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***Abstract*—This paper emphasises on the prototype development and smooth running of IoT based tilted bridge with intelligent illumination and traffic management systems. The paper also focused on the mathematical analysis of power consumption of the bridge through hybridized power supply. The power supply of the total system is hybridized with MAGLEV windmill and Solar PV arrays. A provision to use any commercial power source for any emergency is also made available. The tilted bridge mechanism is based on an android application using Arduino UNO and HC05 Bluetooth module. In this present work, the performances of the fabricated tilted bridge with smart illumination and traffic system have been evaluated for different circumstances. The performance of the small system is found feasible for actual implementation.**

***Index Terms*—Database management system, Hybrid Energy Supply, IoT, MAGLEV Windmill, Smart Illumination, Tilted Bridge Automation**

I. Introduction

THE basic structure of the bridge being inspired by the "The Gateshed Millennium" [1] located in England spanning the Thyne river, has a lattice curved structure; comprising a suspended deck hanging from a vertical arch. The whole structure is able to rotate at an angle of 45 degrees from its normal position; while being very close to water in resting position. Unlike the existing structure [2], [3] it is automated with IoT based control [4] and is powered by hybrid of wind and solar energy sources in combination with fuel cell [5]. This system can work with other renewable energy sources [6], [7] and interlinked to the grid [8], [9] and battery [10]. In this present paper, during the bridge inactivity hybridized energy sources will charge the batteries to supply energy at odd hours of the day. This is interlinked with nearby grid to provide an energy sharing during cases of emergencies on both sides

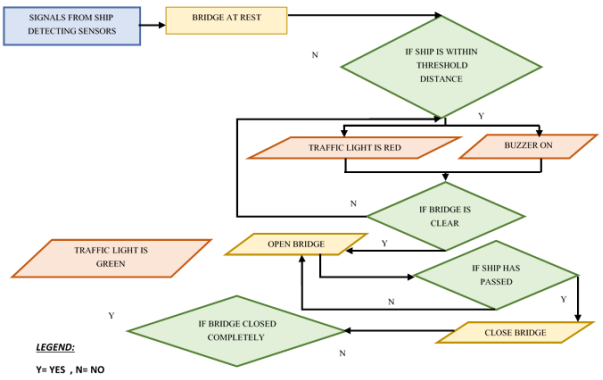

Fig. 1: Flowchart for Bridge Working Algorithm

hence provide energy conservation by reducing wastage. The day light controlled illumination system of this bridge is done with the Light Emitting Diodes (LEDs) [2], [3] which provides brighter lights with much lower heat emissions and about 75% less energy consumptions than normal incandescent lamps, are placed right on the structure giving direct lighting; and beneath the bridge giving indirect illumination. The intensity is automatically controlled by the daylight intensity, hence smarter energy consumption. The traffic lights have been replaced with dual Red-Green (RG LEDs) instead of separate coloured LEDs and are lined on the railing of the deck and the entrances. It is associated with a buzzer [2], [3], [11] as well as which alerts the people about bridge operation. The data regarding the approaching ships, distance, timings, speed, status of bridge and many other parts will get uploaded to the server whenever there is activity and the AI based program model will automatically be able to decide when and how to control the whole system remotely. In the present prototype the IoT

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