IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 6, Issue 1, March 2026
Impact Factor: 8.2

IOT Based Smart Health Monitoring mirror

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Abstract: *The IoT-Based Smart Health Monitoring Mirror is a next-generation smart healthcare system designed to integrate real-time health monitoring into everyday life. The system transforms a conventional mirror into an intelligent digital interface capable of measuring, displaying, storing, and analyzing vital health parameters using Internet of Things (IoT) technology.*

The system incorporates an ESP32 microcontroller, biomedical sensors (MAX30102 for heart rate and SpO_2, DS18B20 for temperature), a two-way mirror with LCD/LED display, Wi-Fi connectivity, cloud storage, and a dedicated Android mobile application. Health data collected from the sensors is processed by the ESP32, displayed instantly on the mirror surface, and uploaded to cloud platforms such as Firebase, Thing Speak, or AWS IoT for long-term storage and remote monitoring.

Voice recognition functionality enables hands-free interaction, enhancing usability and accessibility. The mobile application provides graphical visualization of health trends, daily records, and weight entry features. The system is designed to be cost-effective, scalable, energy-efficient, and suitable for smart home integration.

This project demonstrates the practical implementation of embedded systems, IoT communication, biomedical sensing, cloud computing, and mobile application development in modern preventive healthcare

Keywords: *Health Monitoring Mirror*

DOI: 10.48175/IJARSCT-31474