

## Bridge Monitoring System Using IOT

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### Abstract

*In countries like India there is powerful focus on national infrastructure. New bridges are built each year and the maintenance of those bridges is frequently ignored. The present structures uses very complex and excessive fee wired network and it additionally required high upkeep for optical fiber machine. So the primary objective of this task is to build a cheap bridge tracking machine for developing international locations like India. This project aim to simplify the system for selecting bridge tracking devices. Many bridges within the India are obsolete or structurally deficient to safely increase the life of those bridges, inspection would be vital. Bridge engineers have many duties and it's far not possible to expect one to know. Our device will sense the crack inside the bridge and signal might be given to govern room immediately to stop cars.*

**Keywords:** *Bridge tracking gadget (BMS), harm Detection, Bridge maintainance*

### INTRODUCTION

Bridges area unit incessantly subject of harmful effects of fabric aging, widespread corrosion of reinforcing bars in concrete structures, corrosion of steel structures and parts, increasing traffic volume and overloading, or just overall deterioration and aging. These factors, combined with defects of design and construction and accidental harm, prompt the deterioration of bridges and end in the loss of load carrying capability of bridges. The condition of heavily used urban bridges is even worse. A significant range of those structures would like strengthening, rehabilitation, or replacement, however public funds area unit not usually obtainable for the desired replacement of existing structures or construction of latest ones. Bridges will suffer structural deterioration (worsening) be

cause of aging of bridge, misuse or lack of correct maintenance. Amongst there are numerous factors that have caused the unsatisfactory circumstance of bridge, one difficulty that has been overlooked is that the unsatisfactory examination and observance of present systems. Bridge monitoring is crucial as it saves more human life. Bridge monitoring system (BMS) provides previous indication to us where we can easily save too many lives and we can avoid the loss. The complicated wiring also makes the installation and repair/replacement process difficult and expensive. In this paper, a new idea of bridge monitoring system is suggested.

### LITERATURE SURVEY

Some failures are sudden and catastrophic, and some failures just take their time. Structural Monitoring (SHM) can be very helpful in serving as anal arm system for preventing both types of failures.

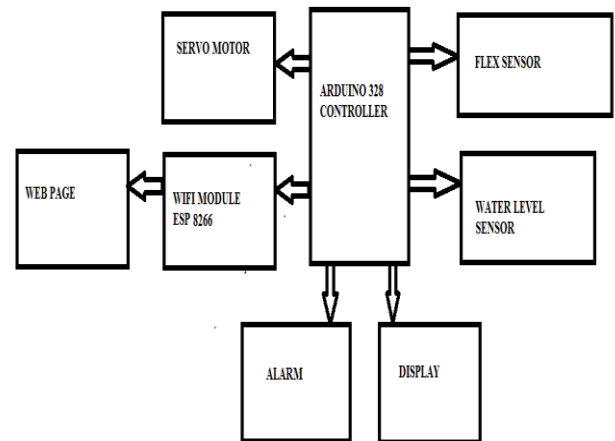
Bridge Engineers need scientific tools which can give quick information about the health of a bridge. Such instrument shall supplement the periodical manual inspections. But when failures happen with any sort of structure there is lack of human lives, money and many greater, maximum of the times. for example, throughout the bridge creation boom of the 1950's and 1960's little emphasis became place do n protection in segment and upkeep of bridges. This modified whilst the two, 235 foot Silver Bridge at factor first-class, WV, collapsed in to the OhioRiver, on Dec.15,1967. forty six people were killed. as a result to make sure the safety of bridges ,the Bridge tracking machine changed into introduced. Some of the pre-vailing technologies/techniques for Bridge tracking gadget are as described.

### MODIFICATION

This system includes IOT for long and short distance wireless data communication. This system also uses sensors and interface LCD (Liquid Crystal Display) for displaying output of all the sensors.

### BLOCK DIAGRAM AND WORKING

The sensors and the LCD are interfaced with the Atmega. The sensors used are Flex and Water level. The Flex sensor measures the angle of tilt of the bridge as well as cracks. The value is set so that if there is any sort of tilt or little crack and if it crosses our set value then the crack is detected. The water level sensor will be placed below the bridge and within the gaps. When the water touches the sensor it will give alertness to the Atmega. Then the alarm will beep.

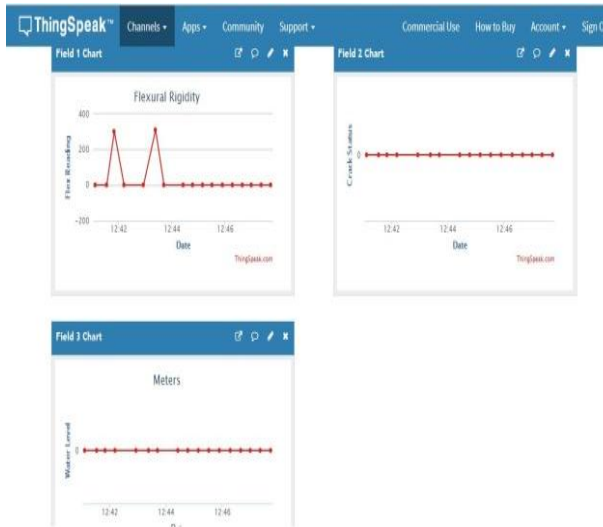


*Fig. 1. BMS block diagram.*



A LCD is kept so that if there is any danger and if the system finds the fault then the LCD will display “DANGER”. Servo motors are also there to closed the roads so that no vehicle reach the bridge. It is placed before the bridge. A buzzer is also used to spread alertness when the danger is detected. The wi-fi modem is used to send the data to the server. We have used “THINGSPEAK” were we can see the reading of the sensors. After every 20sec the readings are updated.

## OBSERVATION



*Fig 2. Observation.*

## NECESSITY

Bridge health monitoring is important because it saves more human life. Bridge health monitoring system (BMS) provides previous indication to us where we can easily save too many lives and we can avoid the loss. Their developmental history up to the present time. It also investigates current associated studies in progress and the limitations of contemporary Bridge monitoring system (BMS) technologies, and suggests possible remedial solutions for a follow up bridge monitoring system.

## ADVANTAGES

1. Improved understanding of in structural behaviour.
2. Early damage detection.
3. Assurances of a structure's strength and serviceability
4. Reduction in down time Improved maintenance and management strategies for better allocation of resources

## OBJECTIVE

The objective of Bridge Health Monitoring System is to provide the necessary information of the structural condition and possible damage in Bridge in order to pro-

vide the documented basis for decisions concerning these matters. The overall aims for Bridge Health Monitoring systems are to

1. Ensure safe structures.
2. Monitoring Structural Performance and Applied Loads.
3. Facilitating the Planning of Inspection and Maintenance.
4. Validating Design Assumptions and parameters.
5. Updating and Revising Design Manuals and Standards.
6. Attain safe economic operation.

## CONCLUSION

Developing a bridge monitoring system is challenging task hardware and software can make this process much smoother. Further, the analysis software lab view provides can render the process of monitoring more effective and informative.

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