Government of the People's Republic of Bangladesh
Ministry of Road Transport & Bridges
Road Transport & Highways Division
Dhaka Transport Coordination Authority (DTCA)

Terms of Reference (ToR) of Information Technology (IT) Service Provider
for
Transport Clearing House Operation & Maintenance

Assignment Title	:	DTCA Clearing House operation and maintenance service.
Assignment duration	:	Preliminary 12 (twelve) Months, extendable on the basis of performance and requirement.
Primary assignment location	:	Nagar Bhaban, 13-14th Floor, Fulbaria, Dhaka-1000
Funding source(s)	:	(GoB) Revenue budget of DTCA
Contracting entity	:	Executive Director, Dhaka Transport Coordination Authority (DTCA)

1. Background

DTCA has established a Clearing House (hereinafter "CH") System for fare collection and settlement of Public Transport Operators (MRT, BRT, Buses etc.). An automated fare collection system for the public transport aims to integrate all modes of transportation through an interface known as IC card (Rapid Pass card) and Clearing House (CH) system has been developed by DTCA. Fare collection and settlement of MRT Line-6 will be done through Rapid Pass Card and MRT Pass Card with the integration between Clearing House System and MRT Line-6. To this end, a Revised Memorandum of Understanding (RMoU) was signed among Road Transport & Highways Division (RTHD), Dhaka Transport Coordination Authority (DTCA), Dhaka Mass Transit Company Limited (DMTCL), and Japan International Cooperation Agency (JICA) on 26 October 2019. A Special Purpose Company (SPC) will be formed for the purpose of operation and maintenance of Clearing House System and the Rapid Pass Card Business Expansion. SPC formation is in process. Metrorail Line-6 is expected to start operations in December 2022, within this period the formation of SPC will not be completed. Before formation of SPC, Clearing House will be run by DTCA from revenue budget. Hence, DTCA wants to appoint one national Information Technology (IT) Service Provider (Firm) for Clearing House Operation and Maintenance.

2. Objectives of the Assignment

2.1 The clearing house system must be operated, monitored and maintained 24 hours a day, seven days a week and 3(Three) shifts per day by the IT service provider.

2.2 Ensure the clearing house system runs smoothly.

2.3 Provide hardware and operational support of the clearing house system and resolve troubleshooting.

2.4 Fare settlement for various public transport operators should be completed within specified time.

2.5 Perform daily monitoring and troubleshooting of various server and network systems.

2.6 Report to the authority (DTCA) on the operation and maintenance services of the clearing house system mentioned as per clause 6.

3. Scope of Services

3.1 The Service Provider shall be a national Information Technology (IT) firm (hereinafter referred to as the "Service Provider") that will provide Clearing House operations and maintenance services. In order to provide Clearing House service to Metrorail Line-6, 8(Eight) IT personnel will have to work 24/7 (24 hours, 7 days a week) in 3(Three) shifts per day, including weekly and public holidays. Table 2-1 shows the list of potential manpower by shifts,

Table 2-1 Daily Shift Information

Shift No.	Duration	Responsibilities	No. of Personnel (Shift-wise)
1st Shift	08:00~16:00	Operation Management, Issue Register &Emergency Support	2
2nd Shift	16:00~00:00	Operation and Maintenance	2
3rd Shift	00:00~08:00	Maintenance and Monitoring	2

3.2 The objective of the IT Service Provider is to achieve efficient and proper operation and maintenance of the CH during the assigned period through the following works:

3.2.1 **Hardware support:** The clearing house servers such as IDMS, monitoring server, settlement server, etc. should be checked round the clock, and troubleshooting should be done if necessary. The network functionality of the server needs to be confirmed. Hardware support will be needed in all of the 3 shifts.

3.2.1.1 **Monitoring the following Hardware:**

1. Physical Server (ID Management Server, Settlement Server, Monitoring Server, Storage Server, Document Server, Web Server, etc.)
2. Server Storage (Storage Server, Linear Tape-Open drive, Hard drive, etc.)
3. Networking equipment (Router, Switch, VPN Router, etc.)

3.2.1.2 **Performing the following maintenance tasks:**

1. Hardware Health Check (Temperature, Input/Output summary, Storage capacity, etc.)
2. Hardware Troubleshooting
3. Hardware Repairing or Replacement

3.2.1.3 **Network Maintenance:**

1. Ensure Network communication (maintain a stable connection) and connectivity.

3.2.2 **Operational support:** The most important part of operational support is the settlement of the financial transaction through the software and it must be completed within the stipulated time. Software functionality needs to be checked whether it is working correctly or not and transaction functionality needs to be ensured. Hardware troubleshooting has to be done and transactional records should be managed.

3.2.2.1 System application Monitoring:

1. Software Monitoring
2. Server-side Application (Batch Application, Rapidware_IDMS, CH Terminal, etc.)
3. Server-side 3rd party tools (Express Cluster, Acronis, NagiOS, etc.)
4. Database Monitoring
5. Transaction Monitoring

3.2.2.2 Settlement:

1. PTO Settlement and Cross check
2. Agent Settlement and Cross check
3. CHU Settlement and Cross check
4. DTCA Account(s) Cross check

3.2.2.3 Error Handling and Troubleshooting
3.2.2.4 PTO or Agent Addition
3.2.2.5 System Security Maintenance
3.2.2.6 Reporting

Note: Procuring Entity will provide with detailed task list when required.

4. Qualification Criteria of the IT Service Provider

4.1 Must be a local IT/ITES firm/service provider with minimum 7 years of total experience in development, surveillance/monitoring, operation and maintenance of IT infrastructure/ Financial Service/Banking System. Documentary evidence (Work completion certificate, experience certificate) must be provided.

4.2 Must have minimum 4 years of experience in development, surveillance/monitoring, operation and maintenance of medium/ large-scale IT infrastructure/ Financial Service/Banking System, which processes a huge amount of data in a short period of time and has common functions about error handling and log output. Documentary evidence (Work completion certificate, experience certificate) must be provided.

4.3 Experience in system development, operation and maintenance of Clearing House System/ Transport Ticketing Solution/IC card-based system will be given preference. Documentary evidence (Work completion certificate, experience certificate) must be provided.

4.4 Must have liquid assets as working capital or credit line of minimum BDT. 75 Lakh.

4.5 Must have Yearly turnover of minimum BDT. 60 Lakh. Must submit updated audit report of previous 1(One) year.

4.6 Must have minimum of 30 (Thirty) total employees and of which minimum of 15 (Fifteen) total IT personnel (both for software support and network operation/maintenance related).

4.7 Must have valid Up to Date trade license, Income Tax Payment certificates, VAT Registration certificates, Certificate of Incorporation (if any).

5. Manpower Required for the Service

5.1 Tentative Manpower resources:

The Service Provider's working team shall consist of the following key personnel. The allocation of manpower for different shifts will be as shown in Tables **5-1** and **5-2**.

Table 5-1 Manpower and Designation

Designation	Short Form	No. of Positions
Team Leader / Operation Manager	TL	1
Senior System Engineer	SSE	1
System Engineer	SE	2
Maintenance Engineer	ME	4
Total		8

Table 5-2 Detail Shifting Structure (Matrix)

Day of the Week	Work Schedule (Timeframe)		
	08:00~16:00 hrs.	16:00~00:00 hrs.	00:00~08:00 hrs.
Sunday	TL, SE-1	SSE, SE-2	ME-1, ME-2
Monday	SSE, SE-2	TL, SE-1	ME-3, ME-4
Tuesday	TL, SE-1	SSE, SE-2	ME-1, ME-2
Wednesday	SSE, SE-2	TL, SE-1	ME-3, ME-4
Thursday	TL, SE-1	SSE, SE-2	ME-1, ME-2
Friday	ME-3	ME-4	ME-1, ME-2
Saturday	ME-1	ME-2	ME-3, ME-4

N.B.: 1. Includes all public and government holidays.

2. Shifting time can be modified later on.

5.2 Detail Qualification of Team Members:

It is desirable for the Service Provider to have sufficient experience in Operation & Maintenance of System management in any large-scale private/government/autonomous IT organizations. Furthermore, the service provider is required to have sufficient knowledge of the Clearing House System. The detailed qualifications of key personnel consisting of Team Members are given in Table **5-3**. Their respective CV's along with relevant academic and professional certificates must be included.

Table 5-3 Detailed Qualifications of the Key Team Members

Designation	Academic qualification, professional experience and other competencies
Team Leader or Operation Manager	**Academic qualifications (Submission of copy of certificate is mandatory):** • Bachelor degree in any Science/Engineering discipline from any UGC approved university. • Post-Graduation in any IT/Management discipline from any UGC approved university will be given preference. **N.B.:** In case of foreign degree, equivalency certificate from UGC has to be submitted. **Professional Experience (Submission of copy of certificate is mandatory):** General: • Minimum 10 Years of professional experience in IT related job. Specific: • Minimum 5 Years of experience as a Team Leader or Operation Manager or equivalent post in IT field. • Experience in Linux-based system. • Experience and clear understanding of the Clearing House/ Banking system and architecture. • Experience in Operation and Maintenance of IC Card-based System will be given preference. **Competencies:** • Excellent understanding of the service goals and objectives. • Good communication and interpersonal skills. • Capable of maintaining strong relationships. • Strong organizational and multi-tasking skills. • Excellent analytical and problem-solving abilities. • Team-management and leadership skills. • Documentation management and ability to use project management tools. • Attention to detail even under pressure. • Time management skills with the ability to meet deadlines. • Ability to work in night-shift if necessary.
Senior System Engineer	**Academic qualifications (Submission of copy of certificate is mandatory):** • Bachelor degree CSE/CS/ICT/IT/Software Engineering/EEE/ETE/ECE or IT relevant field from any UGC approved university. **N.B.:** In case of foreign degree, equivalency certificate from UGC has to be submitted. **Professional Experience (Submission of copy of certificate is mandatory):** General: • Minimum 8 Years of professional experience in IT related job. Specific: • Experience in and clear understanding of Clearing House/ Banking/ Financial/ Ticketing system design, development, and

Designation	Academic qualification, professional experience and other competencies
	implementation of software systems, applications, and related products. • Experience in Linux-based system • Experience in MySQL Database • Experience in systems planning, security principles, and general software management. • Experience in Operation and Maintenance of IC Card-based System will be given preference. **Competencies:** • Excellent understanding of the service goals and objectives. • Knowledge of applicable data privacy practices and laws. • Good project management skills. • Excellent written, oral, and interpersonal communication skills. • Ability to conduct research into systems issues and products as required. • Ability to communicate ideas in both technical and user-friendly language. • Highly self-motivated and directed, with keen attention to detail. • Analytical and creative problem-solving abilities. • Able to prioritize and execute tasks in a high-pressure environment. • Strong customer service orientation. • Ability to work in a team-oriented and collaborative environment. • Ability to work in night shift, if necessary.
System Engineer	**Academic qualifications (Submission of copy of certificate is mandatory):** • Bachelor degree CSE/CS/ICT/IT/Software Engineering/EEE/ETE/ECE or IT relevant field from any UGC approved university. **N.B.:** In case of foreign degree, equivalency certificate from UGC has to be submitted. **Professional Experience (Submission of copy of certificate is mandatory):** General: • Minimum 5 Years of professional experience in IT related job. Specific: • Experience in financial system design, development, and implementation of software systems, applications, and related products. • Experience in Linux-based system. • Experience in MySQL Database. • Experience in Operation and Maintenance of IC Card-based System will be given preference. **Competencies:** • Problem Analysis and solution skills. • Ability to work in night-shift.

Designation	Academic qualification, professional experience and other competencies
	• Excellent communication skills.
Maintenance Engineer	**Academic qualifications (Submission of copy of certificate is mandatory):** • Bachelor degree CSE/CS/ICT/IT/EEE/ETE/ECE or IT relevant field from any UGC approved university. **N.B.:** In case of foreign degree, equivalency certificate from UGC has to be submitted. **Professional Experience (Submission of copy of certificate is mandatory):** General: • Minimum 5 Years of professional experience in IT related job. Specific: • Experience in network and related hardware configuration and maintenance. • Technical knowledge of Linux and Windows server maintenance. • Technical knowledge of VPN Router, Cisco Router, Switch, etc. **Competencies:** • Good verbal and written communication skills. • Ability to work well under pressure. • Ability to work in team. • Ability to work in night-shift.

The above members (Table 5-3) must be permanent employees of the service providing firm. The service provider may propose other experts and supporting staffs required to accomplish the tasks outlined in the ToR. But the payment of the service will be provided based on the manpower mentioned in table **5.1**. It is the service provider's responsibility to select the optimum team and to propose the professionals who it believes best meet the requirements for the Clearing House Operation and Maintenance. In case of any replacement of the assigned key personnel, the Service Provider must inform DTCA at least one week before for consent in written form.

5.3 Scope of work for the respective key personnel:

Detailed information on the major tasks and duties each member of the service-providing team shall perform is provided in Table **5-4**

Table 5-4: Role of Service Providing Professionals

Designation	Responsibilities
Team Leader or Operation Manager	1. Participate in CH operation and maintenance meetings and propose improvements if necessary. 2. Evaluate potential operation and maintenance problems and technical hitches and propose solutions. 3. Plan and design server and security audits, system backup procedures, server maintenance plans, and other recovery processes in accordance with the DTCA's disaster recovery and business continuity strategies. 4. Plan and manage Service Providing Team goals, service schedules, and new information. 5. Supervise and coordinate all team members to keep work flow on track. 6. Manage O&M Reporting by ensuring all necessary materials are current, properly filed, and stored. 7. Direct service-related correspondences with the service team. 8. Communicate with DTCA to identify and define Service requirements, scope, and objectives. 9. As per requirement or if situation demand, Team Leader will work accordingly to DTCA needs.
Senior System Engineer	1. Ensure stakeholder (PTO, Agent, CHU) settlements with the proper cross-checking method. 2. Ensure the effectiveness and efficiency of Clearing House systems; planning, reporting and implementing strategies for improving or further leveraging. 3. Propose and create system operation model, specifications, diagrams, and charts to provide direction to System Engineers and Maintenance Engineers. 4. Design and perform server and security audits, system backup procedures, server maintenance plans, and other recovery processes in accordance with the DTCA's disaster recovery and business continuity strategies. 5. Ensure system connectivity of all servers, software, and other applications. 6. Create and maintain documentation as it relates to system configuration, mapping, processes, and service records. 7. Ensure compatibility and interoperability of system updates (OS, Bios, etc.). 8. Coordinate and perform in-depth tests, including end-user reviews, updating systems. 9. Monitor and test system performance; prepare and deliver system performance statistics and reports. 10. Provide orientation and training to end-users for all modified and new systems. 11. Provide guidance and assign tasks to System Engineers and

Designation	Responsibilities
	Maintenance Engineers
System Engineer	1. Manage and monitor all installed systems and infrastructure for the Clearing House System to be in line with the procuring entity's guidelines or SOP (standard operating procedure). 2. Define procuring entity's needs and functionality in the service-providing cycle. 3. Assist and coordinate with Maintenance Engineers in order to smoothen CH Operation. 4. Install, configure, and test operating systems, application software, and system management tools. 5. Ensure the highest level of systems and infrastructure availability. 6. Implement warranty and support activities for software and hardware. 7. Evaluate the existing system and provide the technical direction to Maintenance Engineers. 8. Take proper measures to ensure system security. 9. Oversee the customization of software and hardware requirement. 10. Collaborate with Senior System Engineer to ensure high-quality deliverables within Service guidelines, policies, and procedures. 11. Deal with work process, optimization methods, and risk management tools for successful accomplishments according to the requirements of the stakeholders.
Maintenance Engineer	1. Planning and undertaking scheduled maintenance. 2. Responding to breakdowns 3. Diagnose hardware faults and fixing them. 4. Repairing equipment. 5. Obtaining specialist components, fixtures, or fittings. 6. Maintaining statistical, operational and maintenance records. 7. Ensuring compliance with health and safety legislation. 8. Creating maintenance procedures. 9. Managing stocks of supplies and equipment.

5.4 Payment

Payment will be started after the commencement of assignment after the initial 2 months of training period. Monthly bill should be submitted along with necessary recommendation from the Clearing House unit of DTCA. Payment will be made monthly against each bill submitted by the service provider. Bill of the previous month should be submitted within 15th of the next month. Bill should be submitted to Executive Director's office and will be paid after deduction of Income Tax, VAT etc. As per government rules and regulations through Account Payee Cheques.

6. Reporting

Within the scope of this ToR, the service provider has to prepare and submit different reports and documents for each category of work to DTCA as shown in Table 6-1. Service provider shall provide an electronic copy and hard copy of each of these reports.

Table 6-1 Reports to Be Submitted

Type of Report	Timing
Monthly Maintenance Report	Every month
Daily Sales Report	Daily
Monitoring Report	Daily
PTO Settlement Report	As required by DTCA
Agent Settlement Report	Monthly
Operation and Maintenance related Quality Control Report	weekly and monthly
Origin Destination Report (OD Data)	As required or upon request by DTCA
Other Technical Report	As required or upon request by DTCA

7. Training /Knowledge sharing

After signing the agreement JET will provide training for 2 (two) months to the key personnel (described in Table 5-3) of the service provider prior to the commencement of the assignment. DTCA will not provide any payment during the training period. The Service provider will have to bear the whole cost of the training i.e. administrative cost, remuneration & others.

8. Non-Disclosure Agreement

A Non-Disclosure Agreement shall be signed between DTCA and Service provider for sharing the minimum level of information of Clearing House System for operation and maintenance the Confidential Information. Service Provider should maintain their internal NDA for their individual assigned employees. When Service provider employs a new staff, NDA shall be concluded between Service Provider and new staff. Service Provider may have subsidiary company which is employed in the operation. In that case, Service Provider shall conclude NDA with subsidiary company.

9. Obligations of both parties

9.1 Procuring Entity

Procuring Entity will provide the following to the service-providing company/firm for the facilitation of services:

1. All required existing user manuals and system specification documents upon signing an NDA (Non-Disclosure Agreement) with Procuring Entity.
2. Work space, chair, table, network connectivity, electricity etc.
3. Procuring Entity may impose a penalty in case of any sort of Service failure/abruption.

9.2 Service Provider

Obligations of the Service provider will include but not be limited to:

1. The Service Provider will be solely responsible for the Operation and Maintenance of the CH System, shift management, attendance, payroll, etc. of their service personnel deployed on DTCA premises.
2. The Service Provider will deploy personnel according to operational and maintenance

schedule of DTCA.

3. The Service Provider will ensure the NDA signing with hired personnel for national security purposes.

4. If any damage or pecuniary loss occur due to service provider or personnel deployed by the service provider during service (contract) period, service provider will be held responsible and damage and pecuniary loss incurred.

5. The Service provider will be responsible to ensure the security and integrity of the system.

6. The Service Provider will be responsible to share the information of replacement of their Key Personnel to DTCA.

7. Any sort of training's cost will be borne by the service provider.

10. Appendix

Abbreviation	Elaboration
AFC	Automatic Fare Collection (System)
CH	Clearing House
CHCI	Clearing House and Card Issuer
CHS	Clearing House System
CPU	Central Processing Unit
DES	Data Encryption Standard
DTCA	Dhaka Transport Coordination Authority
IC Card	Integrated Circuit Card
ID	The unique number which identifies each card
IDMS	ID Management Server
JET	JICA Expert Team
JICA	Japan International Cooperation Agency
LTO	Linear Tape-One
O&M	Operation and Maintenance
PTO	Public Transport Operator
R/W	Reader / Writer
SS	Settlement Server
TOM	Ticket Office Machine
VPN	Virtual Private Network