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Automatic Noise Monitor and Control in Library

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Abstract: ***This paper introduces imperative to sustain a study-friendly atmosphere in libraries, as noise levels can greatly influence patron satisfaction. In order to reduce noise levels in libraries, this project suggests designing and implementing an autonomous noise monitoring and control system. The device constantly measures ambient noise levels by comparing them to predetermined thresholds using sound sensors and an Arduino. The technology reminds users to keep the environment quiet by sounding alerts and displaying visual cautions when acceptable limits are exceeded. To further reinforce silent norms, automatic audio announcements can be incorporated.***
Keywords: Noise Monitoring, Library Automation, Intelligent Systems, Sound Sensors, Microcontrollers, Ambient Noise Control.

I. INTRODUCTION

Libraries are sacred places where people can learn, research, and engage in intellectual inquiry. However, keeping a comfortable study space is always difficult, and noise pollution is a major issue. Overly loud noises can make it difficult to concentrate, reduce productivity, and degrade user experience in general. Conventional approaches to noise control, which depend on human observation and action, frequently fall short.

Because human intervention isn't always possible to control noise pollution, we suggest an automated method for monitoring and warning of noise pollution. When noise levels exceed a predetermined threshold, this automatic noise warning system is designed to detect and alert users. It does this by automatically sounding an alert to alert users to the noise level. Any decibel that exceeds the set range of 55dB to 45dB is acceptable.

It can sound an alarm to quiet the area. Autonomous noise level detection is offered by the system. You can select a loud noise level according to the facility's requirements, and the display will indicate the current noise level and automatically inform you if it exceeds the set amount.

1) User input and noise level data analysis will be used to assess the system's efficacy. This creative approach seeks to:
2) Continue to keep your study space calm
3) Minimize staff interventions in libraries
4) Increase client contentment
5) Encourage customers to practise self-control

II. LITERATURE REVIEW

Enda Murphy, Eoin King had Developed Covers the core theoretical concepts and principles surrounding the mechanics of noise pollution as well as the evidence-base linking noise with public health concerns.

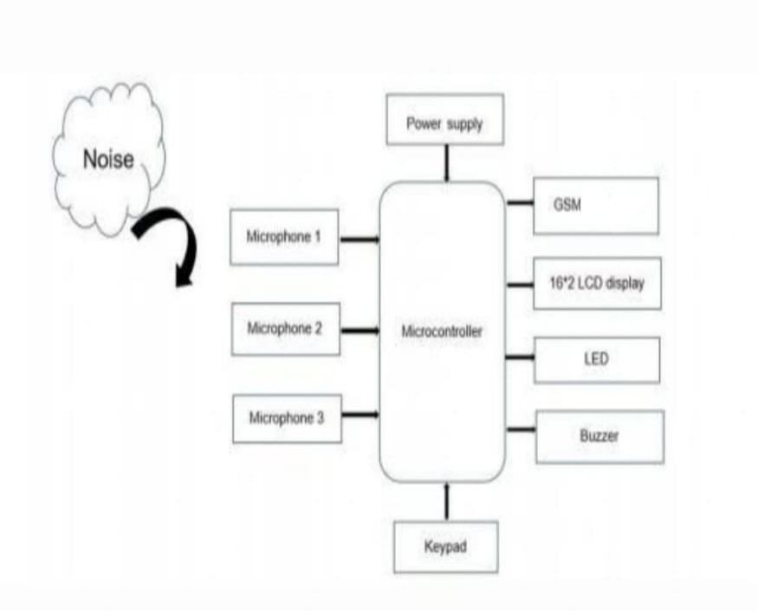
Style - Studies (Kim, 2018; Lee, 2020) emphasize the negative impact of noise on library users' concentration, productivity, and satisfaction.

1) Noise levels above 45 dB can decrease reading comprehension and cognitive performance (Kjellberg, 1996).
2) Research (Shin, 2019; Patel, 2020) showcases the effectiveness of sound sensors and microcontrollers in monitoring noise levels.
3) Wireless sensor networks (WSNs) enable real-time noise monitoring (Li, 2019).
4) Machine learning algorithms enhance noise classification and prediction (Wang, 2020).

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III. BLOCK DIAGRAM



IV. PROPOSED SYSTEM

Automatic noise level monitoring and warning system using GPS presents an automatic functioning of monitoring and warning of noise pollution consist of a hardware prototype and software coding for ambient data collection. noise pollution is equally harmful as are the other pollution. Automatic noise level monitoring and warning system represent a significant contribution to the environment and human health this is an efficient technological solution that collection of data and transmission of data in real time to database using wireless communications.

V. HARDWARE DETAILS

1) POWER SUPPLY: The function of a power supply is to convert one from of electrical energy into another form and, as a result power supplies.
2) MICROCONTROLLER: The microcontroller is used for serial Operation based the program present in the output is take from one of the four ports.
3) LCD DISPLAY: Liquid Crystal Display. it is consisted of liquid crystal used to provide a visible image and electronically modulated optical devices and also it is having seven segment displays in digital clock.
4) GSM MODEM: Global system for Mobile communication (GSM). They are used by mobile devices such as mobile phones and tablet.
5) MICROPHONE: The function of a Microphones is to measure sound pressure levels (SPL) in decibels (dB).
6) BUZZER: The function of buzzer is to produce beeping.

VI. SOFTWARE DETAILS

Embedded System: An embedded system is a microprocessor-based computer hardware system with software that is designed to perform a dedicated function, either as an independent system or as a part of a large system. At the core is an integrated circuit designed to carry out computation for real-time operations.

VII. ADVANTAGES

1) Automatic detection of Noise Level
2) Display current noise level
3) Auto alert if noise level exceeds set amount
4) Ability to set allowed noise level as per facility

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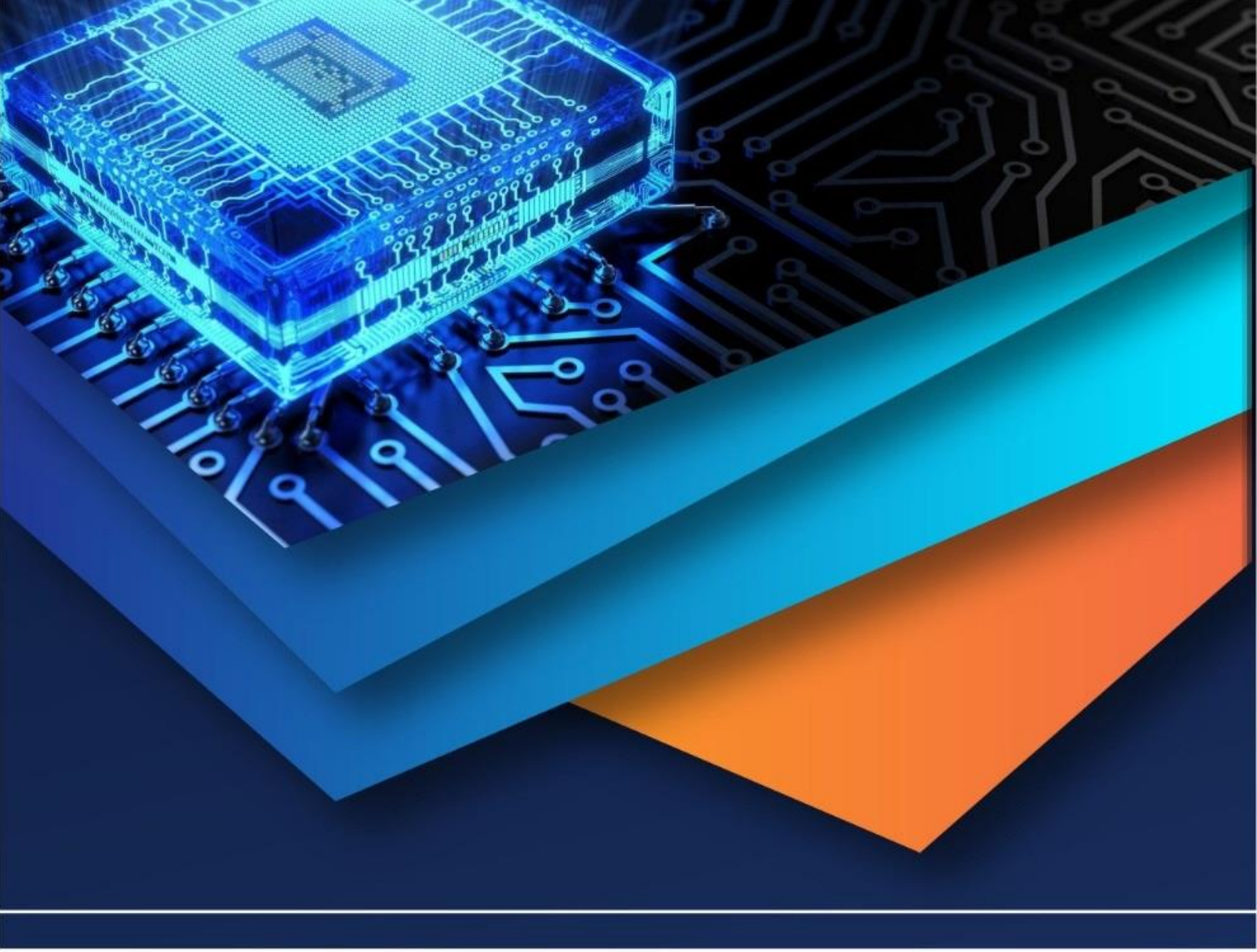
VIII. CONCLUSIONS

An autonomous noise pollution monitoring and warning system with GSM functionality is shown. It consists of software coding for ambient data gathering and a hardware prototype for measuring noise levels. Both other types of pollution and noise pollution are equally damaging. An effective technological solution that uses wireless communications to gather and transmit data in real time to a database is the automatic noise level monitoring and warning system, which has a substantial positive impact on both the environment and human.

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