

# Automatic Mobile Controlled Scrolling Display System Using ATmega128P for Effective Visual Communication

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## ABSTRACT

This article presents the development and deployment of an automatic mobile controlled scrolling display system using the ATmega128 micro-controller. The scrolling display serves as an efficient method for presenting information dynamically and with visual appeal for better communication. The ATmega128 micro-controller, known for its versatility and reliable performance, functions as the central processing unit for controlling the display. The scrolling display consists of a linear array of light-emitting diodes (LED) capable of displaying alphanumeric characters, symbols, and graphics with the help of HC-05 blue-tooth module. The ATmega128 micro-controller interfaces with the LED array, managing the generation of scrolling patterns and content. This gadget work with the help of Bluetooth module connected to the microcontroller for transmission of the data to the RGB led strip. The result of the gadget shows numerous patterns and the words.

**Keywords:** - HC-05, ATmega128, scrolling display

## 1. INTRODUCTION

Businesses may reach their target audience or educate the public by using a variety of advertising. The meaning of commercial is the method for correspondence wherein an item, brand or administration is elevated to a viewership to draw in interest, commitment, and deals. Promotions (frequently abbreviated to advertisements or adverts) come in many structures, from duplicate to intuitive video, and have developed to turn into a urgent component of the application commercial center. Text based visual ad alludes to promoting that integrates both message and visual components to pass on a message. This sort of commercial consolidates the force of words with pictures, recordings, or movements to make a convincing and drawing in specialized device. Literary visual advertisements mean to catch the crowd's eye, convey data successfully, and inspire feelings or activities. By mixing text and visuals, sponsors can make a more noteworthy and effective publicizing effort that resounds with the main interest group.[1]With the help of technology it can be easier to present the advertisement to people to get their product more popular among all the others product. There are severals ways of publishing the advertisements, but the most popular one was the publishing advertisement through scrolling display. According to,Orbit media's survey majority of audience choose to seek advertisement as compare to listen the advertisement.[2]

By seeking these report we choose to implement the modern innovative project of scrolling display. Where, many of the local vendors used it instead of a recorded speaker to minimize the noise pollution and also improve their sales by using the visual way of marketing.

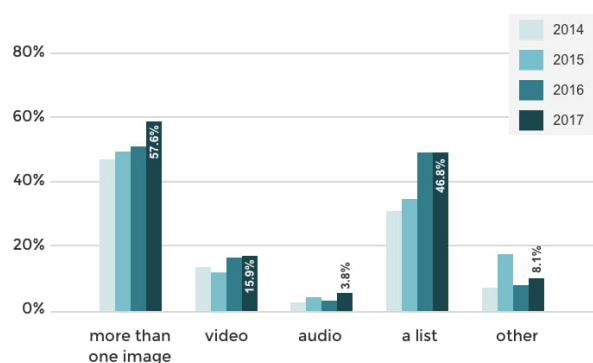


Figure 1: Orbit's Media Survey<sup>[2]</sup>

## 2. LITERATURE REVIEW

The significance of business is the technique for correspondence wherein a thing, brand or organization is raised to a viewership to attract interest, responsibility, and arrangements. Advancements (much of the time condensed to ads or adverts) come in many designs, from copy to natural video, and have formed to transform into an earnest part of the application business center. Text based visual promotion implies advancing that coordinates both message and visual parts to pass on a message. This kind of business merges the power of words with pictures, accounts, or developments to make a persuading and attracting specific gadget. Abstract visual commercials mean to get the group's attention, convey information effectively, and rouse sentiments or exercises. By blending message and visuals, backers can put forth a more imperative and successful publicizing attempt that reverberates with the principal premium group. According to,report study larger part of crowd decide to look for promotion as contrast with listen the advertisement.[2] By looking for these report we decide

to execute the cutting edge inventive undertaking of looking over display. Where, many of the nearby merchants utilized it rather than a recorded speaker to limit the clamor contamination and furthermore work on their deals by utilizing the visual method of marketing. The looking over show comprises of different electronic parts like ATmega128P as it functions as a miniature regulator for getting and sending the information with the assistance of blue-tooth module(HC-05).The different parts are Driven strip WS2812(RGB),5V power supply for working the entire circuit and the cell phone gadget to bring the correspondence.

### 3. FUNCTIONAL BLOCK DIAGRAM

The scrolling display consists of various electronic components like ATmega128P as it works as a micro-controller for receiving and transmitting the data with the help of blue-tooth module(HC-05).The other components are LED strip WS2812(RGB),5V power supply for operating the whole circuit and the smartphone device to start the communication. An ATmega IC is included into the plan as a micro-controller. The HC-05 Blue-tooth Module serves as a framework for transmitting and receiving data to the microcontroller. With the aid of a micro-controller, the RGB information-driven Drive strip (WS2812) operates. An additional 5V DC connection powers the complete circuit. The application that uses the open source platform BYLNK to govern the whole framework. With the use of directional buttons, this program provides remote action. This review highlights how similar it should be to other similar apps on the Google Play Store in terms of flexibility, but it is limited to Android devices.

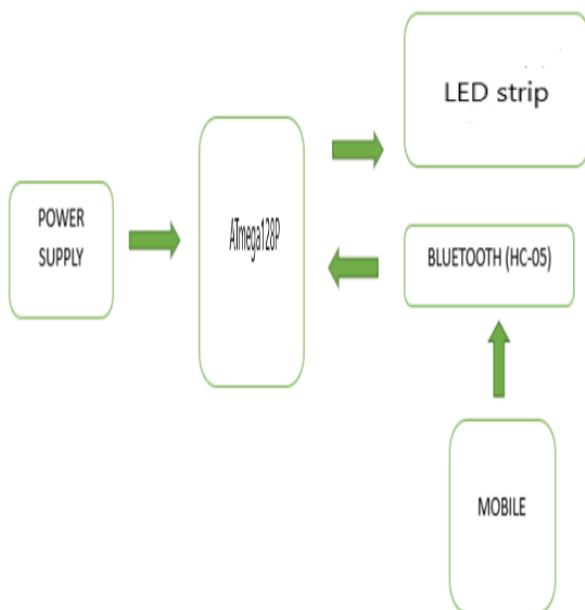


Figure 2: Block Diagram of Scrolling Display

### ATmega128P:

Talking about its architecture, it is built on the AVR (Advanced Virtual RISC) architecture, the Atmega128 employs a modified Harvard architecture with a diverse instruction set and it operates at a maximum frequency of 16 MHz, it boasts 128KB of flash memory for program storage, 4KB of EEPROM for data retention, 4KB of SRAM for temporary data storage and 23 general purpose I/O lines.[3] 32 general purpose working registers, internal and external interrupts, serial programmable USART, a byte-oriented Two-Wire serial interface, SPI serial port, a 6-channel 10-bit A/D converter (that are accessible in TQFP and QFN/MLF packages), programmable watchdog timer with internal oscillator, and five software-selectable power-saving modes.[3] It operates at the range of 4.5v to 5.5v. The device balances power consumption and processing performance by achieving throughputs approaching one MIPS per MHz by executing instructions in a single clock cycle.

### HC-05:

It is utilized for some applications like remote headset, game regulators, remote mouse, remote console, and a lot more shopper applications. It utilizes sequential correspondence to speak with gadgets. It speaks with micro-controller utilizing sequential port (USART).[4] The established IEEE 802.15.1 protocol is what allows one to create a wireless Personal Area Network (PAN). It transmits data over the air using frequency-hopping spread spectrum (FHSS) radio technology. For device communication, it employs serial communication. It uses the serial port (USART) to connect with the microcontroller.[4] A Bluetooth module called HC-05 is intended for wireless communication. It is possible to use this module as a slave or master configuration. All serial-enabled devices can use Bluetooth serial modules to interact with one another. There are six pins total,

- (1)Key/EN
- (2)VCC
- (3)GND
- (4)TXD
- (5)RXD
- (6)State

### LED STRIP WS2812:

The information is moved starting with one pixel then onto the next, so you rapidly the strand or join more eventually. Each thing is carefully controlled, with an inward 8-cycle PWM Driven driver (24-digit tone for 16 million unique tones). The pixels are timed by a micro-controller, we coupled an example code underneath which works at an ATmega128 ought to be not difficult to adjust to various miniature regulator. The gadget works at 5 volts.[5]

**POWER SUPPLY(ADAPTOR):**

This power supply has a standard 5.5mm DC plug and runs at 5V/1A. With a 5.5mm DC plug adapter and an orange 5V 1A power supply, the cable is 1.1 meters long and has a 2 pin EU plug type adaptor. The Raspberry Pi, Arduino board, and other electrical devices have different power requirements, and these adapters are made to accommodate those needs. Applications including toy cars, CCTV cameras, routers, modems, cordless phones, set-top boxes, wireless devices, and point-of-sale machines may all be used with this adapter because it can take up to 1A of electricity.

**4. METHODOLOG AND IMPLEMENTATION**

In this undertaking, the emphasis is on making an effective looking over show which mostly incorporates ATmega128, Bluetooth module(HC-05),LEDstrip (WS2812),5V power supply and cell phone. The plan integrates an ATmega IC as a micro-controller. Blue-tooth module(HC-05) function as a scaffold to send and get the information to the micro-controller. The Drove strip (WS2812) is RGB information Driven which is worked with the assistance of micro-controller. An extra 5V DC connector drives the entire circuit. The whole framework is controlled by means of application made by utilizing open source stage BYLNK. This application offers distant activity through directional buttons. This looking over show similarity should be possible with other comparable applications on the Google Play Store takes into consideration adaptability, yet restricted to Android gadgets as it were.

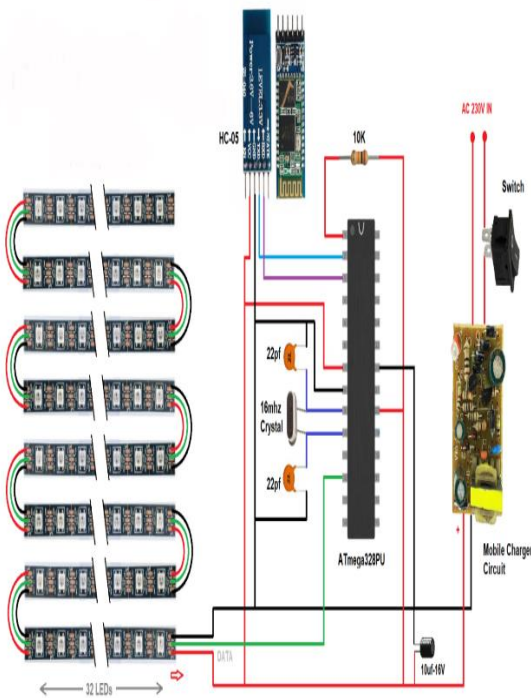


Figure 3: Schematic Diagram of Scrolling Display

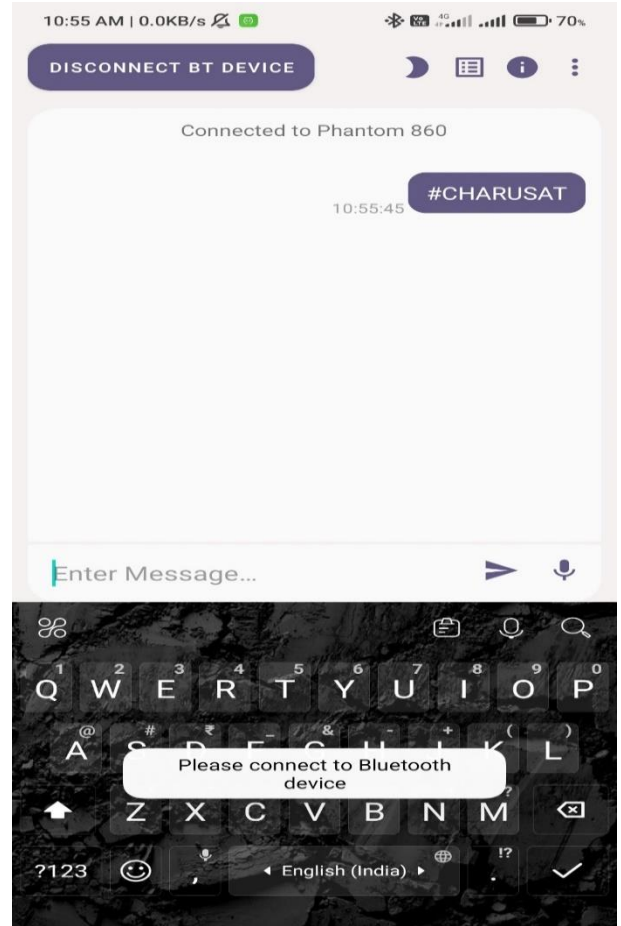


Figure 4: Homepage of Mobile Application

The mobile application has been created with the help of BLYNK software having only terminal feature in it for transferring of the data to the Bluetooth module (HC-05). The software has to be connected to the Bluetooth module (HC-05) before transmission of the data. This application is only for the android version not for the IOS.

**5. RESULTS**

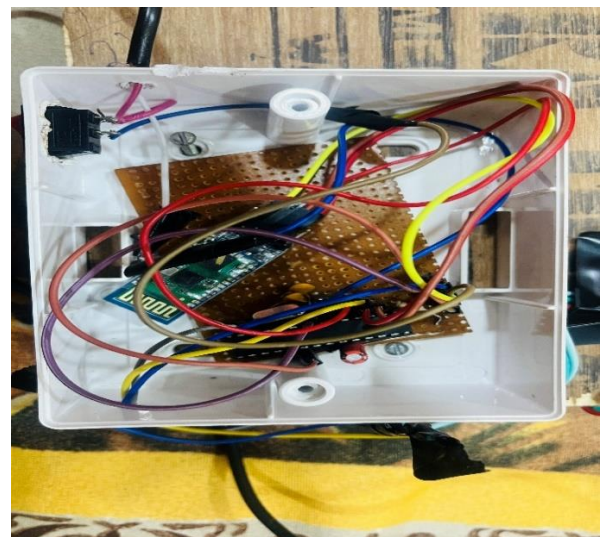


Figure 5: Physical Design of Control Unit



Figure 6: Physical Design of Display System



Figure 7: Result 1



Figure 8: Result 2

## 6. CONCLUSION

In summary, scrolling displays provide a flexible way to effectively communicate information in a range of contexts. They are useful tools for entertainment, information sharing, and advertising because of their capacity to hold viewers' attention and convey ideas in an engaging way. Although they have many advantages, in order to get the most out of them, you need take into account things like readability and technical compatibility. All things considered, scrolling displays provide a compelling chance to captivate viewers and deliver messages that have an impact.

## 7. FUTURE ENHANCEMENT

For, the future enhancement following features can be implemented:

1. Extended Range using NodeMCU
2. Multiple language
3. Wider in size of screen
4. More Privacy

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