



Qucoo Limited
Technology. Consulting. Strategy

Technical Proposal

Implementation of an Asset Management Application

Date:
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I. DOCUMENT CONTROL

1.1 Revision History

Summary of historical revision to the document

Revision Date	Version	Author	Revision Notes/Changes
13-Feb-2026	1.0	Tomiwa Olu-Ajayi Tomiwa.Olu-Ajayi@qucoo.com	Version 1.

1.2 Document Approval

The current/latest version was reviewed and approved by the following people:

Name	Review	Approval
Tope Olakunle Tope.olakunle@qucoo.com	<input type="checkbox"/>	<input checked="" type="checkbox"/>



Yinka Daramola
CEO



2. EXECUTIVE SUMMARY

2.1 Summary of Proposal

Qucoo Limited is pleased to submit this proposal for the design, development, implementation, and support of an integrated Asset Management Application for ValuAlliance Asset Management Limited.

Our proposal delivers a purpose-built, cloud-native platform that automates end-to-end investment management workflows, from portfolio construction and trade execution through fund accounting, regulatory reporting, and client analytics.

The solution is designed specifically for the Nigerian capital market ecosystem and addresses ValuAlliance's requirements across six core areas:

#	Area	Scope
1	Investment Operations	Portfolio setup, trade capture, transaction lifecycle management, valuation and pricing
2	Financial Management	Fund accounting, GL integration, fee calculation, financial statements, reconciliation
3	Valuation & Performance	NAV computation, securities pricing, performance measurement and attribution
4	Regulatory Compliance	SEC statutory returns, AML/CFT monitoring, NDPR compliance, audit-ready reporting
5	Client Reporting & Analytics	Performance reports, AUM tracking, customisable dashboards, export capabilities
6	Management Intelligence	Revenue metrics, profitability analysis, growth KPIs, trend analysis

Why Qucoo:

Qucoo brings direct, relevant experience from active engagements such as:

1. FSDH Merchant Bank (custody management, portfolio tracking, trade settlement, reconciliation, CSCS/FMDQ integration)
2. Stanbic IBTC (trade register automation).

We have built integrated financial platforms for multiple regulated Nigerian institutions, and we understand both the operational workflows and the regulatory landscape ValuAlliance operates within.

Our technology decisions Java, React, MySQL on AWS prioritise performance, security, and long-term maintainability with zero licensing costs on the database layer.

Delivery: 16 weeks, phased, with working software demonstrated every 2 weeks.



2.2 Products & Features Overview

The application is organised into the following modules, integrations, and back-office components:

#	Layer	Components
1	Core Modules	<ul style="list-style-type: none">• Portfolio Management• Trade Capture & Processing• Fund Accounting• Valuation & Pricing Engine• Risk & Compliance• Performance Measurement• Client Reporting
2	Back office	<ul style="list-style-type: none">• Settlement Processing• Reconciliation Engine• Fee Calculation & Billing• Regulatory Returns Generation• Audit Trail & Compliance Logs
3	Integrations	<ul style="list-style-type: none">• General Ledger / ERP• Custodian Systems (CSCS)• Market Data Feeds (NSE, FMDQ)• SEC Reporting Portal• Payment Systems• Bloomberg / Reuters (optional)
4	Cross Cutting	<ul style="list-style-type: none">• Role-Based Access Control• Maker-Checker Workflows• Notification Engine• Document Management• Global Search

2.3 Key Assumptions

#	Assumption	Description
1	Phased Delivery	ValuAlliance agrees to a phased delivery based on an agreed Project Roadmap, with MVP targeted within 16 weeks.
2	Stakeholder Availability	ValuAlliance will provide timely access to key business stakeholders and subject matter experts for requirements validation, UAT, and approvals.
3	Data Availability	Existing data for migration is available in accessible formats (Excel, CSV , database extracts) with reasonable data quality for cleansing.
4	Infrastructure	For cloud deployment, ValuAlliance will provision or approve AWS account access within agreed timelines.
5	Third-Party Access	Third-party systems for integration (custodians, market data providers, SEC portal) will provide API documentation and test environments.
6	Regulatory Stability	Core regulatory requirements (SEC rules, NDPR) remain materially stable during the implementation period.



3. UNDERSTANDING OF PROJECT REQUIREMENTS

3.1 Business Context

ValuAlliance Asset Management Limited operates as a licensed asset management firm within Nigeria's capital market ecosystem, providing portfolio management, investment advisory, and fund management services to institutional and retail clients under SEC regulatory oversight.

We understand that ValuAlliance needs a single, integrated platform to replace what is likely a combination of manual processes, spreadsheets, and disconnected tools; a setup that creates operational risk, data integrity issues, and compliance exposure. The platform must serve as the operational backbone for investment management, financial reporting, and regulatory compliance.

3.2 Key Business Drivers

#	Business Driver	Understanding
1	Operational Efficiency	Automate trade capture, settlement, reconciliation, and reporting to reduce manual effort and operational risk.
2	Regulatory Compliance	Ensure timely and accurate submission of SEC statutory returns, maintain audit-ready records, and embed AML/CFT controls into daily operations.
3	Data Accuracy	Establish a single source of truth for portfolio positions, valuations, and client data with full data lineage and traceability.
4	Governance & Control	Enforce segregation of duties, maker-checker workflows, and comprehensive audit trails.
5	Scalability	Support growth in AUM, new products, and evolving regulations without re-architecture.
6	Client Service	Deliver timely, accurate performance reporting and portfolio analytics to clients.



3.3 Functional Requirements

We have mapped ValuAlliance's functional requirements across five areas. Each is addressed in detail in Section 3 (Proposed Solution).

#	Layer	Components
1	Investment Operations	<ul style="list-style-type: none">• Portfolio setup across multiple asset classes (equities, fixed income, money market, mutual funds).• Full trade lifecycle from order through settlement.• Daily valuation and pricing with market data integration.• Position monitoring with exception management for failed trades, pricing anomalies, and limit breaches.
2	Financial Management	<ul style="list-style-type: none">• Automated GL journal postings from investment events.• Fund and portfolio accounting with accrual processing.• Financial statement generation (trial balance, income statement, balance sheet).• Configurable fee calculation (management fees, performance fees, custody fees) with automated billing.• Daily reconciliation of positions and cash against custodians and counterparties.
3	Business Development & Reporting	<ul style="list-style-type: none">• Client performance reports with benchmark comparison.• AUM tracking with trend analysis.• Revenue and profitability dashboards.• Customisable KPIs by role.
4	Regulatory & Compliance	<ul style="list-style-type: none">• SEC statutory returns (quarterly, annual).• AML/CFT monitoring and reporting.• NDPR compliance (consent tracking, data access controls).• Audit-ready reports with full traceability and immutable logs
5	Reporting Platform	<ul style="list-style-type: none">• Full report lifecycle (create, edit, approve, submit, export).• PDF, Excel, and CSV export• Report versioning with audit trail.• Role-based dashboards with filters, drill-down, and global search.



3.4 Technical & Regulatory Requirements

ValuAlliance requires a modern, scalable architecture with clear documentation, robust security, and regulatory alignment. Our understanding:

#	Area	Requirement
1	Architecture	Cloud-native, API-first design with documented technology stack and dependencies
2	Deployment	Cloud hosting with NDPR-compliant data residency
3	Integration	REST APIs as primary mechanism, with file-based exchange for legacy systems
4	Security	Encryption (TLS 1.3 in transit, AES-256 at rest), MFA, RBAC, and comprehensive audit logging
5	Business Continuity	Automated backups, defined RPO/RTO targets, and quarterly DR testing.
6	Compliance	SEC reporting support, NDPR data protection, internal controls with segregation of duties, and a configurable rules engine to accommodate regulatory changes without code deployment.



4. PROPOSED SOLUTION & APPROACH

4.1 Solution Overview

The Value Alliance Asset Management Portal is a cloud-native, integrated asset management platform built on five design principles:

1. **Single Source of Truth:**
One investment book of record for all portfolios, positions, and valuations.
2. **Compliance by Design:**
SEC, NDPR, and AML/CFT controls embedded into every workflow.
3. **API-First:**
Every capability exposed as a RESTful API for integration and extensibility.
4. **Cloud-Native:**
Containerised microservices on AWS with auto-scaling and managed services.
5. **Role-Based Governance:**
Maker-checker workflows and granular permissions at every layer.

4.2 Solution Architecture

4.2.1 Architecture Overview

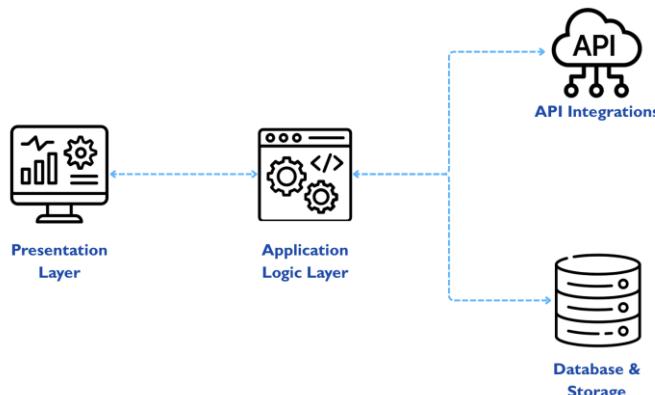


Figure 4. 1: Application Architecture

The platform uses a four-layer architecture with clear separation of concerns.

#	Layer	Purpose	Components
1	Presentation	User interface	React 18, role-based dashboards, report viewer, global search
2	Application	Business logic	Java microservices, one per domain (Portfolio, Trade, Accounting, Valuation, Compliance, Reporting), plus workflow engine, rules engine, and notification dispatcher
3	Integration	External Connectivity	Amazon API Gateway, Amazon MQ (RabbitMQ)
4	Data	Persistence & Analytics	Amazon RDS MySQL, S3, OpenSearch

4.2.2 Technology Stack

#	Component	Technology	Justification
1	Frontend	React 18, TypeScript, Tailwind CSS	Component-based, strong typing, large talent pool
2	Backend	Java, Kotlin	Enterprise performance, mature ORM (EF Core), built-in DI
3	Database	MySQL 16 (Amazon RDS)	Open-source (no licence cost), ACID-compliant, excellent JSON support, managed backups
4	Message Broker	RabbitMQ (Amazon MQ)	Async processing: GL postings, notifications, report generation
5	Search	OpenSearch	Full-text search across portfolios, clients, transactions
6	Storage	Amazon S3	Documents, reports, regulatory submissions, audit archives
7	Containers	Docker on Amazon ECS	Auto-scaling, rolling updates, high availability
8	CI/CD	AWS CodePipeline, Terraform	Automated deployments, Infrastructure-as-Code
9	Monitoring	CloudWatch	Distributed tracing, custom health dashboards

4.2.3 Deployment Architecture

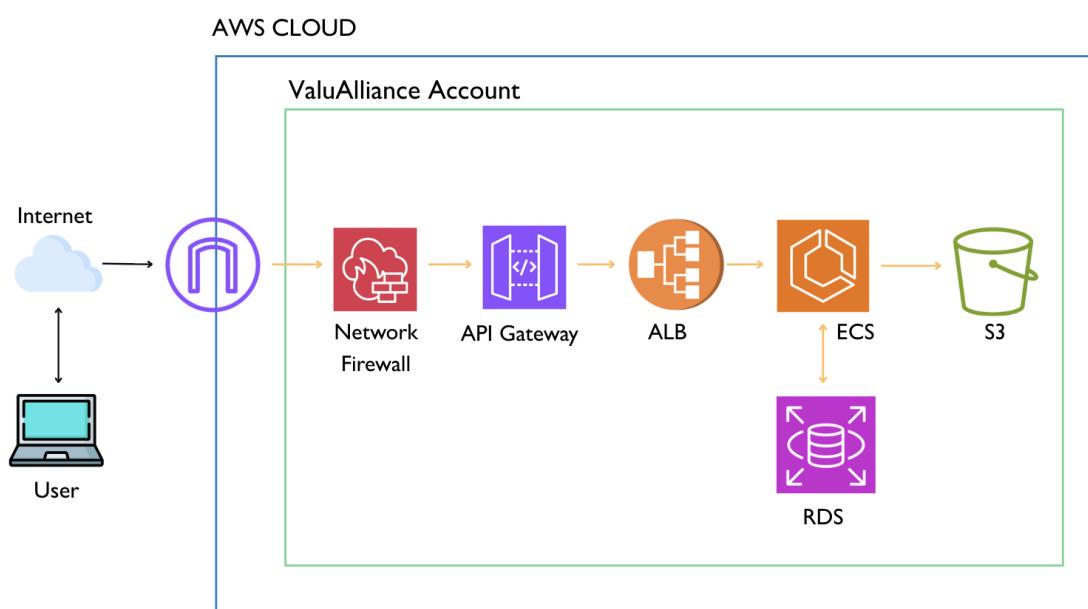


Figure 4. 2: AWS Cloud Deployment Architecture

The System will be deployed on AWS cloud using various resources and configurations:

#	Component	Technology
1	Compute	Amazon ECS
2	Database	RDS MsSQL
5	Environments	Two isolated AWS accounts (Dev, Production)
6	Networking	VPC with private subnets for all backend services. Public access only through API Gateway
7	Secrets	AWS Secrets Manager (credentials, API keys) + KMS (encryption keys)
8	Backup & DR	RDS automated backups (35-day retention), S3 cross-region replication, ECS, redeployable from Terraform. RPO ≤ 30 minutes, RTO ≤ 4 hours.

4.2.4 Integration Architecture

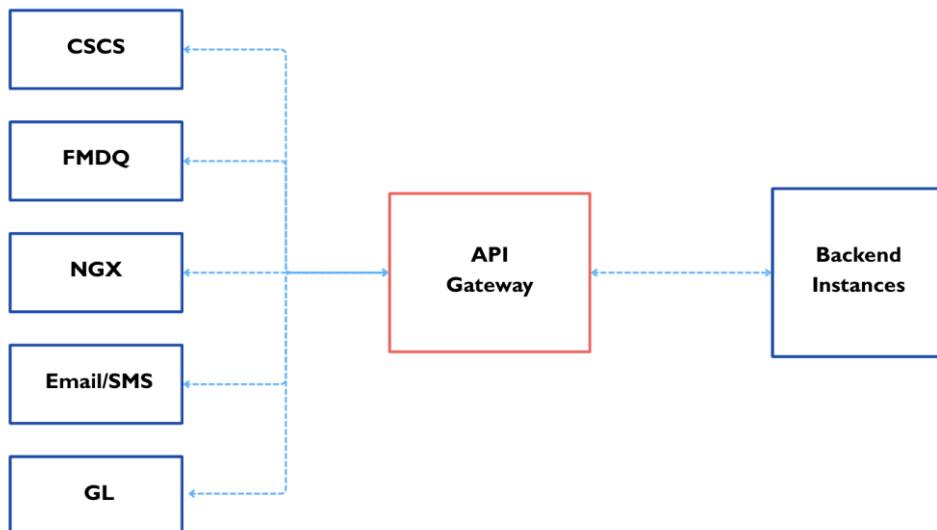


Figure 4. 3: API Integrations Architecture

All external integrations route through Amazon API Gateway for centralised authentication, rate limiting, and logging. Async operations (GL postings, notifications, report generation) flow through the message broker to prevent blocking user workflows.

#	System	Direction	Method	Frequency
1	CSCS	Bidirectional	REST API / SFTP	Daily + on-demand
2	NSE / FMDQ	Inbound	REST API / File	Real-time + EOD
3	General Ledger / ERP	Outbound	REST API / File	EOD batch
4	SEC Portal	Outbound	File (XML/Excel)	Monthly/quarterly
5	Payment / Banking	Bidirectional	REST API	On-demand
6	Bloomberg / Reuters (optional)	Inbound	API / File	Real-time + EOD
7	Email (Amazon SES)	Outbound	API	Event-driven
9	SMS Gateway	Outbound	API	Event-driven

4.2.5 Security Architecture

Security follows a defence-in-depth model across four layers:

#	Area	Scope
1	Perimeter	AWS WAF , AWS Shield,TLS 1.3 termination at the load balancer.
2	Network	VPC with private subnets, Security Groups and NACLs restricting inter-tier traffic. Database and cache accessible only within private subnets.
3	Application	Amazon Cognito for identity with mandatory MFA (OTP via email/SMS/authenticator). RBAC with granular permissions per module and action. Maker-checker on all critical operations. JWT tokens with short TTL. Configurable session timeout (default 15 minutes).
4	Data	AES-256 encryption at rest via AWS KMS (RDS, S3, backups). TLS 1.3 for all data in transit. Secrets Manager for credential rotation. Immutable audit logs stored in S3 with Object Lock (7-year retention minimum). Amazon GuardDuty for continuous threat detection.



4.2.6 Data Architecture

Database design:

The MsSQL database uses a normalised relational schema with core entities: Client, Portfolio, Fund, Security, Trade, Position, Valuation, JournalEntry, FeeSchedule, and AuditLog. Transaction and audit tables are partitioned monthly for query performance on large historical datasets.

OpenSearch powers the global search function. S3 stores documents, generated reports, and archived audit logs, with Glacier for cold storage after a configurable retention period

4.3 Functional Solution Design

The platform comprises 12 core business modules and 6 cross-cutting components, 18 modules in total. This section details the features and capabilities of each module.

The delivery sequence (which modules are built in which phase) is defined in [Section 5.2: Phased Delivery Approach](#).

Core Business Modules

4.3.1 Portfolio Management

This module is the starting point for all investment activity. It manages the setup, configuration, and ongoing monitoring of client portfolios across all asset classes.

#	Feature	Description
1	Portfolio Setup	Create and configure portfolios by client, fund, or mandate, defining investment policy, benchmark, asset class limits, and currency.
2	Asset Allocation Tracking	Track target vs. actual asset allocation with configurable drift thresholds and automated drift alerts.
3	Rebalancing Recommendations	Generate automated rebalancing recommendations when allocation drifts beyond defined tolerances.
4	Position Tracking	Real-time position tracking with aggregate and drill-down views by portfolio, asset class, and security.
5	Multi-Asset Class Support	Supports equities, government and corporate bonds, T-Bills, commercial paper, mutual funds, and alternative investments.
6	Portfolio Cloning	Clone existing portfolio configurations to accelerate setup for similar mandates.



4.3.2 Trade Capture & Lifecycle

This module manages the full trade lifecycle from order entry through to closure, with structured validation and approval at every step.

#	Feature	Description
1	Trade Entry	Structured trade entry forms with field validation for buy, sell, switch, subscription, and redemption orders across all supported asset classes.
2	Trade ID Generation	Automatically generate a unique Trade ID for each entry.
3	Trade Lifecycle	Every trade follows a defined lifecycle with each transition logged: <i>Draft → Submitted → Approved → Executed → Settled → Closed</i>
4	Maker-Checker Approval	Maker-checker approval enforced on all trades, with configurable approval thresholds by value or asset class.
5	Pre-Trade Validation	Automated checks against investment policy limits (asset class, issuer, concentration) before trade submission.
6	Exception Handling	Automatic exceptions raised for failed settlements, pricing anomalies, and limit breaches, with assignment and escalation.
7	Trade Confirmation	Downloadable trade confirmation reports generated on execution.
8	Trade Amendment & Cancellation	Controlled amendment and cancellation workflow with full audit trail of changes.

4.3.3 Settlement Processing

This module handles post-trade settlement with CSD integration, status tracking, and exception management.

#	Feature	Description
1	CSD Integration	Settlement integration with Central Securities Depositories (CSCS) for trade confirmation and delivery-versus-payment (DvP).
2	Settlement Status Tracking	Real-time tracking of settlement status with full audit trail: <i>Pending → Matched → Settled.</i>
3	Failed Settlement Handling	Exception management for failed or partially settled trades, with automatic flagging, assignment, and escalation.
4	Settlement Notifications	Event-driven email and SMS notifications on settlement completion, failure, or pending actions.
5	Settlement Reporting	Settlement activity reports by date range, portfolio, asset class, and status.



4.3.4 Valuation & Pricing Engine

The pricing engine ensures accurate, timely valuation of all positions through automated market data feeds, manual price workflows, and tolerance controls.

#	Feature	Description
1	Automated Price Feeds	Ingest automated market data feeds from NSE, FMDQ, and optionally Bloomberg/Reuters.
2	Manual Price Entry	Allow manual price entry for illiquid or unlisted securities, subject to an approval workflow before prices are applied.
3	Tolerance Checks	Price movements exceeding configurable threshold limits trigger a review process before acceptance.
4	Stale / Missing Price Detection	Detect securities with stale or missing prices and automatically flag them for corrective action.
5	Mark-to-Market (MTM)	Perform daily mark-to-market valuation of all positions, calculating unrealised P&L at both position and portfolio levels.
6	Price History	Maintain full historical price records to support backdated valuations, audits, and historical performance analysis.
7	NAV Computation	Compute daily NAV for pooled funds, including per-unit NAV for creation and redemption. NAVs require approval prior to publication.

4.3.5 Fund Accounting & Financial Management

The platform maintains a centralised investment book of record, the single source of truth for all portfolio positions, transactions, and balances.

#	Feature	Description
1	GL Integration	Generate automated journal entries for all investment events (trades, income, expenses, fees, and valuations) with configurable account mapping. Entries can be posted to an external General Ledger via API or file upload.
2	Accrual Accounting	Perform daily accruals for bond interest, management fees, and expenses with month-end crystallisation. Support dividend and coupon income recognition, including withholding tax computation.
3	Financial Statements	Automatically produce trial balance, income statement, balance sheet, and cash flow statement at both fund level and firm level.
4	Multi-Fund Accounting	Maintain separate accounting books per fund while providing consolidated views across all funds at the firm level.
5	Period Management	Support configurable accounting periods with period-end close workflows, adjustment handling, and period lock controls.



4.3.6 Fee Calculation & Billing

This module automates the calculation, accrual, and billing of all client and fund fees.

#	Feature	Description
1	Configurable Fee Structures	Support management fees (% of AUM), performance fees (hurdle rate, high-water mark), custody fees, and transaction fees. Fee rules are configurable per fund or client.
2	Daily Accrual	Accrue fees daily with periodic crystallisation aligned to defined billing cycles.
3	Invoice Generation	Automatically generate invoices based on configured billing schedules, including detailed fee breakdowns.
4	Fee Override & Waiver	Provide controlled workflows for fee overrides and waivers, enforced through maker-checker approval and full audit trails.
5	Fee Revenue Reporting	Produce fee revenue reports with breakdowns by fund, client, and fee type to support management and financial reporting.

4.3.7 Reconciliation Engine

Automated reconciliation ensures data integrity across internal records, custodians, and banking counterparties.

#	Feature	Description
1	Cash Reconciliation	Perform automated daily matching of cash balances between internal records and bank statements.
2	Position Reconciliation	Perform automated daily matching of security positions between internal records and custodian statements.
3	Break Classification	Automatically classify unreconciled items by type, including quantity breaks, price breaks, missing trades, and timing differences.
4	Assignment & Escalation	Assign reconciliation breaks to responsible officers with SLA tracking and automatic escalation when SLAs are breached.
5	Reconciliation Reporting	Generate daily reconciliation summaries with historical trend analysis and ageing reports for open breaks.

4.3.8 Risk & Compliance

This module embeds regulatory and investment policy controls into daily operations.

#	Feature	Description
1	Pre-Trade Compliance	Enforce investment policy limits (asset class, issuer, sector, concentration) before trade approval.
2	Post-Trade Monitoring	Continuous post-trade monitoring with real-time breach alerts and automated escalation.
3	AML / CFT Controls	Client risk scoring, suspicious transaction monitoring, threshold-based reporting, and KYC compliance tracking.



#	Feature	Description
4	Regulatory Calendar	Track SEC, NFIU, and NDPR submission deadlines with automated reminders and status dashboards.
5	Compliance Reporting	Generate compliance breach reports, AML alert summaries, and regulatory submission status reports.
6	Rules Engine	Configurable compliance rules engine allowing regulatory updates via rule changes without code deployment.

4.3.9 Performance Measurement

The system calculates and attributes investment performance across multiple dimensions and time periods.

#	Feature	Description
1	Return Calculation	Time-weighted (TWR) and money-weighted (MWR) return calculations at portfolio, asset class, and security level.
2	Return Periods	Daily, monthly, quarterly, annual, and since-inception return calculations.
3	Benchmark Comparison	Configurable benchmarks per portfolio with relative performance tracking.
4	Performance Attribution	Brinson-Fachler attribution for equity portfolios covering allocation, selection, and interaction effects.
5	Client Performance Reports	Automatically generated performance reports with charts, tables, and commentary sections.

4.3.10 Client Reporting & Analytics

This module provides the full reporting lifecycle, from creation through approval to distribution.

#	Feature	Description
1	Periodic Client Statements	Automated monthly/quarterly statements showing holdings, transactions, performance, and fee summaries.
2	Report Builder	Configurable report templates with drag-and-drop field selection for ad hoc reporting.
3	Report Lifecycle	Structured lifecycle, with versioning and audit trail: Create → Review → Approve → Publish
4	Export Formats	Export reports as branded PDF, Excel, and CSV.
5	Scheduled Reports	Automated report generation on daily, weekly, monthly, or quarterly schedules.
6	AUM Tracking	AUM tracking with trend analysis, net inflow/outflow tracking, and growth metrics.

4.3.11 Regulatory Returns

Configuration-driven regulatory reporting that adapts to evolving SEC and NFIU requirements without code deployment.

#	Feature	Description
1	SEC Quarterly Returns	Portfolio composition, AUM, performance, client count, and transaction volume reporting.



#	Feature	Description
2	SEC Annual Returns	Financial statements, compliance attestations, and annual fund performance.
3	AML / CFT Reports	STRs, CTRs, and threshold reports submitted to NFIU.
4	NDPR Compliance Log	Data processing logs, consent records, and data subject request tracking.
5	Audit Reports	Exportable user activity logs, transaction trails, and access reports for auditors.
6	Template Engine	Configuration-driven reporting templates with regulator-driven updates delivered under SLA.

4.3.12 Management Dashboards

Five role-based dashboards provide real-time visibility with drill-down to underlying transactions.

#	Dashboard	Key Metrics
1	Executive	Total AUM, growth trends, revenue, net inflows/outflows, fund count, client count.
2	Portfolio Manager	Performance vs benchmark, asset allocation, top/bottom contributors, rebalancing alerts.
3	Operations	Pending trades, settlement status, reconciliation breaks, exception queues.
4	Compliance	Regulatory calendar, policy breaches, AML alerts, audit findings.
5	Finance	Fee revenue by fund/client, accruals, receivables, and expense tracking.

All dashboards support configurable date ranges, filters, and drill-down from summary metrics to individual transactions.

Cross-Cutting Components

These components provide shared services used across all core modules. They are not standalone user-facing modules but are embedded into the platform fabric.

4.3.13 User Management & Access Control (RBAC)

#	Feature	Description
1	Role-Based Access Control	Granular permissions per module and action (view, create, edit, approve, delete).
2	Mandatory MFA	Multi-factor authentication via email OTP, SMS OTP, or authenticator apps.
3	Maker-Checker Controls	Maker-checker enforcement for user creation, role assignment, and status changes.
4	Session Management	Configurable session timeout (default 15 minutes) using JWT with short TTL.
5	Identity Provider	Centralised identity management with support for future SSO/Active Directory integration.

4.3.14 Audit & Logging



#	Feature	Description
1	Comprehensive Logging	Log all system actions with timestamp, user, role, IP address, and before/after values.
2	Immutability	Immutable, append-only audit logs stored with object lock.
3	Searchability	Search logs by user, date range, module, or event type.
4	Export	Export audit logs in CSV and PDF formats for regulators and auditors.
5	Retention	Minimum 7-year retention with automated archival to cold storage.

4.3.15 Notification Engine

#	Feature	Description
1	Email Notifications	Event-driven email alerts for trades, approvals, settlements, compliance events, and deadlines.
2	SMS Notifications	SMS alerts for time-critical events such as limit breaches and settlement failures.
3	In-App Notifications	Real-time in-app notification centre with read/unread tracking.
4	Configurable Rules	Notification triggers and recipients configurable by event type and user role.

4.3.16 Document Management

#	Feature	Description
1	Upload & Storage	Secure storage of trade confirmations, mandates, regulatory correspondence, and documents.
2	Versioning	Full version history with ability to retrieve prior document versions.
3	Tagging & Retrieval	Document tagging by client, portfolio, transaction, or document type.
4	Access Control	Document access governed by RBAC aligned to parent module permissions.

4.3.17 Global Search

#	Feature	Description
1	Full-Text Search	Search across portfolios, clients, transactions, securities, and documents.
2	Faceted Results	Filter results by entity type, date range, status, and portfolio.
3	Real-Time Indexing	Near real-time indexing of new and updated records.

4.3.18 Corporate Actions



#	Feature	Description
1	Dividend Processing	Capture and process cash and stock dividends with automatic position and cash updates.
2	Coupon Payments	Process bond coupon payments with accrual adjustments.
3	Stock Splits & Rights Issues	Handle splits, rights issues, and bonus shares with automatic position updates.
4	Corporate Action Notifications	Notify portfolio managers and operations teams of upcoming and completed actions.
5	Audit Trail	Full audit trail with before/after position snapshots for all corporate actions.

4.4 Non-Functional Requirements

#	Category	Target
1	Page load time	\leq 3 seconds
2	Transaction processing	\leq 2 seconds per trade
3	Report generation	\leq 30 seconds (standard); \leq 5 minutes (batch 10K+ records)
4	System uptime	\geq 99.5% monthly
5	Concurrent users	50+ without degradation
6	Data volume	5+ years of history without performance impact
7	Encryption	TLS 1.3 (transit), AES-256 (rest)
8	Audit retention	Minimum 7 years
9	RPO / RTO	\leq 30 minutes / \leq 4 hours
10	Data residency	AWS Africa (af-south-1, Cape Town)
11	Browser support	Chrome, Edge, Firefox, Safari (latest 2 versions)



4.5 Data Migration Strategy

#	Phases	Timeline (Wks)	Tasks
1	Assessment	1	Inventory existing data sources, assess quality, define migration scope (which data, how far back), identify cleansing needs.
			Deliverable: <i>Data inventory and scope agreement.</i>
2	Design	3–5	Define source-to-target mapping, transformation rules, and validation checks. Develop migration scripts and test data sets.
			Deliverable: <i>Data mapping specification and migration scripts.</i>
3	Execution	10–12	Trial migration in staging, validate against source, resolve discrepancies. Production migration during planned cutover window.
			Deliverable: <i>Trial and production migration reports.</i>
4	Validation	12–13	Reconcile record counts, balances, and positions between old and new systems. User verification. Formal sign-off.
			Deliverable: <i>Reconciliation report and sign-off</i>

Migration scope: Client master data, security master, portfolio and position data, transaction history (up to 5 years), financial records (current state), and documents (to S3).

Controls: Record/balance reconciliation after every run. Minimum 2-week parallel run. Full rollback procedure tested during trial. Migration not complete until ValuAlliance business sign-off.



5. PROJECT PLAN & TIMELINE

5.1 Delivery Methodology

We use a Hybrid approach ; PRINCE2 governance with Agile (Scrum) execution. PRINCE2 provides the structured oversight, stage-gate approvals, and documentation that a regulated entity requires. Scrum enables iterative delivery in 2-week sprints, so ValuAlliance sees working software every fortnight, not just at the end of a 4-month cycle.

Change control is formal: all scope changes are logged, impact-assessed (cost + time), and approved by the Project Board before implementation.

The project is structured into **three delivery phases**, each producing a working, deployable release. This approach ensures ValuAlliance realises value early, validates the solution progressively, and reduces go-live risk. Some activities will run concurrently across phases.

Change control is formal: all scope changes are logged, impact-assessed (cost + time), and approved by the Project Board before implementation.

5.2 Module Summary & Phased Delivery Approach

The ValuAlliance Asset Management Portal comprises **18 modules in total: 12 core business modules** that deliver the primary investment management, accounting, compliance, and reporting capabilities, plus **6 cross-cutting components** that provide shared infrastructure services (security, audit, notifications, search, and document management) used across all core modules.

#	Core Business Modules
1	Portfolio Management
2	Trade Capture & Lifecycle
3	Settlement Processing
4	Valuation & Pricing Engine
5	Fund Accounting & Financial Management
6	Fee Calculation & Billing
7	Reconciliation Engine
8	Risk & Compliance
9	Performance Measurement
10	Client Reporting & Analytics
11	Regulatory Returns
12	Management Dashboards

#	Component
1	User Management & Access Control (RBAC)
2	Audit & Logging
3	Notification Engine



#	Component
4	Document Management
5	Global Search
6	Corporate Actions

The detailed features and capabilities of each module are specified in **Section 4.3 - Functional Solution Design**. The phase allocation below defines the delivery sequence.

Phased Delivery Summary

These 18 modules are delivered across three phases, prioritised by business value and operational dependency. Each phase produces a functional release with its own UAT cycle and go/no-go gate before deployment.

#	Phase	Target	Timeline	Core Modules	Cross-Cutting	Total
1	Phase 1: Foundation & Core Operations	MVP	Weeks 1–6	4	4	8
2	Phase 2: Financial Management & Compliance	60% Functionality	Weeks 7–11	4	2	6
3	Phase 3: Analytics, Reporting & Go-Live	100% Functionality	Weeks 12–16	4	0	4
Total				12	6	18

5.2.1 Phase 1: Foundation & Core Operations (Weeks 1–6)

Objective: Deliver the operational backbone; portfolio setup, trade capture, settlement, and valuation so the investment team can begin working on the platform immediately. This phase also establishes the foundational cross-cutting services that every subsequent module depends on.

Core Modules (4):

1. Portfolio Management
2. Trade Capture & Lifecycle
3. Settlement Processing
4. Valuation & Pricing Engine

Cross-Cutting Components (4):

1. User Management & Access Control
2. Audit & Logging
3. Notification Engine
4. Corporate Actions

Phase 1 Integrations:

1. CSCS (bidirectional)
2. NSE/FMDQ market data feeds (inbound)
3. Email

Phase 1 Deliverables:



1. Working portfolio management, trade capture, settlement, and valuation modules in staging
2. User acceptance testing on Phase 1 scope
3. Phase 1 deployment to production (early go-live)

5.2.2 Phase 2: Financial Management & Compliance (Weeks 7–11)

Objective: Layer fund accounting, fee management, reconciliation, and compliance controls onto the operational foundation delivered in Phase 1. This phase addresses the financial accuracy and regulatory requirements that underpin ValuAlliance's fiduciary obligations.

Core Modules (4):

1. Fund Accounting & Financial Management
2. Fee Calculation & Billing
3. Reconciliation Engine
4. Risk & Compliance

Cross-Cutting Components (2):

1. Document Management
2. Global Search

Phase 2 Integrations:

1. General Ledger / ERP (outbound, API or file)
2. Payment/banking systems (bidirectional).

Phase 2 Deliverables:

1. Working fund accounting, fee calculation, reconciliation, and compliance modules in staging
2. User acceptance testing on Phase 2 scope
3. Phase 2 deployment to production

5.2.3 Phase 3: Analytics, Reporting & Go-Live (Weeks 12–16)

Objective: Complete the platform with performance measurement, client reporting, management dashboards, and regulatory returns. Conduct full data migration, end-user training, and production go-live.

Core Modules (4):

1. Performance Measurement
2. Client Reporting & Analytics
3. Regulatory Returns
4. Management Dashboards

Cross-Cutting Components:

None, all cross-cutting components delivered in Phases 1 and 2.

Phase 3 Integrations:

1. SEC Reporting Portal (outbound, file)
2. Bloomberg/Reuters (optional, inbound).

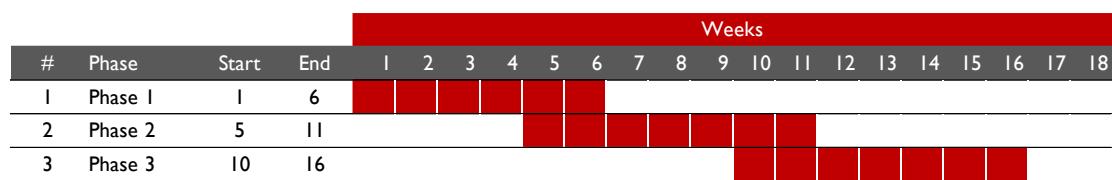
Phase 3 Deliverables:

1. All 18 modules complete and tested
2. Full data migration executed and reconciled
3. End-user and administrator training completed
4. Production go-live



5.3 Project Plan (High Level)

The project overall timeline is as follows:



Note:

Phases overlap by 1–2 weeks to allow design work for the next phase to begin while the current phase completes testing.

Key Milestones

#	Milestone	Week	Exit Criteria
1	Project Kickoff & Requirements Baseline	Week 1	Project Board sign-off
2	Phase 1 Design Complete	Week 2	Design review approval
3	Phase 1 UAT Complete	Week 5	Business sign-off
4	Phase 1 Release to Production	Week 6	Go/no-go decision
5	Phase 2 Design Complete	Week 7	Design review approval
6	Phase 2 UAT Complete	Week 10	Business sign-off
7	Phase 2 Release to Production	Week 11	Go/no-go decision
8	Data Migration Trial Run	Week 12	Reconciliation sign-off
9	Training Complete	Week 13	Competency assessment
10	Full UAT & Performance Testing Complete	Week 14	Business sign-off
11	Production Data Migration & Go-Live	Week 15	Steering Committee go/no-go
12	Hypercare Complete & Handover	Week 16	Formal acceptance



5.4 Data Migration Strategy

Data migration runs in parallel with the delivery phases:

#	Phase	Timeline (Wks)	Tasks
1	Assessment	1–2	Inventory existing data sources, assess quality, define migration scope (which data, how far back), identify cleansing needs. Deliverable: <i>Data inventory and scope agreement.</i>
2	Design	3–5	Define source-to-target mapping, transformation rules, and validation checks. Develop migration scripts and test data sets. Deliverable: <i>Data mapping specification and migration scripts.</i>
3	Trial Execution	10–12	Trial migration in staging, validate against source, resolve discrepancies. Deliverable: <i>Trial migration report.</i>
4	Production Migration	14–15	Production migration during planned cutover window. Minimum 2-week parallel run. Deliverable: <i>Production migration report.</i>
5	Validation & Sign-off	15–16	Reconcile record counts, balances, and positions between old and new systems. User verification. Formal sign-off. Deliverable: <i>Reconciliation report and sign-off.</i>

5.5 Quality Assurance

Quality is built into every sprint, not bolted on at the end:

1. Code reviews on every pull request, with automated linting
2. Unit tests in CI pipeline (80% coverage target)
3. Integration tests on every staging deployment
4. Dedicated testing phase (Weeks 10–11): system, performance, and security testing
5. UAT (Weeks 12–13): ValuAlliance business users execute real-workflow scenarios



5.6 Project Governance

#	Phase	Weeks	Key Activities
1	Steering Committee (ValuAlliance MD + Qucoo CEO)	Monthly	Strategic oversight, escalations, go/no-go decisions
2	Project Board (Sponsors from both sides + PM)	Bi-weekly	Progress review, risk review, milestone approvals
3	Sprint Review (Delivery team + ValuAlliance SMEs)	Bi-weekly	Demo completed work, gather feedback, plan next sprint
4	Daily Standup (Qucoo team)	Daily	Progress, blockers, coordination

Reporting: Bi-weekly sprint reports and project status reports (RAG status, milestones, budget, risks). Weekly test progress reports during Phases 3–4.

5.7 Roles & Responsibilities

#	Activity	Qucoo	ValuAlliance
1	Project management & delivery	Lead	Informed
2	Requirements validation	Lead	Sign-off
3	Solution design & development	Lead	Consulted
4	Data provision & cleansing for migration	Consulted	Lead
5	System & integration testing	Lead	Informed
6	User acceptance testing	Support	Lead
7	Training delivery	Lead	Nominate trainees
8	Cloud Infrastructure Provisioning	Lead	Consulted
9	Go-live decision	Recommend	Sign-off



6. TEAM STRUCTURE & EXPERIENCE

6.1 Project Staffing

#	Role	Count	Key Responsibility
1	Project Manager	1	Delivery, governance, stakeholder management
2	Solutions Architect	1	Architecture, technology decisions, integration design
3	Business Analysts	2	Requirements, user stories, UAT coordination
4	Software Engineers	3	Backend (Java, Kotlin), APIs, database, core modules
5	Frontend Engineers	2	React UI, dashboards, responsive design
6	QA Engineers	2	Test planning, functional/integration/performance testing
7	DevOps Engineer	1	CI/CD, AWS infrastructure (Terraform), ECS, monitoring
8	Database Engineer	1	MySQL schema, migration scripts, query optimisation

6.2 ValuAlliance Team Requirements

#	Role	Expected Commitment
1	Executive Sponsor	2 hours/month (Steering Committee)
2	Project Coordinator	Day-to-Day liaison, internal coordination
3	Business SMEs (Operations, Finance, Compliance)	Phases 1 & 4; Phases 2 & 3
4	IT Lead	Infra provisioning, network/security, internal system access
5	UAT Testers (2–3 users)	During Phase 4



7. VENDOR INFORMATION

7.1 Qucoo Company Profile

7.1.1 Company Overview

We are a company with expertise and experience in Technology, Digital and Consulting. Through our Technology arm, we provide mission-critical systems and Technology consultancy services for firms across various industries – Banking, Capital Market, Payment, Insurance, Technology, Manufacturing etc.

Through the Consulting arm, QuCoon solves our clients' toughest challenges by providing unmatched services in **Strategy, Consulting, Digital, Technology** and **Operations**. We deliver transformational outcomes for a demanding new digital world.

Qucoo Technology

QuCoon Technology powers digital transformation through services designed to reinvent financial application portfolio and a new flair of IT. We combine revolutionary, business and industry insights with innovative and cutting-edge technology to drive growth for businesses. Transform applications to outperform in a cloud-first, mobile-first world while modernizing legacy applications to accelerate the pace of business.

Qucoo Strategy

QuCoon Strategy shapes our clients' future, combining deep business insight with the understanding of how technology will impact industry and business models. Our focus on issues related to digital disruption, competitive agility, operating and business models as well as the future workforce will help our clients find future value and growth in a digital world. QuCoon Strategy helps companies to seize the digital opportunity from our vantage point at the intersection of business and technology strategy. We define long-term strategies that leverage digital enablers.

Qucoo Operations

Operations. The backbone of business. And more and more, the brain, too. Allowing companies to flex rapidly. Respond to ever shorter market cycles. Address volatility. And drive top-line growth through supply chain strategies that deliver business advantage.

Qucoo Digital

We build digital businesses. QuCoon Digital creates digital disruptions to either new value propositions in an existing industry or reinvigorate an existing business model to mobilize the organization to deliver results.

Countries

NIGERIA
GHANA
SIERALEONE
KENYA
ETHIOPIA
UK
CANADA
USA

Consulting Outsourcing Technology

Industries
Financial Services
Banking
Insurance
Capital Market
Financial Technology

Consulting Digital Strategy

Outsourcing
Financial Services
Banking
Financial Technology

Digital Businesses
Digital Banking
Wallet Systems
Agent Banking
Insurance
API & Open Banking
Small Business Solutions
Payments
Lending



7.1.2 Company Contact

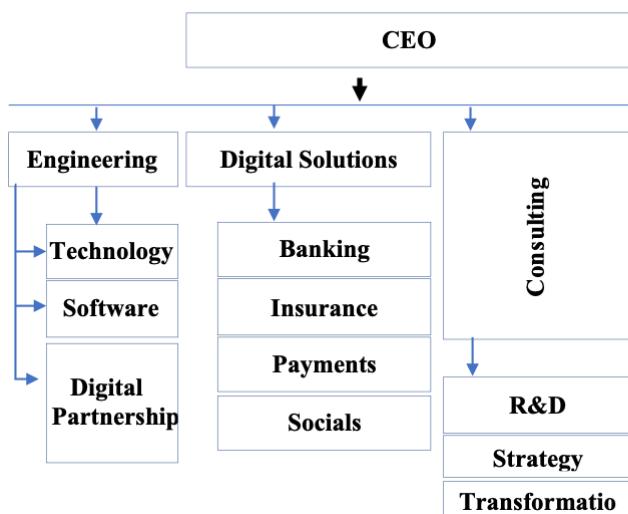
Contact Name	Aliu Muibi - Hammed
Designation	Head, Consulting
Phone Number	+234 812 110 3989
Office Address	10th Floor, Churchgate Towers, Victoria Island, Lagos
Email Address	Aliu.Muibi@Qucoo.com
Company Type	Technology, Consulting, Strategy

7.1.3 Company Summary

Company Name	QuCoon Limited
Year of Incorporation	2016
Website	www.QuCoon.com
Phone Number	+234 812 110 3989
Office Address	10th Floor, Churchgate Towers, Victoria Island, Lagos
RC Number/TIN	1382173 20189301-0001
Company Type	Private Limited Liability Company, LLC
Number of Employees	60
Company History	QuCoon is a Technology & Consulting company with focus on Financial Technology, Digital strategy, Business Strategy Consulting and Outsourcing. 6 years business experience has created digital businesses and tier-1 consulting engagements in Nigeria and some African countries
Core Competences & Specializations	Technology – Cloud, Software Engineering, Project Management Consulting – Project Management, Outsourcing, R&D, Technology, Business Process Optimization, Business Transformation Strategy – Technology, Banking, FinTech, Digital Strategy
Project Management Years	9

7.1.4 Organization Structure

Qucoo Organization structure is presented below:



7.2 Project Experience & References

Qucoo has delivered integrated financial platforms for banks, payment infrastructure providers, and fintech companies across Nigeria. The following engagements are directly relevant to ValuAlliance's requirements.

7.2.1 FSDH Merchant Bank, Global Custody Solution

Client	FSDH Merchant Bank Limited
Engagement	<i>Design and implementation of a Global Custody Solution for management of client financial assets</i>
Duration	Phased delivery (ongoing)

Scope & Relevance:

#	Area	Description
1	Business Context	FSDH's existing custody solution no longer met operational and service expectations, leading to increased manual processing. Qucoo was engaged to deploy an integrated, automated platform.
2	Custody Core Solution	Trade capture and settlement automation, reconciliation engine, corporate actions management, billing and invoicing, income and tax processing, exception management, client account management (hierarchical: Client → Portfolio → Sub-account).
3	Client Portal	Secure self-service portal for clients instruction management, portfolio dashboard, statements and reports, notifications, analytics and insights.
4	Integrations	SWIFT Network (MT5xx/MX/ISO20022), CSCS (equities and bonds), FMDQ (fixed income), NGX (equities), AFEX (commodities), Flexcube (core banking), Internet Banking, Process Maker (onboarding).
5	Security & Compliance	MFA, RBAC, AES-256 encryption at rest, TLS 1.3 in transit, maker-checker workflows, immutable audit logs (7-year retention), NDPR compliance.
6	Non-Functional Targets	99.9% uptime, ≤2s transaction processing, RPO ≤30 min, RTO ≤4 hours.

Client Reference:

Contact	Osamuede Fadaka
Email	ofadaka@fsdhgroup.com
Department	Global Custody
Organisation	FSDH Merchant Bank Limited

Relevance to ValuAlliance:



#	ValuAlliance Requirement	FSDH Experience
1	Portfolio & position management	Client account hierarchies, position tracking across multiple asset classes
2	Trade lifecycle management	End-to-end trade capture through settlement with STP
3	Reconciliation	Automated daily matching with CSCS, NGX, and core banking
4	Fee calculation & billing	Configurable fee templates, automated accruals, invoice generation
5	Regulatory compliance & audit trails	Immutable audit logs, NDPR compliance, regulatory reporting
6	Market data integration	CSCS, FMDQ, NGX, AFEX price feeds

7.2.2 Stanbic IBTC: Ascent Trade Register Automation

Client	Stanbic IBTC
Engagement	<i>Design and Implementation of Ascent Trade Register Solution</i>
Duration	2 months

Scope & Relevance:

#	Area	Description
1	Business Context	Automate trade register management for the bank's trade services division - replacing manual tracking with an integrated digital platform.
2	Capabilities Delivered	Integration with Calypso, Finacle, TRMS, and Exim Bills. Management and regulatory reporting engine. Trade product registers (Form M, LC, Concession, BFC, Maturing Obligations). Nostro reconciliation registers.
3	Deliverables	Full UX/systems/architecture design, wireframes, user journey documents, software design, data architecture, deployment architecture, interface specifications, InfoSee design, technical specifications, features delivery plan.



Client Reference:

Contact	Omolola Brown-Odigie
Designation	Head, Trade Services
Email	omolola.brown-odigie@stambibtc.com
Phone	+234 703 811 8453
Address	IBTC Towers, Walter Carrington Crescent, Victoria Island, Lagos

7.2.3 NIBSS: Industry Core Banking Solution (NCUBE)

Client	Nigeria Inter-Bank Settlement System (NIBSS) Plc
Engagement	Design and implementation of the NCUBE Industry Core Banking Solution
Duration	6 months

Scope & Relevance:

#	Area	Description
1	Capabilities Delivered	Mobile applications (iOS, Android), API Gateway, core banking solution, admin portal. Full design and architecture stack - UX, data architecture, deployment architecture, software design, interface specifications, InfoSec, technical specifications.
2	Deliverables	Industry-scale financial infrastructure project. Demonstrates Qucoon's ability to design and build critical financial platforms with API-first architecture, robust security, and enterprise governance.

Client Reference:

Contact	Oluwatoyin Odutola
Designation	Product Owner
Email	oodutola@nibss-plc.com.ng
Phone	+234 706 065 2429
Address	1230 Ahmadu Bello Way, Victoria Island, Lagos 106104



7.2.4 Keystone Bank: Digital Banking Omnichannel (KeyDigital)

Client	Keystone Bank Nigeria Limited
Engagement	<i>Design and implementation of digital banking omnichannel platform</i>
Duration	5 months

Scope & Relevance:

#	Area	Description
1	Capabilities Delivered	Mobile applications (iOS, Android), API Gateway, core banking solution, admin portal. Full design and architecture stack - UX, data architecture, deployment architecture, software design, interface specifications, InfoSec, technical specifications.
2	Deliverables	Demonstrates Qucoo's ability to deliver enterprise-scale, multi-channel platforms with robust security, high availability, and modern UX; capabilities directly transferable to the ValuAlliance asset management portal.

Client Reference:

Contact	Edafe
Designation	Chief Information Officer
Address	Keystone Avenue, Victoria Island, Lagos

7.3 Management Assessment Experience

In addition to building financial systems, Qucoo has served in an advisory and evaluation capacity for Tier-I financial institutions:

#	System	Category	Client	Summary
1	CEVA	Agent Banking System	First Bank Nigeria	Evaluation for stability and scalability
2	Channels Platform	Omnichannel Stability	First Bank Nigeria	Evaluation for stability and scalability
3	Finacle	Core Banking System	First Bank Nigeria	Validation and implementation management
4	T24	Core Banking System	Rand Merchant Bank	Systems requirements management

This advisory experience demonstrates Qucoo's deep understanding of enterprise financial platforms and our ability to evaluate, design, and implement systems that meet the rigorous standards of Tier-I institutions.



7.4 Summary of Relevant Experience

#	Capability Required by ValuAlliance	Demonstrated At
1	Portfolio & position management	FSDH (<i>client portfolios, positions, asset classes</i>)
2	Trade capture & lifecycle	Stanbic IBTC, FSDH (<i>end-to-end trade processing</i>)
3	Fund accounting & GL integration	FSDH (<i>Flexcube integration</i>)
4	Reconciliation	FSDH (<i>CSCS/NGX reconciliation</i>), Stanbic IBTC (<i>Nostro reconciliation</i>)
5	Fee calculation & billing	FSDH (<i>configurable fee templates, automated invoicing</i>)
6	Regulatory compliance & reporting	Stanbic IBTC (<i>regulatory reports</i>), FSDH (<i>compliance logs</i>)
7	Market data integration	FSDH (<i>CSCS, FMDQ, NGX, AFEX</i>)
8	Security & audit controls	All engagements (<i>MFA, RBAC, encryption, audit trails</i>)
9	Client-facing portals	FSDH (<i>custody portal</i>), Keystone (<i>digital banking</i>), Rubies (<i>digital banking</i>)
10	Cloud-native architecture	NIBSS NCUBE, Keystone KeyDigital



8. TRAINING & KNOWLEDGE TRANSFER

8.1 Approach

Training is organised into three tracks:

1. End-User - portfolio managers, operations, compliance, finance
2. Administrator - IT, system admins
3. Technical - IT, developers.

All training is conducted in the staging environment using realistic data, role-based (each group learns only their relevant modules), and assessed for competency on completion.

ValuAlliance's IT staff participate in design workshops, architecture reviews, and sprint reviews throughout the project. Knowledge transfer is continuous, not a one-time handover.

8.2 Schedule

#	Course	Audience	Duration	Timing
1	Portfolio Management & Trade Capture	Portfolio managers, operations	1 day	Week 12
2	Fund Accounting & Financial Management	Finance, operations	1 day	Week 12
3	Valuation, Performance & Reporting	Portfolio managers, finance, client service	0.5 day	Week 12
4	Compliance & Regulatory Reporting	Compliance, risk	0.5 day	Week 12
5	Management Dashboards	Senior management	0.5 day	Week 13
6	System Administration	IT team	1 day	Week 13
7	Technical Architecture & Support	IT team	1 day	Week 13



9. COMMERCIAL PROPOSAL

9.1 Pricing Summary

#	Component	Amount (NGN)
1	One-Time Implementation	325,000,000.00
2	Annual Support & Maintenance - Year 1	48,750,000.00
3	Annual Support & Maintenance - Year 2	48,750,000.00
4	Annual Support & Maintenance - Year 3	48,750,000.00
Total Cost of Ownership (3 years)		471,250,000.00

All prices in NGN, exclusive of VAT (7.5%). AWS infrastructure costs billed directly by AWS based on actual

Consumption and not included above. Qucoo will provide estimated monthly AWS costs during design phase.

9.2 Payment Schedule

#	Milestone	%	Trigger
1	Project Kickoff	30%	Signed contract
2	Design Sign-off	20%	Requirements and design approved (end Phase 1)
3	UAT Commencement	30%	Core modules in staging, UAT begins (end Phase 3)
4	Go-Live & Acceptance	20%	Production go-live and formal acceptance



10. ASSUMPTIONS, RISKS & MITIGATIONS

10.1 Risk Register

#	Risk	Probability	Impact	Mitigation
1	Third-party API delays: CSCS, FMDQ, or GL access delayed	Medium	High	Mock APIs for development. Phase 2 integrations can be deferred without blocking go-live. Early escalation through ValuAlliance IT.
2	Data quality issues: Source data has errors, duplicates, gaps	Medium	High	Early quality assessment (Week 1–2). Cleansing rules defined collaboratively. Buffer in migration timeline. Parallel run validates data.
3	Stakeholder unavailability: Key ValuAlliance staff not available for	Medium	High	Named participants and calendar blocks agreed at kickoff. Decisions not made within 2 days escalated to Steering Committee.
4	Scope creep: New requirements during development	Medium	Medium	Formal change control. MVP scope locked after Phase 1 sign-off. New requests assessed for impact before approval
5	Regulatory change - SEC or NDPR issues new requirements mid-project	Low	High	Compliance rules engine is config-driven, most changes need no code. If code required, managed via change control.
6	Integration complexity - External systems behave differently in production	Medium	Medium	Comprehensive staging tests. Circuit-breaker patterns. File-based fallback for unstable APIs.
7	Production migration failure	Low	Critical	Minimum 2 trial migrations. Full reconciliation after each. Tested rollback procedure. Go/no-go gate before cutover.
8	Performance under load	Low	High	Performance testing with realistic volumes in Phase 3. Auto-scaling on ECS.
9	Key personnel turnover	Low	Medium	Knowledge distributed (no single-person dependencies). All designs documented. Qucocon bench replacement within 1 week.
10	User adoption resistance	Low	Medium	Early engagement from Phase 1. Quick wins in Weeks 5–9. Hands-on training. Management sponsorship.