Terms of Reference (ToR) for the Upgradation and Maintenance of the Existing DSHE EMIS software

(Contract Package No. SD-16)

Education Management Information System (EMIS)

Directorate of Secondary and Higher Education

Bangladesh, Dhaka.

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Contents

Abbreviations

BCS	Bangladesh Civil Service
BCP	Business Continuity Plan
CII	Critical Information Infrastructure
CISA	Certified Information Systems Auditor
CISM	Certified Information Security Manager
CISSP	Certified Information Systems Security Professional
DRP	Disaster Recovery Plan
DSHE	Directorate of Secondary and Higher Education
EFT	Electronic Fund Transfer
EMIS	Education Management Information System
ERP	Enterprise Resource Planning
HCI	Hyper Converged Infrastructure
HRM	Human Resource Management
ICT	Information and Communication Technology
IMS	Institutional Management System
IRP	Incident Response Plan
ISO	International Organization for Standardization
MPO	Monthly Pay Order
NCSA	National Cyber Security Agency
OSCP	Offensive Security Certified Professional
PDS	Personal Data Sheet
SESIP	Secondary Education Sector Investment Program
ToR	Terms of Reference
VAPT	Vulnerability Assessment and Penetration Testing

Terms of Reference (ToR)
Consulting Services for Upgradation and maintenance of the existing DSHE EMIS software
(Contract Package No. SD-16)

1. Background:

The existing system of the Education Management Information System (EMIS) Cell of the Directorate of Secondary and Higher Education (DSHE) was developed in 2020 under the Secondary Education Sector Investment Program (SESIP) and 5 years have since passed.

The EMIS Cell of the DSHE serves as the digital backbone for the nation's secondary and higher education sectors. It is the core platform through which all critical administrative and operational activities are managed. These essential services include the processing of Monthly Pay Orders (MPO), execution of Electronic Fund Transfer (EFT) for educators, management of the Personal Data Sheet (PDS) for government employees and Bangladesh Civil Service (BCS) Education Cadre, as well as the comprehensive oversight of the Institution Management System (IMS), Human Resource Management (HRM) functions—spanning releases, joining, transfers, and vacancy tracking—and the coordination of training and inventory management.

While the current system has been foundational in digitizing these processes, it has reached a point where strategic evolution is necessary to meet the growing complexities and future demands of a modern management system. The existing software architecture, while functional, presents limitations in terms of data integration, advanced analytics, and scalability. To move beyond simple data management and into the realm of strategic educational planning, a fundamental software upgrade is required to address new challenges as well as integrate new technological solutions.

This initiative, therefore, focuses on the transformation of the existing EMIS into a sophisticated, integrated, and AI-enhanced Education Enterprise Resource Planning (ERP) system. The vision is to create a seamless, integrated platform that breaks down data silos between different modules (like MPO, HRM and IMS). This will empower DSHE with a holistic view of the educational landscape, enabling proactive, data-driven decision-making rather than reactive problem-solving. This software-centric modernization is crucial for building a resilient, efficient, and future-ready educational management framework for Bangladesh.

Learning Acceleration in Secondary Education (LAISE) is a World Bank-aided hybrid project comprising of a Program-For-Results (PforR) component of $280 million, across 8 Disbursement Linked Indicators (DLIs), and a $20 million using the Investment Project Financing (IPF) instrument. The project implementation period is five years (October 2023 to September 2028), which syncs with the duration of the Government's Secondary Education Program (SEP). DHSE intends to apply a portion of the said credit to engage a firm ("Consultants") for providing consultancy services for upgradation and maintenance of the existing DSHE EMIS software.

Overview of the Assignment:

This assignment represents a landmark initiative with two interconnected, paramount objectives: to re-architect the EMIS software into a cutting-edge Education ERP and to fortify it to achieve formal designation as a national Critical Information Infrastructure (CII). This dual focus ensures the system will be not only functionally advanced and efficient but also secure, resilient, and recognized as a

protected national asset. The synergy between the ERP upgrade and CII compliance forms the foundation of this transformation:

Secure and Empowered Stakeholder Access: The new Education ERP will provide modern, role-based dashboards and interfaces for all stakeholders of DSHE as well as the concern linkage groups. This will be built upon a "Zero Trust" security framework, ensuring that users are granted access only to the information explicitly required for their roles. This enhances usability while enforcing the stringent access controls mandated for a CII, ensuring that sensitive data is protected at every point of interaction.

In summary, this initiative transcends a standard technical upgrade. It is a fundamental modernization of the nation's educational backbone, designed to be both intelligent and impregnable. By integrating the advanced capabilities of an Education ERP with the rigorous security and resilience standards of a CII, this project will equip DSHE with a system that is smart, efficient, and trusted. It will safeguard the operational continuity of the education sector and fortify a critical component of Bangladesh's national infrastructure for the future.

2. Objectives of the Assignment

Primary Requirements: EMIS Software System Upgradation and Enhancement

2.1. Objective

The primary objective of assignment is to modernize and optimize the existing EMIS software system. The goal is to transform EMIS into a modular, national Education ERP built on a centralized data registry and data lake. This transformation will incorporate predictive analytics and agentic AI workflows to support planning, automation, and transparency. Additionally, it aims to empower DSHE through automation with a comprehensive, data-driven platform to effectively manage and analyze educational information for executive decisions support.

2.2. Specific Objectives

Enhance Data Management:

- Improve data accuracy, consistency, and completeness.
- Establish central registries for Institutions, Teachers, Employees, Students and relevant stakeholders as well as ensure proper push-pull API connectivity to avoid data duplications.
- Streamline data collection and entry processes through adopting standardized data dictionaries (aligned with global education indicators).
- Implement real-time mobile/web data collection with AI anomaly detection.
- Develop efficient data storage and retrieval mechanisms.
- Implement robust data security and privacy measures.

Optimize Decision-Making:

- Provide real-time and historical data insights.
- Generate insightful reports and analytics through Role-based dashboards for policymakers, districts, and schools.
- Support evidence-based policy formulation and implementation.
- Facilitate timely and informed decision-making through predictive forecasting (teacher demand, dropout risk), scenario simulations (budget vs staffing), and natural language queries.

Improve Operational Efficiency:

- Automate routine tasks and workflows:
    - Introduce Agentic AI workflows for MPO validation, payroll processing, leave approvals, and transfers.
    - AI-assisted document archiving (OCR + tagging);
    - Compliance bots to detect ghost teachers, duplicate payments, anomalies.
- Reduce manual intervention and errors.
- Enhance service delivery to schools, institutions, and stakeholders.
- Streamline administrative processes.

Facilitate Stakeholder Engagement:

- Provide user-friendly interfaces for various stakeholders:
    - Multi-channel portals & mobile apps for teachers, schools, parents; chatbots for Frequently Asked Questions (FAQs) (stipend status, training & workshop profile, transfer queries).
    - Sentiment analysis from surveys.
    - Public dashboards with aggregated education indicators.
- Enable seamless communication and collaboration.
- Empower stakeholders with access to relevant information.
- Foster transparency and accountability.

By achieving these objectives, the upgraded EMIS Education ERP System will significantly contribute to the overall improvement of secondary and higher education in Bangladesh.

Passive Requirements: Endorsed EMIS as CII

1. Objectives

The **primary objective** is to successfully prepare, submit, and achieve the formal designation of the DSHE EMIS as a Critical Information Infrastructure (CII) from the National Cybersecurity Agency of Bangladesh.

2. The **specific objectives** are to:

1. Conduct a comprehensive assessment of the EMIS against NCSA's CII criteria and international cybersecurity standards (e.g., ISO 27001, NIST).
2. Perform a thorough risk assessment, vulnerability analysis, and penetration testing (VAPT) to identify all security gaps and weaknesses.
3. Develop and document a robust cybersecurity governance framework, including all policies and procedures required by the NCSA.
4. Provide a clear, actionable roadmap for remediating all identified vulnerabilities and policy gaps.
5. Prepare and compile the complete CII application package and act as the technical liaison with the NCSA on behalf of DSHE.

3. Scope of Services

3.1 Primary Requirements: EMIS Software System Upgradation and Enhancement

The scope of Services includes the following tasks (but not limited to):

Software Upgradation:

- Upgrade the existing EMIS software system to an AI driven Modular, API-first ERP framework with cloud-readiness and offline-first mobile apps.
- Integrate new modules and features to enhance functionality with automation & AI orchestration layer for workflows.
- Ensure compatibility with the existing and renewed hardware infrastructure.

Software Development:

- Digital Archive System with AI Optical Character Recognition (OCR) for DSHE documents, reports, correspondences, and historical records.
- Inquiry Management System with ChatBot triage for handling public and internal inquiries more efficiently, ensuring accountability and timely responses.
- Upgradation HRM module linked to Payroll and Transfer along with Annual Confidential Report (ACR) Management System for streamlining the process of performance evaluation for public officials under the DSHE.
- Employees Personal Asset Information Management System that tied to employee PDS.
- Online Date Collection Module with multi-level approvals & AI validation as tailored for DSHE's diverse operational needs to secure as well as to efficient alternative to conventional form-based data gathering.
- Project Management System with AI scheduling & risk alerts for improving planning, monitoring, and execution of DSHE's operational projects.

Data Management:

- Migrate existing data to the new system.
- Implement ML-based continuous data quality monitoring to ensure data validation and cleansing processes.
- Develop data backup and recovery mechanisms.
- Develop Data Archiving System.
- Transform paper-based data to digital data.
- Integrate passive services with EMIS to create an Education Data Hub.

Stakeholder Engagement:

- To ensure the successful development and adoption of the modernized EMIS, a participatory approach is mandatory. The selected consultants will be required to plan, organize, and facilitate a series of structured workshops and Focus Group Discussions (FGDs). These activities are crucial for requirements validation, user feedback, and ensuring stakeholder buy-in throughout the project lifecycle. Therefore, each module requirement will be finalized through workshop and that requirement will be fixed and developed with intensive FGDs.

User Training:

- Provide training sessions for DSHE staff and stakeholders (i.e., end-users, technical administrators, policymakers).
- Add AI literacy modules for using dashboards, interpreting predictions, and querying AI assistants.
- Develop interactive user manuals and documentation.

Testing and Validation:

- Conduct thorough testing of the upgraded software system.
- Validate system performance and functionality.

Support and Maintenance:

- Provide ongoing support and maintenance for the upgraded system.
- Address any issues or bugs that arise post-implementation.
- Provide full-fledged support for paper-based data conversion to digital system.

3.1.2 User Training and Documentation:

User Training:

- Comprehensive training sessions for all relevant stakeholders, including administrators, data entry operators, and report users.
- Hands-on training on system features, functionalities, and best practices.
- Customized training materials tailored to the specific needs of different user groups.

Documentation:

- Detailed user manuals and guides covering all aspects of the system.
- Online help resources and tutorials for easy reference.
- Regular updates to documentation to reflect system changes and improvements.

3.1.3 Testing and Validation Reports:

System Testing:

- Rigorous testing of all system components to ensure functionality and performance.
- Identification and resolution of bugs and errors.
- Performance testing to assess system responsiveness and scalability.
- Security testing to identify and address potential vulnerabilities.

Validation Reports:

- Comprehensive reports documenting the testing process, results, and findings.
- Detailed analysis of system performance and user experience.
- Recommendations for further improvements and optimizations.

3.1.4 Ongoing Support and Maintenance Services:

Technical Support:

- Prompt resolution of technical issues and inquiries.
- Dedicated helpdesk support for user assistance.
- Remote troubleshooting and system maintenance.

System Updates and Upgrades:

- Regular system updates and patches to address security vulnerabilities and improve performance.
- Timely implementation of new features and functionalities based on evolving needs.
- Proactive monitoring of system health and performance.

Data Backup and Recovery:

- Regular data backups and disaster recovery plans to ensure data security and availability.
- Robust data recovery procedures to minimize data loss in case of emergencies.

3.1.5 Risk Management Plan:

To ensure the successful completion of the assignment, the following risk management plan will be implemented:

- **Risk Identification:** Identify potential risks that could impact the project, such as delays in procurement, hardware compatibility issues, and technical failures.
- **Risk Assessment:** Evaluate the likelihood and impact of each identified risk.
- **Risk Mitigation:** Develop strategies to mitigate identified risks, such as establishing contingency plans, conducting thorough testing, and ensuring consultant's support.
- **Risk Monitoring:** Continuously monitor risks throughout the project and adjust mitigation strategies as needed.
- **Risk Reporting:** Regularly report on the status of risks to the project stakeholders.

3.1.6 Quality Assurance Measurement:

To ensure the quality of the upgraded software system, the following measures will be implemented:

- **Testing and Validation:** Conduct thorough testing and validation of all software components to ensure they meet the required specifications.
- **Performance Monitoring:** Continuously monitor the performance of the new software system to identify and address any issues.
- **Feedback Mechanism:** Establish a feedback mechanism to collect input from stakeholders and make necessary adjustments.

3.1.7 Data Migration Process:

To ensure a smooth transition to the upgraded software system, the following data migration process will be implemented:

- **Data Assessment:** Assess the existing data to identify any inconsistencies, duplicates, or errors.
- **Data Cleansing:** Cleanse the data to remove any inconsistencies, duplicates, or errors.
- **Data Mapping:** Map the existing data to the new system's data structure.
- **Data Migration:** Migrate the cleansed and mapped data to the new system.
- **Data Validation:** Validate the migrated data to ensure accuracy and completeness.
- **Data Backup:** Create backups of the migrated data to ensure data integrity and security.

3.1.8 Key Performance Indicators (KPIs):

To measure the success of the task/assignment, the following KPIs will be monitored:

- **Data Accuracy:** Percentage of accurate data in the new system.
- **System Uptime:** Percentage of time the system is operational and available.
- **User Satisfaction:** Feedback from users on the performance and usability of the new system.
- **Task Automation:** Percentage of tasks automated by the new system.
- **Decision-Making Efficiency:** Improvement in the speed and accuracy of decision-making processes.

3.1.9 Sustainability of Upgraded EMIS:

To ensure the long-term sustainability of the upgraded EMIS software system, the following measures will be implemented:

- **Capacity Building:** Provide ongoing training and capacity-building programs for DSHE staff to ensure they have the skills and knowledge to manage and maintain the system.
- **Regular Updates:** Implement a schedule for regular software updates and upgrades to keep the system current and secure.
- **Maintenance Plan:** Develop a comprehensive maintenance plan to address any technical issues and ensure the system's continued performance.
- **Stakeholder Engagement:** Foster continuous engagement with stakeholders to gather feedback and make necessary improvements to the system.
- **Resource Allocation:** Ensure adequate resources are allocated for the ongoing support and maintenance of the system.

3.1.10 Workshops and FGDs

3.1.10.1 Workshops

Sl.	Workshop Area	Justification
1	Area Identification Workshops	These initial workshops will be held at the beginning of the project. The primary goal is to engage with a cross-section of DSHE officials and end-users to identify current system pain points, define the scope of new functional areas, and gather high-level requirements for the future Education ERP. The output of these sessions will form the basis of the detailed system requirements.
2	Piloting Workshops	Prior to the full-scale rollout, the consultants will organize workshops for a selected group of pilot users. These sessions will serve to introduce the new system's core modules, provide hands-on training, and gather crucial initial feedback on usability, workflow efficiency, and overall user experience. This feedback will be used to refine the system before the UAT phase.
3	User Acceptance Testing (UAT) Workshops	These are formal, structured sessions where trained end-users will test the system against predefined test cases and scenarios. The consultant's role will be to facilitate these workshops, guide users through the testing process, record feedback meticulously, and formally capture system bugs or defects. The objective is to achieve formal user sign-off, confirming that the system meets all agreed-upon requirements.
4	Finalization Workshops	Before the official system launch, these workshops will be conducted to present the final, UAT-approved version of the software to all key stakeholders. The sessions will cover the final features, the official rollout plan, the data migration strategy, and the support mechanism, ensuring all parties are aligned and prepared for the system's "go-live" date.
And other workshops as required.		

3.1.10.2 FGDs:

In addition to the broader workshops, the consultants will conduct targeted Focus Group Discussions (FGDs). Unlike workshops, FGDs will be smaller, intensive sessions designed to deep-dive into specific, complex functionalities.

These discussions will involve subject matter experts (SMEs) and key personnel who have deep operational knowledge of a particular domain (e.g., MPO processing rules, teacher transfer policies, PDS data verification). The purpose of these FGDs is to precisely map out intricate business processes, clarify complex rules, and validate the detailed design of specialized system modules, ensuring the final product accurately reflects the nuanced operational realities of DSHE. Considering the project volume and diversification, it is considered to keep provision for FGDs which will be implemented with prior approval of the Project Director.

3.1.11 Defect Liability (Warranty):

Defect Liability Period (Warranty Period): The "Defect Liability Period" (also referred to as the "Warranty Period") shall mean the duration of validity of the warranties provided by the Consultants, commencing from the date of successful completion of the Piloting and Improvement Phase. During this period, the Consultants shall remain fully responsible for identifying, rectifying, and resolving any defects in the upgraded EMIS software.

The Consultants shall submit a **Warranty Defect Repair and Technical Support Service Sub-Plan**, which must detail a structured mechanism for logging, tracking, and resolving defects throughout the warranty period. The Sub-Plan shall include, at a minimum:

1) **Service Level Agreements (SLAs):** Clearly defined response and resolution timelines categorized by severity level of reported issues.
2) **Support Availability:** Provision of 24/7 technical support, including both on-site and remote troubleshooting, to ensure uninterrupted system performance.
3) **Software Updates and Patches:** Delivery and deployment of necessary security updates, bug fixes, and minor enhancements to maintain system stability, security, and compliance during the warranty period.

3.1.12 Change Management:

To manage changes effectively throughout the assignment, the following change management process will be implemented:

- **Change Request:** Any changes to the assignment scope, timeline, or budget must be formally requested through a change request form.
- **Change Assessment:** The impact of the requested change on the project will be assessed, including potential risks, costs, and benefits.
- **Change Approval:** The change request will be reviewed and approved by the Project Steering Committee before implementation.
- **Change Implementation:** Approved changes will be implemented, and the assignment plan will be updated accordingly.
- **Change Communication:** All stakeholders will be informed of the approved changes and their impact on the assignment.
- **Acceptance:** Each delivery will specify content, format, acceptance criteria, approver, and due date. The Client will review within ten (10) business days and issue acceptance or consolidated comments. The Consultant will incorporate one (1) major and one (1) minor revision cycle per deliverable without additional cost.

3.2 Integrated Requirements: System Security

3.2.1 Security Update:

Regular security updates will be implemented to ensure that the EMIS system remains protected against emerging threats and vulnerabilities. This includes:

- Applying the latest security patches and updates to all software and hardware components.
- Regularly updating antivirus and anti-malware definitions.
- Implementing security best practices and guidelines to enhance the overall security posture of the system.
- Ensuring that firewall licenses are up-to-date and properly configured to provide robust network security.

3.2.2 Vulnerability Assessment and Penetration Testing (VAPT):

Vulnerability Assessment and Penetration Testing (VAPT) will be conducted to identify and address potential security weaknesses in the EMIS system. This includes:

- Conducting regular vulnerability assessments to identify security gaps and vulnerabilities.
- Performing penetration testing to simulate real-world attacks and assess the system's resilience.
- Providing detailed reports on identified vulnerabilities and recommended remediation measures.
- Implementing corrective actions to address identified vulnerabilities and enhance system security.

3.2.3 IT Audit:

An IT audit will be conducted to evaluate the effectiveness and efficiency of the EMIS system's security controls and processes. This includes:

- Reviewing the current security policies, procedures, and practices.
- Assessing the compliance of the EMIS system with relevant security standards and regulations.
- Identifying areas for improvement and recommending enhancements to the security framework.
- Ensuring that all security measures are properly documented and implemented.

By implementing these security measures, the EMIS system will be better protected against potential threats and vulnerabilities, ensuring the continued integrity, confidentiality, and availability of educational data.

3.3 Passive Requirements: Endorsed EMIS as CII

3.3.1 Background and Rationale

The Education Management Information System (EMIS) is the digital cornerstone of the Directorate of Secondary and Higher Education (DSHE). It governs the core administrative and financial operations for the entire secondary and higher education sector of Bangladesh. The system processes and manages highly sensitive data and critical services, including:

- **Monthly Pay Orders (MPO)** and EFT transfers for hundreds of thousands of teachers and staff.
- **Personal Data Sheets (PDS)** contain sensitive personal identifiable information (PII) of government employees.
- **Human Resource Management (HRM)** including transfers, postings, and recruitment.
- **Institutional Management Systems (IMS)** for thousands of educational institutions nationwide.

Given its central role, the sustained and secure operation of EMIS is of national importance. Any disruption, breach, or failure of the EMIS would have a catastrophic impact on the education sector, leading to nationwide salary disbursement failures, administrative paralysis, and a significant loss of public trust.

In alignment with the Cyber Security Ordinance 2025 and the directives of the National Cybersecurity Agency (NCSA), it is imperative that nationally vital systems like the EMIS are officially recognized and protected as Critical Information Infrastructure (CII). Here's the outlines the scope of Services for consultants to guide DSHE through the entire process of achieving CII designation for the EMIS.

3.3.2. Scope of Services

The consultants will be responsible for the following tasks, structured in distinct phases:

Phase I: Scoping and Gap Analysis (Month 1)

- **Task 1.1:** Review all existing architecture diagrams, network topologies, data flow diagrams, and operational documents of the EMIS.
- **Task 1.2:** Formally map the services provided by EMIS to the NCSA's definition of a CII, justifying its criticality based on potential national impact.
- **Task 1.3:** Conduct a thorough Gap Analysis comparing the EMIS's current security posture (technical, administrative, and physical controls) against the NCSA's CII security guidelines.

Phase II: Technical Security Assessment (Months 2-3)

- **Task 2.1:** Conduct a comprehensive **Vulnerability Assessment and Penetration Test (VAPT)** covering all components of the EMIS, including web applications, mobile applications, databases, servers, and network infrastructure.
- **Task 2.2:** Perform a detailed security audit of the system's configuration, access control mechanisms, encryption standards (for data in transit and rest), and logging/monitoring capabilities.
- **Task 2.3:** Conduct a source code review for critical application modules to identify underlying security flaws.
- **Task 2.4:** Assess the physical security measures of the data center where the EMIS is hosted.

Phase III: Technical Policy and Documentation Development for CII (Months 2-4)

- **Task 3.1:** Based on the gap analysis, develop or formalize a suite of cybersecurity documents compliant with NCSA requirements, including:

- An overarching Information Security Policy.
- A robust **Business Continuity Plan (BCP)**.
- A detailed **Disaster Recovery Plan (DRP)**.
- A comprehensive **Cyber Incident Response Plan (IRP)**.
- Data Classification and Handling Policy.
- Access Control Policy.
- Change Management Procedures.

Phase IV: Remediation Plan and Application Preparation (Month 5)

- **Task 4.1:** Develop a detailed Remediation Report and Action Plan, prioritizing all findings from the VAPT and gap analysis based on risk level.
- **Task 4.2:** Provide technical advisory support to the EMIS technical team during the implementation of critical remediation measures.
- **Task 4.3:** Compile all assessments, reports, and policy documents into a complete and professional CII Application Package as per NCSA format.

Phase V: Submission and Liaison (Month 6)

- **Task 5.1:** Formally submit the CII application to the NCSA.
- **Task 5.2:** Act as the primary technical point of contact, managing all communications, responding to queries, and facilitating any further verification required by the NCSA until the designation is granted.

4. Knowledge Transfer

4.1 Training

Alongside the dissemination workshops, following training programs are proposed for Knowledge Transfer and product dissemination

- Advance training on Software Development Life Cycle: 4 Training for 10 EMIS officials
- Intensive training on Software Development Management and Maintenance: 4 Training for 20 EMIS and Field IT Officials
- General Training on Software Management and Maintenance: 1 Training for 60 IT Officials.
- Dissemination Training for Software Operations: 9 Training in 9 Zones for Field level Officials

5. Consultant Team Composition

5.1 Key Experts

To successfully deliver the upgraded EMIS and associated software systems (Digital Archive, Inquiry Management, and Project Management as well as any associate requirements), the Consultants must provide a team of qualified and experienced professionals. The manpower engagement timeframe will be **intermittent**. But consultants will get flexibility to increase or decrease the number of personnel as per volume of Services. The following key personnel are essential for the implementation:

Key Experts and their Qualifications & Experiences

A. Project Manager (1 position)

- **Education Qualification:** Master's degree in computer science, Software Engineering, ICT, Information Systems, or a related discipline like Statistics, Electronics, Physics, Applied Physics, Mechanical Engineering, Bioinformatics along with higher level diploma in ICT.
- **Experience:**
    - 10 years of experience in managing large-scale software development or ERP implementation projects.
    - Proven experience in education sector, ICT projects or EMIS systems is highly desirable.
    - Must have domain knowledge of Education Ecosystem
    - Strong leadership, coordination, and stakeholder engagement skills.
    - Familiarity with government ICT procurement and development processes is an advantage.
    - Proven experience in handling end-to-end software lifecycle, vendor coordination, and risk management.
    - Ability to clearly explain technical concepts to both technical and non-technical audiences.
    - PMP or Prince2 certification preferred or 5 years' experience in managerial responsibilities in relevant Government projects.

B. QA / Testing Expert (1 Position)

- **Education Qualification:** Bachelor's degree in IT, Computer Science, or Quality Assurance-related discipline.
- **Experience:**
    - 4 years of experience in software quality assurance and testing.
    - Proficient in test planning, automation, performance testing, and UAT processes.
    - Familiar with tools like Selenium, JMeter, or similar.
    - Experience in validating large-scale data migration projects is preferred.

C. Senior Software Architect (1 Position)

- **Education Qualification:** Bachelor's or Master's degree in Computer Science or Software Engineering.
- **Experience:**
    - 8 years of experience in software architecture design and system integration.
    - Hands-on experience in developing scalable, secure, and modular enterprise applications.

- Deep understanding of database design, microservices architecture, Big date and API integration.
- Prior work with EMIS, HR, or financial systems is preferable.
- Expertise in system integration, modular design, and scalable architecture.
- Experience in developing secure and interoperable government systems is highly desirable.

D. Database Specialist / Data Migration Expert (2 positions)

- **Education Qualification**: Bachelor's degree in Computer Science, Information Systems, or Data Engineering.
- **Experience**:
  - 7 years of experience in database design, data migration, and data validation.
  - 3 years of experience in Data Science along with ability to deliver the core mathematical and statistical theories that underpin AI and ML algorithms.
  - Strong skills in SQL, ETL tools, data mapping, and data cleansing.
  - Experience with tools like Apache Spark and Hadoop is often required for handling massive datasets.
  - A solid grasp of core machine learning concepts is non-negotiable, including supervised learning (e.g., regression, classification), unsupervised learning (e.g., clustering, dimensionality reduction), and reinforcement learning.
  - Hands-on experience in large-scale data migration projects, preferably within education or public sectors.
  - Expertise in data migration, cleansing, normalization, and validation.
  - Experience with database optimization, backup, and recovery strategies.
  - Understanding data security, integrity, and audit mechanisms.

E. UI/UX Designer (1 Position)

- **Education Qualification:** Degree or diploma in Human-Computer Interaction, Graphic Design, or related field.
- **Experience:**
  - 3 years of experience in designing user-centric web and mobile interfaces.
  - Strong knowledge of UX research, wireframing, prototyping, and accessibility standards.
  - Proficient in design tools like Figma, Adobe XD, or Sketch.

F. MIS Specialist / Functional Analyst (1 position)

- **Education Qualification**: Bachelor's or Master's degree in Education, Public Administration, or Information Systems.

- **Experience**:
    - **6 years** of experience in EMIS or education sector ICT systems.
    - Deep understanding of functional requirements of educational data systems.
    - Skilled in translating user needs into system specifications.
    - Experience in education sector systems analysis or EMIS is a strong advantage.
    - Skilled in documentation, stakeholder interviews, and gap analysis.

5.2 Non-Key Experts

In addition to key experts, the following non-key expert/staff may be required to deliver the service. Indicative non-key staff is a guideline for the consultants. However, the consultants are free to make their own estimate to propose non-key staff.

A. Full Stack Developers (4 Positions)

- **Education Qualification**: Bachelor's degree in Computer Science, Software Engineering, or a related field.
- **Experience**:
    - **5 years** of experience in full-stack development (frontend and backend).
    - Proficiency in modern web development frameworks (e.g., Angular, React, Node.js, Laravel, Django, PHP, .NET, Java, Python).
    - Experience in developing user-friendly, responsive, and secure applications.
    - Should have mastery of Deep Learning Frameworks like TensorFlow, PyTorch, and Keras.
    - Should have mastery of Machine Learning Libraries such as Scikit-learn for various ML tasks, and Pandas and NumPy.
    - Knowledge of various algorithms such as linear regression, logistic regression, decision trees, support vector machines, and neural networks is also critical.
    - Familiarity with education management platforms is a plus.
    - *Special Requirements for AI / ML dedicated Developer/s*:
        - Portfolio for AI and ML projects
        - Certifications like- TensorFlow Developer Certificate / Microsoft Certified: Azure AI Engineer Associate / Google Professional Machine Learning Engineer / Certified Artificial Intelligence Scientist (CAIS)

B. Domain Expert (1 position)

- **Education Qualification:**
    - Graduate from Education or any discipline

- If graduate form any other discipline but Education, the expert must have a Master's degree from education or at least any advance diploma (foreign university) in Educational Management / Development /Planning, or a closely related field is required.
- Advance Training in EdTech is preferred.
- Any higher degree like M.Phil., PhD or Postdoc will be an added value.
- Any research project or journal in Education, EdTech will be highly appreciated.

- **Experience:**
  - 15 years of professional experience working within the education sector.
    - 7 years in a significant role involving the design, implementation, or management of education-enabling technology, such as an EMIS, SIS, or large-scale EdTech projects.
    - Proven experience working directly with government bodies, preferably the Ministry of Education or DSHE in Bangladesh.
  - Deep, demonstrable understanding of Bangladesh's secondary and higher education system, including its administrative structures, key policies, and operational challenges.
  - Strong leadership, coordination, and stakeholder engagement skills.
  - Familiarity with government ICT procurement and development processes is an advantage.
  - As a Technical Acumen, must have strong familiarity with the functionalities of enterprise-level information systems (like ERPs or EMIS) and a solid grasp of how data can be used to drive decision-making in education.

C. Cybersecurity Specialist (1 position)

- **Education Qualification**: Bachelor's degree in Cybersecurity, Information Security, Computer Science, or a related field. A Master's degree is preferred.
- **Experience**:
  - 6 years of professional experience in cybersecurity, with demonstrated expertise in securing enterprise-grade systems, including ERP or EMIS platforms.
  - Proven experience in conducting security assessments, vulnerability testing, risk analysis, and implementing mitigation measures.
  - Strong knowledge of international and national data protection laws, standards, and frameworks (e.g., ISO/IEC 27001, NIST, GDPR).
  - Hands-on experience in firewall configuration, intrusion detection/prevention systems (IDS/IPS), encryption techniques, and access control management.
  - Proficiency in developing and implementing security protocols, incident response plans, and disaster recovery strategies.
  - Professional certifications such as **CISSP**, **CISM**, **CEH**, or equivalent are **highly desirable**.

D. Junior Developer cum Support Engineer (2 position)

Education Qualifications: A Bachelor's degree in Computer Science, Software Engineering, Information Technology, or a related field.

Experiences:

- 3 years of professional, hands-on experience in web application development.
- Proficiency in front-end technologies such as HTML, CSS, and JavaScript. Experience with a modern framework (like React, Vue, or Angular) is a plus.
- Solid experience with a server-side programming language (e.g., PHP, Python, Node.js).
- Strong knowledge of relational databases like MySQL or PostgreSQL.
- Familiarity with version control systems, particularly Git.
- Experience working with RESTful and Json APIs.
- Excellent problem-solving abilities, strong communication skills, and a collaborative, team-oriented mindset.

CVs of the proposed non-key expert staff must be provided.

Note: Only the **Key Experts** positions listed above will be scored in the technical evaluation. However, individual staff must be proposed by the consultants for all the positions (Key Experts and non-Key Experts/other experts) listed in the TOR are required to meet qualification requirements specified for each position in the TOR. If any proposed staff does not meet the specified qualification requirements, and if the proposing consultants still ends up achieving the overall highest combined technical and financial score, then the consultants will be required during contract negotiations and prior to Contract signing to replace the unqualified individual with another individual who fully meets the qualification requirements for that position as specified in the TOR. CV must be signed by the experts.

5.3 Key & Non-Key Experts Inputs

The indicative staff inputs are tabulated below:

The proposed staff inputs (Key & Non-Key Experts) for the scope of services: Timeline is envisioned for 12 Months but the manpower provision is for intermittent time so that the consultants will have opportunity to use their manpower within the entire contract period.

Sl	Key Experts (CVs shall be evaluated)	Inputs in month		
		No	Man-month	Total (mm)
1	Project Manager	1	18	18
2	QA / Testing Expert	1	4	4
3	Senior Software Architect	1	12	12
4	Database Specialist / Data Migration Expert	2	15	30
5	UI/UX Designer	1	4	4
6	MIS Specialist / Functional Analyst	1	6	6
Total (Key Experts Inputs)		7		**74**
	Non-Key Experts/Other Experts			
1	Full Stack Developers	4	15	60
2	Domain Expert	1	6	6

Sl	Key Experts (CVs shall be evaluated)	Inputs in month		
		No	Man-month	Total (mm)
3	Cybersecurity Specialist	1	6	6
4	Junior Developer cum Support Engineer	2	18	36
Total (Non-Key Experts/Other Experts)		**8**		**108**
Total Staff Inputs (Key + non-Key)				**182**

Total estimated key experts' input is **74-man months**.

Substitution of Key Experts shall occur only in exceptional circumstances with prior written approval by the Client. Replacements shall possess equal or superior qualifications and experience, with a minimum of two weeks' overlap for knowledge transfer.

6. Deliverables:

Key Deliverables for Primary Requirements: EMIS Software System Upgradation and Enhancement

A. Upgraded EMIS Software System:

Enhanced Features and Functionality:

- Improved data entry, validation, and retrieval capabilities.
- Streamlined workflows for efficient data processing.
- Advanced reporting and analytics tools for data-driven insights.
- Robust security measures to protect sensitive educational data.
- User-friendly interface for seamless interaction.
- Integration with other relevant systems (e.g., HR, finance, procurement).

B. Data Migration and Validation:

Data Migration:

- Accurate and efficient transfer of existing data from the old system to the new Education ERP System.
- Data cleansing and standardization to ensure data quality.
- Mapping data fields and structures to maintain data integrity.

Data Scanning:

- Scanning service to transform paper data to digital data for the archiving system (Approximately 30,00,000 pages).

Data Validation:

- Rigorous testing to verify the accuracy and completeness of migrated data.
- Cross-checking and reconciliation of data to identify and resolve discrepancies.
- Implementation of data quality checks and controls to prevent future errors.

C. System Development:

To strengthen the efficiency, transparency, and responsiveness of the Directorate of Secondary and Higher Education (DSHE), several new software systems are proposed for development. These systems aim to support digital transformation initiatives and complement existing e-services provided by DSHE. The following systems are to be developed:

Digital Archive System:

This system will serve as a centralized, secure digital repository for DSHE documents, reports, correspondences, and historical records. Proposed system will be used to track, manage and store, retrieve record/newspaper/ Old Magazine/ Gazette/ Debate/ Reports and reduce paper. With the capabilities of keeping a record/newspaper/books/sha/ Gazette/ Debate/ Reports of the various versions created and updated. It will:

- Enable easy retrieval and search of archival documents.
- Ensure long-term preservation of institutional knowledge.
- Improve document sharing and access control among authorized personnel.
- Support digitization efforts and reduce dependency on physical records.
- Integration with DSHE's all online services for file management.

Inquiry Management System

This system is intended to handle public and internal inquiries more efficiently, ensuring accountability and timely responses. Key features will include:

- Online submission and tracking of inquiries or complaints.
- Categorization and routing of queries to relevant departments.
- Status notifications and response timelines.
- Analytical reports on inquiry types, trends, and response performance.

ACR Management System

The ACR Management System is proposed to streamline the process of performance evaluation for public officials under the Directorate of Secondary and Higher Education (DSHE). Traditionally handled through paper-based and manual processes, the new digital system will ensure confidentiality, efficiency, and traceability. Key features include:

- Secure digital platform for preparing, reviewing, and storing ACRs.
- Role-based access for reporting officers, countersigning authorities, and HR administrators.
- Structured input forms to ensure uniformity and completeness of performance evaluations.
- Automated alerts and workflow management to ensure timely completion of ACR cycles.
- Archival and retrieval functionalities for historical ACRs.
- End-to-end encryption and strict access control to maintain data confidentiality in accordance with government regulations.

Employees Personal Asset Information Management System

To the growing need for managing and tracking employees' personal assets provided by the Directorate of Secondary and Higher Education (DSHE), a comprehensive Employee Personal Asset Information Management System (PAIMS) is to be developed as integrated way with Personal Data Sheet (PDS). This system will enable the DSHE to effectively maintain records

of all personal assets provided to employees, ensuring proper accountability, tracking, and reporting for the government. The system aims to:

- Track all personal assets to employees who have been submitted e-Return and other resources recommended / demanded by the authority.
- Facilitate asset information report at the end of employment or any point of employment.
- Generate comprehensive reports and dashboards to monitor personal assets.

Online Data Collection Module

The Online Data Collection Module will serve as a dynamic, secure alternative to conventional form-based data gathering (e.g., Google Forms or offline templates). Tailored for DSHE's diverse operational needs, this module will allow rapid and structured data collection from field offices, educational institutions, and other stakeholders. Its core capabilities include:

- A configurable and reusable form builder for creating custom data collection templates.
- Multi-step validation process with admin approval at different levels (e.g., Upazila → District → DSHE).
- User authentication and access restrictions based on organizational hierarchy.
- Real-time data monitoring dashboards with filtering, aggregation, and export options.
- Integration with the EMIS database for seamless data ingestion and reporting.
- Enhanced security features to protect sensitive educational or personnel data.

Project Management System

To improve planning, monitoring, and execution of DSHE's development and operational projects, this system will offer:

- Project lifecycle tracking from initiation to completion.
- Task assignment, progress monitoring, and milestone management.
- Budget tracking and reporting tools.
- Integration with procurement and finance modules, if applicable.
- Dashboards for performance metrics and reporting to stakeholders.

Key Deliverables for Passive Requirements: Endorsed EMIS as CII

1. **Inception Report:** Outlining the detailed work plan, methodology, and timelines.
2. **CII Justification and Gap Analysis Report.**
3. **Comprehensive VAPT Report** with detailed findings and vulnerability descriptions.
4. **Full Suite of Security Policy Documents:** Including BCP, DRP, IRP, and others as listed in Scope of Services.
5. **Prioritized Remediation Action Plan.**
6. **The Final, Compiled CII Application Package.**
7. **Monthly Progress Reports** and a **Final Project Completion Report** summarizing all activities and the final status of the CII application.

7. Duration:

The Software Development and Upgradation area of this assignment is projected for 30 months (12 months development and improving + 18 months Piloting, Maintenance and Bug fixing) from the date

of contract signing. But the development part is expected to be completed within 12 months from the date of commencement. The rest of the time will be considered as Piloting, Enhancing / Upgradation and Maintenance Period.

7.1 Timeline

The detailed timeline for each task is as follows:

Sl. No.	Timeline	Activities
1	**Month 1**	▪ Kick off meeting. ▪ Submission of Inception Report.
2	**Month 2**	▪ Need analysis and SRS drafting ▪ SRS Report submission
3	**Month 3**	▪ Initiate upgradation of existing modules ▪ Initial setting up and configuration of the upgraded software system.
4	**Month 4**	▪ Data migration and validation processes.
5	**Month 5**	▪ Integration of new modules and features. ▪ Development of user manuals and documentation.
6	**Month 6**	▪ Sketch out new demand of DSHE ▪ SRS submission for new demands of DSHE.
7	**Month 7**	▪ Development of New Modules
8	**Month 8**	▪ Initial testing and validation. ▪ User feedback sessions.
9	**Month 9**	▪ Final testing and validation. ▪ Draft Final Training Manual ▪ User training sessions ▪ System performance optimization.
10	**Month 10**	▪ Implementation of support and maintenance processes. ▪ Addressing any post-implementation issues.
11	**Month 11 & 12**	▪ Interactive Training Materials and Sessions ▪ Final review. and Acceptance for initiation
12	**Month 13 to 18**	▪ Piloting ▪ Improving and Upgradation ▪ Final User Manuals and Interactive Training Sessions ▪ Acceptance of Satisfactions
13	**Month 19-24**	▪ Warranty support ▪ Accommodate Chage Requirements (if any)

Sl. No.	Timeline	Activities
14	**Month 25-30**	▪ Maintenance ▪ Bug fixing ▪ Fine tuning ▪ Final Acceptance Letter

7.2. Project Milestones:

Milestone 1: Inception Report (End of Month 1).

Milestone 2: SRS Report (End of Month 2)

Milestone 3: Integration of new modules and development of documentation (End of Month 5).

Milestone 4: Development of New Modules and User feedback sessions (End of Month 10).

Milestone 5: Final testing and validation of New Modules (End of Month 12).

Milestone 6: Piloting of New Modules and Interactive Training Sessions (End of Month 18).

Milestone 7: Report on satisfaction of Warranty Support (End of Month 24).

Milestone 8: Clearance for Accommodation of Change Requirement (End of Month 24).

Milestone 9: Proper maintenance report (End of Month 27)

Milestone 10: Clearance report for any Bug fixing and fine tuning (End of Month 30).

8. Management of the Assignment

8.1 Project Governance:

To ensure effective governance of the assignment, the following governance structure will be implemented:

- **Project Oversee Committee:** A committee comprising senior representatives from DSHE, the consultants, and key stakeholders will be established to provide strategic direction and oversight for the project.
- **Project Focal Point:** A dedicated project focal point will be appointed to oversee the day-to-day management of the project, including coordination with stakeholders, monitoring progress, and addressing any issues that arise.
- **Project Team:** A project team comprising representatives from DSHE, the consultants, and other relevant departments will be formed to execute the assignment tasks and deliverables.

8.2 Stakeholder Roles and Responsibilities:

LAISE & EMIS, DSHE:

- Oversee the project, ensure alignment with DSHE objectives, and provide regular updates to stakeholders.
- Responsible for the installation, configuration, and testing of hardware and infrastructure components with the assistance of the nominated Firm.

Software Firm:

- Provide hardware and infrastructure components, support installation and configuration, and ensure timely delivery.
- Collaborate with the DSHE to ensure the new modules meet the needs of the EMIS system.
- Provide feedback on the performance of the new infrastructure and report any issues.

8.3 Communication Plan:

To ensure effective communication throughout the assignment, the following communication plan will be implemented:

- **Regular Meetings:** Schedule regular meetings with stakeholders to provide updates on project progress and address any issues.
- **Progress Reports:** Provide regular progress reports to the Senior System Analyst, EMIS Cell, DSHE.
- **Feedback Mechanism:** Establish a feedback mechanism to collect input from stakeholders and make necessary adjustments.
- **Contact Information:** Provide contact information for key project personnel to facilitate communication.

8.4 Project Dependencies:

The successful completion of this assignment depends on the following factors:

- Availability of skilled personnel for installation and configuration.
- Coordination between various departments of DSHE, including field level stakeholders.
- Firm support and cooperation.

8.5 Reporting:

The consultants will provide regular progress reports to the DG DSHE through the PD LAISE with CC to EMIS Cell, DSHE.

8.6 Contact Information:

For any queries or further information, please contact:

DG, Directorate of Secondary and Higher Education Bangladesh, Dhaka. With CC to Projector Director, LAISE and Senior System Analyst of EMIS, DSHE.

8.7 Administration for Scope of Services 3.3 & Proposed Timeline

The primary will take the whole responsibility to do necessary technical groundwork along with relevant administrative liaisons in coordination with DSHE / Project authority.

8.8 Governance and Reporting for Scope of Services 3.3

The consultants will work under the direct supervision of the Project Director of the LAISE and in collaboration with EMIS Cell, DSHE. Formal monthly reports will be mandatory.

8.9 To be provided by the Consultants

During the assignment, the Consultants shall provide all the facilities for their staff and other logistical requirements on their own to fulfill their obligations. These will also include backstopping experts,

support staff and office facilities, office equipment and supplies, required equipment and materials for the assignment and communications as required. The Consultants will set out the phase wise requirements in the technical proposal and provide the financial cost estimates for these in their financial proposal.

IP & Data Ownership: All intellectual property rights and data generated under this assignment shall be vested in the Client. The Consultant is granted a nonexclusive, non-transferable license to use non confidential learnings for internal purposes with the Client's prior written consent.

8.10 To be provided by the Client

The client will provide appropriate data, information, etc. necessary to carry out the assignment.