



Terms of Reference  
For

Hiring a firm for Enhancement, Maintenance AND  
IT Service Management for Ekipay System

Aspire to Innovate (a2i)  
Government of the People's Republic of Bangladesh  
ICT Division  
Agargaon, Dhaka



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# 1. Background

The Government of the People's Republic of Bangladesh had taken the initiative to ensure that Government services are made available to citizens electronically through the improvement of online infrastructure, and Internet connectivity, or by making the country digitally empowered in the field of technology.

EkPay is an integrated bill payment system in the country that offers interoperable and accessible bill payment services to citizens through multiple payment nodes. EkPay provides citizens a convenient way for paying bill through Web Portal, Mobile Application, and eKpay integrated bank agent point. During the Access to Information phase III, a2i inaugurated the first version of the platform with limited technology features and limited biller and payment instrument integration. To continue the effort to make the bill payment easy and convenient for citizens, Aspire to Innovate wants to upgrade the eKpay platform with the latest technological innovations for bill payment, continuous integration, and increase the customer experience for bill payment anywhere, anytime.

To further strengthen financial service delivery and enhance citizens' experience in a rapidly evolving digital ecosystem, Aspire to Innovate (a2i) has undertaken the initiative to upgrade the ekPay platform with state-of-the-art technologies, automated processes, and scalable integrations. This modernization aims to ensure uninterrupted, secure, and user-friendly bill payment facilities—anywhere, anytime. The enhanced ekPay platform will not only support continuous innovation and interoperability across payment systems but will also play a vital role in advancing the national vision of a digitally empowered, service-oriented government.

## 2. About the Organization

Aspire to Innovate (a2i), a whole-of-government programme of ICT Division, supported by Cabinet Division and UNDP, that catalyzes citizen-friendly public service innovations, simplifying government and bringing it closer to people. It supports the government to be on the forefront of integrating new, whole-of-society approaches to achieve the society. The objective of the project is to increase transparency, improve governance, and reduce the time, difficulty and costs of obtaining government services for under-served communities of Bangladesh. This is to be achieved by the following 3 major components of the project:

**Component 1:** Institutionalizing Public Service Innovation and Improving Accountability

**Component 2:** Catalyzing Digital Financial Services and Fintech Innovations

**Component 3:** Incubating Private Sector-enabled Public Service Innovation

### 3. Review of the Existing System

ekPay, the national payment aggregator platform, began its journey under the a2i programme to ensure interoperable, secure, and citizen-centric bill payment services in Bangladesh. Over the years, ekPay has evolved into a trusted digital payment aggregator platform, enabling citizens to pay various government and private-sector bills through a unified interface. The platform integrates a wide range of billers, financial institutions, and payment instruments, making it one of the most inclusive payment ecosystems in the country.

#### 3.1. What is ekPay System?

ekPay is the national interoperable payment gateway and bill payment platform of the Government of Bangladesh. It is a core component of the government's Digital Financial Services (DFS) ecosystem, enabling citizens, government agencies, and service providers to perform secure, fast, and unified digital payments through a single platform. The platform streamlines end-to-end payment processes for government fees, utility bills, educational payments, e-service charges by offering a standardized and interoperable payment interface.

#### 3.2. Existing Features and Functions:

##### 3.2.1. Payment Aggregator Management

The module is a critical component of the system, responsible for configuring and integrating multiple third-party payment gateways such as Mobile Financial Services (MFS), card payment systems, internet banking, and digital wallets. This module ensures secure, reliable, and seamless communication between the ekPay platform and external payment processors, thereby facilitating efficient digital transactions. It allows system administrators to manage gateway credentials, define transaction routing priorities, monitor real-time performance metrics such as success rates and latency, and dynamically switch between gateways to ensure optimal performance and availability. By centralizing the management of diverse payment channels, this module enhances operational flexibility, improves transaction reliability, and supports uninterrupted service delivery to end-users.

##### 3.2.2. Payment Instrument Management (Bank, MFS, IB, Wallet)

This feature manages and orchestrates all types of financial instruments that users can utilize to make payments within the system. It supports a diverse range of payment sources, including traditional bank accounts, mobile financial services (MFS) such as bKash or Nagad, internet banking (IB) platforms, and various digital wallets. The module ensures secure registration, verification, and maintenance of these instruments, enabling users to select their preferred payment method seamlessly. By centralizing the management of all financial instruments, the

system enhances flexibility, simplifies user experience, and establishes a reliable framework for processing transactions across multiple channels.

### **3.2.3. Rate & Charge Management**

This module defines and controls the various fees, commissions, and charges applied to different types of transactions. It allows for flexible rate configuration based on service type, transaction volume, or user category. Admins can set flat or percentage-based and slab-based charges and apply tiered pricing structures.

### **3.2.4. Micro-Merchant Management**

Micro-Merchant Management oversees the onboarding, verification, and operational tracking of micro merchants who facilitate digital payments or customer services. Each merchant can be assigned specific roles, service types, locations, and permissions based on business requirements. The module includes service-based commission configuration, KYC verification, status and activity monitoring, and detailed transaction history. It ensures that micro merchants adhere to compliance standards and deliver reliable, efficient service to end-users.

### **3.2.5. Refund Management**

This feature facilitates the process of issuing refunds for failed, reversed, or customer-requested transactions. It ensures that eligible refunds are processed accurately and promptly. The system tracks the refund status, logs reasons, and integrates with payment gateways or financial institutions for automated settlements.

### **3.2.6. Payment QR**

Payment QR enables fast, contactless transactions by generating and scanning QR codes. Merchants can generate static or dynamic QR codes linked to specific amounts or invoices. Users can scan these codes using mobile apps to complete payments instantly.

### **3.2.7. Challan Management**

Challan Management is designed for the generation and tracks payment challans for government services revenue. The system generates challans with unique IDs based on the transaction and track statuses. It integrates with various service providers (merchant) institutions for direct payment processing.

### **3.2.8. Service Aggregation Management**

This module functions as a centralized service aggregator, connecting government agencies and utility service providers (such as gas, water, electricity, telecom, land services, education and different Govt. services) to the digital payment ecosystem in a single API. It offers a unified and interoperable platform that enables citizens to conveniently pay a wide range of bills and fees through a single interface. By this integration it eliminates individuals integration with different services for the financial service providers (bank, MFS, Fintech platform). The aggregator framework enhances accessibility, operational efficiency, and transparency in digital financial transactions. This module maintains comprehensive records and processes payments through the ekPay system. It includes billers' identification details, payment channels, and categories. Additionally, the module supports the onboarding, updating, and monitoring of billers & Government agencies.

### **3.2.9. Merchant Management**

Merchant Management handles the registration, configuration, and monitoring of merchants who accept payments through the platform. It allows for defining merchant profiles, business categories, payment preferences, and commission structures. The module supports merchant onboarding with KYC verification, contract handling. Merchants can access their dashboards to track transactions, refunds, settlements, and performance metrics, ensuring transparency and smooth operations.

### **3.2.10. Merchant-wise Payment System Mapping Management**

This feature allows administrators to map specific payment systems (such as certain gateways or channels) to individual merchants. It provides flexibility in defining which payment routes are available to which merchant, based on their business model or agreement. This ensures optimized routing, cost efficiency, and compliance with custom contractual obligations.

### **3.2.11. Assisted Partner Management**

Assisted Partner Management supports third-party partners who facilitate payment services for service fees and utility bill collection. The financial organizations are the main consumers of these services. The agent points and UDC entrepreneurs can use this module under their base organization too.



### 3.2.12. Assisted Partner-wise Biller Mapping Management

This module enables the assignment of specific billers to assisted partners. It ensures that partners only have access to the billers relevant to their operations, reducing errors and improving security.

### 3.2.13. Dispute Management

Dispute Management handles transaction-related conflicts raised by users, merchants, or billers. It provides tools for lodging disputes, assigning cases, verifying evidence, and issuing resolutions. The module supports different dispute categories like failed payments, duplicate charges, and unauthorized transactions.

### 3.2.14. Reconciliation Management

The ekPay reconciliation module includes functionality to upload manually reconciled data into the system in Excel format. The module also provides the capability to download reconciliation files in accordance with operational requirements.

### 3.2.15. eKYC & Due Diligence Management

Currently, the eKYC process in Ekpay involves the manual entry of basic merchant/assisted partners information during onboarding by the admin. The system allows the admin to capture essential merchant details, including Name, Mobile Number, Email ID, Address, Company Name, Web URL, White Listed IP Address, Merchant Type etc. Additionally, multiple contact persons can be added for each merchant, ensuring proper communication channels.

Furthermore, Ekpay supports capturing merchant bank account details, allowing the admin to record information such as Account Number, Account Holder Name, Bank Name, Branch City, Routing Number etc. This ensures that all financial and settlement-related information is accurately maintained for each merchant.

These manually collected details form the foundational eKYC dataset, enabling verification, record-keeping, and financial management for merchants within the Ekpay platform, ensuring both operational efficiency and compliance in merchant onboarding.

### 3.2.16. Top-up Management

The top-up module facilitates recharging of mobile balances. It integrates with telecom operators, financial institutions, and service providers to enable seamless and instant top-up

services. Users can perform top-ups using their preferred payment methods. The system logs all top-up transactions, handles failures with retry mechanisms, and provides usage reports. It enhances user convenience and adds value to the platform's service offerings.

### 3.2.17. EMI Management

EMI (Equated Monthly Installment) Management allows users to convert eligible transactions into monthly installments. It defines EMI terms, interest rates, tenure options, and eligibility criteria based on user profiles and merchant agreements. The module integrates with banks and financial partners for credit approvals and payment processing.

### 3.2.18. Instant-debit Management

Instant-debit Management enables real-time deduction of funds from a user's linked financial account the moment a transaction is triggered. The system continuously synchronizes with banks, mobile financial services, or digital wallets to validate available balance, generate secure debit requests, and process them within milliseconds. It ensures seamless automation by eliminating manual intervention, reducing payment delays, and improving service efficiency.

### 3.2.19. Interoperable D-Toll Management

The interoperable toll management system enables seamless digital toll operations across multiple toll plazas and vehicle types. It supports user registration for easy onboarding, along with vehicle registration to link vehicles to individual accounts. Users can top up for transactions conveniently, ensuring uninterrupted toll payments. The system facilitates real-time toll transaction management, automatically deducting fees and generating receipts for each passage. Through transaction management, users can monitor balances, recharge history, and transaction statements. Comprehensive reporting features allow both administrators and authorities to track usage patterns, revenue collection, and system performance. The platform's interoperability ensures compatibility with other D-toll systems, promoting a unified experience for users across regions. With secure, automated, and transparent processes, toll management solution enhances efficiency, reduces congestion, and supports smart transportation initiatives.

1. User Registration
2. Vehicle registration
3. Top Up
4. Toll Transaction Management
5. Report

### 3.2.20. Account Verification

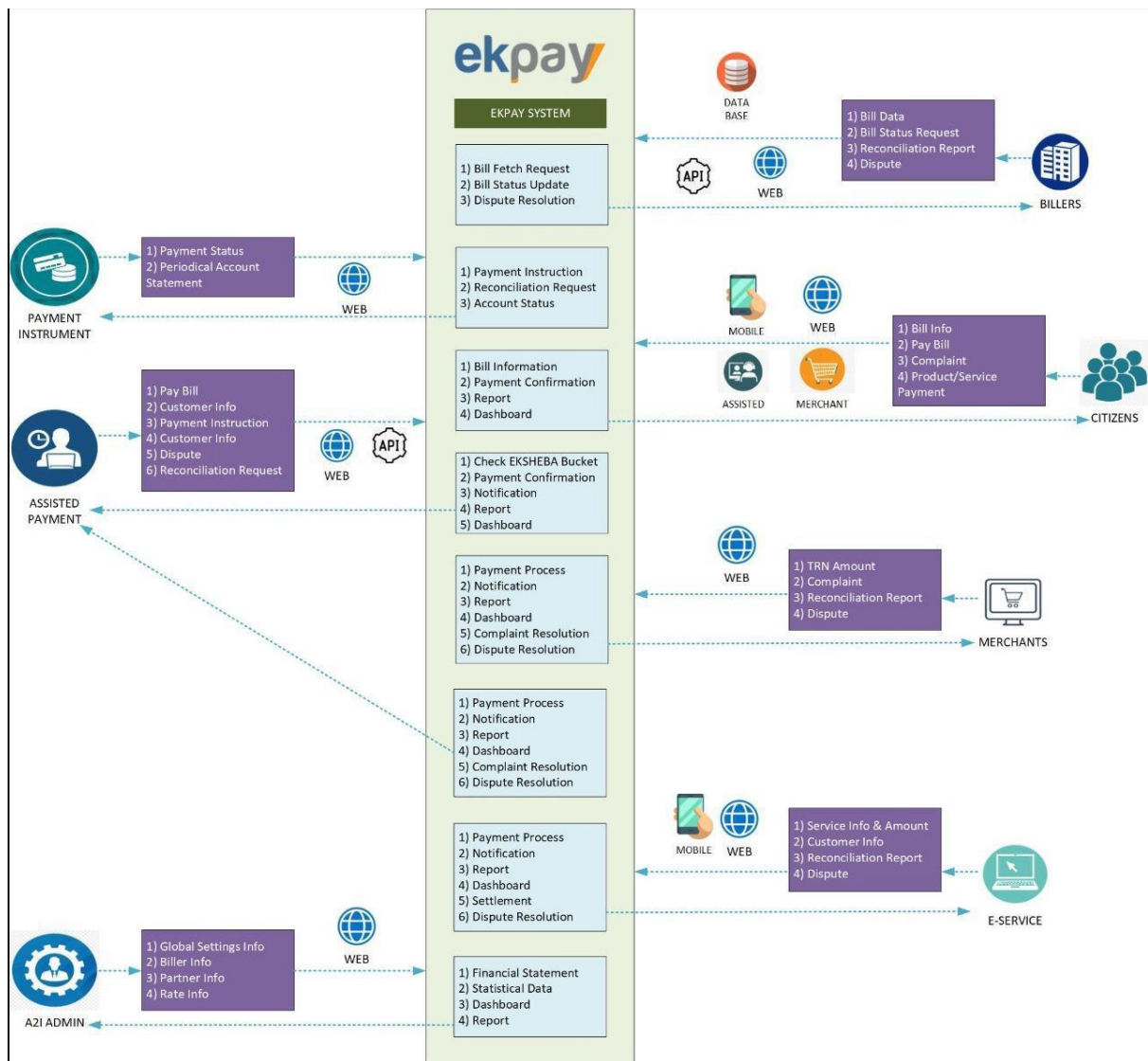
Bank Account Verification is the process of validating a customer's bank account details to ensure accuracy, ownership authenticity, and eligibility for financial transactions. The system connects securely with banking networks to confirm account status, holder information, and operational readiness before allowing any debit, credit, or recurring payment setup. This verification reduces fraud, prevents failed transactions, and enhances trust between service providers and users.

### 3.2.21. Reporting Management

This module offers advanced reporting capabilities for administrative, financial, and operational insights. Reports can be filtered by date, service, region, or user type. Export options (PDF, Excel, CSV).

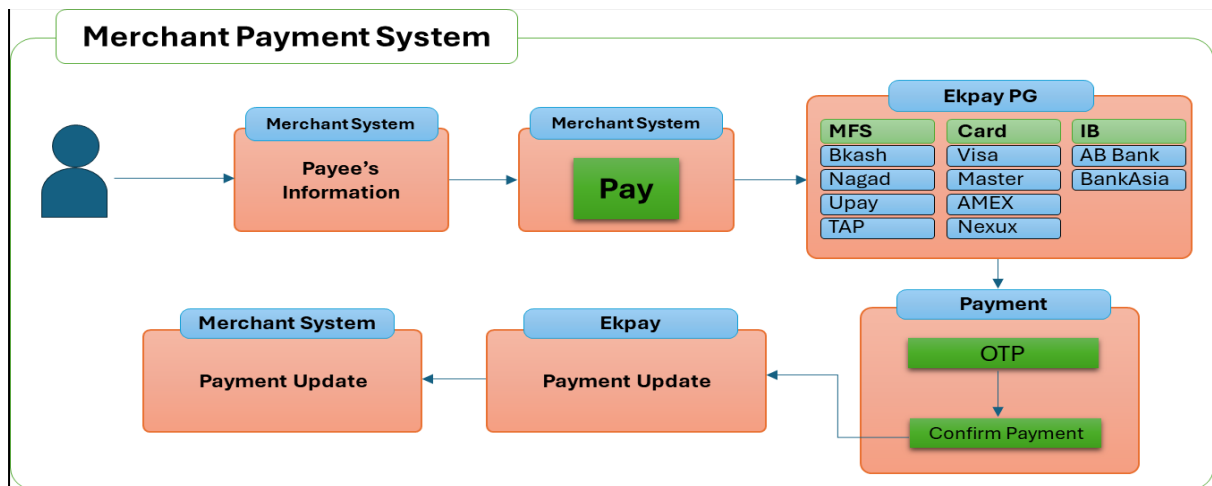
### 3.2.22. Process Flow of ekPay

Context Diagram of ekPay illustrates the complete ecosystem of stakeholders and external systems that interact with the national interoperable bill payment platform. At the center, the ekPay system connects multiple entities-billers, citizens, merchants, payment instruments, assisted payment channels, e-service providers, and administrative units such as a2i-through secure APIs, web interfaces, and mobile channels. Each stakeholder exchanges specific information with ekPay, such as bill data, payment instructions, customer information, notifications, reconciliation reports, financial statements, and dispute resolutions. The diagram highlights how ekPay orchestrates end-to-end bill payment processes, from bill retrieval to payment confirmation, reporting, settlement, and complaint management, ensuring a seamless and integrated digital payment experience across diverse service providers and citizen touchpoints.



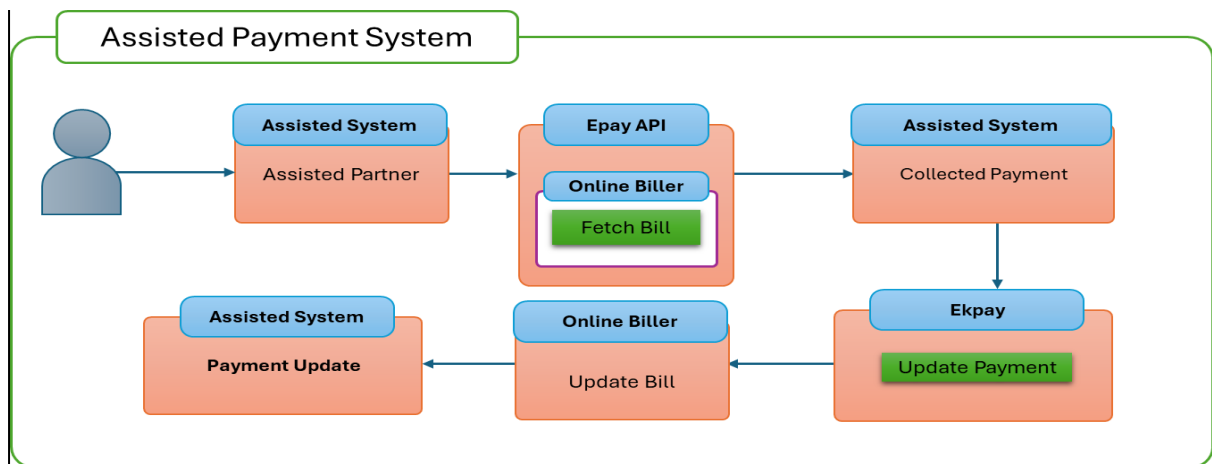
**Fig: System Context Diagram of ekPay**

The Merchant Payment of **ekPay** enables seamless digital payment processing between customers, merchants, and the ekPay Payment Gateway. The process begins when a customer provides payee or transaction information through the merchant's system, which then initiates the payment request. ekPay routes the transaction to a wide range of supported payment channels, including Mobile Financial Services (such as bKash, Nagad, Upay, TAP), card networks (Visa, Mastercard, AMEX, Nexus), and Internet Banking options. During the payment process, the customer undergoes OTP verification to securely confirm the transaction. Once the payment is completed, ekPay sends a real-time payment update back to the merchant system, ensuring accurate transaction status and enabling seamless reconciliation. This integrated flow ensures a secure, interoperable, and efficient digital payment experience for merchants and customers alike.



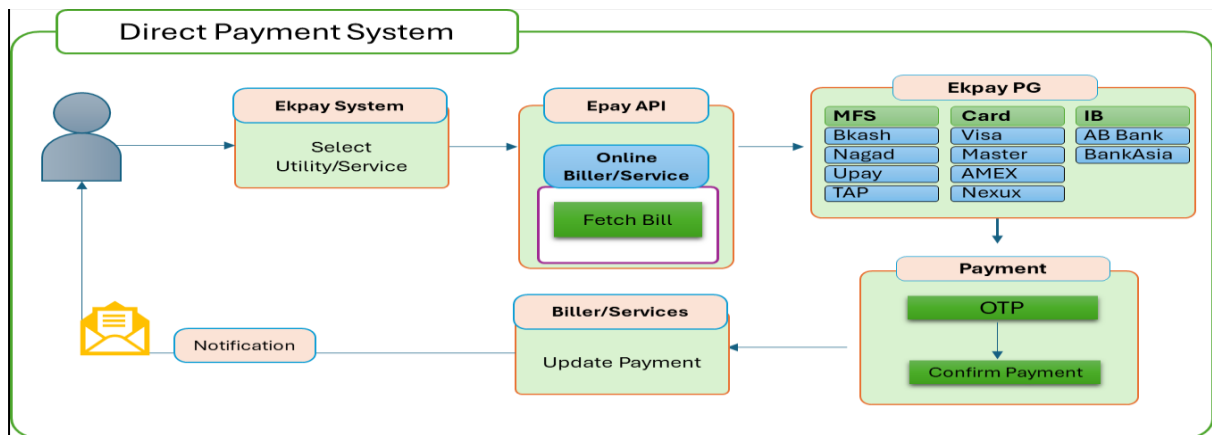
**Fig:** Merchant payment System

**Assisted Payment** for ekPay, where an Assisted System interacts with the Online Biller and Epay API. The process begins with the Assisted System fetching the bill via the Online Biller and Epay API. Once the bill is retrieved, the payment is updated and collected by the Assisted System. The final step involves the ekPay platform updating the payment status after the payment is successfully processed.



**Fig:** Assistant Payment System

**Direct Payment** of ekPay. The user selects a utility or service via the ekPay System, which then interacts with the ekPay API to fetch the bill. The payment process involves various payment gateways (such as MFS, Card, and IB) for payment processing, where the user receives a notification and an OTP for security. Finally, the user confirms the payment, and the system updates the payment status via the Biller/Services.



**Fig : Direct Payment System Technology Platform of existing system**

Front End Layer	HTML5, CSS3, jQuery, Angular, Android
Development Language	Java
Applicaton Layer	Apache
Framework	spring
Load Balancer	NGINX
Network & Security Tool	NMAP, BURPSUIT
Quality Assurance	JUnit5, JMeter
Security Standard	SSL SECURITY, OWASP
Database & ORM Layer	PostgreSQL
ORM Layer	Hibernate
API Technology	REST API, SOAP
API Testng Tool	POSTMAN
Development Environment (SDK)	IntelliJ IDEA, eclipse, NetBeans
GUI and Dependency Tool	balsamiq, Maven
Documentaton Tools	Word, Excel
Issue Tracking Tools	Ments
Project Management Tools	OpenProject
Data Export / Import	PDF, XLS, CSV

## 4. Objective of the assignment

The overall objectives of this assignment will be the following:

- Perform necessary technological upgrades to improve system performance, enhance security, increase scalability, and deliver a better user experience.
- Enable seamless integration of new services and partners including merchants, billers, banks, fintech platforms, mobile apps, online banking services, MFS, and e-wallet providers aligned with evolving business needs.
- Provide continuous technical support and maintenance to ensure the stable, efficient, and uninterrupted operation of the ekPay system.
- Ensure robust hosting infrastructure and data center support to maintain smooth, secure, and high-availability system operations.
- Migrate existing legacy data with accuracy and security to the enhanced platform, ensuring data integrity and operational continuity.
- Permanently resolve recurring technical and functional issues through root cause analysis and sustainable fixes.
- Strengthening system security, data integrity, and compliance with government standards.
- Improve system responsiveness and reduce downtime through proactive monitoring and performance tuning.
- Upgrade system architecture, codebase and underlying technologies where necessary to align with modern technology standards and best practices.
- Ensure long-term maintainability of the platform through documentation, clean coding practices, and automation of routine operations.
- Increase adoption and user satisfaction by addressing pain points identified through user feedback and analytics.

## 5. Scope of the Assignment

The Firm will be required to complete the up-gradation and enhancement of the ekPay system following the SDLC methodology and perform the relevant activities accordingly within the proposed stipulated time. This system's scope and different terms are described hereunder from a high-level perspective:

### Definition

All the necessary terms are briefly interpreted hereunder.

Terms	Definition
Biller	Biller is someone or something that processes bills
Assisted User/Modality	The payment instruments are connected directly with ekPay using a single API while paying bills this modality is called the assisted modality.

Terms	Definition
Merchant	A merchant represents a person or company that sells goods or services.
Payment Instrument	Any physical or digital instrument (exp. Debit Card, Credit Card, MFS, etc.) that is used to make cashless transactions.
Slab Charge	Slabs are usage ranges defined in the form of units. Multiple price slabs are defined in the system for generating charges
DR	Disaster Recovery
OTP	One-time Password
AIT	Advance Income Tax
KYC	Know Your Customer
VAT	Value-Added Tax
API	Application Programming Interface
SMS	Short Messaging Services
D-Tool	Digital Toll Management System
2FA	Two-Factor Authentication

The system's scope is described here from the high-level perspective into 2(two sections)

- Functional Requirements and
- Non-functional Requirements.

## 5.1. Functional Requirement

### 5.1.1. New Development Modules

The functional requirements of the newly developed modules are outlined below

#### 5.1.1.1. Multi-tenant Aggregator

The purpose of this document is to define the business requirements for developing a Multi-Tenant Aggregator Management System that enables a hierarchical structure where a Parent Tenant (Aggregator) can onboard, manage, and oversee multiple Child Tenants (Sub-Merchants). This system ensures secure onboarding, controlled access, and transparent reporting between tenants.

The system workflow begins with the System Administrator creating or applying through the eKYC. A Parent Tenant, who can then onboard multiple Child Tenants under their account. Each Child Tenant remains in a Pending Approval state until approved by the Parent Tenant. Once approved, the Child Tenant becomes active and gains access to system features and reports based on configured permissions. Parent Tenants can monitor and manage their Child Tenants, including access rights, service configurations, and commission settings. All actions such as



onboarding, approval, and configuration changes are securely logged for transparency and auditability.

The reporting module must provide both Parent and Child Tenants with access to relevant insights based on their roles. Child Tenants can view their own performance, transaction, and commission reports, while Parent Tenants can access aggregated and detailed reports across all Child Tenants. Reports should cover key areas like performance, commissions, access rights, and service configurations. The system should also support configurable visibility, export options (EXCEL/CSV/PDF), and audit tracking to ensure accuracy, transparency, and control.

- Tenant Onboarding and Hierarchy
- Secure Approval Workflow
- Service and Configuration Management
- Transaction and Commission Management
- Required Reporting & Dashboard

#### 5.1.1.2. Configurable VAT & Other Govt. Duties Calculation

The VAT Other Govt. Duties Calculation Module to create, update, or manage VAT rules for specific merchants, partners, and utility service providers. Each configuration is centrally maintained, allowing VAT rules to be assigned dynamically based on business requirements. Once a VAT rule is configured, the VAT Calculation Module automatically applies it to every relevant transaction.

During transaction processing, the system computes the VAT amount according to the latest government-approved VAT rate and stores the calculated values as part of the transaction record. All configuration modifications—whether addition, update, or deletion—are logged with user information and timestamps to maintain a complete audit trail. The module ensures seamless integration with other financial components such as Ledger, Settlement, Billing, and Invoicing.

The module provides both detailed and summary-level VAT reporting capabilities. Users can generate transaction-wise VAT breakdowns, total VAT collected per merchant or partner, and comprehensive configuration change logs. Reports support multi-level filtering (date range, merchant, partner, service provider) and offer multiple export options including Excel, CSV, and PDF.

- Centralized VAT Configuration Management
- Dynamic VAT Rule Assignment
- Automated VAT Calculation

- Integration with relevant Modules (Ledger, Settlement, Billing & Invoicing, PG, Assisted etc.)
- VAT Reporting & Analytics
- Compliance & Monitoring (Aligned with NBR VAT guidelines and future regulatory updates)
- Advanced Filtering & Export Options

### 5.1.1.3. Settlement Management

The purpose of the Settlement Management Module is to automate and streamline the end-to-end process of settling funds from transactions, reducing manual effort, ensuring accuracy, maintaining transparency, and supporting financial reconciliation between systems (payment gateway, merchants, and banks).

The Settlement Management Module offers a comprehensive set of features designed to ensure accuracy, transparency, and efficiency in financial settlements. It supports configurable settlement rules to define payout frequency and methods per merchant, along with automated calculation of commissions, fees, and VAT. The system handles batch settlements for efficient processing and provides real-time tracking of settlement statuses. Through bank and payment gateway integrations, payouts are executed seamlessly, while a reconciliation engine verifies transaction records against bank statements. The module also includes comprehensive reporting for merchants and finance teams, audit trails for compliance, multi-currency and tax support, and role-based access control to protect sensitive financial data and ensure proper authorization across users.

- Configurable Settlement Rules
- Automated Settlement Calculation
- Batch Settlement Processing (if required)
- Real-Time Settlement Status Tracking
- Integration with Core Financial Modules

### 5.1.1.4. Ledger Management

The main purpose of the Ledger Management Module is to maintain a complete and auditable financial record of all system transactions in a double-entry accounting format. It ensures that every inflow and outflow of money whether from payments, refunds, commissions, settlements, or adjustments is properly recorded and balanced. This module acts as the foundation for financial integrity, reconciliation, and regulatory compliance.

The Ledger Management Module provides a robust financial tracking system ensuring every transaction is accurately balanced with corresponding debit and

credit entries. It features automated posting of all financial activities, including payments, settlements, commissions, and VAT, along with real-time balance tracking across all accounts. The module supports ledger segregation for merchants, partners, and system accounts, and includes reconciliation tools to match records with external sources like banks.

- Automated Ledger Posting
- Segregated Ledger Structure
- Real-Time Account Balance Tracking
- Integration with Reconciliation Management
- Comprehensive Audit Trail (Immutable Logs)
- Regulatory Retention & Compliance

#### 5.1.1.5. Integration Portal for Developers

The Integration Portal for Developers is designed to provide a centralized platform for external developers, merchants, partners, and system integrators to access ekPay APIs, SDKs, documentation, and testing tools. The module serves as a one-stop interface for onboarding, integration, and testing of payment, settlement, VAT, ledger, and dispute management services. It ensures secure and seamless interaction with ekPay services while promoting standardization, transparency, and operational efficiency. The portal will provide sandbox environments for testing, detailed API references, real-time status updates, and troubleshooting guides. By offering self-service capabilities, automated onboarding, and monitoring tools, the Integration module enhances developer experience, reduces integration time, and ensures consistent, reliable, and compliant interactions with the ekPay ecosystem.

- Integration information for developers
- API Documentation
- Sandbox Environment
- API Key & Credential Management
- Integration Testing & Monitoring Tools
- Self-Service Onboarding
- Automated Integration Report checker tools

#### 5.1.1.6. New Service Development [10 services]

The New Service Development initiative for ekPay aims to design, develop, and deploy for 10 services to enhance the platform's interoperability, integration capabilities, and service automation. E.g. Education Management, Remittance eKYC, City Corporation Service Management etc. [The development cost will be considered as reimbursable.]

### 5.1.1.7. System Performance and Health Monitoring Tools

The System Performance & Analytics module of ekPay shall provide comprehensive monitoring, analysis, and visualization of the platform's application and infrastructure performance. The module shall enable real-time monitoring of all critical components, including application services, databases, middleware, and supporting infrastructure, providing metrics such as CPU, memory, disk, network usage, response times, throughput, and error rates.

- Real-Time Monitoring
- Performance Metrics Collection
- Interactive Dashboards
- Historical Analysis & Reporting
- Alerting & Notifications
- Service Health & SLA Tracking

### 5.1.1.8. Mobile App

To develop and maintain the ekPay Mobile Application for Android and iOS platforms to provide citizens with a secure, reliable, and accessible channel for digital bill payments and related services. The mobile application shall support integration with multiple billers and payment instruments, enabling real-time payment processing, transaction tracking, bill notifications, and comprehensive reporting features. The application must ensure a user-friendly interface, high performance, and compatibility across a wide range of devices, while adhering to national digital payment standards and best practices in information security, including encryption and multi-factor authentication. The mobile app will serve as a citizen-centric tool to facilitate efficient, transparent, and inclusive digital payment services, aligning with the government's e-Governance and financial inclusion objectives.

Major features of the mobile app-

- Dashboard
- Registration
- Profile Info update
- Pay Bills
- Option to check previously paid bill
- View payment History
- Offers
- Auto debit features
- Promotion
- Notification
- Report

Supported Platform

- Android App (including HarmonyOS)
- iOS App

## 5.1.2. Modules/Features for Enhancement:

The functional requirements of the modules/features for enhancement are outlined below.

### 5.1.2.1. eKYC & Due Diligence Management

This module enables a Financial Service Operator (FSO) to onboard and manage customers via eKYC, register and manage merchants (including government service providers), and integrate partners (banks, FIs, payment processors) as per Bangladesh Bank guidelines. It supports automated identity verification, secure data flows, audit trails for partners and merchant systems. Different types of partners like Government, Semi-Government, autonomous body, education institute etc. will be onboarded and submit information as per the rules and the form will have to be configurable and customizable from the system back-end.

Sl.	Existing	Enhancement	Description
1.	Registration through admin panel		Option to add multiple fields dynamically with validation
2.		Self-Registration	The partners will complete their registration with all information as per Bangladesh Bank compliance.
3.		Identity verification Integration	Identity will be verify using NID/BDRN etc.
4.		Liveliness check using facial recognition	to ensure that the submitted identity belongs to a real, present person and to prevent spoofing or fraudulent submissions.
5.		Approval	System Admin will approve from admin panel after information verification based on configurable checklist
6.		Regulatory Compliance	As per Bangladesh bank guideline there will a checklist and the information will compare in a single page.
7.		Notification	After approval or declined the partner will be notified.

Sl.	Existing	Enhancement	Description
8.		Authority Change	This feature will be applicable for the authorization change and each record will be stored for further Audit.
9.	Other module Dependencies		Enhance merchant/assisted management, user management etc. to support eKYC module.
10.		Periodic re-eKYC	Automated periodic re-verification of merchant/customer KYC information based on predefined time intervals or risk levels, with notification, document re-submission to ensure continuous regulatory compliance.
11.		Auth & Monitoring	Option to freeze the partners/Merchant activities and monitor to prevent illegal activity e.g. cross-border transaction, spamming etc.

### 5.1.2.2. Interoperable Toll Management

The interoperable toll management system provides a secure and seamless digital solution for managing toll operations across multiple plazas and vehicle types. It enables easy user and vehicle registration, convenient wallet top-ups, and real-time toll transactions with automatic fee deduction and receipt generation. The system offers comprehensive transaction tracking and reporting for users and authorities, while ensuring interoperability with other D-toll platforms. Overall, it enhances operational efficiency, transparency, and supports smart transportation initiatives.

SL.	Existing	Enhancement	Description
1.	User Registration		<ul style="list-style-type: none"> <li>Enhance registration process through ekPay web, mobile App etc.</li> <li>Enable single-user D-Toll Identity access across multiple Financial Institutions</li> <li>Improve registration compliance regulatory authorities, eKYC etc.</li> </ul>
2.	Vehicle Registration		<ul style="list-style-type: none"> <li>Improve vehicle verification process through multiple channels.</li> <li>Bulk vehicle registration facilities.</li> <li>Vehicle Registration through ekPay Interface</li> <li>Vehicle bind/unbind with separate API</li> </ul>

SL.	Existing	Enhancement	Description
3.	TopUp		<ul style="list-style-type: none"> <li>• TopUp Mechanism through ekPay</li> <li>• Low Balance notification</li> <li>• Value addition features e.g. Discount, promotion etc.</li> </ul>
4.	Transaction Management		<ul style="list-style-type: none"> <li>• Enhance to support refund, Settlement, dispute resolution, reclaim, day-end closing etc.</li> <li>• Shareable Reporting dashboard API for stakeholders</li> </ul>
5.		Toll Plaza Management	Develop UI along with API for CRUD operation of Toll Plaza, Booth etc.
6.	FI Aggregator		<ul style="list-style-type: none"> <li>• Develop and improve API for partners to support features mentioned in the scopes.</li> <li>• Incorporate D-Toll on ekpay Registry service</li> <li>• Enhance EkPay Assisted API to incorporate all D-Toll services.</li> </ul>
7.		Auto Debit Mechanism	Develop and improve auto debit API for partners to handle instant high-frequency transaction response.

### 5.1.2.3. Dispute Management

Dispute Management Module provides a centralized, automated system for capturing, tracking, and resolving transaction-related disputes among customers, merchants, partners, and service providers. It ensures accurate categorization, workflow-driven resolution, and seamless integration with Ledger and Settlement modules so that refunds or reversals are automatically reflected. The module maintains a complete audit trail, supports SLA-based escalation, real-time monitoring, notifications, and reporting to improve transparency, compliance, operational efficiency, and customer trust.

Sl.	Existing	Enhancement	Description
1.	Add Dispute		Raise dispute from citizen/partners/admin panel by selecting individual or multiple transaction/settlement items instead of manually input as well as option to raise dispute based on reconciliation automatically.
2.	View Dispute		Re-design dispute as per change of enhancement of add dispute.

Sl.	Existing	Enhancement	Description
3.	Dispute List		Dispute list will be enhanced by adding relevant fields, filtering criteria etc.
4.		Dispute workflow	Enabling to resolve disputes efficiently, with automated notifications, status updates, and escalation mechanisms with relevant modules e.g. settlement, reconciliation, refund, Ledger, transaction, dashboard report etc.
5.		Dispute Categorization & Classification	Option to add dynamically dispute categorically.
6.		Dispute tracking	Option to track dispute by stakeholders and will store/record end-to-end all information
7.		Notification	In-app, SMS and mail notification have to be developed

#### 5.1.2.4. Reconciliation Module

The Reconciliation Module will automate and streamline the process of matching, verifying, and resolving transactions between ekPay, banks, government systems, and other payment channels.

SL.	Existing	Enhancement	Description
1.	File Upload		Option to upload transactional data received from partners in a prescribed format by the following users- merchant, Financial Institutions, Billers, Assisted Partner as well as admin.
2.		Auto Reconciliation	<ul style="list-style-type: none"> <li>Automatically match and verify transaction records between ekPay, partner banks, payment gateways, and billers by comparing transaction IDs, amounts, and timestamps etc. The system identifies mismatches, generates reconciliation reports, and flags exceptions for manual review to ensure financial accuracy and timely settlement.</li> <li>Configurable matching rules and thresholds for reconciliation.</li> <li>Detailed audit trail of all reconciled and unmatched transactions.</li> </ul>



SL.	Existing	Enhancement	Description
			<ul style="list-style-type: none"> <li>Notification and escalation mechanisms for unresolved issues</li> </ul>
3.		Integration	Reconciliation data must be reflected on all the relevant modules (e.g. dispute, settlement, transaction, ledger etc.) to complete the financial settlement ecosystem.
4.	Download Reconciliation File		Option to download reconciliation data in customized format to support stakeholders needs.

#### 5.1.2.5. Audit Log Management

The Audit Log Management Module is designed to ensure full traceability, accountability, and transparency across all financial and operational activities within the ekPay system. It maintains an immutable, time-stamped record of every critical system action, including configuration updates, financial postings, settlement operations, user activities, and administrative changes. The module captures detailed metadata such as the user/system, the exact operation performed, input parameters, and before/after values in structured JSON format. By offering centralized log storage, secure access controls, and comprehensive reporting capabilities, the module supports internal governance, regulatory audits, fraud detection, and post-incident investigations. It plays a crucial role in ensuring compliance with Bangladesh Bank, NBR, and internal audit policies, while providing a reliable historical record for long-term data retention and accountability.

SL.	Existing	Enhancement	Description
1.	System activity logs	Centralized audit log repository	Records all critical system activities including financial transactions, settlements, configuration changes,

			user actions, and administrative operations across the ekPay platform. Show all types of critical logs on user interface based on role management.
3.	Metadata storage	Structured JSON-based metadata storage	Stores previous and updated values for configuration and data changes by capturing system-generated timestamp and maintains detailed event data in structured JSON format, including input parameters, execution results etc. with the regulatory compliance support (Bangladesh Bank)
4.		Log retention & Archiving	Provides a unified and centralized storage for all audit logs, supporting easy access, consistency, long-term retention, and archiving.
5.		Advanced search, filter, and query capabilities	Allows querying logs by date range, user, transaction ID, service type, operation category, and severity level.
6.		Fraud detection and investigation support	Enables monitoring of suspicious activities and provides historical data for fraud analysis and forensic investigations for post-incident forensic analysis.
8.		Log Export	Export logs data in formats such as PDF, CSV, or Excel.

#### 5.1.2.6. Application Log Monitoring

The Application Log Management Module is designed to provide a centralized, real-time, and visually rich system for monitoring, analyzing, and managing all application-level logs of the ekPay platform. By integrating with the ELK stack (Elasticsearch, Logstash, and Kibana), this module collects logs from various ekPay services, indexes them in Elasticsearch, and provides intuitive visualization and analytics through Kibana dashboards. It enables administrators and support teams to quickly detect errors, track user activities, monitor transaction flows, and identify system performance issues. This centralized log management approach enhances operational transparency, supports incident response, enables performance optimization, and ensures that the system meets audit and compliance requirements.

The module also provides alerting capabilities for critical events, allowing proactive issue resolution and uninterrupted financial operations.

SL.	Existing	Enhancement	Description
1.	Application Logs	UI to view Logs	Develop an UI to view all application logs which will reflect on Role-based access module
2.		Advanced search, filter, and query capabilities	Filters by module, log level (INFO, WARN, ERROR), user ID, merchant ID, or transaction ID etc.
3.		Log Export	Export logs data in formats such as PDF, CSV, or Excel for RCA.
4.		Log Standardization	Standardized log structure including timestamp, service/module, log level, transaction ID, and user context.

#### 5.1.2.7. Configurable Reporting System for Partners

The ekPay Reporting Module shall be enhanced to provide a flexible, partner-centric reporting capability, enabling partners (including merchants, aggregators, billers, and other stakeholders) to generate customized transactional, summary, reconciliation, settlement, dispute, and refund etc. reports by selecting required data fields, date ranges, and relevant filters. The enhanced module will support scheduling of recurring reports, user-defined export formats (including Excel, CSV, and JSON), advanced data grouping, and graphical/chart-based visualizations. Additionally, the module will incorporate comprehensive audit trail features and role-based data visibility controls to ensure secure access to sensitive information and full compliance with regulatory requirements.

SL.	Existing	Enhancement	Description
1.	Report view		Currently, more than 40 reports are available in the ekPay reporting module. Under the expanded scope of this contract, additional reports will be designed, developed, and incorporated to address the newly defined reporting requirements. The report will have to downloadable formats (Excel, CSV, JSON etc.) along with printable format.
2.		Report Configuration	The Configurable Reporting feature of ekPay will enable dynamic addition, modification, and removal of report fields based on operational and business requirements. The module will

			incorporate fine-grained access control at the field level, allowing administrators to restrict the visibility of sensitive data to authorized users only, thereby ensuring information security, compliance, and controlled access within the reporting framework.
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#### 5.1.2.8. Agent Management Module

Improve the existing Agent Management module and upgrade the existing development like define master-agent add sub-agent under the master-agent. Upgrade rate, commission configuration for core-agent, master-agent add sub-agent, permissions, active-inactive, enroll, de-enroll etc.

SL.	Existing	Enhancement	Description
1.	Agent Registration	Self-Registration	Agent self-registration option through e-KYC.
2.		Registration through API	Develop APIs for 3 <sup>rd</sup> party Agent management system.
3.		Agent hierarchical	Mange Agent hierarchical from admin panel as well as from 3 <sup>rd</sup> party Agent management system.
4.		Agent Commission	Able to configure agent commissions for different stakeholders.
5.		Integration with other modules	The feature enables the ekPay Agent Module to seamlessly connect, coordinate, and interact with other system modules, ensuring smooth execution of transactions, data exchange, and operational workflows across the platform
6.		Agent Type	Develop agent type add/edit/delete and connection with registration process

#### 5.1.2.9. Improvement of Assisted API

The Assisted API need to improve the following areas-

SL.	Existing	Enhancement	Description
1.	Fetch Biller List		Performed to fetch biller list from ekPay Bill pay Registry services.
2.	Fetch Bills		Enhance API to fetch bills with the uniform identity for best customer experience.
3.	Pay Bills		Improve pay bills API based on the newly designed fetch bill API
4.	Get Bill Status		Purse the bill payment status store and forward the response to the assisted partner
5.		Separate Balance (Pre-paid/Post Paid)	Balance has to define as prepaid or postpaid that will reflect Assisted partner type.
6.		Comprehensive API Document	Improve the API document with detail definition of response and explanation error codes.
7.		Fees/VAT/Charges	Configurable VAT management and other rate & charges module will be incorporate here.

#### 5.1.2.10. Central Role-Based Access Control

The Role Management module of ekPay provides a secure and flexible access control framework where roles are generated dynamically and assigned to users based on operational needs. A Super Admin oversees the entire access control system with authority to create, modify, view, and list roles, assign or revoke roles from users, and define module-wise and action-wise permissions. The module enforces least-privilege access across all interfaces and functions, ensures controlled execution of sensitive financial operations, and maintains full auditability in compliance with Bangladesh Bank regulatory requirements.

SL.	Existing	Enhancement	Description
1.	User Creation		Option to notify (email, SMS etc.) user for 2FA to activate user
2.		Creation Role	Option to create a role having module-wise and action-wise permission along with access control for specific data.
3.	Assign Role		This feature is able to comply with dynamically created roles.
4.		2FA Verification	2FA Verification will be applicable for eKYC, Password reset, re-eKYC etc.

#### 5.1.2.11. UI/ UX Enhancements

The UI/UX Enhancement initiative for ekPay aims to improve the overall user experience, accessibility, and usability of the platform across all user segments, including citizens, billers, and internal operators. The module focuses on delivering an intuitive, responsive, and consistent interface that simplifies navigation, reduces task completion time, and enhances user satisfaction. Enhancements will be guided by user feedback, usability testing, and iterative design improvements to ensure the platform meets evolving user expectations while maintaining branding consistency and operational efficiency. a2i will arrange a UI/UX review session for the new design and the consulting firm will fix the issues and recommendations received from the session.

#### 5.1.2.12. ekPay other Modules/Features Enhancement:

The Firm will have to maintain the all-existing components, modules and features but the below items are needed to enhance.

SL.	Existing	Enhancement	Description
1.	Rate & Charge		The system administrator can configure rates and charges considering different perspective e.g. FI, Biller, card etc.
2.	Payment QR		Development of EkPay QR Code Payment UI that enables customers, merchants, agents, and partners to perform secure, fast, and interoperable digital payments through standardized QR codes with real-time authorization, instant settlement, and comprehensive reporting support as well as features to add or customize fields.
3.	Mobile Top-up		<ul style="list-style-type: none"><li>• Incorporate TopUp API to Assisted API.</li><li>• Make available to Agent module.</li><li>• Improve the Registry module to enhance all 3rd party APIs Billers, services are integrated here.</li></ul>
4.	Payment EMI		<ul style="list-style-type: none"><li>• The ekPay EMI module will be enhanced to enable seamless management of Payment EMIs, allowing users to schedule, track, and process installment-based payments with real-time updates, secure authentication, and automated notifications for due or completed payments.</li><li>• Issue or CR incorporation raised by the merchants.</li></ul>

5.	Auto Debit	The Auto Debit module will be enhanced to support mobile app integration, enabling users to set up, manage, and authorize recurring payments directly through the ekPay mobile application with secure authentication and real-time status tracking.
6.	USD Payment	USD payment is developed for Passport. Enhancement to support settlement and compliance for cross-border transactions.

### 5.1.2.13. Support and Maintenance ekPay

The maintenance scope of the ekPay system includes continuous operational support to ensure system stability, security, and regulatory compliance. This covers timely bug fixing, issue resolution, and performance optimization across all modules. The service provider shall handle change requests through a formal change management process, including impact analysis, approval, implementation, and rollback where required. Routine patch management, configuration updates, and preventive maintenance shall be performed to minimize service disruption. The scope also includes monitoring, incident management, root cause analysis, and support for minor enhancements arising from regulatory, business, or operational needs.

## 5.1.3. Integration

### 5.1.3.1. A-Challan Integration

Integrate with the A-Challan (Automated Challan) platform used by government bodies or institutions for collecting duties, fees, or taxes. The integration will automate challan creation, validate challans in real time with government databases, and ensure accurate payment updates post settlement. This will reduce manual errors, speed up tax/payment processes, and improve compliance with regulatory frameworks.

### 5.1.3.2. Integration with Bank/MFS/FI, Biller and other services

During the development and maintenance period there will be scopes of integration with the Bank/MFS/FI, Biller Integration and other services. The technology development partner will be responsible to integrate those services as required. The number of integrations is 20.

## 5.1.4. Certification

### 5.1.4.1. PCI DSS certification

The selected Firm needs to ensure all technology standards & development to get PCI DSS certificate for ekPay. The Firm will support the selected consultants' firms in this regard.

### 5.1.4.2. ISO 27001 Certification

The Firm will ensure all information security standards to meet the ISO 27001 certification. The selected Firm will also take necessary steps and procedures to get the ISO certificate for ekPay.

### 5.1.4.3. Renewal of SSL Certification Subscription

The Firm will ensure Renewal of SSL Certification Subscription for all domain and subdomains to ensure uninterrupted secure communication and maintain trust for all users. Timely renewal will continue to safeguard sensitive data and uphold the highest standards of online security for the platform.

## 5.1.5. System Deployment

The purpose of implementing Kubernetes (K8s) for ekPay is to establish a scalable, resilient, and automated container orchestration environment that supports high-availability payment services. K8s will ensure seamless deployment, load balancing, self-healing, and zero-downtime updates for all ekPay microservices, improving system reliability and operational efficiency. By containerizing services and automating application lifecycle management, the K8s platform will enable ekPay to handle increased transaction loads, maintain strict security standards, and support continuous integration/continuous delivery (CI/CD) pipelines for rapid and controlled releases.

- **Containerized Deployment:** All ekPay services deployed as Docker containers for consistency and portability.
- **Auto-Scaling:** Horizontal Pod Autoscaling (HPA) to automatically scale services based on traffic and resource usage.
- **High Availability:** Multi-node cluster setup ensuring service continuity and failover capability.



- **Self-Healing Mechanism:** Automatic restart, replacement, and rescheduling of failed containers.
- **Rolling Updates & Rollbacks:** Zero-downtime deployment with safe rollback options.
- **Service Discovery & Load Balancing:** Built-in K8s services for efficient routing and traffic distribution.
- **Secure Secrets & Config Management:** Use of K8s Secrets and ConfigMaps to manage sensitive data and runtime configurations.
- **Resource Monitoring:** Integration with Prometheus/Grafana for metrics, alerts, and cluster health insights.
- **CI/CD Integration:** Automated deployment pipelines using GitLab CI/Jenkins/GitHub Actions.
- **Namespace-based Multi-Tenancy:** Logical segregation for dev, QA, staging, and production environments.
- **Compliance & Audit Logging:** Centralized logging of pods, nodes, events, and configuration changes.

### 5.1.6. Technology Stack Upgrade

The objective of this assignment is to modernize the ekPay system's existing technology stack to enhance performance, scalability, security, and long-term maintainability. The modernization scope includes upgrading the backend from Java 8 to a current LTS release and migrating Spring Boot 2.7.18 to Spring Boot 3.x, along with refactoring legacy dependencies. The frontend will be updated by moving from Angular 5.2 and TypeScript 2.6 to the latest stable versions to improve UI responsiveness and developer efficiency. Deployment architecture will be transformed from standalone Tomcat 9 to containerized microservices using Docker and Kubernetes, supported by optimized NGINX configurations. The database layer will be strengthened through PostgreSQL tuning and integration of caching technologies such as Redis. Additional improvements include introducing an API Manager for secure API exposure, implementing CI/CD pipelines for automated testing and deployment, and establishing modern monitoring and logging frameworks. This modernization will ensure ekPay remains resilient, interoperable, citizen-centric, and aligned with global digital payment platform standards.

- **Upgrade Java Version**
  - Move from **Java 8** → **Java 17 or Java 21 (LTS)** for enhanced security, performance, memory efficiency, and long-term support.
- **Upgrade Spring Boot Framework**
  - Upgrade **Spring Boot 2.7.18** → **Spring Boot 3.x**, enabling Jakarta EE transitions, native image support, and cloud-native optimizations.
- **Frontend Framework Upgrade**

- Migrate **Angular 5.2** → **Angular 17+**, improving rendering performance, security, TypeScript support, and developer productivity.
- **Update TypeScript Version**
  - Upgrade **TypeScript ~2.6.2** → **latest stable version**, enabling stronger typing, improved build tooling, and better compatibility with modern Angular.
- **Containerization & Orchestration**
  - Move from Tomcat standalone deployment to **Docker + Kubernetes (K8s)** for scalable, resilient, and automated deployments.
- **Adopt Modern Web Server Gateway**
  - Retain NGINX but optimize configurations for caching, load balancing, and API gateway integration.
- **Database Modernization**
  - Optimize PostgreSQL 15 but enhance with **caching layers (Redis)**, partitioning, connection pooling, and backup automation.
- **API Security & Gateway**
  - Introduce **API Manager** for secure API lifecycle, throttling, analytics, and centralized authentication.
- **CI/CD Pipeline Implementation**
  - Integrate **Jenkins / GitHub Actions / GitLab CI** for automated testing, vulnerability scanning, and deployment pipelines.
- **Adopt Microservices Architecture**
  - Move to **domain-driven microservices** for faster release cycles and easier maintenance.
- **Logging & Monitoring Modernization**
  - Implement **ELK / EFK stack, Prometheus, Grafana** for real-time monitoring, analytics, and proactive issue detection.

**NOTE: All the development will start from the upgraded version.**

### 5.1.7. Automation Testing

The Automation Testing initiative for ekPay aims to implement a comprehensive, repeatable, and efficient testing framework to validate functional, integration, regression, and performance aspects of the platform. The purpose is to ensure system reliability, accuracy, and robustness across all modules. By leveraging automated test scripts, the system reduces manual testing effort, accelerates release cycles, and ensures consistent quality. The initiative includes designing reusable test suites, executing automated test scenarios, capturing results, and generating actionable reports for development and QA teams. The automation initiative will target the automation of **30% of ekPay test cases** to enhance efficiency and coverage.

- Test Strategy & Plan
- Test Case & Script Repository

- Test Environment Setup
- Test Execution & Reporting
- Regression & Reusable Test Suites
- Regression & Reusable Test Suites

#### 5.1.8. IT Service Management (ITSM) for ekPay

The objective of this ITSM is to engage a competent and experienced firm to manage the hosting infrastructure and data center services for ekPay to ensure uninterrupted availability, high performance, and strong security of the hosting environment. This includes provisioning and maintaining servers, storage, networking, virtualization, and backup systems. The firm must also implement robust monitoring, incident management, and technical support mechanisms. Ensuring compliance with government data protection policies and industry-standard security practices is mandatory. Regular performance optimization, capacity planning, and system updates are expected. The firm will also need to establish and maintain business continuity and disaster recovery solutions. Continuous collaboration with a2i's technical teams will be required to support service improvement initiatives. Ultimately, the goal is to ensure seamless, secure, and reliable operation. To ensure high availability, performance, and data sovereignty for hosting government-critical platforms, the deployment must be aligned with national infrastructure standards. Hosting infrastructure will be provided by a2i.

#### 5.1.9. Hosting Infrastructure Management

- **Infrastructure Operations:** Manage both cloud and on-premises infrastructure for all platforms.
- **System Monitoring:** Perform daily checks on uptime, performance, storage, and security metrics.
- **Performance Optimization:** Ensure optimal configuration of web servers, databases, cache, and load balancers.
- **Environment Management:** Enforce network segmentation and strict separation of dev, staging, and production environments.
- **High Availability:** Implement redundancy and failover mechanisms to ensure service continuity.
- **Data Connectivity:** Ensure encapsulated and secure data transmission across both private and public networks, leveraging internet service providers to establish reliable, encrypted connectivity for all Financial Institutions. Firm may claim reimbursable cost.

### 5.1.10. Commissioning & Scalability

- **Infrastructure Planning:** Assess platform-specific needs and provision required servers and resources.
- **Scalability:** Implement auto-scaling and high-availability mechanisms to manage peak load.
- **Environment Setup:** Configure new hosting environments in line with rollout and upgrade plans.
- **Cloud Optimization:** Leverage cloud-native features like horizontal scaling and elastic resource allocation where applicable.

### 5.1.11. Performance Monitoring & Optimization

- **Monitoring:** Deploy open source and reliable real-time performance monitoring tools (e.g., Prometheus, Grafana, Zabbix).
- **Optimization:** Continuously tune infrastructure for performance and cost-efficiency.
- **Maintenance:** Ensure timely updates of hosting software, OS, tools, and patches.
- **Task Execution:** Implement performance-related tasks assigned by the a2i infrastructure team.
- **Bottleneck Resolution:** Identify and eliminate system bottlenecks impacting responsiveness or scalability.
- **Cost Analysis:** Conduct periodic cost-performance reviews to maintain budget compliance and service levels.

### 5.1.12. Issue Resolution & Incident Response

- **Support Coverage:** Provide Level 1 and Level 2 support for all hosting infrastructure incidents.

Support Level	Responsibilities	Typical Activities
<b>Level 1 (L1) – Frontline Support</b>	First point of contact; performs basic troubleshooting and categorization.	Ticket logging, initial diagnosis, assigning severity (P1/P2/P3), resolving simple known issues, user communication.

<b>Level 2 (L2) – Technical Support</b>	Handles incidents requiring deeper technical knowledge; resolves infrastructure, application, and configuration issues.	Advanced troubleshooting, log analysis, patch/application fixes, coordinating with L3 if required.
<b>Level 3 (L3) – Expert / Engineering Support</b>	Highest technical escalation; resolves complex system-level defects, code issues, or architectural problems.	Root cause analysis (RCA), permanent fixes, system recovery, deployment of hotfixes, design recommendations.

- **24/7 Monitoring:** Ensure round-the-clock monitoring and rapid response across all platforms.
- **Root Cause Analysis:** Investigate incidents thoroughly and implement permanent resolutions for recurring issues.
- **ITSM Integration:** Use a centralized ticketing system to maintain traceable, auditable incident workflows.
- **Escalation Protocol:** Define and follow a clear escalation matrix with severity classifications.

Priority	Definition	Initial Response
<b>P1 – Critical</b>	Major outage causing full-service disruption or severe business impact. e.g. Platform down, payment failure, security breach, database crash etc.	<b>Immediate (≤ 30 minutes)</b>
<b>P2 – High</b>	Partial service degradation impacting many users but not fully down. e.g. Slow performance, intermittent API errors, high latency etc.	<b>≤ 2 hours</b>
<b>P3 – Medium/Low</b>	Minor issue with limited impact; business operations continue normally. e.g. UI glitches, non-critical API warnings, routine fixes etc.	<b>≤ 1 Day</b>

### 5.1.13. Security, Compliance & Risk Mitigation

- **Access & Identity Management:** Enforce MFA, RBAC, and least privilege for all admin access.
- **Network & Data Protection:** Apply firewall policies, encryption, and centralized log management.
- **Compliance:** Ensure adherence to national ICT Security Policy and a2i's internal guidelines.
- **Vulnerability Management:** Analyze VAPT reports provided by a2i and remediate the issues following the timeline, terms and conditions of SLA.
- **Threat Monitoring:** Integrate systems with SIEM for real-time threat detection and alerting.
- **Incident Response:** Incident handling will be as per SLA conditions.

### 5.1.14. Backup, Migration, Recovery & Disaster Preparedness

- **Automated Backups:** Implement daily full backups and incremental backups based on system criticality.
- **Disaster Readiness:** Periodically test data restoration and disaster recovery plans for effectiveness.
- **Planned Migrations:** Migrate platforms based on risk, performance, or policy changes.
- **Continuity Planning:** Maintain updated business continuity plans for critical services.
- **Recovery Objectives:** Define and enforce RPO (Recovery Point Objective) and RTO (Recovery Time Objective) targets for all mission-critical platforms.

### 5.1.15. DevOps & Automation Support

- **CI/CD Management:** Establish and maintain CI/CD pipelines for all development teams.
- **Automation:** Automate server provisioning, configuration, and deployments using tools like Ansible, Terraform, Jenkins, or GitLab CI/CD. The consulting firm will use open source versions of these tools. In case of the necessity of the premium version tools, a2i will manage those.
- **Containerization:** Support containerized and microservices deployments with Docker, Kubernetes, etc.
- **Environment Consistency:** Ensure staging and production environments remain in sync to avoid deployment issues.
- **Observability:** Implement observability best practices, including distributed tracing and structured logging.

### 5.1.16. Collaboration and Technical Coordination

- **Cross-Team Coordination:** Work closely with a2i's infrastructure, development, SRE, DevOps, QA, and operations teams.
- **External Liaison:** Interface with cloud providers, data centers, and government hosting authorities.
- **Infrastructure Planning:** Provide input on infrastructure needs during upgrades and development cycles.
- **Regular Meetings:** Participate in bi-weekly technical coordination meetings and maintain shared action trackers with a2i teams.

### 5.1.17. Documentation & Reporting

- **Documentation:** Maintain up-to-date system architecture, server configs, network diagrams, and SOPs.
- **KPI Reporting:** Include KPIs such as MTTR, uptime %, resource efficiency, and SLA compliance in all reports.
- **Regular Reports:** Submit weekly and monthly reports covering:
  - Uptime and availability metrics
  - Performance statistics
  - Incident and issue logs
  - Change logs and deployment history

### 5.1.18. SRE (Site Reliability Engineering) Implementation

#### 1. SRE Framework Establishment

- Define SRE principles, objectives, and practices tailored for ekPay.
- Establish Service Level Indicators (SLIs), Service Level Objectives (SLOs), and Error Budgets for core functionalities.

#### 2. Monitoring and Observability

- Deploy comprehensive monitoring tools for infrastructure, application, database, and storage layers.
- Implement logging, tracing, and metrics collection for end-to-end observability.
- Build real-time dashboards for system health and performance tracking.

### **3. Incident Management and Response**

- Establish incident detection, classification, and escalation workflows.
- Implement automated alerting and notification mechanisms.
- Define Incident Response Playbooks to ensure quick recovery during outages.

### **4. Performance and Reliability Engineering**

- Conduct load testing, stress testing, and capacity planning exercises.
- Optimize system architecture to minimize downtime and latency.
- Introduce caching, replication, and failover strategies for high availability.

### **5. Automation and Tooling**

- Automate deployment pipelines (CI/CD) for faster and safer releases.
- Dockerization of all components of the ekPay systems
- K8S deployment of all components of ekPay systems.
- Automate routine maintenance tasks such as scaling, backups, and monitoring checks.

### **6. Change and Release Management**

- Define safe release practices with canary deployments and rollback mechanisms.
- Introduce automated testing and validation pipelines before production rollout.
- Monitor release impact in real time to minimize risks.

### **7. Security and Compliance**

- Integrate security monitoring and vulnerability scanning into SRE workflows.
- Ensure compliance with government data protection and operational standards.
- Implement role-based access and audit logging for critical operations.

### **8. Disaster Recovery and Business Continuity**

- Design and implement disaster recovery plans, backup strategies, and failover systems.
- Conduct periodic DR drills to validate readiness.
- Ensure zero data loss and minimal downtime during failovers.

### **9. Continuous Improvement and Postmortems**



- Perform root cause analysis (RCA) for major incidents.
- Conduct blameless postmortems and document lessons learned.
- Continuously refine SLOs, SLIs, and reliability practices based on insights.

## 10. SRE Dashboard

- Develop and implement SRE Dashboard to visualize, monitor the progress of SLOs, SLIs, Error Budget, etc.
- The Dashboard prompts the SRE team for adequate action

## 5.2. Non- Functional requirement

### 5.2.1. Project Management

The project management plan serves as a comprehensive document outlining the execution, monitoring, control, and closure of a project. It brings together and incorporates all subsidiary management plans, baselines, and essential information required for effective project management. The project management team assures the system performance with optimized resource utilization and also shares performance index & upgrade with discussing all stockholders. The specific requirements of the project dictate the inclusion of relevant components within the project management plan.

**Initiation:** Initiation will mark the initial phase of the project lifecycle. During this stage, the project's value and feasibility will be assessed. The identification of all project stakeholders will also take place in this phase.

**Planning:** After receiving approval, the project will require a robust plan to lead and ensure the team's adherence to schedule and budget. A meticulously crafted project plan will provide guidance on resource allocation, securing financing, and procuring necessary materials. It will provide clear direction to the team in terms of delivering high-quality outcomes, mitigating risks, fostering stakeholder acceptance, communicating benefits, and effectively managing suppliers. Additionally, the project plan will equip the team with the necessary preparation to tackle any obstacles that may arise throughout the project and facilitate their comprehension of the project's cost, scope, and timeframe.

**Execution:** The upcoming phase, often synonymous with project management, will be the Execution phase. Its primary objective is to construct deliverables that meet customer requirements. Team leaders will play a crucial role in accomplishing this by allocating resources and ensuring team members remain dedicated to their assigned tasks.

**Monitoring and Control:** Monitoring and Control will be integrated with Execution as they frequently take place concurrently. While teams carry out the project plan, they will continuously monitor their progress. This constant vigilance will facilitate the smooth progression of the project.

**Closure:** Project will be considered closed once the team delivers the completed project to A2I. This crucial phase in the project lifecycle enables the team to assess and document the project, subsequently transitioning to the next endeavor.

## 5.2.2. Change Management

The Change Management process aims to effectively manage and implement changes, enhancements, and updates to the system while minimizing disruption and maximizing user acceptance. It involves identifying, planning, communicating, and controlling changes to ensure smooth transitions and successful adoption by users. The supplier will be responsible for following and maintaining the 7'R of change management process.

7'R are:

- Who RAISED the change?
- What is the REASON for the change?
- What is the RETURN required from the change?
- What are the RISKS involved in the change?
- What RESOURCES are required to deliver the change?
- Who is RESPONSIBLE for the build, test and implementation of the change?)

The Change Management process shall include the following functionalities:

1. **Change Request Management:** A formal and standardized mechanism shall be maintained for initiating, reviewing, evaluating, and approving all change requests. The process must comply with **CMMI/ITIL/ISO 27001** standards and Bangladesh Bank's regulatory guidelines for payment systems. Each request must be assessed based on business impact, security risk, financial implications, priority level, and alignment with ekPay's operational and compliance objectives.

2. **Change Planning and Documentation:** A detailed change plan must be developed for every proposed change, outlining objectives, scope, timelines, resources, dependencies, testing requirements, and identified risks. All changes—including functional enhancements, incident resolutions, patches, configuration updates, and release packages—shall be fully documented, version-controlled, and retained in accordance with regulatory audit requirements.

3. **Stakeholder Communication:** Clear and timely communication channels shall be established to notify all relevant stakeholders—including banks, MFS providers, government agencies, and merchants—of scheduled changes, expected benefits, timelines, and potential service impacts. Communication must follow pre-defined

SLAs and ensure transparency to maintain trust and compliance with financial system operations.

4. **Training and User Support:** User training and awareness activities shall be conducted prior to the deployment of significant changes. Training materials, user guides, system updates, and support channels shall be provided to ensure all users—including internal operations teams and external partners—are fully aware of the change implications and capable of using the updated ekPay features securely and effectively.

5. **Change Implementation and Testing:** All changes shall be implemented in a **controlled, phased, and secure manner**, including development, QA, staging/UAT, and production deployment. Mandatory steps include functional testing, security testing, regression testing, and financial transaction validation to ensure compliance with security standards such as **PCI-DSS, ISO 27001**, and Bangladesh Bank’s cyber-security guidelines. The process must aim to minimize downtime, errors, and disruptions to live financial transactions.

6. **Post-Implementation Evaluation:** After deployment, each change shall undergo post-implementation monitoring to verify performance, system stability, financial accuracy, and user experience. Feedback from stakeholders shall be collected, and any deviations, incidents, or anomalies shall be addressed promptly. The impact of the change on operational efficiency, transaction integrity, security, and regulatory compliance must be evaluated and documented for audit purposes.

**The following template should follow for Change Management**

Section	Details to Capture
Change ID	Unique identifier for the change request
Change Title	Short, clear title of the change
Change Raised By	Person/department who raised the change (7’R: Who Raised)
Reason for Change	Business / technical justification (7’R: Reason)
Description of Change	Summary of what is being changed or enhanced
Expected Return / Benefit	Value, improvement, or outcome expected (7’R: Return)
Risk Assessment	Summary of risks (7’R: Risks) including: Security risk Operational risk Financial risk Compliance impact
Risk Level	Low / Medium / High
Mitigation Plan	Actions to reduce or handle risks

Section	Details to Capture
Resources Required	Manpower, tools, budget, environment (7'R: Resources)
Responsible Owner	Who will build, test & implement (7'R: Responsible)
Impact Analysis	Effect on business, users, integrations, transactions
Dependency / Pre-requisites	Tasks, approvals, or systems needed beforehand
Testing Requirements	Functional, security, UAT, regression, financial validation
Implementation Plan	Steps for deployment (Dev → QA → UAT → Prod)
Downtime Required	Yes / No + estimated duration
Communication Plan	Stakeholders to notify and communication method
Approval Status	Pending / Approved / Rejected + Approver Name
Post-Implementation Validation	Performance check, issue monitoring, stakeholder feedback
Documentation & Audit Notes	Logs, version history, compliance remarks

### 5.2.3. Quality Assurance and Testing

The QA and testing team's mission are to help developers to deliver the best possible product within the estimated timeline, detecting any issues that might block the successful operation of the software or even affect the user experience. The QA and Testing team will follow any of the international quality management system standards such as ISO 9001/CMMI. There will be 2 major parts of the quality assessment:

1. Functional – the product's compliance with functional (explicit) requirements and design specifications. This aspect focuses on the practical use of software, from the point of view of the user: its features, performance, ease of use, absence of defects.
2. Non-Functional – system's inner characteristics and architecture, i.e. structural (implicit) requirements. This includes the code maintainability, understandability, efficiency, and security.

## 5.2.4. Expected Activities

1. **Quality Planning:** Develop a comprehensive quality management plan that outlines the objectives, processes, and resources required to ensure the quality of the ekPay.
2. **Requirement Validation:** Verify and validate the requirements of the system to ensure they are complete, accurate, and aligned with stakeholder expectations.
3. **Test Planning and Execution:** Plan and execute testing activities, including functional, performance, security, and usability testing, to identify defects, ensure system reliability, and validate system behavior. To ensure maximum quality of the platform both manual and automated tests will have to be performed.
4. **Defect Tracking and Resolution:** Establish mechanisms to track, prioritize, and resolve defects identified during testing or reported by users, ensuring timely resolution and quality improvement.
5. **Quality Control and Process Compliance:** Implement quality control measures to monitor adherence to defined processes, standards, and best practices throughout the development and maintenance lifecycle.
6. **Documentation and Audit:** Maintain comprehensive documentation of quality processes, test plans, test cases, and test results. Conduct periodic quality audits to identify areas for improvement and ensure compliance with quality standards.

The consulting firm should have to perform below testing:

**a. Unit testing**

Unit testing is to verify individual components, modules and features of the system for correctness. Automated or manual testing of each code unit will be accomplished by developers before integration.

**b. Integration testing**

This testing will ensure correct interaction and data exchange between modules and external systems. The QA team will conduct end-to-end tests on connected modules to verify data exchange and workflow.

**c. Regression testing**

This test will confirm that recent code changes do not break existing functionality. The QA team will execute previously created test cases after every update, bug fix, or enhancement.

**d. Smoke testing**

This test will validate that the critical functionalities of the system are working. The QA team will perform quick checks on major features before detailed testing; usually automated or manual.

**e. Whitebox testing**

Following this testing, the developers will examine the internal logic, code paths, and structure of the application. Code-level testing will be performed by developers to detect logic errors, vulnerabilities, or improper handling.

**f. Functional testing**

The QA team will perform functional testing to ensure that system functions meet the specified requirements. The team will execute test cases based on functional specifications, including workflows, user actions, and business rules.

**g. User Acceptance Testing**

User Acceptance Testing (UAT) will validate that the system meets the real users' needs and expectations. a2i will conduct the UAT sessions ensuring presence of end-users in a controlled environment with real-life scenarios; feedback documented for resolution. Consulting firm will provide all technical supports and resources accordingly.

**h. Performance testing**

The QA team will conduct this testing to assess system responsiveness, stability, and scalability under expected conditions. The team will simulate realistic usage scenarios using performance testing tools; measure response time, throughput, and resource utilization.

**i. Automation Testing**

The Automation Testing initiative for ekPay aims to implement a comprehensive, repeatable, and efficient testing framework to validate functional, integration, regression, and performance aspects of the platform. The initiative includes designing reusable test suites, executing automated test scenarios, capturing results, and generating actionable reports for development and QA teams.

**j. Vulnerability Assessment and Penetration Testing (VAPT)**

a2i will conduct VAPT at least one also based on security incidents. a2i will share the VAPT reports with the consulting firm, and the firm will mitigate the issues timely.

**k. Load Testing**

Software load testing is a type of performance testing that evaluates the behavior and performance of a software system under normal and anticipated peak load conditions. It involves subjecting the software application to simulated user traffic and workload to assess its response time, scalability, and reliability. The primary goal of load testing is to identify performance bottlenecks and ensure that the software can handle the expected user load without degradation in performance.

Key aspects and objectives of software load testing will be:

- Performance Assessment.
- Response Time Analysis.
- Stress Testing.
- Resource Utilization.
- Performance Optimization.
- Failover and Recovery Testing
- Capacity Planning

The consultant firm will be responsible for performing a load test on overall ekPay systems, rectifying the artifacts and resolving accordingly.

The consulting firm will perform the tests mentioned and submit test reports in a timely manner.

### 5.3. Data Ownership

The ownership of all data generated, processed, transmitted, or stored within the ekPay platform shall remain solely with the Government of Bangladesh (GoB). The selected firm must ensure that no data—whether in raw, processed, metadata, or derivative form—is duplicated, transferred, stored, or used outside the authorized ekPay environment without written approval from the authority. All intellectual property rights, documentation, configurations, code repositories, logs, and platform-related datasets shall be treated as government property. The firm must guarantee unrestricted administrative access and ensure that full data portability is maintained throughout the contract period and after completion of the assignment.

### 5.4. Data Security

The firm must ensure end-to-end data security for the ekPay platform, applying national cybersecurity guidelines and internationally recognized standards such as ISO/IEC 27001, OWASP, and NIST best practices. All data at rest and in transit must be protected through strong encryption mechanisms. The firm shall implement adequate access control, identity management, security hardening, network-level protection, continuous monitoring, and vulnerability remediation. Any security breach, anomaly, or suspected threat must be immediately reported to the authority along with detailed incident analysis and mitigation actions. The firm must also ensure secure API communication, regular patching, secure coding practices, and periodic security audits.

### 5.5. Technology Handover

Upon completion or termination of the contract, the firm shall conduct a comprehensive technology handover to the authority or any nominated agency. This

includes full delivery of source code, database, technical documentation, API documentation, system architecture diagrams, deployment scripts, configuration files, test cases, credentials, version control repositories, and operational manuals. The firm must ensure that all knowledge, processes, and tools required for the uninterrupted operation, maintenance, and future enhancement of the ekPay platform are fully transferred. A hands-on knowledge transfer session, along with detailed walkthroughs and technical demonstrations, must be conducted to ensure smooth transition without service disruption.

## 5.6. IT Compliance

The firm must ensure that the ekPay platform and all related services strictly comply with national ICT policies, digital security laws, data protection regulations, and government interoperability guidelines. The platform must also maintain compliance with international best practices including secure coding standards, accessibility guidelines, data privacy principles, and software licensing norms. The firm must maintain transparent audit trails, adopt proper change-management procedures, and ensure that all infrastructure, software, and operational activities adhere to IT governance, quality assurance, and documentation standards mandated by the authority.

## 5.7. Performance Management & Monitoring

The Consultancy firm will manage, administer and monitor the technology Infrastructure that includes Physical Server, Virtual machine, Services, network etc. The firm will ensure that the development and deployment will maintain a continuous process involving the team members of all teams concerned. They will follow and establish the standard DevOps practices throughout the team. The major scope of the assignment will be:

- IT Service Management
- NOC Operation
- Resource administration
- Incident Management
- Change Management
- Adopting Continuous Integration and Continuous Delivery (CI/CD)
- Version controlling
- Automated testing
- Performance Tuning
- Data back and data integrity testing.
- Monitoring and logging
- Collaboration and communication
- Security



## 5.8. Support & Helpdesk

The firm will ensure continuous support and maintenance by deploying multi-layered support services. The scope of the assignment and deliverables are:

### **Helpdesk Support (1<sup>st</sup> Layer Support):**

The efficient provision of first-layer helpdesk support will be the responsibility of the firm. Several dedicated agents will be responsible for addressing user queries and providing assistance.

The firm will ensure that the helpdesk support team will be well-equipped and capable of delivering high-quality support services.

### **Issue Management (2nd Layer Support):**

For issue management, we need to have a monitoring and review stage after actions are implemented. Here are the proposed steps:

- Issue investigation, issue Categorization, Prioritization and Escalation.
- Preparing and managing SoP based on the frequently asked questions and fixing basic level troubleshooting issues of application, database, and infrastructure in accordance with the prepared SoP.
- Collaboration and coordination among the layers.
- Collecting feedback from both service recipient and service provider end and adjusting feedback through the proper communication and coordination with ekPay Team and Technology Team.
- Prepare customized support reports for the management

### **Technical Support (3rd Layer Support):**

The consulting firm will ensure third-layer technical support in collaboration with core technology partners of ekPay platform. Here are the proposed steps:

- Core applications, Database and Infrastructure level bug fixing.
- Accommodating change requests at Core applications, Database and Infrastructure level.
- Continuously analyze service logs and take necessary actions if required.
- Taking prompt preventive action solely or with the help of core technology partners if any misconfiguration or anomaly is found in the Core applications, Database and Infrastructure.
- Periodically health checking of Core applications, Database and Infrastructure.

**The consulting firm will have to deploy:**

- A support ticket management system and provide necessary accesses to the management so that they can track the issues and monitor the overall project status.

## 5.9. Language and Localization

The language for the solution will be Bangla, and the solution should be adapted to the other language especially in the English Version.

## 5.10. Fault Tolerance

- The solution should implement proper exception handling at all layers.
- The solution must be able to recover from exceptions relating to communication failures with external or remote systems.
- The solution must ensure atomicity of transactions such that if any element of a transaction is not successful then the whole transaction is roll-backed completely.
- The solution must ensure that no transaction failure will result in irrecoverable data loss.
- The solution must report back all relevant exception and error messages with clear instructions on recovery methods and next steps.

## 5.11. Supportability

The solution should be modifiable, extensible, and evolvable so as to allow for the future addition of new functionality, features, and capabilities, and exploitation of new technologies.

## 5.12. Configurability

- The behavior of the solution should be controlled through configuration.
- Changes to configuration should not require the modification of source code or redeployment of any packages or compiled objects.
- Local or Central Database tables should be used to store the configuration that controls the solution behavior. This configuration should be loaded automatically at runtime.

## 5.13. Scalability

The solution should have the ability to easily expand to accommodate additional users and additional transactions and data as the additional users are added.

## 5.14. Configuration Management

The source (I.e. software program codes, database object codes, configuration files, operating system scripts, and system documents) for the solution must be maintained under version control software.

## 5.15. Human Factors

- The solution should be intuitive and easy to use by users without prior training.
- The solution should be easy to learn and should allow users to efficiently complete tasks once they have learned the solution.
- The solution should be designed to limit the quantity and severity of user errors and should provide the user with clear error messages and instructions on error recovery.

## 5.16. Minimum SLA Terms to Comply With

Below minimum SLA terms are listed. The consultant firm will ensure the uptime throughout the assignment period while developing, deployment, enhance, maintenance or upgradation of the system. Firm may propose additional terms and terminologies:

- a2i/a2i nominated data center will be responsible for Physical Server, Network Equipment, Power and External Connectivity.
- Availability (Uptime): 99.99% Uptime of Managed server and resources.
- Performance: 99% deployed clusters response time should be less than 30 seconds.
- Fault handling process and response time:

The firm shall propose the fault handling process and response time in accordance with the following format.

7 Days a week from 7:00 AM to 11:59 PM hours except for government National holidays:

Priority Definitions	MTTA (mean time to acknowledge)	MTTR (Mean time to Response)	Update Intervals
Out of Service	5 Mins	1 Hour	15 Mins
Service Interruption	10 Mins	4 Hours	60 Mins
Non-Service Affecting	1 Hours	24 Hours	6 Hours
Incident Receive	20 Mins	1 Hour	30 Mins

Beyond Working Hours:

Priority Definitions	MTTA	MTTR	Update Intervals
Out of Service	30 Minutes	6 Hours	2 Hours
Service Interruptions	60 Minutes	8 Hours	2 Hours
Non-Service Affecting	90 Minutes	24 Hours	12 Hours
Incident Receive	1 Hour	2 Hours	1 Hours

## 6. Capacity Management:

The consulting firm will develop a capacity management framework, provide training support, assist with training planning and materials, provide trainers, collect feedback, and offer other relevant assistance as needed for capacity enhancement.

- The Consulting firm will arrange knowledge sharing and brainstorming workshops at least one session to explore new innovation/technology.
- The Consulting firm will assist in preparing the training related documents, presentations and user manuals.
- Furthermore, any other relevant assistance regarding training and workshop will be provided by the consulting firm as and when required.

## 7. Documentation and Manuals

firm must deliver comprehensive documentation covering architecture, database schema, APIs, infrastructure, and user interaction flows. All documents must adhere to best practices and standards. API documentation must follow OpenAPI/Swagger format, while infrastructure documentation must include environment setup, server roles, and failover procedures.

### Technical Documents

The following is an approximate list of technical documents required for the successful completion of this assignment:

1. Inception Report
2. Software Requirement Specification (SRS)
3. SDD (Software Design Document)
4. Source Code (a2i Internal Git repository)
5. Source Code Document / Code Guideline
6. Testing Documents and Reports
7. Infrastructure & Access Management
8. Technical Manual
9. User Manual (PDF, Video)
10. Training manual (PDF, Video)

## 8. Knowledge & Technology transfer Capacity Development

The firm will cover the Knowledge & Technology transfer Capacity Development and training for the ekPay initiative. These activities will bring stakeholders together to enhance existing systems, equip staff with necessary skills, ensure data security, and leverage emerging technologies. Capacity development will focus on enhancing technical expertise and fostering innovation. The firm's commitment to continuous learning will drive the success of ekPay. All the costs associated with the knowledge transfer sessions will be borne by a2i and consultant firm will provide the resource person for conducting the session.

## 9. Duration of the Assignment

The total duration of the assignment will be Ten (10) months. Both the Development & Enhancement activities and the Maintenance & Support Services shall commence from the first day of signing the contract.

- Development & Enhancement duration **06 months**
- Maintenance and support services duration **10 months**

## 10. Deliverables

### 10.1. Deliverable for Developments and Enhancement

No	Deliverable/ Report (Scope of report)
1	a) Inception Report including enhancement and maintenance template.
2	b) System Requirement Specifications (SRS)
	c) System Design Document (SDD) including ER Diagram, data definition/Database Schema
3	a) Interoperable Toll Service Management
	b) K8S deployment
4	a) ekPay other Modules/Features Enhancement (scope of work).
	b) Multi-tenant Aggregator Module

No	Deliverable/ Report (Scope of report)
	c) Technology stack upgrade
	d) Integration Portal for Developers
	e) Agent Management Module
	f) Central Role-Based Access Control
	g) VAT Management
5	1. Dispute management
	2. Settlement Management
	3. Ledger Management
	4. Reconciliation Module
	5. Audit Log Management
	6. Mobile App (Android and iOS)
	7. Application Log Monitoring
	8. Improvement of Assisted API
	9. System Performance and Health Monitoring Tools
	10. Test script of automation Test
6	1. Backup/Restore along with tools & documentation.
	2. All documentation (updated version) mentioned in this contract
	3. Knowledge/Technology transfer
	4. All Test Reports

## 10.2. Deliverable for IT Service Management & System Maintenance

No	Deliverable/ Report (Scope of report)
1	1. ITSM Activities
	3.1. Server maintenance report
	3.2. Connectivity maintenance and costing bill
	3.3. Incremental backup report (daily, monthly).
	2. Existing System Maintenance report.

No	Deliverable/ Report (Scope of report)
2	1. ITSM Activities <ul style="list-style-type: none"> <li>a. Server maintenance report</li> <li>b. Connectivity maintenance and costing bill</li> <li>c. Incremental backup report (daily, monthly).</li> </ul>
	2. Existing System Maintenance report.
4	a) Existing System Maintenance report
	b) ITSM Activities <ul style="list-style-type: none"> <li>a. Server maintenance report</li> <li>b. Connectivity maintenance and costing bill</li> <li>c. Incremental backup report (daily, monthly).</li> </ul>
5	c) System Maintenance report.
	d) ITSM Activities <ul style="list-style-type: none"> <li>a. Server maintenance report</li> <li>b. Connectivity maintenance and costing bill</li> <li>c. Incremental backup report (daily, monthly).</li> </ul>
6	e) System Maintenance report
	f) ITSM Activities <ul style="list-style-type: none"> <li>a. Server maintenance report</li> <li>b. Connectivity maintenance and costing bill</li> <li>c. Incremental backup report (daily, monthly).</li> </ul>

### 10.3. Deliverable for Reimbursable Services

No	Deliverable/ Report (Scope of report)
1	<ul style="list-style-type: none"> <li>a) Integration (4 FI, Biller etc.)</li> <li>b) Payment Integration Testing Cost (2 services)</li> <li>c) Service Development (2 Services)</li> <li>d) Data Connectivity (total 30)</li> </ul>
2	<ul style="list-style-type: none"> <li>a) Integration (4 FI, Biller etc.)</li> <li>b) Payment Integration Testing Cost</li> <li>c) Service Development (10 Services)</li> <li>Data Connectivity (total 30)</li> </ul>
3	<ul style="list-style-type: none"> <li>a) Integration (4 FI, Biller etc.)</li> <li>b) Payment Integration Testing Cost (2 services)</li> </ul>

No	Deliverable/ Report (Scope of report)
	c) Service Development (2 Services) Data Connectivity (total 30)
4	a) Standardization Certification (PCI DSS+ISO 27001) b) SSL Certification for Domains c) Integration (4 FI, Biller etc.) d) Payment Integration Testing Cost e) Service Development (2 Services) Data Connectivity (total 30)
5	a) Standardization Certification (PCI DSS+ISO 27001) b) Integration (4 FI, Biller etc.) c) Payment Integration Testing Cost(2 services) d) Service Development (2 Services) Data Connectivity (total 30)

## 11. Qualification

SL	Position	Minimum Qualification	
<b>Project Management</b>			
1	Project Manager	<b>Job Description:</b> <ul style="list-style-type: none"> <li>Lead overall planning, execution, monitoring, and delivery of all ekPay development, enhancement, and support activities.</li> <li>Coordinate with a2i, development teams, QA teams, and stakeholders to ensure timely milestone completion.</li> <li>Ensure requirement analysis, sprint planning, resource allocation, and technical decision-making.</li> <li>Maintain project documentation, risk matrix, mitigation plan, and progress dashboard.</li> <li>Ensure compliance with standards, security guidelines, and government procedures.</li> </ul>	<b>Experience, Expertise and Educational Requirement:</b> <ul style="list-style-type: none"> <li>i) Minimum graduate in Computer Science and Engineering/ICT or a related discipline from a recognized institution.</li> <li>ii) Minimum 10 years of professional experience in the IT sector, including at least 5 years of proven experience in managing large-scale IT projects, preferably in payment systems, financial platforms, or large government services.</li> <li>iii) Professional certifications such as PMP/PRINCE2/Scrum Master, or equivalent</li> </ul>



SL	Position	Minimum Qualification	
2	Business Analyst	<b>Job Description:</b> <ul style="list-style-type: none"> <li>• Conduct requirement analysis, stakeholder discussion, and documentation of system processes.</li> <li>• Prepare user stories, use-case diagrams, workflows, and requirement specifications.</li> <li>• Assist Sr. BA in validating requirements, managing change requests, and conducting UAT.</li> <li>• Coordinate with UI/UX, development, and QA teams for requirement clarification.</li> <li>• Support functional review of developed modules.</li> </ul>	<b>Experience, Expertise and Educational Requirement:</b> <ul style="list-style-type: none"> <li>i) Minimum Bachelors in CS/CSE/EEE or any relevant discipline from university.</li> <li>ii) Minimum 8 years' professional experience in the IT Industry.</li> <li>iii) Minimum 5 years' professional experience as a business analyst.</li> </ul>
3	Technical Documentation Expert	<b>Job Description:</b> <ul style="list-style-type: none"> <li>• Prepare user manuals, system documentation, SRS, API documentation, and release notes.</li> <li>• Develop structured documentation for all major modules of ekPay based on inputs from BA and development teams.</li> <li>• Ensure version-controlled, updated, and standardized documents following government documentation guidelines.</li> <li>• Assist QA and support teams by preparing troubleshooting guides and FAQs.</li> </ul>	<b>Experience, Expertise and Educational Requirement:</b> <ul style="list-style-type: none"> <li>i) Bachelors in CSE/IT or any relevant discipline.</li> <li>ii) 3 years of experience in technical documentation.</li> </ul>
<b>Development and Enhancement</b>			

SL	Position	Minimum Qualification	
4	Solution Architect	<b>Job Description:</b> <ul style="list-style-type: none"> <li>● Lead system and solution architecture design for ekPay core system and sub-modules.</li> <li>● Define architecture patterns, integrations, database structures, API standards, and security models.</li> <li>● Review system scalability, performance, load distribution, and failover strategies.</li> <li>● Guide development teams with best practices and ensure alignment with cloud and on-prem standards.</li> <li>● Evaluate new technologies for system enhancement and optimization.</li> </ul>	<b>Experience, Expertise and Educational Requirement:</b> <ul style="list-style-type: none"> <li>i) Bachelor's/Master's in CSE or any relevant discipline.</li> <li>ii) Minimum 8 years of experience in software development, with at least 5 years in a solution architect role as medium/large-scale projects.</li> <li>iii) Relevant certification in TOGAF/AWS/Azure/Google/Oracle Solution Architect or equivalent.</li> </ul>
5	System Analyst	<b>Job Description:</b> <ul style="list-style-type: none"> <li>● Translate business requirements into technical requirements, workflows, data models, and system diagrams.</li> <li>● Prepare SRS, system design documents including sequence diagrams, ERD, API specifications, and module interactions.</li> <li>● Work closely with Solution Architect to finalize system logic.</li> <li>● Support developers by clarifying system behaviors and constraints.</li> <li>● Validate functional and system-level alignment before development.</li> </ul>	<b>Experience, Expertise and Educational Requirement:</b> <ul style="list-style-type: none"> <li>i) Bachelor's in CSE or any relevant discipline.</li> <li>ii) Minimum 5 years of experience in analysis, with at least 2 years in system analysis, requirement gathering and documentation.</li> </ul>
6	Sr. Software Engineer (Frontend)	<b>Job Description:</b> <ul style="list-style-type: none"> <li>● Develop, enhance, and maintain the frontend of ekPay using Angular and jQuery, ensuring a responsive and user-friendly interface.</li> <li>● Collaborate with backend developers working with Java, Spring Boot, and PostgreSQL to</li> </ul>	<b>Experience, Expertise and Educational Requirement:</b> <ul style="list-style-type: none"> <li>i) Bachelor's degree in Computer Science, Software Engineering, or a related field.</li> <li>ii) Minimum 5 years of professional experience in frontend development,</li> </ul>

SL	Position	Minimum Qualification	
		<p>integrate RESTful APIs and other services.</p> <ul style="list-style-type: none"> <li>• Optimize frontend performance, accessibility, and security across web and mobile platforms.</li> <li>• Implement best practices for frontend development, including modular design, reusable components, and code versioning.</li> <li>• Participate in code reviews, testing, and debugging to ensure high-quality software delivery.</li> <li>• Stay up-to-date with emerging frontend technologies and propose improvements to the existing technology stack..</li> </ul>	<p>preferably in large-scale web applications.</p> <p>iii) Strong expertise in Angular (latest versions), jQuery, HTML, CSS, bootstrap, and JavaScript/TypeScript along with RESTful APIs, integrating frontend with backend services (Java/Spring Boot), version control systems (e.g., Git) and agile development practices.</p>
7	Sr. Software Engineer (Backend)	<p><b>Job Description:</b></p> <ul style="list-style-type: none"> <li>• Design, develop, and maintain backend services using Java and Spring Boot.</li> <li>• Develop and integrate RESTful APIs for frontend and third-party service consumption.</li> <li>• Collaborate with frontend teams (Angular, jQuery) to ensure seamless application flow.</li> <li>• Optimize backend performance, database interactions, and system scalability.</li> <li>• Design and implement database schemas, queries, and optimization strategies in PostgreSQL.</li> <li>• Ensure security, reliability, and compliance of backend systems.</li> <li>• Participate in code reviews, testing, and debugging to ensure high-quality software delivery.</li> <li>• Maintain technical documentation for backend services and APIs.</li> <li>• Stay updated with emerging backend technologies and suggest improvements to the existing stack.</li> </ul>	<p><b>Experience, Expertise and Educational Requirement:</b></p> <p>i) Bachelor's degree in Computer Science, Software Engineering, or a related field.</p> <p>ii) Minimum 5 years of professional experience in backend software development.</p> <p>iii) Strong expertise in Java, Spring Boot, relational databases, especially PostgreSQL, and RESTful API development along with version control systems (e.g., Git) and agile development practices.</p>

SL	Position	Minimum Qualification	
8	UI/UX Expert	<b>Job Description:</b> <ul style="list-style-type: none"> <li>● Lead UI/UX design for ekPay web and mobile platforms.</li> <li>● Prepare wireframes, mockups, prototypes, and visual interfaces aligned with government usability guidelines.</li> <li>● Ensure accessibility, user experience consistency, and responsive design.</li> <li>● Conduct user research, usability testing, and interaction design improvements.</li> <li>● Collaborate with frontend and BA teams for seamless UI implementation.</li> </ul>	<b>Experience, Expertise and Educational Requirement:</b> <ol style="list-style-type: none"> <li>i) Bachelor's in any relevant discipline.</li> <li>ii) Minimum 5 years of experience in UI/UX design for medium to large scale web-based applications.</li> </ol>
9	Database Architect / DBA (Senior)	<b>Job Description:</b> <ul style="list-style-type: none"> <li>● Design and optimize large-scale database architecture for ekPay.</li> <li>● Implement sharding, indexing, clustering, backup, and high-availability strategies.</li> <li>● Conduct query optimization, performance tuning, and slow-query analysis.</li> <li>● Lead DB migration, capacity planning, and monitoring.</li> <li>● Ensure data integrity, security, and disaster recovery readiness.</li> <li>● Ensure high availability</li> </ul>	<b>Experience, Expertise and Educational Requirement:</b> <ol style="list-style-type: none"> <li>i) Bachelor's in CSE or any relevant discipline.</li> <li>ii) Minimum 8 years of experience with database design, query optimization, slow query analysis.</li> <li>iii) Strong expertise in PostgreSQL administration, specialize in high-availability cluster management and replication, utilizing advanced techniques such as table partitioning, sharding strategies, and indexing optimization to facilitate seamless (GB-scale) database migrations</li> </ol>
10	Integration Engineer	<b>Job Description:</b> <ul style="list-style-type: none"> <li>● Plan and execute system-to-system integration using REST, SOAP, and middleware.</li> <li>● Develop APIs, manage integration endpoints, and handle authentication protocols.</li> <li>● Diagnose integration issues and ensure proper data synchronization.</li> </ul>	<b>Experience, Expertise and Educational Requirement:</b> <ol style="list-style-type: none"> <li>i) Bachelor's in CSE or any relevant discipline.</li> <li>ii) Minimum 5 years of experience in software development, with at 2 years in system integration projects using REST, SOAP, middleware and integration</li> </ol>

SL	Position	Minimum Qualification	
		<ul style="list-style-type: none"> <li>Document integration flows and prepares test scripts.</li> <li>Work with external government agencies for API onboarding.</li> </ul>	standards tools.
11	Software Engineer (Frontend)	<b>Job Description:</b> <ul style="list-style-type: none"> <li>Develop and maintain frontend components using <b>Angular</b> and <b>jQuery</b>.</li> <li>Integrate frontend with backend services developed in <b>Java/Spring Boot</b> via <b>RESTful APIs</b>.</li> <li>Ensure responsive design, performance optimization, and cross-browser compatibility.</li> <li>Write clean, modular, and reusable code following best practices.</li> <li>Participate in testing, debugging, and resolving frontend issues.</li> <li>Collaborate with team members to deliver high-quality software within project timelines.</li> <li>Maintain technical documentation related to frontend development.</li> </ul>	<b>Experience, Expertise and Educational Requirement:</b> <ol style="list-style-type: none"> <li>Bachelor's degree in Computer Science, Software Engineering, or related field.</li> <li>Minimum 3 years of professional experience in frontend development using Angular, jQuery, HTML5, CSS3, and JavaScript/TypeScript as well as experience in integrating frontend with RESTful APIs, version control systems (e.g., Git) and agile development practices.</li> </ol>
12	Software Engineer (Backend)	<b>Job Description:</b> <ul style="list-style-type: none"> <li>Develop and maintain backend services using <b>Java</b> and <b>Spring Boot</b>.</li> <li>Implement and integrate <b>RESTful APIs</b> for frontend and third-party service consumption.</li> <li>Collaborate with frontend teams (Angular, jQuery) to ensure seamless application functionality.</li> <li>Design and optimize database schemas, queries, and interactions in <b>PostgreSQL</b>.</li> <li>Ensure system reliability, security, and performance.</li> <li>Participate in code reviews, testing, and debugging to deliver high-quality software.</li> <li>Document backend services and</li> </ul>	<b>Experience, Expertise and Educational Requirement:</b> <ol style="list-style-type: none"> <li>Bachelor's degree in Computer Science, Software Engineering, or a related field.</li> <li>Minimum 3 years of professional experience in backend development using Java, Spring Boot, and RESTful API development, PostgreSQL, version control systems (e.g., Git) and agile development practices.</li> </ol>

SL	Position	Minimum Qualification	
		APIs for internal reference and integration purposes.	
13	Senior Developer Mobile App	<b>Job Description:</b> <ul style="list-style-type: none"> <li>● Lead mobile app architecture design, coding, testing, and deployment.</li> <li>● Develop Android/iOS modules, UI components, and offline-first functionalities.</li> <li>● Integrate APIs, optimize performance, and ensure app security.</li> <li>● Guide mobile team and conduct code reviews.</li> <li>● Coordinate with backend and QA teams for full-stack integration.</li> </ul>	<b>Experience, Expertise and Educational Requirement:</b> <ul style="list-style-type: none"> <li>i) Bachelor's in CSE or any relevant discipline.</li> <li>ii) Should have a minimum 05 years of profound experience in the field of mobile apps design and development.</li> </ul>
<b>Security</b>			
14	Security Expert	<b>Job Description:</b> <ul style="list-style-type: none"> <li>● Lead implementation of application and infrastructure security measures.</li> <li>● Configure security tools, firewalls, WAF, IAM, and encryption mechanisms.</li> <li>● Develop security guidelines and enforce secure coding practices.</li> <li>● Respond to security incidents and perform forensic analysis.</li> <li>● Support compliance with GDPR, ISO27001, and government security standards.</li> </ul>	<b>Experience, Expertise and Educational Requirement:</b> <ul style="list-style-type: none"> <li>i) Bachelor's in CSE or any relevant discipline.</li> <li>ii) Minimum 5 years of experience in web security implementation.</li> <li>iii) Certification in CISSP/CEH or equivalent.</li> </ul>
<b>Quality Assurance</b>			
15	QA Engineer	<b>Job Description:</b> <ul style="list-style-type: none"> <li>● Develop test cases, perform manual/automated testing, and report defects.</li> <li>● Conduct functional, UI, smoke, and regression testing.</li> <li>● Work with BA and developers to validate requirements and fixes.</li> </ul>	<b>Experience, Expertise and Educational Requirement:</b> <ul style="list-style-type: none"> <li>i) Bachelor's in CSE or any relevant discipline.</li> <li>ii) Minimum 5 years of experiences in software testing and quality assurance for medium/large scale web-</li> </ul>

SL	Position	Minimum Qualification	
		<ul style="list-style-type: none"> <li>Track bugs using appropriate tools and ensure retesting.</li> <li>Maintain test documentation and support UAT.</li> </ul>	based/mobile applications as well as experienced in test cases, bug tracking, automation testing and functional testing.
<b>IT Service &amp; Release Management</b>			
16	Cloud Architect	<b>Job Description:</b> <ul style="list-style-type: none"> <li>Design and implement scalable, secure, and high-availability cloud architectures for production, testing, and development environments.</li> <li>Manage cloud resources, including compute, storage, networking, and databases, for optimal performance and cost efficiency.</li> <li>Implement cloud security best practices, including identity management, encryption, and network segmentation.</li> <li>Define and manage cloud deployment strategies, automation, CI/CD pipelines, and monitoring solutions.</li> <li>Ensure disaster recovery (DR) and business continuity through robust backup and replication strategies.</li> <li>Collaborate with development and operations teams to support cloud-native application design.</li> <li>Evaluate and recommend cloud technologies, tools, and platforms to improve operational efficiency.</li> <li>Maintain technical documentation of cloud architecture, policies, and procedures.</li> </ul>	<b>Experience, Expertise and Educational Requirement:</b> <ol style="list-style-type: none"> <li>Bachelor's degree in Computer Science, Information Technology, or related field.</li> <li>Minimum 5 years of experience in cloud architecture, deployment, configuration, storage, database services, security, disaster recovery (DR), backup with regulatory compliance for financial systems.</li> </ol>
17	Hosting Infrastructure Expert	<b>Job Description:</b> <ul style="list-style-type: none"> <li>Manage server infrastructure, virtualization, storage, and deployment systems.</li> <li>Troubleshoot hosting issues, performance bottlenecks, and</li> </ul>	<b>Experience, Expertise and Educational Requirement:</b> <ol style="list-style-type: none"> <li>Bachelor's in CSE or any relevant discipline.</li> <li>Minimum 5 years of experience in IT</li> </ol>

SL	Position	Minimum Qualification	
		<p>network-related problems.</p> <ul style="list-style-type: none"> <li>• Support production environment, monitoring, and high-availability setup.</li> <li>• Work with DevOps, security, and DBA teams during releases.</li> <li>• Prepare infrastructure documentation and capacity planning.</li> </ul>	<p>infrastructure, including 2 years in designing, deploying &amp; maintaining cloud-hosted applications on Cloud Infrastructure, as well as all cloud hosting roles like virtualization, storage management, and infrastructure troubleshooting.</p>
18	NOC Engineer	<p><b>Job Description:</b></p> <ul style="list-style-type: none"> <li>• Monitor <b>network, server, and application performance</b> in a 24x7 NOC environment.</li> <li>• Detecting, troubleshooting, and resolving <b>network and infrastructure incidents</b>.</li> <li>• Escalate complex issues to <b>infrastructure, application, or security teams</b> as needed.</li> <li>• Maintain and manage <b>network devices</b> including routers, switches, firewalls, and load balancers.</li> <li>• Support <b>cloud-hosted infrastructure</b> monitoring, preferably on <b>OCI Cloud</b>.</li> <li>• Ensure <b>incident response and SLA adherence</b>.</li> <li>• Prepare <b>incident reports and performance metrics</b> for management.</li> <li>• Collaborate with <b>DevOps, security, and application teams</b> to maintain system health and uptime.</li> </ul>	<p><b>Experience, Expertise and Educational Requirement:</b></p> <p>i) Bachelor's degree in computer science/Information Technology/Electronics &amp; Communication Engineering, or a related field.</p> <p>ii) Minimum 3 years in network protocols, firewalls, routers, switches, and load balancers, or IT operations, monitoring &amp; supporting enterprise IT environments and cloud-hosted applications in a 24x7 NOC environment.</p>



SL	Position	Minimum Qualification	
19	DevOps engineer	<b>Job Description:</b> <ul style="list-style-type: none"> <li>● Implement CI/CD pipelines, containerization, and automated deployment workflows.</li> <li>● Manage Kubernetes, Docker, Terraform, Ansible, and cloud infrastructure.</li> <li>● Optimize application performance through monitoring and scaling.</li> <li>● Coordinate with developers, QA, and hosting teams for release cycles.</li> <li>● Ensure secure and reliable DevOps practices.</li> </ul>	<b>Experience, Expertise and Educational Requirement:</b> <ul style="list-style-type: none"> <li>iii) Bachelor's degree in Computer Science, Information Technology/ Software Engineering, or a related discipline.</li> <li>iv) Minimum 5 years of hands-on experience in DevOps roles supporting medium/large-scale applications and hosting infrastructures as well as CI/CD, containerization (Docker, Kubernetes), cloud platforms and infrastructure automation tools like Ansible and Terraform.</li> </ul>
20	SRE Engineer	<b>Job Description:</b> <ul style="list-style-type: none"> <li>● Design, implement, and maintain highly available, scalable, and secure infrastructure for ekPay.</li> <li>● Automate deployment, monitoring, and operational processes to minimize manual intervention.</li> <li>● Manage CI/CD pipelines, deployment strategies, and release processes.</li> <li>● Conduct root cause analysis (RCA) for incidents and implement preventive measures.</li> <li>● Implement observability solutions, including logging, metrics, and alerting frameworks.</li> <li>● Optimize cloud resources for cost, performance, and security efficiency.</li> </ul>	<b>Experience, Expertise and Educational Requirement:</b> <ul style="list-style-type: none"> <li>i) Bachelor's degree in Computer Science, Information Technology/ Software Engineering, or a related discipline.</li> <li>ii) Minimum 5 years of hands-on experience in Site Reliability, DevOps, or Cloud Operation. Experience with monitoring and observability tools (Prometheus, Grafana, ELK Stack, New Relic, Datadog), Jenkins, GitLab CI/CD, or GitHub Actions, database operations (MySQL, PostgreSQL, MongoDB) and performance tuning</li> </ul>
		<b>Support and Helpdesk</b>	
21	Technical Support Engineer	<b>Job Description:</b> <ul style="list-style-type: none"> <li>● Install and configure software and computer systems and resolve issues with software or hardware.</li> <li>● Receive feedback from the help</li> </ul>	<b>Experience, Expertise and Educational Requirement:</b> <ul style="list-style-type: none"> <li>i) Bachelor's in Computer Science, IT, or equivalent.</li> <li>ii) 3 years of experience in</li> </ul>

SL	Position	Minimum Qualification	
		desk or directly from the clients and adjust feedback. <ul style="list-style-type: none"> <li>• Solve critical issues in collaboration with the core technology team.</li> <li>• Prepare customized support reports for the management.</li> </ul>	application support, incident management, and troubleshooting as well as understandings of client/server systems, databases, and basic networking.

## 12. Team Composition

Position	No. of Person
<b>Project Management</b>	
Project Manager	1
Business Analyst	1
Technical Documentation Expert	1
<b>Development and Enhancement</b>	
Solution Architect	1
System Analyst	1
Sr. Software Engineer (Back-end)	2
Sr. Software Engineer (Frontend)	1
UI/UX Expert	1
Database Architect / DBA (Senior)	1
Integration Expert	1
Software Engineer (Back-end)	5
Software Engineer (Front-end)	2
Senior Developer Mobile App	2
<b>Security</b>	
Security Expert	1
Quality Assurance	
QA Engineer	2
<b>IT Service &amp; Release Management</b>	
Cloud architect	1
Hosting Infrastructure Expert	1
DevOps Engineer	1
SRE Engineer	1
NOC Engineer	1
<b>Support and Helpdesk</b>	

<b>Position</b>	<b>No. of Person</b>
Technical Support Engineer	3
<b>Total</b>	<b>31</b>