Biomedical Management System

Shraddha Manik Pawar[1], Iccha Raju khairmode[2], Jiya Jameer Inamdar[3], Purva Aadhikrao patil[4], Smt.Supriya.S.Patil[5]

[5]*Guide, Lecturer in Medical electronics*

[1,2,3,4]*Diploma in Medical Electronics, Government Polytechnic, Miraj, Maharashtra, India*

Abstract- Biomedical equipment plays an important role in modern healthcare systems. Hospitals use many medical devices such as ECG machines, ventilators, infusion pumps, patient monitors, and diagnostic instruments for patient care. Proper management of these devices is necessary to ensure their reliability, safety, and availability. However, many hospitals still maintain equipment records manually, which can lead to data loss, difficulty in tracking equipment status, and delays in maintenance.

This paper presents a Biomedical Management System (BMS), a web-based system developed to improve the management and monitoring of biomedical equipment in hospitals. The system includes modules for equipment management, complaint handling, preventive maintenance scheduling, equipment transfer tracking, warranty alerts, and report generation. By digitizing equipment records and maintenance activities, the system helps biomedical engineers manage hospital equipment efficiently.

The proposed system reduces equipment downtime, improves maintenance planning, and enhances the overall efficiency of hospital biomedical departments.

I. INTRODUCTION

Biomedical equipment is essential in hospitals for diagnosis, treatment, and patient monitoring. Devices such as ECG machines, infusion pumps, ventilators, and laboratory analyzers are widely used in healthcare facilities. Proper maintenance and management of these devices are necessary to ensure their correct functioning and patient safety.

Traditionally, many hospitals maintain equipment records manually using registers or spreadsheets. This approach makes it difficult to track equipment location, maintenance history, warranty details, and service reports. As the number of medical devices in hospitals increases, manual record-keeping becomes inefficient and time-consuming.

To overcome these challenges, a digital Biomedical Management System is required. This system helps biomedical engineers and hospital administrators maintain a centralized database of equipment and manage maintenance activities more efficiently.

II. SYSTEM METHODOLOGY

The Biomedical Management System is designed as a web-based platform that helps biomedical engineers manage hospital equipment through different functional modules.

❖ Equipment Management

This module maintains a database of biomedical equipment including equipment name, model number, serial number, manufacturer, installation date, department location, and vendor information. This helps in maintaining an organized inventory of hospital equipment.

❖ Complaint Management

Hospital staff can register equipment complaints through the system when a device is not functioning properly. Biomedical engineers can view the complaints, assign technicians, and update the repair status.

❖ Preventive Maintenance

Regular preventive maintenance is necessary to ensure proper equipment performance. The system allows biomedical engineers to schedule maintenance activities and record maintenance history.

❖ Warranty and Alerts

The system tracks equipment warranty details and generates alerts before warranty expiration. This helps hospitals plan service contracts and avoid unexpected repair costs.

❖ Equipment Transfer Tracking

Sometimes equipment is transferred between departments. This module records equipment transfer details such as department name, transfer date, and authorized personnel.

❖ Report Generation

The system can generate various reports such as equipment inventory reports, maintenance reports, complaint status reports, and department-wise equipment distribution.

III. SYSTEM ARCHITECTURE

The Biomedical Management System follows a three-layer architecture:

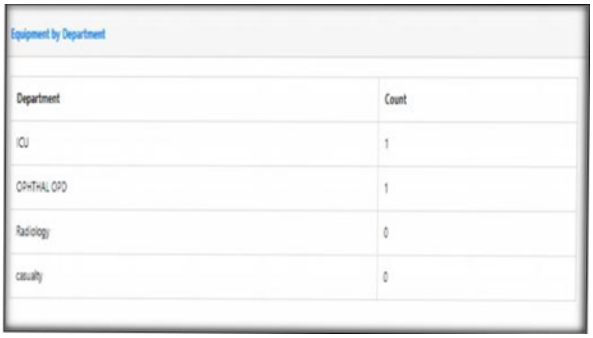
User Interface Layer – Allows administrators, biomedical engineers, and hospital staff to access the system through a web interface.

Application Layer – Processes system operations such as equipment registration, complaint management, and maintenance scheduling.

Database Layer – Stores equipment details, maintenance records, complaint data, and user information.

IV. RESULTS AND DISCUSSION

The proposed Biomedical Management System improves hospital equipment management by replacing manual record-keeping with a digital platform. The system helps biomedical engineers track equipment information, schedule preventive maintenance, and manage complaints more efficiently.



The implementation of this system provides several advantages such as reduced equipment downtime, faster complaint resolution, improved equipment tracking, and better maintenance planning. It also helps hospital administrators analyze equipment performance through generated reports.

V. CONCLUSION

Efficient management of biomedical equipment is essential for providing reliable healthcare services. Traditional manual methods of equipment management are inefficient and prone to errors. The proposed Biomedical Management System provides a digital solution for managing hospital equipment effectively.

By integrating modules such as equipment management, preventive maintenance, complaint handling, and report generation, the system improves the efficiency of biomedical engineering departments. The system helps hospitals maintain accurate equipment records and ensure better utilization of medical devices.