Project Proposal in WEB SYSTEM AND TECHNOLOGIES 2

Project Title: *Biometric Attendance System Using IOT*

Project Objectives:

General: *To develop a cost-effective Biometric Attendance System using IoT that automates the process of attendance management by leveraging biometric authentication and real-time data transmission by utilizing affordable hardware components and open-source software, ensuring reliable performance while minimizing implementation and maintenance expenses for small to medium-sized organizations.*

Specific:

1. *To integrate biometric authentication (e.g., fingerprints) to uniquely identify and record individual attendance using low-cost sensors and IoT-compatible microcontrollers to reduce hardware expenses.*
2. *To enable real-time data transmission and storage using affordable IoT technologies and widely available network infrastructure for centralized monitoring and reporting.*
3. *To optimize system design for efficient resource usage, achieving reliable performance with minimal hardware requirements and simplified installation.*
4. *To implement secure data handling and encryption to protect sensitive employee information without compromising budget constraints.*
5. *To utilize open-source software platforms for system development, minimizing licensing costs while ensuring scalability and adaptability for organizations of different sizes.*
6. *To design a user-friendly interface for administrators to efficiently access attendance records, generate reports, and manage the system without added complexities.*

Scope:

1. ***Biometric Authentication:***
   - *Integration of affordable fingerprint scanners to uniquely identify individuals.*
2. ***IoT Integration:***
   - *Use of IoT-compatible microcontrollers (e.g., ESP32) for real-time data transmission and centralized storage. Compatibility with existing Wi-Fi networks for seamless connectivity.*
3. ***User Interface:***
   - *Development of a basic web-based dashboard for administrators to view attendance records, generate reports, and manage the system.*
4. ***Cost Optimization:***
   - *Utilization of low-cost hardware components and open-source software to minimize expenses.*
5. ***Core Features Only:***

- *Focus on essential features such as attendance tracking and reporting to maintain simplicity and affordability.*

Limitations:

1. *Advanced biometric sensors (e.g., iris recognition) are excluded due to cost constraints, limiting the choice to more affordable options like fingerprints or facial recognition.*
2. *While secure data handling will be implemented, the encryption level may not match that of enterprise-grade systems due to budget considerations.*
3. *The system's functionality is optimized for small to medium-sized organizations and may require additional customization for larger enterprises.*
4. *Advanced features like integration with HR management systems or payroll software may not be included in the basic implementation.*
5. *Customization beyond the core features may require additional costs and technical expertise.*

Hardware Components

- Biometric Sensor
- Microcontroller with IoT Compatibility
- Power Supply/Adapter
- Real-Time Clock (RTC) Module
- Display Module (optional but recommended for user interaction)
- Enclosure/Case
- Backup Battery
- Network Connectivity

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