



## Annexure A - Technical Requirements for Ubank DWH RFP

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## 1. Scope of Work & Services

The successful bidder will be responsible for the end-to-end delivery of their proposed **Enterprise Data Warehouse platform**. This includes, but is not limited to, the following key areas:

### 1. Thorough Requirement Gathering and Analysis:

- a. Complete due diligence of solution requirements to ensure that all platform requirements are met
- b. Conduct workshops with Ubank stakeholders and relevant teams to thoroughly gauge the functional requirements in accordance with the information provision in the RFP.

### 2. Supply, Delivery & Provisioning of Data Warehouse Platform and Infrastructure

- a. Provision of on-premises Enterprise DHW platform as per RFP requirements, including all required components such as hardware, licenses, software, support services and warranties etc. at designated installation sites of Ubank.
- b. Complete solution for Primary Site (PR) and Disaster Recovery (DR) site must be provided to ensure the mentioned SLA in this document is fully complied with.
  - The vendor must execute two full cycles of DR switch over and fall back. The DR switchover must be fully functional for at least 3 calendar days before falling back to primary site.
  - Vendor must provide comprehensive runbook for use by Ubank DR Office, with step-by-step instructions on switching over to DR and falling back to primary site.
  - As part of DR design, vendors must specify the RPO and RTO of the solution, based on Ubank's requirements and all involved moving parts.
  - Vendor must qualify configuration items (CI) that need to be replicated along with replication frequency and changed based on the flow of information (primary or DR).

### 3. Physical Installation, Configuration and Commissioning:

- a. End-to-end physical installation, configuration and commissioning of the supplied Enterprise DWH solution as per required specifications.

### 4. Integration Services (such as but not limited to):

- a. Seamless integration with Ubank's existing Active Directory (AD) and LDAP for user authentication and synchronization.

- b. Must integrate with existing third-party systems to fulfill the functional requirements of the RFP.

#### 5. **Testing:**

- a. Rigorous and comprehensive testing (system, unit, integration, UATs etc.) of the new/proposed system.
- b. Before UAT kickoff, Ubank will provide detailed list of UAT. Vendors must execute all UAT cases before formally calling out UAT. UAT results along with evidence (logs, screenshots, videos, etc.) must be shared with Ubank before formal UAT by Ubank can be started.
- c. Vendor must execute at least 1 cycle of performance testing before production cutover. Detailed performance test cases, test results and summary outcome of performance testing cycle(s) will be provided by the vendor. Testing must include load testing, stress testing and response time testing. Performance testing results must comply with the load forecast provided by Ubank as part of this RFP.
- d. Vendor must provide detailed integration testing results to validate the integrations. In case no test environment for a third party is available or access to third party is not possible, vendors must develop stubs / mocks for bi-directional calls. Detailed test cases for integration testing and results of integration testing along with evidence (logs, screenshots, videos, etc.) must be supplied to Ubank.

#### 6. **Documentation & Handover**

- a. **Artifacts:** Architecture diagrams, data dictionaries, lineage, transformation specifications, job schedules, runbooks, SOPs, and compliance mappings.
- b. **Handover:** Knowledge transfer, admin credential handover, environment access, and exit plan (including data export formats and de-provisioning procedures per SBP framework).

#### 7. **Training Program**

- a. Conduct comprehensive hands-on sessions for analysts/operations team covering the entire solution.
- b. Provision of all necessary training materials.

#### 8. **Ongoing and Post-Go Live Support:**

- a. Provide continuous support and maintenance for the proposed solution as per the agreed Service Level Agreement (SLA).
- b. Provide on-site support for the proposed solution as per the agreed Service Level Agreement (SLA).

- c. **Response/Resolution:** Prioritized incident tiers with response and resolution times as per defined SLA in this document.
- d. **Warranty:** Full warranty on supplied hardware/software for five years, including patches/updates, replacement parts, and compatibility assurance when scaling vertically
- e. **Security Support:** Incident response procedures, breach notification timelines, periodic access reviews, vulnerability patching cadence; alignment with SBP incident management expectations

#### 9. **Logging:**

- a. The solution must provide detailed logging at all layers and components.
- b. The logging level at individual layer must be configurable based on various levels of logging (e.g. information, debug, error, critical, etc.).
- c. Logging level for each layer / component must be independently configurable.
- d. All sensitive data must be logged with strong but standard encryption techniques. The encryption should be irreversible for relevant components of data (e.g. MPIN, etc.) and reversible for other components of data (e.g. CNIC, etc.).
- e. A comprehensive logging solution document must be provided with details of fields being logged and other configurations.
- f. A responsive and efficient user interface must be provided for searching through logs for individual transactions (correlated at all layers) using various fields.
- g. The log searching UI must have provision of roles and privileges to be assigned to different users of the UI.
- h. The solution must be able to integrate with SIEM for centralize monitoring of application authentication and privileged accounts' activities logs.

## 2. Functional Requirements

The following functional specifications must be met by the proposed solution in order to qualify as a technically feasible solution:

### 1. Infrastructure & Scalability (The 5-Year Roadmap)

- **Initial Storage Capacity:** Provision of a baseline **15TB of usable, high-performance storage**.
- **Modular Expansion:** The system must be engineered to be **extendable up to 50TB** through yearly growth phases without requiring system migration or significant downtime.

- **Customer Volume Scaling:** The DWH must maintain high query performance as the customer base scales from approximately **4.5 million to 15 million customers**.
- **Staged Growth Milestones and minimum Solution Sizing Requirements:**

Year	Year 1	Year 2	Year 3	Year 4	Year 5
<b>Usable Storage (TB)</b>	15 TB	25 TB	35 TB	45 TB	50 TB
<b>Approximate Customer base (Millions)</b>	4.5M to 6M	6M to 9M	9M to 12M	12M to 14M	15M

- **On-Demand Scalability:** The system must feature modular scaling, allowing for the addition of storage and compute resources "time-to-time" as the bank's data footprint evolves.
- **Data Retention:** The architecture must maintain a minimum of two (2) years of searchable historical data across the entire 5-year cycle.

## 2. Data Modeling & Architecture

- **OLAP Model Implementation:** The vendor shall design and implement a robust OLAP model optimized for multi-dimensional banking analytics. The vendor must justify their chosen schema (e.g., degree of normalization) based on the requirement for high-speed querying for **4.5M to 15M customer records**.
- **Multi-Layered Environment:**
  - **Staging Layer:** Dedicated area for raw data ingestion for the **9 core files**.
  - **Transformation Layer:** Mandatory use of **Dedicated Temp Tables** and high-speed loading utilities native to the database engine to meet tight batch processing windows. **All sourcing logic will be provided as per business rules and definitions.**
  - **Production Layer:** Daily-partitioned Main Fact Tables and Dimension Tables organized by date, optimized for **24-month historical trend analysis**.
- **Performance Logic:** The system must ensure data is processed on a "**Date -1**" basis, ensuring all reports reflect the previous day's close of business by the start of the current business day.

## 3. Implementation Phase: Core Engineering

### 3.1 Current File Ingestion (Total 9 Files)

Development of automated, daily ETL pipelines for the primary source files. All sourcing logic will be provided as per business rules and definitions.

1. Deposits
2. Disbursements

3. Repayments
4. Dues
5. Collateral
6. Rollover
7. Write-off
8. Additional Core Banking File A
9. Additional Core Banking File B

### 3.2 ETL Engineering & Processing

- **Automated Pipelines:** End-to-end development of ETL jobs to migrate and process the entire core banking database.
- **Logic Components:** Delivery of all necessary Stored Procedures, Data Parsers, and Transformation Scripts required to normalize banking data.
- **Efficiency:** Optimization of data pipelines to handle the scale of **15 million customers approx.** within the nightly batch window.
- **Historical Migration:** Successful migration of at least 24 months of historical records based on provided business logic.

### 4. User Access & Internal Management

- **In-House User Management:** The bank must be provided with an administrative interface to create and manage internal user logins.
- **Role-Based Access Control (RBAC):** Users must be assigned to different roles (e.g., Data Analyst, Developer, Operations) with specific permissions (view-only, select, create, drop rights, etc.).
- **Self-Service Capabilities:** Internal users with appropriate permissions must have the ability to:
  - Execute SQL queries to retrieve daily reports.
  - Create and manage **temporary tables within the dedicated Temp Space** for ad-hoc analysis and testing.
  - Trigger or manage high-speed data loading processes for specific internal data jobs.

### 5. Operational Monitoring & Governance

- **BI Dashboarding Tool Recommendation:** Integration of **one (1) industry-standard BI tool** for dashboarding and automated report extraction.
- **Execution Logging:** Detailed audit trails for every table, stored procedure, and parser execution, including timestamps and row counts.

- **Job Tracking Portal:** A centralized Web Portal for the IT team to track job progress, dependencies, and performance in real-time.
- **Reconciliation & Alerts:**
  - **Daily Recon:** Automated Recon Emails for data integrity validation between source and target.
  - **Alerting:** Automated system for job completions, failures, or data anomalies.

## 6. Post-Implementation Phase (5-Years Plan)

- **Ongoing Sourcing Support:** Architecture must support ingestion of **additional sourcing files time-to-time**.
- **Future Business Modules:** Provision for seamless onboarding and modeling of:
  - Digital Customer Data
  - Nano Lending
  - Financial Modeling



### 3. Licensing Requirements

The proposed systems must be fully loaded with all applicable licenses to ensure that all functional and non-functional requirements of this RFP are met from day-1 while ensuring possibility to take full advantage of the proposed solution.

## 4. General Technology and Information Security Requirements

### 1. Information and Cyber Security Requirements:

- a. The solution must comply with all financial industry standard security requirements.
  - b. Solution must adhere to Ubank's Information Security standards, attached in **Annexure-B: Compliance Sheet**, named **"Information Security"** to this RFP document.
  - c. Solution must adhere to any other security guidelines by State Bank of Pakistan and / or Ubank's Information Security department, that are made public and intimated by Ubank before the sign-off of design phase.
2. All components / layers must be designed on an easy-to-execute horizontal and vertical scaling.
  3. All the hardware and software proposed for the solution must be compatible with existing allied solutions for managing systems (e.g. backup system, NOC monitoring, etc.)
  4. The vendor must provide a complete lifecycle of all hardware and software components being delivered as part of the solution.
  5. The vendor must ensure that all hardware, software and license components being delivered as part of the solution remain in full enterprise support for at least 5 years post complete deployment.
  6. Vendor will be responsible for upgrading to relevant version of the hardware and / or software in case the version under implementation is going end of life or end of support before full first production cutover.

### 7. Implementation Methodology

- a. Vendor/Bidder must provide detailed implementation methodology, including work breakdown structure, complete deployment plan, project implementation plan (in MS Project format) with tangible and measurable criteria for sign-off of each implementation phase.
- b. Post 1<sup>st</sup> cutover, vendor must propose an agile approach along with establishing a rapid Continuous Integration – Continuous Development (CICD) pipeline.

### 8. General Implementation Principles

- a. Vendor/Bidder must complete the standard test phases (unit testing, integration testing, user acceptance testing, performance testing, vulnerability testing and full-dress testing).

- b. **Unit Testing:** Vendor/Bidder must provide detailed unit testing results for all functionality, along with proper screenshots and evidence, on JIRA.
  - c. **Integration Testing:** Vendor/Bidder must provide detailed integration testing results to validate the integrations. In case no test environment for a third party is available or access to third party is not possible, vendor must develop stubs / mocks for bi-directional calls. Detailed test cases for integration testing and results of integration testing along with evidence (logs, screenshots, videos, etc.) must be uploaded by the vendor on Ubank's JIRA instance.
  - d. **User Acceptance Testing:** Before UAT kickoff, Ubank will provide detailed list of UAT cases. Vendor/Bidder must execute all UAT cases before formally calling out UAT. UAT results along with evidence (logs, screenshots, videos, etc.) must be shared by vendor before formal UAT by Ubank can be started.
  - e. **Performance Testing:** Vendor/Bidder must execute at least 1 cycle of performance testing before production cutover. Detailed performance test cases, test results and summary outcome of performance testing cycle(s) will be provided by the vendor. Performance testing results must comply with load forecast provided by Ubank as part of this RFP.
  - f. **Vulnerability Assessment / Penetration Testing (VA/PT):** Vendor/Bidder must execute VA/PT cycles on the solution and all integrated layers, using standard VA/PT toolset, to be arranged by the Vendor. Ubank will also execute VA/PT cycles on all components using its toolset. Vendor/Bidder is responsible to close all critical, high, medium and low anomalies / vulnerabilities identified in any component of the solution, before going live.
9. **Training:** Vendor/Bidder must provide detailed training and transition plan (along with training delivery) at the start of the project, for transitioning implementation artifacts to Ubank's relevant teams and configuration / customization training of Ubank's resources. The training and transition plan should also ensure Ubank's resources are equipped with necessary skills to undertake Operations of the production platform from day-0.

#### 10. Warranty and Support:

- a. Vendor/Bidder must provide **1 year of warranty and support**, without any additional cost, for all components (may include but not limited to: all hardware components, software, license, services, functionality etc.) delivered as part of the solution without any additional cost to Ubank.
- b. The warranty period will require SLA based incident resolution; penalties would be applicable in case of SLA breach.
- c. Warranty period will start from signoff of final production deployment and complete in-scope Go-live items.
- d. Vendor/Bidder must also commit to providing **at least 4 years of support post warranty period**, with penalties backed SLA, as part of their proposal.

## **11. Documentation:**

- a. Vendor/Bidder must provide detailed documentation on the architecture and implementation of the solution.
- b. Documentation must contain details of the architecture, including logical and physical architecture, deployment architecture and integration architecture.
- c. The solution documentation must be provided in the form of a wiki / live document, instead of static word / pdf documents.

## **12. Configuration Management**

- a. The vendor must comply to the configuration management process below, including:
- b. All source code / scripts / implementation will be property of and in the ownership of Ubank.
- c. The vendor must set up a configuration management function at the start of the implementation.
- d. All development by the vendor must be performed in the development environment, with nightly code check-in.
- e. Ubank team will build the implementation artifacts using the checked-in code, on nightly basis. Vendor must ensure that nightly build is not broken.
- f. For any new deployment on test / pre-prod or production environment, either nightly build or on-demand build prepared by Ubank's configuration management team will be deployed by Ubank's team on the relevant environment.
- g. Vendors will not have access to any environment other than development environment.

## 5. Service Level Agreement (SLA)

The proposed solution must be backed by a robust Service Level Agreement (SLA) covering, but not limited to, the following aspects:

1. **Incident Response, Restoration & Resolution Times:** The vendor must commit to the following maximum timelines for SLA:

Incident Severity	Coverage	Response Time	Restoration Time	Resolution Time	Target Thresholds
Severity 1	24 x 7 (including public holidays)	< 30 minutes	< 4 hours	< 2 calendar days	99%
Severity 2	24 x 7 (including public holidays)	< 1 hour	< 8 hours	< 4 calendar days	97%
Severity 3	Workdays	< 1 workday	< 3 workdays	< 6 workdays	95%
Severity 4	Workdays	< 2 workdays	< 5 workdays	< 10 workdays	90%
Technical Query	Workdays	< 24 hours	Best possible effort	Not Applicable	

Table 1: SLA for Incident Support

Severity Level	Description
Severity 1 – Critical Issue	Essential Business Process or Workgroup affected – any highly critical system or service outage that result in loss of defined business processes and/or capabilities, and for which there is no workaround acceptable to Ubank (availability of workaround renders it “High”)
Severity 2 – High Issue	Part of an Essential Business Process or Workgroup affected - Degradation of system or service performance that impacts end user service quality or significantly impairs business process control or operational effectiveness, but for which there is a workaround acceptable to Ubank.
Severity 3 – Low Issue	Part of essential/Non-Essential Business Process or Workgroup or Individual affected and can be replicated with discrete steps – Minor degradation of system or service performance that does not have any impact on end user service quality.
Severity 4 – Other Issue	A low-level priority defect that cannot be replicated, is caused by corruption in data, or has other non-software related cause
Technical Query	A query regarding technical information regarding a feature implemented

Table 2: Severity Level Definitions

Time Span	Description
Response Time	Response time is defined as the elapsed time between the vendor receiving the support request and formal acknowledgement of the request by the vendor back to the Ubank.
Restoration Time	Restoration time is defined as the elapsed time between response time and successful restoration of the service, by temporary or permanent fix or workaround, as confirmed and agreed by Ubank.
Resolution Time	Resolution time is defined as the elapsed time between restoration time and successful deployment of a permanent fix for the reported incident.

Table 3: Time Span Definition

2. **Performance:** Bidder to define & share metrics for system response times and UI responsiveness, report generation etc.

3. **Disaster Recovery:** In case of on-premises solution, the bidder must supply, deploy and configure a full-fledged Disaster Recovery (DR) site at U Bank Disaster Recovery DC to ensure seamless services, SLA compliance and automatic services shifting to DR in case any outage at primary site.
4. **Support Channels:** Availability of 24/7 support via multiple channels (phone, email, chat, dedicated portal).
5. **Data Backup & Recovery:** Bidder to share details on backup frequency, retention policies, and disaster recovery plans with defined Recovery Point Objective (RPO) and Recovery Time Objective (RTO).
6. **Security Incident Response:** Bidder to define & share the process and timelines for responding to and notifying Ubank of any security breaches or incidents.
7. **Penalties:** Clear penalties for failure to meet agreed-upon SLA targets.
8. **Reporting:** Regular performance reports on SLA adherence.
9. **Escalation Matrix:** The vendor must provide a clear escalation matrix for all issues, incidents, and change requests related to their provided solution. This matrix should outline the contact points and escalation paths within the vendor's organization.

Escalation Level	Role/Contact Person	Contact (Email/Phone)	Method	Response Expectation	Time
Level 1	Service Desk / L1 Support				
Level 2	Team Lead / L2 Support				
Level 3	Manager / L3 Support				
Level 4	Director / Executive				

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