



TECHNICAL & COMMERCIAL PROPOSAL

Smart Zoo Visitor Monitoring System

An AI-Based Intelligent Visitor Tracking & Analytics Solution

Prepared For

Gwalior Zoo

Nagar Nigam Gwalior

Madhya Pradesh

Prepared By

Technobazaar Pvt. Ltd.

Gwalior, Madhya Pradesh

[GSTIN: 23AAMCT3522D1ZO]

Date:

Project Overview

The Smart Zoo Visitor Monitoring System is an advanced Artificial Intelligence-based solution designed to modernize visitor management and monitoring operations at Gwalior Zoo.

The proposed system will provide automated visitor counting, real-time crowd monitoring, analytics, and reporting capabilities by utilizing AI-based video processing technology integrated with CCTV infrastructure.

The solution will enable zoo authorities to understand visitor movement patterns, manage crowd density, improve operational efficiency, and enhance the overall visitor experience.

By reducing dependency on manual counting processes and introducing automated analytics, the system will support data-driven decision-making and help maintain a safer and more organized zoo environment.

2. Proposed Solution Features

A. AI-Based Visitor Counting System

- Automatic visitor entry and exit counting
- Eliminates the need for manual counting
- Real-time visitor statistics
- Hourly, daily, and monthly visitor reports
- Historical visitor trend analysis

B. Crowd Monitoring & Management

- Real-time monitoring of visitor density in different zoo zones
- Identification of peak crowd hours
- Crowd congestion alerts
- Improved visitor flow management
- Better utilization of zoo resources

C. Dashboard & Analytics

The web-based administration dashboard will provide:

- Total visitor count
- Current visitor occupancy inside the zoo
- Zone-wise visitor statistics
- Date-wise visitor reports
- Peak visiting hour analysis
- Data export facility for management reports

D. CCTV Integration

- Integration with existing CCTV cameras
- Support for multiple camera feeds
- Real-time video processing
- AI-based visitor detection and tracking
- Scalable architecture for future expansion

E. Alert Management System

- High crowd density alerts
- Abnormal visitor movement monitoring
- Real-time notifications for administrators
- Improved security monitoring

F. Improved Visitor Management

- Automated and accurate visitor counting
- Real-time understanding of visitor occupancy
- Better crowd distribution across zoo areas

G. Enhanced Security & Safety

- Continuous monitoring of visitor movement
- Early identification of crowd congestion
- Faster response to unusual situations

H. Data-Driven Decision Making

- Visitor trend analysis
- Peak hour identification
- Historical reports for planning and management

I. Operational Efficiency

- Reduction in manual monitoring efforts
- Centralized monitoring dashboard
- Better resource planning

3.Company Profile

TechnoBazaar Private Limited Gwalior.

Technobazaar Pvt. Ltd. is an IT solutions and technology development company providing innovative software solutions, system integration services, and digital transformation solutions for government and enterprise organizations.

The company focuses on developing scalable, secure, and technology-driven applications using modern technologies including Artificial Intelligence, Cloud Computing, Web Applications, Mobile Applications, and Enterprise Software Solutions.

Our Technical Expertise

Artificial Intelligence & Computer Vision

- AI-based object detection
- Video analytics solutions
- Image processing
- Intelligent monitoring systems

Enterprise Software Development

- Web-based business applications
- Enterprise management systems
- Dashboard and reporting solutions
- API-based integrations

Cloud & Infrastructure

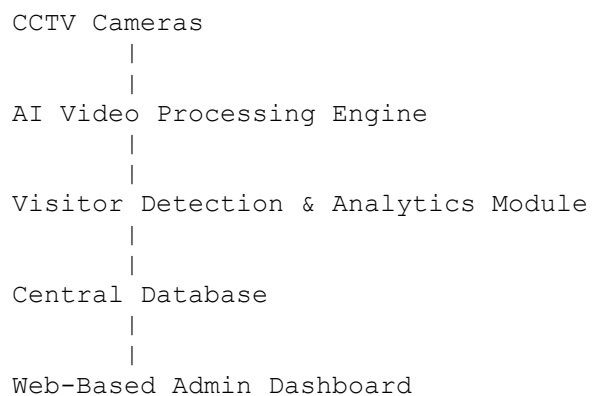
- Application deployment
- Database management
- System integration
- Server configuration

Our Commitment

Technobazaar Pvt. Ltd. is committed to delivering reliable, innovative, and cost-effective technology solutions that help organizations improve efficiency, transparency, and operational excellence.

Through this Smart Zoo Visitor Monitoring System, we aim to support Gwalior Zoo in adopting modern AI-based monitoring capabilities and creating a better experience for visitors and management teams.

4. Technical Architecture



5. Hardware & Software Cost Estimation

Sr. No.	Component	Description	Amount (INR)
1	AI Processing Unit	AI-enabled video processing hardware	80,000
2	Camera Integration Setup	2 CCTVs connectivity and configuration	45,000
3	Database & Storage Setup	Visitor data storage and reporting infrastructure	6,000
4	Server Configuration	Application deployment and server setup	12,000
5	AI Software Development	Visitor detection, counting, and analytics engine	65,000
6	Web Dashboard Development	Admin panel and reporting dashboard	8,000
7	Installation & Deployment	Installation, configuration, and testing	10,000
8	Training & Documentation	User training and technical documentation	3,000
9	Additional Service charges	Additional Cables/Wirings/Device and Service charges	2,280
10	Software/Application's GST	18% GST Charges on software	18,720
Total Project Cost			₹2,50,000/-

6. Implementation Timeline

Phase	Duration
Requirement Analysis	1 Week
Software Development	3 Weeks
Hardware Installation & Configuration	1 Week
Testing & Optimization	1 Week
Final Deployment & Handover	1 Week

Estimated Project Duration: 6-7 Weeks

7. Warranty & Support

- Application warranty: 3 Months
- Bug fixing and technical support during warranty period
- Remote assistance for system-related issues
- Deployment and configuration support

8. Payment Terms

Milestone	Payment Percentage
Project Confirmation	40% Advance
Software Demonstration & Hardware Installation	40%
Final Deployment & Handover	20%

Note:

The proposed solution can be further customized based on Gwalior Zoo's specific operational requirements and future expansion plans.

9. Detailed Technical Specification

9.1 AI-Based Video Analytics Engine

The Smart Zoo Visitor Monitoring System will use Artificial Intelligence and Computer Vision technologies to analyze live CCTV video streams and extract meaningful visitor insights.

Key Capabilities:

- Real-time person detection using AI models
- Visitor movement analysis
- Entry and exit counting
- Multiple person tracking
- Crowd density estimation
- Video stream processing
- Automated analytics generation

9.2 Visitor Detection & Counting Module

The visitor counting module will automatically detect and count people entering and exiting different areas of the zoo.

Features:

- Automatic visitor identification
- Entry/exit counting
- Real-time occupancy calculation
- Zone-wise visitor statistics
- Daily and monthly visitor reports
- Accuracy improvement through AI-based processing

9.3 Web-Based Monitoring Dashboard

A centralized web dashboard will provide zoo administrators with complete visibility of visitor activities.

Dashboard Features:

- Live visitor count display
- Camera-wise monitoring status
- Zone-wise visitor analytics
- Daily/monthly/yearly reports
- Graphical data visualization
- Report download/export facility
- User-based access control

9.4 Data Management & Reporting

The system will maintain centralized visitor analytics data for future reference and planning.

Data Management Features:

- Secure database storage
- Historical visitor records
- Automated report generation
- Data filtering by date and location
- Performance analytics

10. Hardware Specification

The proposed system will require the following hardware components:

Component	Specification / Purpose
AI Processing Unit	GPU-enabled processing device for AI video analytics Connection with existing or new surveillance cameras
CCTV Camera Integration	CCTV must have AI, OnVif, RTSP, 30-60 fps, min 4MP HD, human face detection feature and should able to send data to Computer directly via LAN.
Storage Device	Storage for analytics data and system logs
Server Infrastructure	Application hosting and database services
Network Equipment	Reliable connectivity between cameras and processing unit
Display System (Optional)	Live monitoring display for control room

11. Software Technology Stack

Artificial Intelligence

- Computer Vision Algorithms
- Deep Learning Models
- Object Detection Technology
- Video Analytics Engine

Backend Platform

- Secure API-based application architecture
- Database-driven application design
- Scalable server-side processing

Frontend Platform

- Web-based responsive dashboard
- Real-time monitoring interface
- Analytics visualization

Database

- Centralized database for visitor records
- Secure data storage and retrieval

12. Limitations & Operational Considerations

The proposed solution is designed to provide efficient monitoring and automated analysis; however, certain operational limitations and dependencies should be considered for smooth functioning of the system.

Hardware Limitations

- The computer/server hardware should be installed in a secure, dust-free, and controlled environment. It should not be exposed to extreme temperatures, moisture, water leakage, or direct sunlight.
- CCTV/AI cameras should be installed at approved locations with proper protection from physical damage, weather conditions, and unauthorized access.
- The camera position, viewing angle, height, and focus should not be changed without prior consultation with the Technobazaar support team, as it may impact AI detection and monitoring accuracy.
- Any unauthorized modification, relocation, disconnection, or tampering with the installed hardware may affect system performance.
- Hardware components such as computers, storage devices, network equipment, and cameras may require maintenance or replacement in case of failure. During such downtime, application services may be temporarily unavailable until the issue is resolved.
- Continuous power supply is required for the system. In case of power failure, hardware and application services may stop working. Installation of UPS/Inverter backup is recommended to minimize downtime and prevent data loss.
- Adequate storage capacity should be maintained for video recordings, AI processing data, and system logs. Storage limitations may impact data retention capability.
- Network connectivity between cameras, processing hardware, and application servers should remain stable for real-time monitoring and analysis.

Software & AI System Limitations

- The performance and accuracy of the software application are dependent on the quality, configuration, and performance of the underlying hardware infrastructure.
- AI-based detection accuracy may vary depending on environmental conditions such as:
 - Poor lighting conditions
 - Heavy rain, fog, or dust
 - Camera obstruction
 - Animal movement patterns

- Multiple objects overlapping in the camera view
- The system requires a continuous connection between cameras and the processing system for real-time monitoring and analysis.
- The application and AI services must remain operational on the designated hardware for uninterrupted monitoring.
- Any changes in camera placement, zoo layout, lighting conditions, or monitoring area may require AI model configuration adjustments or system calibration.
- Software updates, security patches, and system maintenance activities may require temporary service downtime.
- The system depends on the availability and reliability of third-party components such as operating system, database services, network infrastructure, and external integrations (if applicable).
- Data generated by the system should be periodically backed up to prevent loss due to unexpected hardware or software failures.

Environmental & Operational Dependencies

- The monitoring area should have sufficient lighting and clear visibility for cameras to capture accurate data.
- Objects, trees, cages, barriers, or other physical changes in the monitoring area may impact camera visibility and AI detection performance.
- Authorized personnel should operate and manage the system. Any unauthorized access or configuration changes may affect system reliability.
- Regular preventive maintenance of hardware, cameras, and software is recommended to ensure continuous operation.
- Technobazaar support team should be informed before making any changes to hardware placement, network configuration, or system settings.

Note:

The above limitations are standard operational considerations for any AI-based surveillance and monitoring solution. Proper installation, regular maintenance, stable power supply, and network availability will ensure maximum system performance and reliability.

13. Future Enhancement Possibilities

The proposed system can be enhanced in future phases with additional intelligent features:

AI-Based Animal Monitoring

- Animal movement tracking
- Animal activity analysis
- Health monitoring assistance

Smart Ticketing Integration

- Online ticket integration
- Visitor entry validation
- Digital ticket analytics

Mobile Application

- Zoo management mobile application
- Real-time alerts
- Monitoring from anywhere

Facial Recognition (Optional)

- VIP visitor management
- Authorized personnel identification
- Enhanced security monitoring

IoT Integration

- Smart sensors integration
- Environmental monitoring
- Automated alerts

14. Project Advantages

The Smart Zoo Visitor Monitoring System will provide:

- Automated visitor management
- Improved operational efficiency
- Better crowd control
- Enhanced visitor safety
- Accurate data analytics
- Modern AI-enabled infrastructure
- Increase revenue now by decreasing the unauthorized person monitoring.
- It may increase revenue 10-20 times more if we utilize more AI features in next version.

15. Conclusion

The Smart Zoo Visitor Monitoring System will transform traditional visitor monitoring processes into an intelligent, automated, and data-driven solution.

By implementing AI-based video analytics and centralized monitoring capabilities, Gwalior Zoo will be able to improve visitor experience, enhance security measures, and make informed operational decisions.

Technobazaar Pvt. Ltd. is committed to delivering a reliable, scalable, and future-ready solution that aligns with the digital transformation goals of modern public facilities.

Thank you,

TECHNOBAZAAR PRIVATE LIMITED

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MADHYA PRADESH