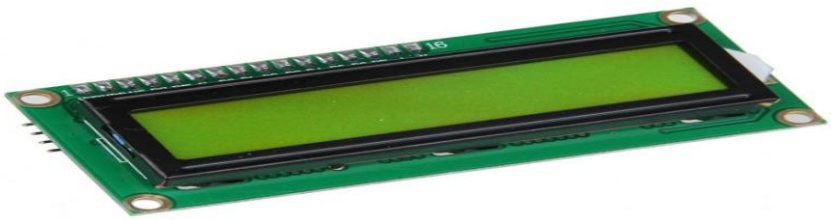

Fig 3.6: LCD Display

The 14.2 mm (0.56 inch) LED seven segment displays are designed for viewing distances up to 7 meters (23 feet). These devices use an industry standard size package and pin out. Both the numeric and ±1 overflow devices feature a right hand decimal point. All devices are available as either common anode or common cathode.

3.5.1 Features

- Industry Standard Size
- Industry Standard Pin out 15.24 mm (0.6 in.) DIP Leads on 2.54 mm (0.1 in.) Centers
- Choice of Colors AlGaAs Red, High Efficiency Red, Yellow, Green
- Excellent Appearance Evenly Lighted Segments Mitered Corners on Segments Gray Package Gives Optimum Contrast ±50° Viewing Angle
- Design Flexibility Common Anode or Common Cathode Single and Dual Digits Right Hand Decimal Point ±1. Overflow Character
- Categorized for Luminous Intensity Yellow and Green Categorized for Color Use of Like Categories Yields a Uniform Display
- High Light Output
- High Peak Current
- Excellent for Long Digit String Multiplexing

3.6 IR SENSOR

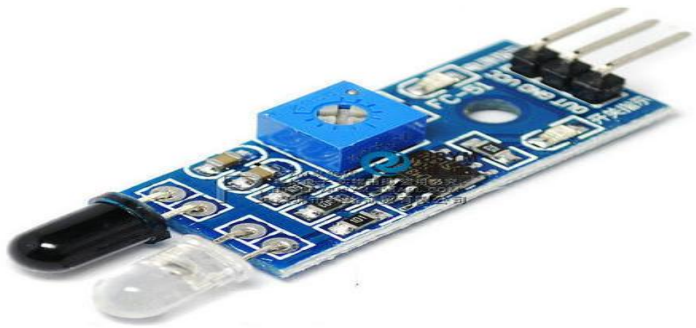

Fig 3.7: IR sensor

An infrared sensor is an electronic device that emits in order to sense some aspects of the surroundings. An IR sensor can measure the heat of an object as well as detects the motion. These types of sensors measures only infrared radiation, rather than emitting it that is called as a passive IR sensor. Usually in the infrared spectrum, all the objects radiate some form of thermal radiations. These types of radiations are invisible to our eyes that can be detected by an infrared sensor. The emitter is simply an IR LED (Light Emitting Diode) and the detector is simply an IR photodiode which is sensitive to IR light of the same wavelength as that emitted by

the IR LED. When IR light falls on the photodiode, the resistances and these output voltages, change in proportion to the magnitude of the IR light received. IR sensors are used in various Sensor based projects and also in various electronic devices which measures the temperature.

An Infrared Sensor works in the following sequence:

- IR source (transmitter) is used to emit radiation of required wavelength.
- This radiation reaches the object and is reflected back.
- The reflected radiation is detected by the IR receiver.
- The IR Receiver detected radiation is then further processed based on its intensity. Generally, IR Receiver output is small and amplifiers are used to amplify the detected signal.

Typical working of IR sensor detection system can be understood by Figure 3.8 below.

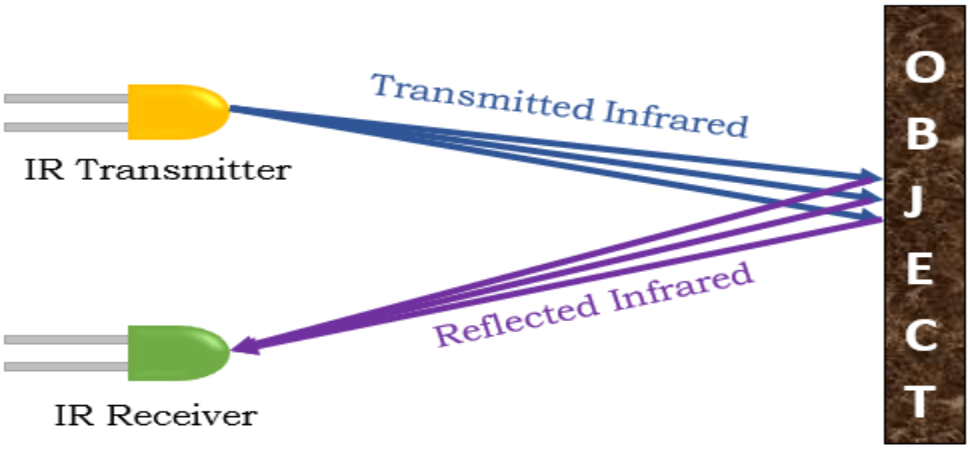

Fig 3.8: Working of IR sensor detection system

Incidence in an IR Detection System may be direct or indirect. In case of Direct Incidence, there is no hindrance in between transmitter and receiver. Whereas, in Indirect Incidence IR Transmitter and Receiver are kept side by side and the object is in front of them.

3.7 POWER SUPPLY

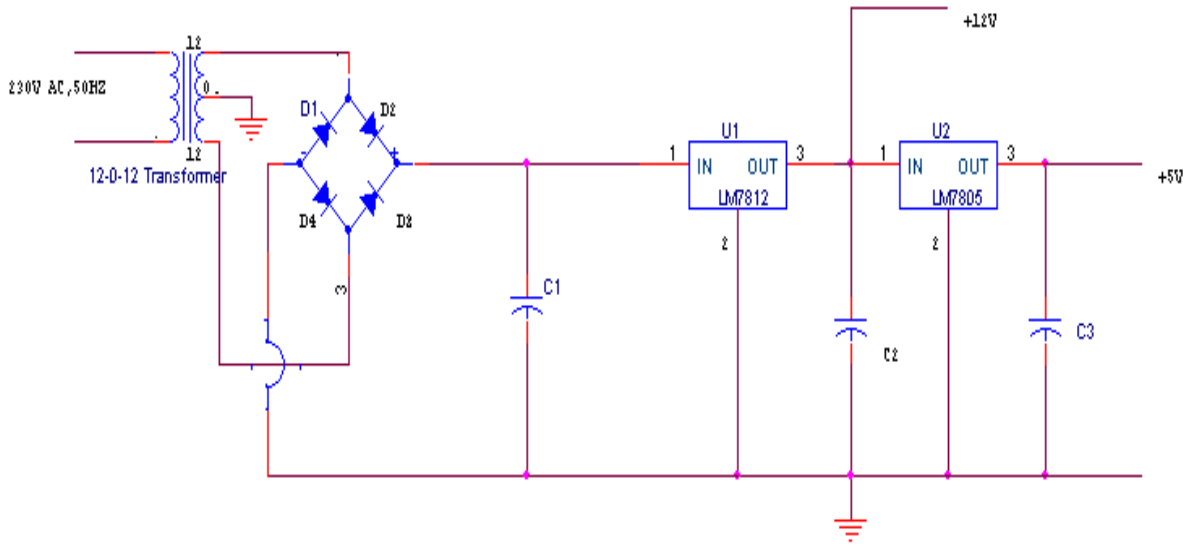

Fig 3.9: Block diagram of 12 v dc supply

In every project we need different voltages for different circuits. So we need to construct different power supply of different voltages employing different voltage transformers, rectifier circuits, filter circuits and regulator circuits.

This type of construction requires many components (transformers, capacitors, regulators.....etc.). So the size of the power supply becomes bulky and costly. To overcome above disadvantages by using regulator IC'S the different voltages (12V, 9V.....etc.) can be obtained with only one transformer.

The circuit diagram of Dual power supply is shown in the figure 3.9. The function of each component of the circuit is explained below. The circuit consists of following stages.

1. Transformer
2. Rectifier
3. Filter
4. Regulator

- **Transformer**

It is an electrical device which transfers the power from one winding to the other winding with Isolation. All the electronic gadgets work for less voltage (normally 3V to 12V).So a step down Transformer is used, whose function is to step down the AC voltage from 230V to required Voltage depending on the need. In this project 12V-0-12V is used. The output of transformer is 12V AC which is connected to the diodes for rectification.

- **Rectifier Circuit**

It employs diodes, which converts AC voltage into DC voltage. The output of rectifier circuit is not a pure DC. It also consists of some AC components, which is called ripples. In order to remove these AC components, filter circuits are employed. So the output of rectifier circuit is fed to the filter circuit (capacitor).

- **Filter Circuit**

Filter circuit employs electrolytic capacitors in order to remove the AC components. As we know the capacitor does not allow DC components to pass through it because it offers high reactance to the DC component. And offers less reactance to the AC component, so all AC components will be bypasses through the capacitors to ground.

- **Regulator**

Regulator is an electronic circuit whose function is to keep output always constant though the input is varied. In this project the three terminal IC regulators of 7812 & 7805 is used for providing output DC voltages. E.g. 7809, the number 78 represents the positive regulator IC and 09 represents the output voltage i.e. output is 12V.

3.8 RELAY

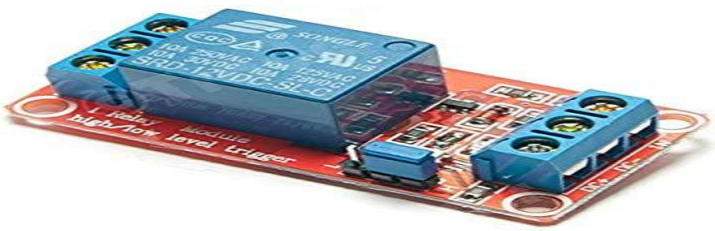

Fig 3.10: Relay

A relay is an electrically operated switch. Many relays use an electromagnet to mechanically operate a switch, but other operating principles are also used, such as solid-state relays. Relays are used where it is necessary to control a circuit by a separate low-power signal, or where several circuits must be controlled by one signal. The first relays were used in long distance telegraph circuits as amplifiers: they repeated the signal coming in from one circuit and re-transmitted it on another circuit. Relays were used extensively in telephone exchanges and early computers to perform logical operations.

This Board can be used to Control Solonoids, Motors etc.

- Input Logic -5v level from MUC
- Interfaced with Transistor 547.
- Input Pin connected to Burg stick.

3.8.1 Applications

- Number and type of contacts — normally open, normally closed, (double-throw)
- Contact sequence — "make before break" or "break before make". For example, the old style telephone exchanges required make-before-break so that the connection didn't get dropped while dialing the number.
- Contact current rating — small relays switch a few amperes, large contactors are rated for up to 3000 amperes, alternating or direct current
- Contact voltage rating — typical control relays rated 300 VAC or 600 VAC, automotive types to 50 VDC, special high-voltage relays to about 15,000 V
- Operating environment — minimum and maximum operating temperature and other environmental considerations, such as effects of humidity and salt
- Assembly — Some relays feature a sticker that keeps the enclosure sealed to allow PCB post soldering cleaning, which is removed once assembly is complete.
- Mounting — sockets, plug board, rail mount, panel mount, through-panel mount, enclosure for mounting on walls or equipment
- Switching time — where high speed is required
- "Dry" contacts — when switching very low level signals, special contact materials may be needed such as gold-plated contacts

- Contact protection — suppress arcing in very inductive circuits
- Coil protection — suppress the surge voltage produced when switching the coil current
- Isolation between coil contacts
- Aerospace or radiation-resistant testing, special quality assurance
- Accessories such as timers, auxiliary contacts, pilot lamps, and test buttons.
- Regulatory approvals.
- Stray magnetic linkage between coils of adjacent relays on a printed circuit board.

3.9 RFID READER

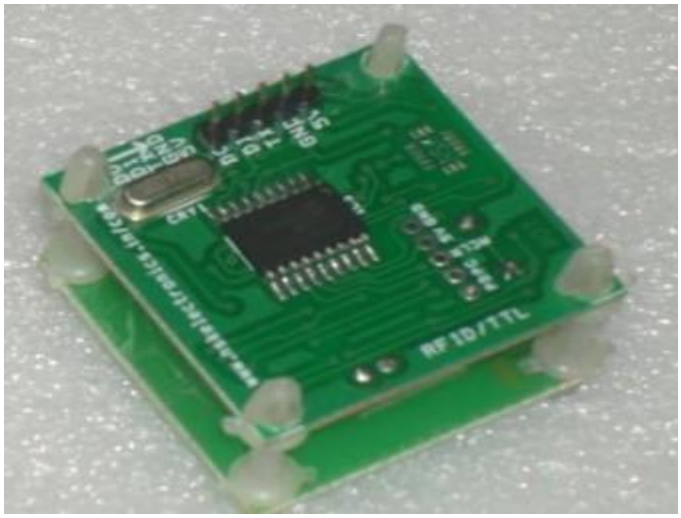

Fig 3.11: RFID Reader

The **NSK125 series** RFID Proximity OEM Reader Module has a built-in antenna in minimized form factor. It is designed to work on the industry standard carrier frequency of 125 kHz. This LF reader module with an internal or an external antenna facilitates communication with Read-Only transponders—type UNIQUE or TK5530 via the air interface. The tag data is sent to the host systems via the wired communication interface with a protocol selected from the model. The LF model is best suited for application in access control, time and attendance, asset Management, Handheld Readers, Immobilizers and other RFID enabled applications.

3.9.1 Key Features

- Output- TTL or Wigand26
- Plug-and-Play, needs +5V to become a reader
- Buzzer indicates tag reading operation

3.10 L293D MOTOR DRIVER

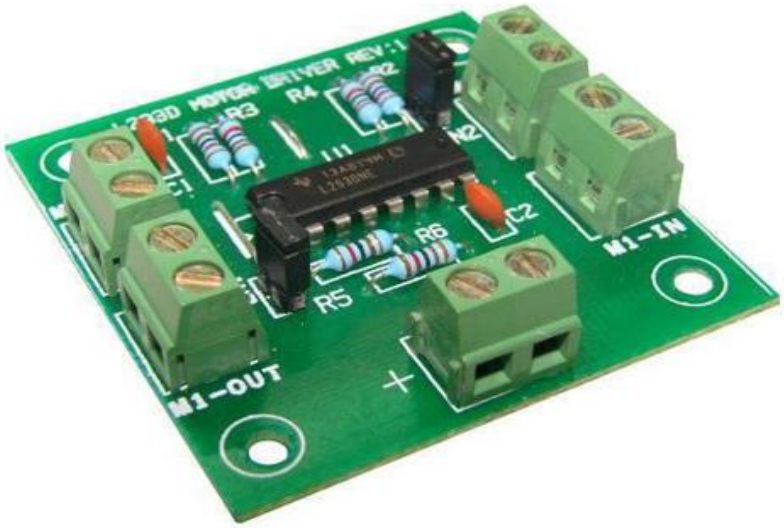

Fig 3.12: L293D Motor driver

This L293D motor driver board is a medium power motor driver perfect for driving DC motors and Stepper motors. It uses the popular L293D H-bridge motor driver IC. It can drive 4 DC motors in one direction, or drive 2 DC motors in both the directions with speed control. The driver greatly simplifies and increases the ease with which you may control motors, relays, etc from microcontrollers. It can drive motors up to 12 V with a total DC current of up to 600mA.

3.10.1 Features

- Wide Supply-Voltage Range: 4.5 V to 36 V.
- Separate Input-Logic Supply.
- Internal ESD Protection.
- High-Noise-Immunity Inputs.
- Output Current 1 A Per Channel (600 mA for **L293D**)
- Peak Output Current 2 A Per Channel (1.2 A for **L293D**)

3.11 EMBEDDED SYSTEM

An embedded system is a system that has software embedded into hardware, which makes a system dedicated for an application or specific part of an application or product or part of a larger system. Every year millions of computing systems are built destined for desktop computers but surprisingly, billions of computing systems are built every year embedded within larger electronic devices and still goes unnoticed. Any device running on electric power either already has computing system or will soon have computing system embedded in it. Today, embedded systems are found in cell phones, digital cameras, camcorders, portable video games, calculators, and personal digital assistants, microwave ovens, answering machines, home security systems, washing machines, lighting systems, fax machines, copiers, printers, and scanners, cash registers, alarm systems, automated teller machines, transmission control, cruise control, fuel injection, anti-lock brakes, active suspension and many other devices/gadgets as shown in the fig 1.4.

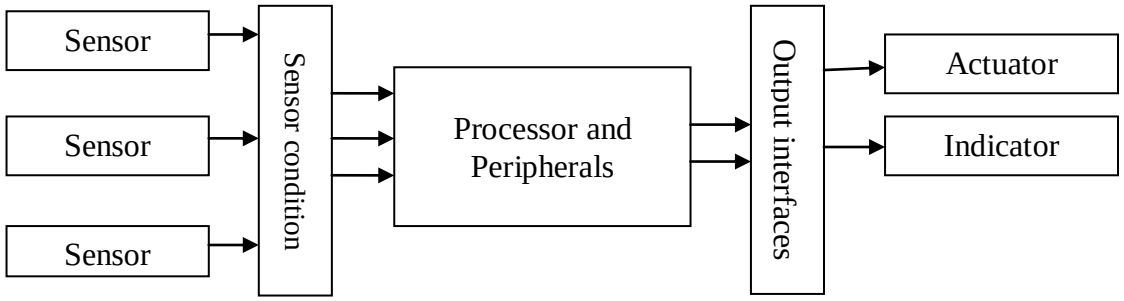

Fig 3.13: Block diagram of typical embedded system

An embedded system is an engineering art of act involving computation that is subject to physical constraints (reaction constraints and execution constraints) arising through interactions of computational processes with the physical world. Reaction constraints originate from the behavioral requirements and specify deadlines, throughput and jitter whereas execution constraints originate from the implementation requirements and put bounds on available processor speeds, power, memory and hardware failure rates. The key to embedded systems design is to obtain desired functionality under both kinds of constraints.

3.11.1 Basic diagram of embedded system

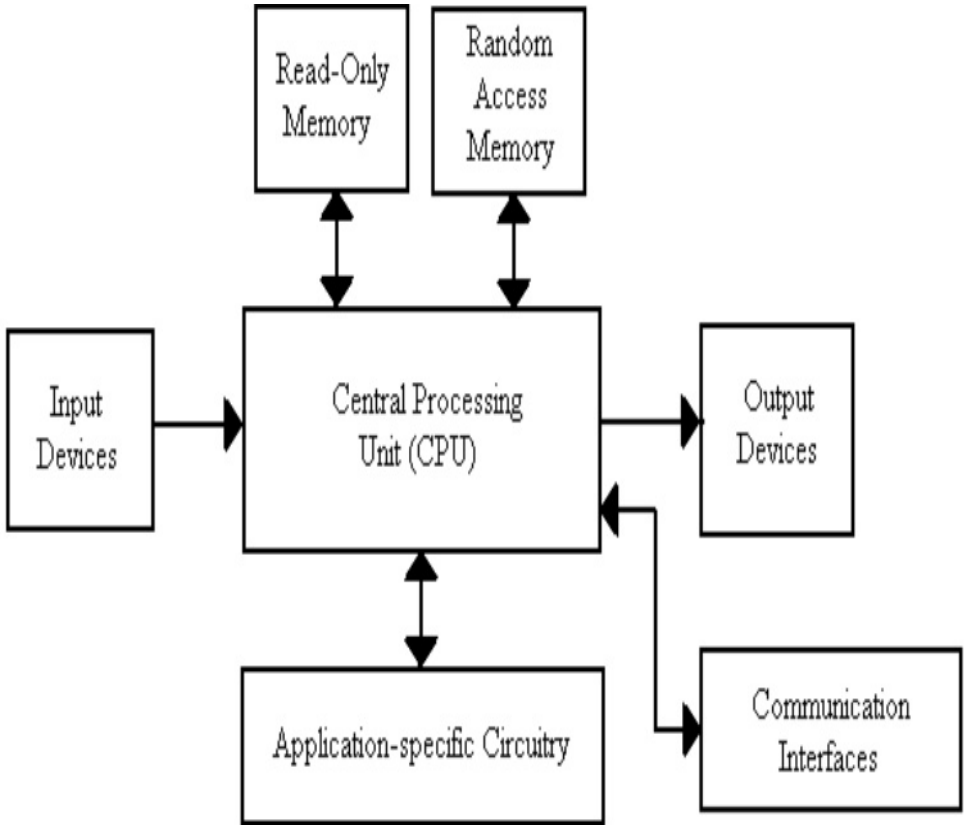

Fig 3.14: Basic Block Diagram of Embedded System

Now, the details of the various building blocks of the hardware of an embedded system

as shown in Fig 3.14 are

- Central Processing Unit (CPU)
- Memory (Read-only Memory and Random Access Memory)
- Input Devices
- Output devices
- Communication interfaces
- Application-specific circuitry

3.11.2 Central Processing Unit (CPU)

The Central Processing Unit (processor, in short) can be any of the following: microcontroller, microprocessor or Digital Signal Processor (DSP). A micro-controller is a low- cost processor. Its main attraction is that on the chip itself, there will be many other components such as memory, serial communication interface, analog-to digital converter etc. So, for small applications, a micro-controller is the best choice as the number of external components required will be very less.

3.11.3 Memory

The memory is categorized as Random Access Memory (RAM) and Read Only Memory (ROM). The contents of the RAM will be erased if power is switched off to the chip, whereas ROM retains the contents even if the power is switched off. So, the firmware is stored in the ROM. When power is switched on, the processor reads the ROM; the program is executed.

3.11.4 Input devices

Unlike the desktops, the input devices to an embedded system have very limited capability. There will be no keyboard or a mouse, and hence interacting with the embedded system is not an easy task. Many embedded systems will have a small keypad-you press one key to give a specific command.

3.11.5 Output devices

The output devices of the embedded systems also have very limited capability. Some embedded systems will have a few Light Emitting Diodes (LEDs) to indicate the health status of the system modules, or for visual indication of alarms. A small Liquid Crystal Display (LCD) may also be used to display some important parameters.

3.11.6 Communication interfaces

The embedded systems may need to, interact with other embedded systems at they may have to transmit data to a desktop. To facilitate this, the embedded systems are provided with one or a few communication interfaces such as RS232, RS422, RS485, Universal Serial Bus (USB), and IEEE 1394, Ethernet etc.

3.11.7 Varieties in Embedded System

Embedded system are commonly used in consumer, cooking, industrial, automotive, medical, commercial and military applications. Telecommunications system employs numerous embedded systems from telephone switches for the network to cell phones at the end user. Computer networking uses dedicated routers and network bridges to routers and network bridges to route data. Consumer electronics include personal digital assistants (PADs), mp3 player, mobile phones, videogame console, digital camera, DVD players, GPS receivers and printers. Household appliances, such as microwave ovens, washing machines and dishwasher, include embedded systems to provide flexibility efficiency and features. Advanced HVAC systems use networked thermostats to more accurately and efficiently control temperature that can change by time of day and season. Home automation uses wired and wireless networking that can be used to control lights, climate, security, audio/visual, surveillance, etc., all of which use embedded devices for sensing and controlling.

Transportation systems from flight to automobiles increasingly use embedded system. New aero planes contain advanced avionics such as inertial guidance systems and GPS receivers that also have considerable safety requirements. Various electric motors and brushless DC motors, induction motors and DC motor use electric/electronic motor controllers. Automobiles, electric vehicles and hybrid vehicles increasingly use embedded systems to maximize efficiency

and reduce pollution. Other automotive safety systems include anti-lock braking system (ABS), Electronic stability control (ESC/ESP), traction control (TCS) and automatic four wheel drive.

3.11.8 Processors In Embedded Systems

Embedded processors can be broken into two broad categories as microprocessor and microcontrollers. Ordinary microprocessor use separate integrated circuits for memory and peripherals. Microcontrollers have on chip peripherals, thus reducing power consumption, size and cost. In contrast to the personal computer market, many different basics CPU architecture are used, since software is custom developed for an application and is not commodity product installed by the end user. Both Von Neumann as well as various degrees of Harvard architecture is used. RISC as well as non RISC processors is found. Word length varies from 4-bits to 64-bits and beyond, although the most typical remain 8/16-bit. Most architecture comes in a large number of different variants and shapes, many of which are also manufactured by several different companies. Numerous microcontrollers have been developed for embedded systems use. General purpose microprocessors are also used in embedded systems, but generally require more support circuitry than microcontrollers.

The embedded system designers must know about the hardware architecture to write programs. These programs play prominent role in monitoring and controlling external devices. They also directly operate and use the internal architecture of the microcontroller, such as interrupt handling, timers, serial communication and other available features.

3.11.9 Applications

The applications of embedded system basics include smart cards, computer networking, satellites, telecommunications, digital consumer electronics, missiles, etc.

- Embedded system in automobiles include motor control, cruise control, body safety, engine safety, robotics in an assembly line, car multimedia, car entertainment, E-com access, mobiles etc
- Embedded system in telecommunications includes networking, mobile computing, and wireless communications, etc.
- Embedded systems in smart cards including banking, telephone and security system.

- Embedded systems in satellites and missiles include defence, communication, and aerospace.
- Embedded systems in computer networking and peripherals include image processing, networking systems, printers, network cards, monitors and displays.

3.12 EMBEDDED C LANGUAGE

Embedded C programming is the soul of the processor functioning inside each and every embedded system we came across in our daily life, such as mobile phones, washing machine. Each processor is associated with embedded software. The first and foremost thing is the embedded software that decides functioning of the embedded system. Embedded C language is most frequently used to program the microcontroller.

Earlier, many embedded applications were developed using assembly level programming. However, they did not provide portability. This disadvantage was overcome by the advent of various high level languages like C, PASCAL and COBOL. However, it was the C language that got extensive acceptance for embedded system, and it continues to do so. The C code written is more reliable, scalable, portable; and in fact much easier to understand

3.12.1 Salient Feature

- C language is software designed with different keywords, data types, variables, constants, etc.
- Embedded C is a generic term given to a programming language written in C, which is associated with particular hardware architecture.

- C language is a software designed with different keywords, data types, variables, constants, etc.
- Embedded C is a generic term given to a programming language written in C, which is associated with a particular hardware architecture.
- Embedded C is an extension to the C language with some additional header files. These header files may change from controller to controller.
- The microcontroller 8051 #include<reg51.h> is used.

3.12.2 DIFFERENCE BETWEEN C AND EMBEDDED C

C programming	Embedded C programming
Possesses native development in nature.	Processes cross development in nature.
Independent of hardware architecture.	Dependent on hardware architecture.
Used for Desktop applications, OS and PC memories.	Used for limited resources like RAM, ROM and I/O peripherals on embedded controller.

Table 3.1: Difference between C and Embedded C

3.12.3 The Basic Additional Features of the Embedded System

- **Data Types**

The data type refers to an extensive system for declaring variables of different types like integer, character, float, etc. The embedded C software uses four data types that are used to store data in the memory. The ‘char’ is used to store any single character; ‘int’ is used to store integer value, and ‘float’ is used to store precision floating point value.

Data Types	Size	Range
Char or signed char	1 byte	-128 to+128
Unsigned char	1 byte	0 to 255
Int or signed int	2 byte	-32768 to +32768
Unsigned int	2 byte	0 to 65535

Table 3.2: Data Types

- **keywords**

There are certain words that are reserved for doing specific tasks. These words are known as keywords. They are standard and predefined in the embedded C. Keywords are always written in low case. These keywords must be defined before writing the main program. The basic keywords of embedded software are given below:

Name	Function
Sbit	Accessing of single bit
Bit	Accessing of bit addressable memory of RAM
Sfr	Accessing of sfr register by another name

Table 3.3: Keyword

a) Sbit

This data type is used in case of accessing a single bit of SFR register.

- Syntax: sbit variable name=SFR bit;
- Ex: sbit a=P2^1;
- Explanation: If we assign p2.1 as ‘a’ variable, then we can use ‘a’ instead of p2.1 anywhere in the program, which reduces the complexity of the program.

b) Bit

This data type is used for accessing the bit addressable memory of RAM (20h-2fh).

- Syntax: bit variable name:
- Ex: bit c;
- Explanation: It is a bit sequence setting in a small data area that is used by a program to remember something.

c) SFR

This data type is used for accessing a SFR register by another name. All the SFR register must be declared with upper case.

- Syntax: SFR variable name = SFR address of SFR register;
- EX: SFR port0=0x80;

- Explanation: If we assign 0x80 as ‘port0’, then we can use 0x80 instead of port0 anywhere in the program, which reduces the complexity of the program.

3.12.4 ADVANTAGES OF EMBEDDED C PROGRAM

- Its takes less time to develop application program.
- It reduces complexity of the program.
- It is easy to verify and understand.
- It is portable in nature from one controller to another.

3.13 DESCRIPTION OF KEIL MICRO VISION SOFTWARE

Keil was founded in 1982 by Günter and Reinhardt Keil, initially as a German GbR. In April 1985 the company was converted to Keil Electronic GmbH to market add-on products for the development tools provided by many of the silicon vendors. Keil implemented the first C compiler designed from the ground-up specifically for the 8051 microcontroller.

Keil provides a broad range of development tools like ANSI C compiler, macro assemblers, debuggers and simulators, linkers, IDE, library managers, real-time operating systems and evolution for Intel 8051, Intel MCS-251, ARM and XC16x/C16x/ST10families.

The µVision IDE combines project management, run-time environment, build facilities, source code editing, and program debugging in a single powerful environment. µVision is easy-to-use and accelerates your embedded software development. µVision supports multiple screens and allows you to create individual window layouts anywhere on the visual surface as shown in Fig. 3.15 The µVision Debugger provides a single environment in which you may test, verify, and optimize your application code. The debugger includes traditional features like simple and complex breakpoints, watches windows, and execution control and provides full visibility to device peripherals. With the µVision Project Manager and Run-Time Environment you create software application using pre-build software components and device support from Software Packs. The software components contain libraries, source modules, configuration files, source code templates, and documentation. Software components can be generic to support a wide range of devices and applications.

Fig 3.15:Keil software

The NXP (founded by Philips) LPC2148 is an ARM7TDMI-S based high-performance 32-bit RISC Microcontroller with Thumb extensions 512KB on-chip Flash ROM with In-System Programming (ISP) and In-Application Programming (IAP), 32KB RAM, Vectored Interrupt Controller, Two 10bit ADCs with 14 channels, USB 2.0 Full Speed Device Controller, Two UARTs, one with full modem interface. Two I2C serial interfaces, Two SPI serial interfaces Two 32-bit timers, Watchdog Timer, PWM unit, Real Time Clock with optional battery backup, Brown out detect circuit General purpose I/O pins. CPU clock up to 60 MHz, On-chip crystal oscillator and On-chip PLL.

The µVision IDE combines project management, run-time environment, build facilities, source code editing, and program debugging in a single powerful environment. µVision is easy-to-use and accelerates your embedded software development. µVision supports multiple screens and allows you to create individual window layouts anywhere on the visual surface. The µVision Debugger provides a single environment in which you may test, verify, and optimize your application code. The debugger includes traditional features like simple and complex breakpoints, watch windows, and execution control and provides full visibility to device peripherals.

CHAPTER 4

EXPERIMENTAL RESULT ANALYSIS

An Autonomous all time medicine counter for medicine self dispensing using LPC2148 microcontroller and made up of some more devices is shown in figure the system is tested and the results of each device used in the system are obtained and discussed below.

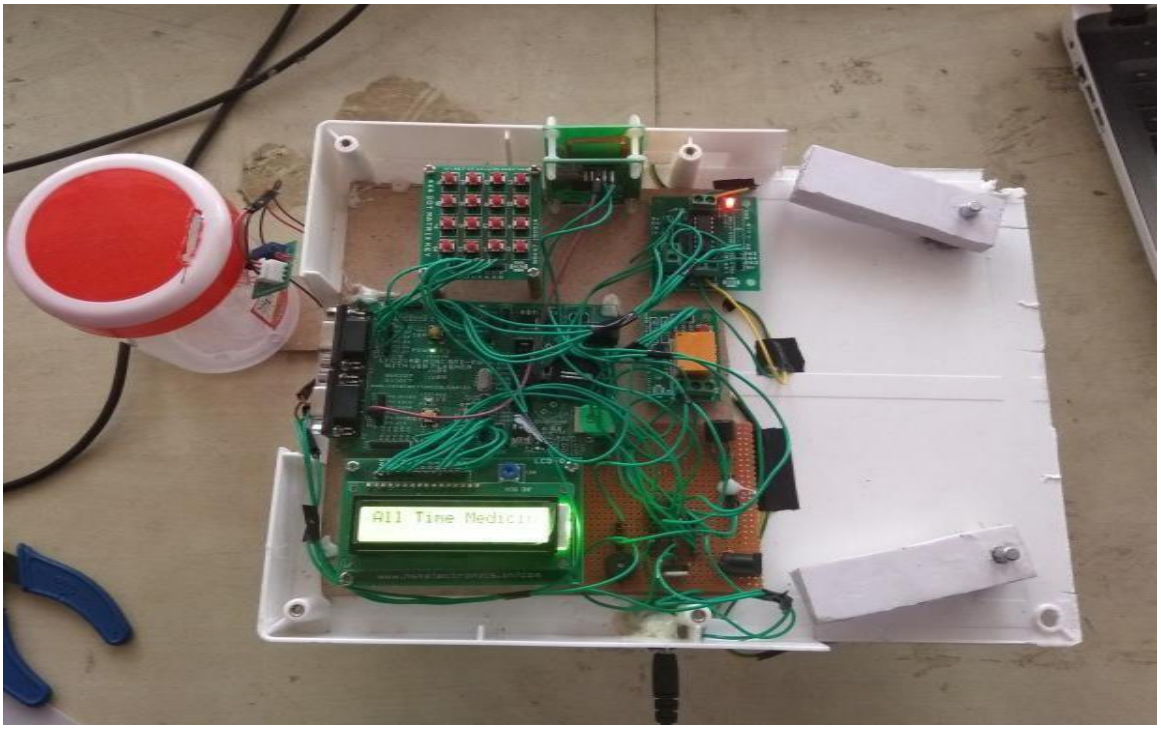

Fig 4.1: Experimental setup of the system

Step 1: The user should swipe the card which is given by hospital.

Fig 4.2: Swipe card

Step 2: RFID card reader helps us detect whether the proper card was used by the user or not. If the card is valid "valid card" message will be displayed on the LCD.

Fig 4.3: valid card

Step 3: If the card is invalid buzzer will turn on and "invalid card" message will be displayed on LCD.

Step 4: Then on LCD we will see the enter password message

Fig 4.4: Enter the password

Step 5: If the password is correct it will show medicines available are: 1. tablet, 2.Ointment message with respective amount of each medicine will be displayed

Fig 4.5: medicines available are

Fig 4.6: Shows the available medicine

Step 6: LCD will display how many tablets you want massage on selecting tablet as a medicine.

Fig 4.7: Amount of tablets

Step 7: If the password is incorrect buzzer will turn on In order to start the operation again from the beginning reset button is to be pressed.

Step 8: Two types of payment available i.e 1.Cash 2.Card.

Fig 4.8: Payment type

Step 9: The user can select the required medicine using hexa keypad i.e. by pressing either 1or 2

Fig 4.9: Cash or card

Step 10: Select the payment type using keypad. When the user select coin as their payment mode, he/she need to put the coins in the box shown in the figure.

Fig 4.10: Put the coin in the box

Step 11: For example, if he selects the medicine as tablet the amount is 15Rs he has to put coins in the manner 5Rs of 3 coins one by one into the box.

Step 12: The IR sensor will sense the coin, then payment successful message will be displayed and medicine will be dispensed.

Fig 4.11: IR detected

Fig 4.12: payment success

Step 13: If user selects card payment, he should swipe a card provided if this card is invalid then buzzer will turn on,

Step 14: If the card is valid it show enter password message

Fig 4.13: Enter password for card type payment

Step 15: On entering the correct password the payment successful message is displayed then the medicine will be dispensed through dispenser using L293D driver which controls the dc motor to rotate in 360 degree.

Fig 4.14: payment success for card type payment

CHAPTER 5

ADVANTAGES AND APPLICATION

5.1 ADVATAGES

- It is very much portable that it can be installed in very less area.
- No Individual person needed for maintenance.
- Easy to use.
- Provides 24/7 medicine facility.
- Payment mode is simple so that each and everyone can utilize it.

5.2 APPLICATIONS

- The main application area will be in healthcare field. It will helps to increase the network of good organization and in providing the medical facility at the doorstep at the required one.
- It will useful in providing medical facility to busy areas such as railway station, airport, market etc.
- Provide facility to people during their journey as it is installed in aircraft, rails and ships.
- This system can be used by the defense organization such as aircraft, military etc.
- It help rural India to get better medical facility at most lower cost.

CONCLUSION AND FUTURE SCOPE

CONCLUSION

From this idea we can infer that, the Autonomous all time medicine counter for medicine dispensing is actually attainable to the general population.. It gives accessibility of solutions constantly, likewise in provincial regions. It is exceptionally useful. It gives straightforward entry too. It is sales representative less administration which depends on brilliant card. Along these lines the all time medicine counter for medicine dispensing will defeat the issue of inaccessibility of therapeutic offices at long courses prepare, parkways country region and so on. It can likewise be actualized at transport terminals, railroad station, and oil pumps. As Result of this venture the general population would have the capacity to get to the ATM 24*7. This machine can be introduced at transport stations, railroad stations and lanes of the city. Medications can be made accessible in reasonable rates. Every individual getting to the machine would be given a novel ID utilizing which the client can be recognized.

FUTURE SCOPE

Prospective customer survey / study has been planned in order to understand Indian users for such a machine. Block diagram would be detailed out for each block and module development would be started. Legal, medical and administrative aspects would be studied for feasibility study and further changes in design. Further hurdles would be funds, timely resource availability & formation of think-tank team.

REFERENCES

[1]. “Med-e-lert Medication Pill Box Reminder Dispenser”

[2]. International Journal of Technical Research and Applications e-ISSN: 2320-8163, www.ijtra.com Volume 4,Issue 3 (May-June, 2016), PP. 73-76

[3]. Smart Medication Dispenser: Design, Architecture and Implementation- Pei-Hsuan Tsai, Tsung-Yen Chen, Chi-Ren Yu, Chi-Sheng Shih, Member, IEEE, and Jane W. S. Liu, Fellow, IEEE.

[4]. DeClaris, J.-W.; D-ATM, a working example of healthcare interoperability: From dirt path to Implications, Engineering Management, IEEE Transactions on, Volume: 46 , Issue: 3, Year: 2009 , Page(s): 4643 – 4645.

[5]. Dhanush j.Nair, Sunny nahar, “ ATM transaction : A new time based approach research paper “, International journal of science, engineering, and technology research(IJSETR),volume 4,issue,6,june 2015, ISSN:2278-7798.

[6]. JamesLim 2014, Programmable automatic pill dispenser,United Staes Patent,*1*(12).

[7]. Boquete L, Rodriguez Ascariz JM, ArtachoI, Cantos Frontela J, Peixoto N 2010 Dynamically programmable electronic pill dispenser system, *Journal of Medical Systems*.34,357–366

[8]. Lewisetal 2007,Automatic pill dispenser and method of administering medical pills, United States Patent.

[9]. Ahadani MA, DeSilva LC, PetraI, Hameed MFA, & Wong TS, Low cost robotic medicine dispenser. *Proceding Engineering*.**41**,202–209.

[10]. Balasubramanian et al 2012, Apparatus for counting and dispensing pill using multi-stage ills insulation, united States Patent.