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DESIGN OF POLYMATHIC ARMOUR BASED ON IOT TECHNOLOGY

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ABSTARCT: In this project the development of polymathic armour based on IOT technology is implemented. The entire system is controlled by ARM. Rain Sensor is will detect the rain and turn ON the stepper motor. If the temperature of engine is varied then stepper motor will be off and displayed on LCD. If there is variation in heart pulses, then the heart beat sensor will detect and display on LCD and gives a beep sound. Whenever accident is occurred then accident detection sensor will detect and sends the SMS and Location to the corresponding member. Hence this project gives effective result.

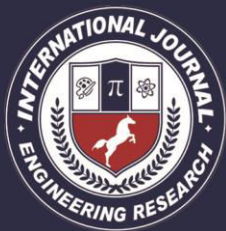
KEY WORD: ARM, Rain sensor, Accident Detection Sensor

I. INTRODUCTION

Most developing countries are in urgent need of highway construction programmers. The primary objective of road infrastructure development project is to generate benefits to the users, such as, convenience, cost savings, reduced travel time, and thereby accelerating economic development in the influence area of the road project. No infrastructure project should be undertaken unless the economic benefits criteria and economic viability is fully established prior to the decision on investment in road projects [1]. Traditionally, highways in India have been viewed as a public convenience that must be financed and operated by the public sector. But the Govt. faced funding constraints in later stage development because of chronic budgetary problems.

The sector witnessed the emergence of Public Private Partnership model in highway development in early 1990s and subsequently, the National Highway Authority of India (NHAI) was set up in the year 1995 for overseeing the functioning of the private entities in the highway development thereafter. Since then a number of projects have been implemented on PPP model, particularly through Build, Operate and Transfer (BOT) contract. Consequently, it has become increasingly accepted that highways should be built, financed, and operated by private firms and that road user should pay toll for using them.

Moreover, users are more likely to accept the concept of paying for roads owned by private sector that builds highways faster



and more efficiently than state-owned firms. However, the National Highway Authority of India (NHAI) continues to carry out regulatory functions including monitoring the projects, setting up quality norms, etc. During the specified period prescribed in PPP contract, the private firm operates and maintains the infrastructure created, thereby assuring road users of adequate quality services, safety, and security standards on the toll way stretches. Thus, the system of toll road has been operating for quite some time in India and has benefitted all passengers travelling on toll roads [8]. While the toll collection and recovering the project development costs are the key objectives of private entities, the issues arising out of providing quality services to the toll road commuters is the matter of highest concern and need to be addressed adequately. It is mandated to ensure that the highway users are provided with quality services for the toll they pay.

It ensures that the road contractor and developers maintain the standards that they are supposed to, according to the concession agreement between the contractors and NHAI, as after all the commuter is levied toll for not just the highway usage but certain services as well. But, it is often observed that once the road is ready for operation, toll collection starts and service performance parameters are forgotten. The concessionaire continues to collect toll from the ever-increasing traffic and neglects quality services to the commuters and deviates from the service deliveries as promised in the concession agreement.

Road User Services are the advantages or service benefits accruing to the vehicle drivers or owners or occupants through features like road safety, comfort, convenience, etc. For example, a group of services the toll road operators are expected to provide to the travelling public include patrolling services, ambulance facilities at the time of accidents, communication facilities, parking lots, rest rooms along road side, motels etc. [9].

II. LITERATURE REVEIW

Tolls have been placed on roads at various times in history, often to generate funds for repayment of toll revenue bonds used to finance constructions and/or operation [4]. In recent years there has been a growing realization in the govt. that road development cannot be brought about only through budgetary support or even through private investment support.

The consensus is that a combination of different sources of funding would be the best way forward for the road development. Involving private sector in exchange for the right to charge user tolls was seen as a way to shifting the financial burden to users and maintaining roads more efficiently. However question arise as to what kind of roads in terms of traffic density are suitable for tolling, levy of user charges and commercially viable model of finance and to what extent the toll roads are successful and toll fee support the finance required for the road development in India [5].

After World War II, high performance expressways were built in most developed countries in Europe, U.S.A, Canada and

Japan. For funding these expressways, some countries adopted tax financing while others relied on toll financing. Even both these systems have been used in some countries as in the U.S. In France, Spain, and Italy only intercity expressways were tolled. However, in recent times, it has been observed that many developed countries which once depended on tax financing have also turned to toll system due to erosion of the purchasing power of government taxes because of inflation.

Many developing countries such as Mexico, Malaysia, Indonesia and Thailand, however, have recently started to build high performance expressways relying mostly on toll financing and private concessions (Kapila et. al. 1996). Highway infrastructure traditionally has been funded through general government budgets and dedicated taxes and fees rather than tolls. In most industrial countries 90 percent or more of highway kilometers are publicly funded; in developing countries governments often bear the entire cost.

However, the limited resources available through traditional government funding sources has led to increasing interest in private toll roads as an alternative way of meeting highway needs. Several additional factors have contributed to the renewed interest in private tolling, including a worldwide trend toward commercialization and privatization of state-owned enterprises; the success of public toll roads in raising capital; and advances in tolling technology, making tolling more efficient and convenient (Fisher, Babbar, 1996)

III. PROPOSED SYSTEM

The above figure (1) shows the block diagram of proposed system. The entire system is controlled by the ARM. Solar panel is used to charge the battery. Power bank is used to store the energy. Rain sensor and heart beat sensor and accident detection sensor will play important role in entire system. RS-232, GSM and GPS are used for communication purpose. Buzzer is used for indication of sign. At last compared to other systems, it gives effective results.

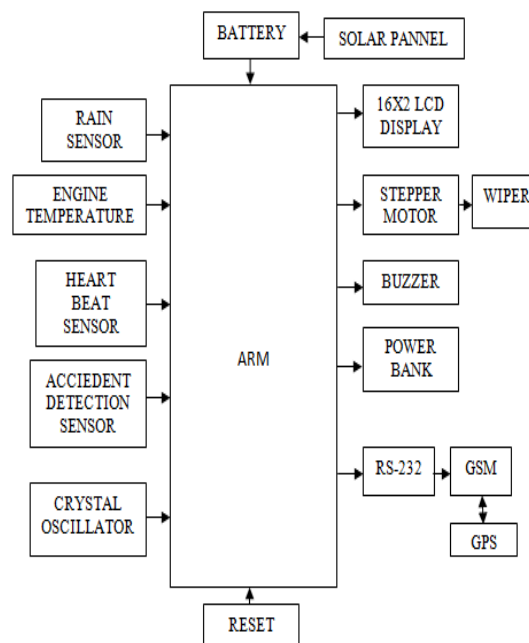


Fig. 1: PROPOSED SYSTEM

A. ARM

The LPC2148 microcontrollers are focused around a 16-bit or 32-bit ARM7TDMI-S CPU with constant imitating and implanted follow help, which consolidate microcontroller with inserted high velocity streak memory extending from 32 kb to 512 kb. A 128-bit wide memory interface and one of a kind quickening agent building

design empower 32-bit code execution at the most extreme clock rate. For discriminating code size applications, the option 16-bit Thumb mode decreases code by more than 30 percent with negligible execution punishment.

Because of their little size and low power utilization, LPC2148 are perfect for applications where scaling down is a key prerequisite, for example, access control and purpose of-offer. Serial interchanges interfaces running from a USB 2.0 Full-speed gadget, various UARTS, SPI, SSP to I2c-transport and on chip SRAM of 8 kilo Bytes up to 40 Kilo Bytes, make these gadgets extremely appropriate for correspondence entryways and convention converters, delicate modems, voice distinguishment and low end imaging, giving both extensive cradle size and high transforming force. Different 32-bit clocks, single or double 10-bit ADC(s), 10-bit DAC, PWM channels and 45 quick GPIO lines with up to nine edge or level touchy outside intrude on pins make these microcontrollers suitable for mechanical control and restorative frameworks.

B. RAIN SENSOR

A rain sensor or rain switch is a switching device activated by rainfall. There are two main applications for rain sensors. The first is a water conservation device connected to an automatic irrigation system that causes the system to shut down in the event of rainfall. An additional application in professional satellite communications antennas is to trigger a rain blower on the aperture of the antenna feed, to remove

water droplets from the cover that keeps pressurized and dry air inside the wave-guides.

C. HEART BEAT SENSOR

The basic heartbeat sensor consists of a light emitting diode and a detector like a light detecting resistor or a photodiode. The heart beat pulses causes a variation in the flow of blood to different regions of the body. When a tissue is illuminated with the light source, i.e. light emitted by the led, it either reflects (a finger tissue) or transmits the light (earlobe). Some of the light is absorbed by the blood and the transmitted or the reflected light is received by the light detector. The amount of light absorbed depends on the blood volume in that tissue. The detector output is in form of electrical signal and is proportional to the heart beat rate

D. GSM

Global System for Mobile Communications (GSM) modems are specialized types of modems that operate over subscription based wireless networks, similar to a mobile phone. A GSM modem accepts a Subscriber Identity Module (SIM) card, and basically acts like a mobile phone for a computer. Such a modem can even be a dedicated mobile phone that the computer uses for GSM network capabilities.

E. GPS

The Global Positioning System (GPS) is a U.S. space-based global navigation satellite system. It provides reliable positioning, navigation, and timing services to worldwide users on a continuous basis in all

weather, day and night, anywhere on or near the Earth.

F. STEPPER MOTOR

A Stepper motor is an electric motor that runs on direct current (DC) electricity. In any electric motor, operation is based on simple electromagnetism. A current-carrying conductor generates a magnetic field; when this is then placed in an external magnetic field, it will experience a force proportional to the current in the conductor, and to the strength of the external magnetic field.

G. BUZZER

A buzzer or beeper is an audio signaling device, which may be mechanical, electromechanical, or piezoelectric. Typical uses of buzzers and beepers include alarm devices, timers. Early devices were based on an electromechanical system identical to an electric bell without the metal gong.

IV. RESULTS

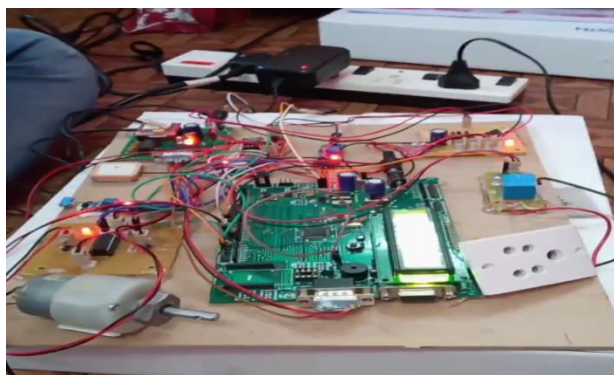


Fig. 2: EXPERIMENTAL VIEW OF PROPOSED SYSTEM

V. CONCLUSION

Hence in this project the design and development of polymathic armour based on IOT technology is presented. The entire system is controlled by the ARM. Stepper motor plays important role in entire system. RS-232, GSM and GPS are used for the

communication purpose. Buzzer will give indication according to the condition. Hence this project gives effective results.

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