Smart Bus Transportation System

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Abstract - Now-a-days public transport is an emerging and important parameter as far as development of the whole nation is concerned. Most of the people use public transport in their day to day life to go to their work or travelling. Mostly people find it cheaper and time-consuming way to travel. When it comes to the public transport public is more concerned about availability of the transport & safety while travelling. The system, which we are about to design can be a solution to the problems discussed above. In this project a smart information system is presented for the bus passengers that have the ability to interconnect passengers with real-world public bus. The Smart information system based on distributed IOT System consists of alcohol sensor, IR Sensors, GPS Module, FPGA, ADC module and IOT Module to count the number of passengers and to provide information about current and next location of the bus. Since the users are provided with real time information about the vacant seats, the passengers will able to take better decisions in terms of which bus they would take.

Key Words: FPGA Controller,LCD Display,IR Sensor,GPS Module,GSM Module..

1. INTRODUCTION

Brilliant help for open transport framework is an extraordinary development of a cutting edge innovation. Transports are given by the Government as an open administration, nature of which will legitimately decide the accommodation of open travel. It is a significant rule for nature of administration measures that transport achieves the station on schedule and reports which station it is found precisely. As there are devoted staff individuals toward the begin and toward the end the promptness can be ensured. So for center stations, reliability can't be ensured and locate the definite area of the transport. It may be a smart thought utilizing the GPS framework for observing the transport. Utilizing GSM sending message to PMT office, likewise check individual include in transport.

In everyday life we for the most part face issue of open transport framework. It resembles someone is hanging tight for some transport for 60 minutes, however when transport lands at his/her stop, it could be completely stacked and he/she won't get an opportunity to go into it. Here and there driver would not try to stop the transport. With the goal that hour is squandered that he/she paused. We are building up a framework which will have android application. It will check for seat tally by utilizing snag sensors at passage entryway and leave entryway.

Equipment module will persistent track its area by utilizing GPS innovation and impediment sensors will give us include of travelers in transport. From, and at the press of the come back to home button, it will automatically return to this spot.

2. LITERATURE SURVEY

1st Smart ITS sensor for the transportation planning using the IoT and Bigdata approaches to produce ITS cloud services:

As of now, there exist a ton of difficulties in the transportation scope that specialist are attempting to determine and one of them can be centered around transportation arranging. The fundamental commitment of this paper was the structure and usage of an ITS brilliant sensor model that fuses and consolidate the Internet of Things (IoT) and Bigdata approaches so as to deliver ITS cloud administrations for helping transportation getting ready for Bus Rapid Transit (BRT) frameworks.

2nd Smart ITS Sensor for the Transportation Planning Based on IoT Approaches Using Serverless and Microservices Architecture:

Right now, there are numerous difficulties. in the transportation scope that scientists are endeavoring to determine, and one of them is transportation arranging. The primary commitment of

this paper is the structure and usage of an ITS (Intelligent Transportation Systems) shrewd sensor model that consolidates and joins the Internet of Things (IoT) approaches utilizing the Serverless and Microservice Architecture, to help the transportation getting ready for Bus Rapid Transit (BRT) frameworks.

3rd Implementation of 2-axis Circular Interpolation for a FPGA-based 4-axis Motion Controller:

To satisfy the motion control of numerical control machine and robot, this paper introduces an approach to implement 4-axis motion controller based on field programmable gate array (FPGA). Starting with introduction to existing excellent 4-axis motion controller MCX314, this paper describes the fundamental structure of the FPGA-based 4-axis motion controller. As the one of main function modules in controller, the implementation of 2-axis circular interpolation module in FPGA is the main content to be discussed in the paper.

4th The research of the PID controller based on FPGA:

This paper is to realize the PID controller, which is in a special embedded system's skeleton using FPGA. PID controllers as the industry's most commonly used controllers, occupy nearly 90% controllers used in the control loop in industry. If PID controllers are intelligent, the use of PID controllers will be much easier. So use FPGA to complete the design of intelligent controller.

5th FPGA Implementation of a Novel Oversampling DeadBeat Controller for PMSM Drives:

This paper presents a novel Oversampling DeadBeat (OS-DB) current control approach for Permanent Magnet Synchronous Motors (PMSMs) drives capable of operating at a controller sampling frequency multiple of the power converter switching frequency. Model based controllers suffer form heavy computational demand and performance degradation due to parameters uncertainties.

3. BLOCK DIGRAM
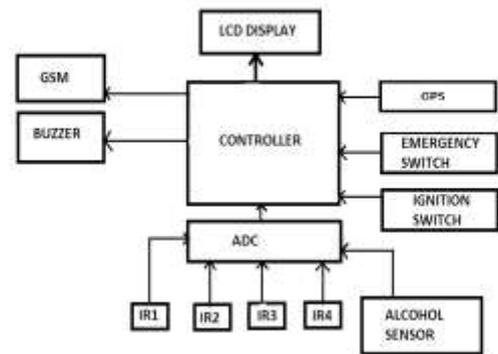
Fig 3.1 Block Diagram

3.1 FPGA controller

The Spartan-3E family design consists of 5 basic programmable practical elements:

- Configurable Logic Blocks (CLBs) contain versatile Look-Up Tables (LUTs) that implement logic and storage parts used as flip-flops or latches. CLBs perform a large form of logical functions similarly as store knowledge.

- Input/Output Blocks (IOBs) management the flow of knowledge between the I/O pins and therefore the internal logic of the device. Every IOB supports bifacial knowledge flow and 3-state operation. Supports a spread of signal standards, as well as four superior differential standards. Double Data-Rate (DDR) registers square measure enclosed.

- Block RAM provides knowledge storage within Multiplier Blocks settle for 2 18-bit binary numbers as inputs and calculate the merchandise.

- Digital Clock Manager (DCM) Blocks provide self-calibrating, fully digital solutions for distributing, delaying, multiplying, dividing, and phase-shifting clock signals.

3.2 LCD Display

A general purpose alphanumeric digital display, with 2 lines of sixteen characters. Digital display used here is that the 16×2 line digital display. liquid show that is usually referred to as liquid crystal show LCD digital display alphanumeric display is AN display it

implies that it will display Alphabets, Numbers still as special symbols therefore liquid crystal show LCD digital display alphanumeric display could be a user friendly show device which may be used for displaying numerous messages not like seven phase display which may display solely numbers and a few of the alphabets. The sole disadvantage of liquid crystal show LCD digital display alphanumeric display over seven phase is that seven phase is strong display and be envisioned from a extended distance as compared to digital display. Here we've got used sixteen x two alphanumeric display which suggests on this display. We are able to show 2 lines with most of sixteen characters in one line.

3.3 IR Sensor

An infrared detector is Associate in Nursing device, that emits so as to sense some aspects of the environment. Associate in Nursing IR detector will live the warmth of Associate in Nursing object further as detects the motion. These styles of sensors measures solely actinic radiation, instead of emitting it that's known as as a passive IR detector. Sometimes within the spectrum, all the objects radiate some variety of thermal radiations. These styles of radiations area unit invisible to our eyes, that may be detected by Associate in nursing infrared detector. The electrode is solely associate in Nursing IR crystal rectifier (Light Emitting Diode) and also the detector is solely Associate in Nursing IR photodiode that is sensitive to IR light-weight of an equivalent wavelength as that emitted by the IR crystal rectifier. Once IR light-weight falls on the photodiode, The resistances and these output voltages, amendment in proportion to the magnitude of the IR light-weight received. An infrared detector circuit is one amongst the essential Associate in Nursingd in style detector module in an device.

3.4 GPS Module

The Global Positioning System (GPS), originally Navstar GPS, could be a satellite-based radio navigation system owned by the us government and operated by the us Air Force. it's a worldwide navigation satellite system that gives geolocational time data to a GPS receiver anyplace on or close to the planet wherever there's AN unclogged line of sight to four or additional GPS satellites. Obstacles like mountains and buildings block the comparatively weak GPS signals.

The GPS doesn't need the user to transmit any information, and it operates severally of any telecommunication or net reception, through these technologies will enhance the quality of the GPS positioning data. The GPS provides crucial positioning capabilities to military, civil, and industrial users round the world. Our government created the system, maintains it, and makes it freely accessible to anyone with a GPS receiver.

3.5 GSM Module

GSM (Global System for Mobile communications) could be a commonplace developed by the EU Telecommunications Standards Institute (ETSI) to explain the protocols for second-generation digital cellular networks employed by mobile devices like tablets. It absolutely was 1st deployed in Suomi in Dec 1991. As of 2014, it's become the worldwide commonplace for mobile communications – with over ninetieth market share, operative in over 193 countries and territories. GSM could be a second-generation (2G) commonplace using time-division multiple-Access (TDMA) spectrum-sharing, issued by the EU Telecommunications Standards Institute (ETSI). The GSM commonplace doesn't embody the 3G Universal Mobile Telecommunications System (UMTS) code division multiple access (CDMA) technology nor the 4G LTE orthogonal frequency-division multiple access (OFDMA) technology standards issued by the 3GPP.

GSM, for the primary time, set a commonplace typical standard for Europe for wireless networks. It absolutely was additionally adopted by several countries outside Europe. This allowed subscribers to use different GSM networks that have roaming agreements with one another. The common commonplace reduced analysis and development prices, since hardware and package may be oversubscribed with solely minor variations for the native market.

4. RESULT

The below figures shows the prototype of bus Transportation system. In this project we interface various modules and sensors with FPGA controller. For example as shown in below figure Count of people who are entering in the bus with the help of IR sensor. This will help to easily count the number of people so that the problem of overloaded will be reduced. Also indicates the direction of bus by using the GPS module. This will help the unknown person to recognize the place.
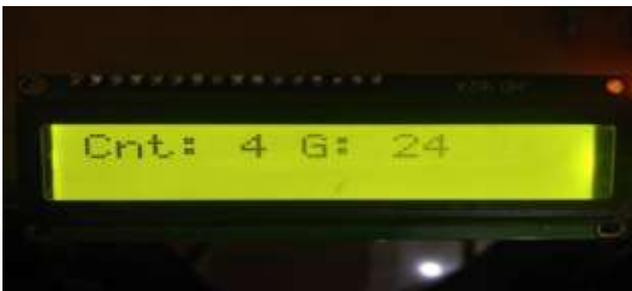
Fig 4.1 result

5. CONCLUSIONS

We will implement Smart Transport System using spartan3E controller. As the name indicates it will work smartly, it has many advantages like tracing of location count of people also we have used alcohol sensor so there is low chances accidents. In this way in future we can implement as many applications in this system.In day to day life we generally face problem of public transport system. It's like somebody is waiting for some bus for an hour, but when bus arrives at his/her stop, it could be fully loaded and he/she will not even get a chance to enter into it. Sometimes driver would not bother to stop the bus. So that hour is wasted that he/she waited.

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