Review Paper on LED Based Display For Cafeteria

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ABSTRACT

In this review paper our aim to present a paper on design of LED based display for cafeteria and other uses. LED based display are very useful for day to day life like to show daily schedule in college, office, to show the bus routes, to show the token no. in companies, and to show the menu of canteen. Here our proposed LED project is for cafeteria use in college. It gives flexibility to display daily updated menu. And about the prices of updated foods. This project mainly contain a Arduino and a display board to show the menu. We make this by LED because the LED are cost effective, efficient and durable. The purpose of our project to make this project for using in some practical application like in cafeteria etc. The proposed design can work on low voltage supply. We make this project that it can show message without any delay.

KEYWORDS

LED Display, Android Phone, Arduino, Low Voltage Supply.

INTRODUCTION

LED are one of the most efficient energy source. It works on very low voltage about 1.8v. So they consume very less power. And these are very cheap in cost. So LED display boards are very useful to display messages, advertisement and for other business purpose. The boards can be used indoor as well as outdoor. A LED emit light in specific direction, reducing need for diffusers and reflectors. LED emit very little heat in comparison incandescent bulbs release 90% of their energy as heat and CFLs release about 80% of their energy as heat. There are many different project using LED's.

A comprehensive literature review of material relating to LED lighting technology was a vital element of this project. This involved a research focus on the development of the commercial lighting market, including traditional technologies and the emergence of new innovations in LED technology. Our project focuses on the use this for business purposes. Our main focus to build this project is to make this cost effective with low power supply and make it long time durable.

LITERATURE REVIEW

We reviewed many research paper on LED project and we get useful information from this. LED have many advantage like very cheap in cost, efficient, durable, light weight and have excellent brightness. The LED boards are used in to show information on public transport, traffic signs, banks, in home purpose, café's, schools and for different commercial purposes etc.

COMPARISONS OF LED, LCD AND SEVEN SEGMENTS

LED V/S LCD

"Liquid Crystal Display" is the full form of LCD, And LCD and LED both are these display. These Display work on same technology, there are two layers of polarized glass, one block and other one pass the light at a specific position.

The main difference is LCD use fluorescent light and LED use Light emitting diode. In LED TV diodes are place behind the screen or in corner. In LCD TV fluorescent light are place only behind the screen. So LED are thinner than LCD's. LCD are made up of fluorescent light so this is expensive, consume more power and not more clear while LED's are cheaper, consume less power and provide more clear picture quality and Now the LED TV are prefer than LCD TV.

LED TV provide more better picture quality due to two reasons. First, LED can be dimmed. The capability of dimming on the back lighting, it allows picture to display black by blocking the lights rom passing panel. And second is LED TV work with clear RGB (red, green, blue) colored lights for real and sharper colors. This is not present in LCD TV. So the LED TV are provide truer white than fluorescent light used in LCD TV's.

The display area of LED are small and LCD are large. The material used in LED are Gallium Arsenide Phosphide and LCD used liquid crystal and glass electrodes. The switching time of LCD are slower than LED. The direct current will effect LCD's while it doesn't harm LED's. The contrast ratio

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of LED's is lower than LCD's. The resolution of LED are higher than LCD's.



Figure 1.1 Graph of current and voltage. (Source-LEDnique.com)



Figure 1.2 Seven segment display (Source-Amazon.in)



SEVEN SEGMENT

The seven segment display consist 7 (seven) LED's so its name is seven segment display. These are arranged in rectangular shape which can show numbers. This is called segment because of it make a numerical digit both decimal and hex to displayed. We can use two seven segment connect with each other to show no. greater than or equal to 10. Sometimes there can be 8th LED to display decimal point. The LED's are arranged like to make different combination of numbers. The 7 segment display glows when these LED's are forward biased. And there intensity depends on the forward bias current. And this forward current provided by driver circuit or driver IC. The negative terminal of all LED are connected together for common anode.

We configure this display like to show decimal no. 6 the code is 111101(gfedcba). These display can be used in many electronic appliances like digital clocks, electric stove, meters etc.

Hardware design-

1.LED Display

We take 32*16 LED display panel. This display having high brightness. These display can be used either indoor or outdoor. This display have 512 red LED's. These LED's are mounted on high quality plastic.



Figure 1.3 Seven segment display (Source-

rarecomponent.com)

2.Arduino

It is a hardware development board. This has an important role in embedded engineering. The board have a microcontroller AtMega328. Arduino have different variations and here we use Arduino UNO(R3). There is a power connector to give external power supply.

We program the Arduino as per our desire. The main feature of Arduino is we can reprogram this. For programming there is an open software.

Figure 1.4 Arduino Uno board (Source-

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arduino.cc)

Features Microcontroller: ATmega328

- 1. Input Voltage : 7-12V.
- 2.Operating Voltage: 5V.
- 3. DC Current in 3.3V Pin: 50 mA.
- 4. Analog Pins: 6
- 5. Digital Pins: 14
- 6.DC Current I/O Pin: 40 mA.

3. Power Supply

Power supply required 5 v and 12 amp current. This supply provided by step down transformer. These led display board requires very less power.

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Figure 1.5 Stepdown transformer (Source-

IndiaMart.com)

Circuit Diagram



Figure 1.6 Circuit display (Source-

circuitdigest.com)

Applications-

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2. Financial and Tickers

- 3.Scoreboards
- 4. Military signs
- 5.Health and Safety
- 6.Retail
- 7. Reception and Welcoming
- 8.Office and Call Centres
- 9. In café's to show menu and their prices.

Features

- 1. The LED boards are useful in every field to show information.
- 2. LED's are cheap in cost and these are very efficient, durable etc.
- 3. This work at high speed and show message without delay.
- 4. We can update menu when we want.
- 5. This work on very low voltage supply.

Cost analysis of LED and LCD display.

We have displayed some of the figures that represents some important differences.

S.NO	LED	LCD
1.	The back light of led display saves power.	The back light of LCD display uses more power.
2.	LED is costly.	LCD is less costly than led.
3.	LED display board consume less power.	LCD display board consume more power.
4.	Cost of our cafeteria display board will go less than or equal to2000.	Cost of our cafeteria display board will go more than2000.
5.	Less power of cafeteria is consumed.	More power of cafeteria is consumed due to LCD display.
6.	LED display won't affect the eyes. As it prevents the damage to the retina of eyes, which is costlier than anything.	LCD display would affect the eyes. As it damages to the retina of eyes, which is costlier than anything. So, it's costly.
7.	LED is best for use.	LCD are less used than LED.
8.	This display saves electricity.	It uses more electricity.

Table 1. Comparison of LED and LCD.

Items	LCD	OLED	LCD w/ Mini LED BLU	RGB Micro LED
	10.1" 1366x768 IPS on a-Si	10.1" 1280x800 RGB on LTPS	10.1" 1540x720 IPS on a-Si (6,720 chips)	10.1" 1366x768 with 50 micrometer chip
Manufacturing cost	\$22.8	\$36.8	\$212	>\$400 (RGB LED chips only)
Gap to LCD	19	×1.6 (\$14)	×10 (\$189)	× >10 (>\$380)

	© 2018 IHS
Source: IHS Markit	Markit

Figure 1.7 Comparision

(Source-IHS Markit)

CONCLUSION

It has been observed that LED are more efficient and cheaper than LCD and 7 segment display. So we uses LED board for display and this project can be used in different fields. This use very low power supply. The display can be reprogramed so it is useful.

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