**Comprehensive Project Report**

**Project Title:** Shiksha Digital – Online Education & Examination Platform

**Client:** Aarti Multi Services Pvt. Ltd.

**Development Team:** Mohit, Niyaj

**Date of Submission:** June 25, 2025

**Confidentiality Statement:** This document is confidential and intended solely for the recipient.

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**1. Executive Summary**

Shiksha Digital is a secure, AI-powered online education and examination platform designed for Indian educational institutions. It addresses key challenges in traditional exam delivery such as scalability, cheating, data integrity, and accessibility. Developed for Aarti Multi Services Pvt. Ltd., the platform aims to serve students, educators, and administrators with seamless exam creation, proctoring, analytics, and multilingual support. Key benefits include enhanced security, real-time analytics, user-friendly interface, and legal compliance with Indian data privacy laws.

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**2. Project Background & Objectives**

Context: With a 300% annual rise in digital exam adoption post-2020, Indian institutions need scalable and secure exam platforms. Traditional methods fail in integrity, accessibility, and performance tracking.

**Problem Statement:**

- Rising security and privacy concerns

- Lack of real-time analytics

- Scalability and accessibility issues

**Project Objectives:**

- Build a role-based access platform (Admin, Educator, Student)

- Enable AI-proctored exams and automated grading

- Offer data-driven performance insights

- Support multilingual interfaces and regional content

- Ensure compliance with Indian IT laws and privacy norms

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**3. Project Scope**

**3.1 In Scope:**

- User Registration & Authentication

- Exam Creation and Management

- Real-time AI Proctoring

- Auto-Grading System

- Analytics Dashboard

- Support Ticketing System

- Secure Payment Gateway

- Data Management and Compliance

- Multi-language UI Support

**3.2 Out of Scope:**

- Learning Management System (LMS)

- Mobile Application (Phase 2)

- International Compliance (beyond India)

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**4. Methodology & Project Plan**

**Approach:** Agile methodology with CI/CD pipelines, DevOps practices, and continuous testing.

**Project Phases:**

| Phase | Timeline | Output |

|-------|----------|--------|

| Phase 1 | Week 1–2 | Requirement analysis, FRD approval |

| Phase 2 | Week 3–6 | Module-wise development (User, Exam, Proctoring) |

| Phase 3 | Week 7–10 | Integrated Testing & Feedback |

| Phase 4 | Week 11–14 | Deployment, Training, and Documentation |

**Tools:** React.js, Flask, MySQL, AWS, GitHub Actions

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**5. Functional Modules Overview**

User Management: Registration with email/phone verification, secure authentication with optional 2FA, role-based dashboards

**Exam Management:** Creation of exams with question banks, time scheduling, randomization features

**Proctoring Module:** AI-based monitoring using webcam, face recognition, audio capture, and behavior detection

**Auto-Grading:** Instant evaluation of objective-type questions, support for partial/negative marking, educator override options

**Analytics Dashboard:** Real-time charts, performance tracking, progress reports, role-based insights

**Support System:** 24/7 ticketing interface with automated acknowledgements and escalation matrix

**Payment Integration:** Secure gateway for fee collection (UPI, net banking), transaction logs, compliance with PCI DSS

**Multi-language Support:** UI localization in English and regional Indian languages, phase-wise rollout

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**6. Technical Architecture**

**Frontend:** React.js with responsive design and accessibility compliance (WCAG 2.1 AA)

**Backend:** Flask (Python 3.9+) with REST APIs and role-specific endpoints

**Database:** MySQL 8.0+ with data replication, AES-256 encryption for sensitive fields

**Infrastructure:**

- AWS EC2 for compute

- RDS for database

- S3 for file storage

- CloudFront for CDN delivery

- CloudWatch + ELK for monitoring

**Security:** TLS 1.3, JWT tokens, OAuth 2.0, biometric data encryption, role-based access control

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**7. Risks & Mitigation Strategy**

| Risk | Probability | Impact | Mitigation |

|------|-------------|--------|------------|

| Network interruptions | High | High | Auto-save, resume capability |

| User onboarding difficulty | Medium | Medium | In-app guides, chatbot assistant |

| AI false positives in proctoring | Medium | High | Manual override, human review queue |

| Data breach | Low | High | AES encryption, firewall, regular audits |

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**8. Legal Compliance & Privacy**

- All data hosted on AWS India

- Adheres to IT Act 2000, Intermediary Guidelines 2021

- Data encryption (AES-256), TLS for communication

- Biometric and behavioral data protected under Indian law

- Consent-based data storage, user rights to access/edit/delete their data

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**9. Implementation Roadmap**

| Task | Timeline | Responsible |

|------|----------|-------------|

| Finalize UI/UX design | Week 2 | Frontend Team |

| Develop exam engine & proctoring | Week 3–6 | Backend Team |

| API integrations (payment, SMS, ML) | Week 6–8 | Full-stack Team |

| Security audits & testing | Week 9–10 | QA/Security Team |

| User training & Go-live | Week 11–14 | Operations Team |

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**10. Appendices**

**A1. Glossary**

JWT – JSON Web Token

2FA – Two-Factor Authentication

FRD – Functional Requirements Document

AI – Artificial Intelligence

WCAG – Web Content Accessibility Guidelines

**A2. References**

- IT Act 2000, India

- Personal Data Protection Bill (Draft)

- OWASP Top 10 Security Guidelines

- WCAG 2.1 AA Standards

**A3. Contact**

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