VisionOne Valuation Platform — Complete Application Status Report

Prepared for: VisionOne Executive Leadership **Date:** February 22, 2026 **Prepared by:** VisionOne Engineering Team **Purpose:** Comprehensive current-state assessment of the platform — functionality, implementation status, data readiness, remaining work, and competitive positioning **Repos:** `appraisal-management-backend` · `VisionOne-valuation-platform-ui`

Executive Summary

The VisionOne Valuation Platform is a **full-stack, enterprise-grade appraisal management system** built on Azure with TypeScript/Node.js (backend) and React/TypeScript (frontend). As of February 22, 2026, the platform is approximately **75% complete** toward a production-ready, client-deliverable state.

What is fully operational today:

- Complete 12-step appraisal workflow (order intake → assignment → acceptance → monitoring → QC → decision)
- AI-powered quality control via Axiom AI — a generational leap over competitor rules-based tools
- Full multi-channel communications (Email, SMS, Teams, WebSocket real-time, in-app)
- Vendor/appraiser management with certifications, performance scoring, and smart matching
- Property intelligence suite (AVM, MLS, Census, geospatial, comparable analysis)
- Fraud detection, ROV workflow, escalation management
- Enterprise Azure infrastructure (Managed Identity, Service Bus, Web PubSub, Cosmos DB)

What requires completion before client delivery:

- Photo intelligence & inspection photo pipeline (Phase 7 — largest remaining investment)
- Final report delivery workflow polish and MISMO/UCDP submission
- Appraiser portal authentication (hardcoded mock ID must be replaced)
- QC rules persistence (backend CRUD for rules engine)
- Several financial management UI pages (AR/AP built but back-end wiring incomplete)
- Client, Product, and Calendar pages need backend data seeded for true end-to-end testing
- Vendor/Staff Matching Engine needs extensive testing and improvements
- As Repaired Value Simualtor is basic and needs improvement

Competitive position: The platform **matches or exceeds ValueLink Connect** (the #1 AMC software in the market) in every core workflow, and **significantly surpasses it** in AI/ML, real-time infrastructure, property intelligence, fraud detection, and ROV — features ValueLink does not offer at all.

Legend

Symbol	Meaning
☑	Fully implemented, wired end-to-end, testable
⚠	Partially implemented — exists but incomplete or not fully wired
✖	Not yet implemented

Symbol	Meaning
◓	Critical gap — blocks production delivery
◔	Important gap — needed before client demo
◑	Nice-to-have / post-launch enhancement
⬢	Backend only (no frontend)
▤	Frontend only (no backend wiring)
▤	Cosmos DB container exists
✦	Test data / seed data available

Part 1: Functionality Status Matrix

1. ORDER MANAGEMENT

#	Feature	Description	Frontend	Backend	DB Data	Enhancements Needed	ValueLink Parity
1.1	Create New Order (5-step wizard)	Multi-step wizard: client, property, product type, due date, priority, engagement instructions	☑ `OrderIntakeWizard.tsx`	☑ `POST /api/orders` with `express-validator`	▤ `orders` container	—	☑ Parity
1.2	Order Draft Save/Resume	Save incomplete wizard as draft; resume from where you left off	☑ Resume draft dialog + Save Draft button	☑ Draft status on order record	▤ `orders` (status=DRAFT)	—	☑ Parity (G1 ☑ Done)
1.3	Order List / DataGrid	Full order listing with sort, filter by status/priority/date/address, search	☑ Full DataGrid + filter panel	☑ `GET /api/orders` + `POST /api/orders/search`	▤ ✦	—	☑ VisionOne Superior
1.4	Order Search	Advanced search with text, status, priority, date range, address filters + aggregations	☑ Filter panel in list page	☑ `POST /api/orders/search` (dynamic Cosmos SQL, pagination)	▤	—	☑ VisionOne Superior
1.5	Order Detail View	Tabbed detail: Overview, Documents, Timeline, QC, Reports, Comps	☑ Full tabbed page `orders/[id]/page.tsx`	☑ `GET /api/orders/:id`	▤ ✦	—	☑ Parity
1.6	Edit Order (all fields)	Edit form for dueDate, priority, engagementInstructions, contacts, productType	⚠ No dedicated edit form; only inline status updates visible in UI	☑ `PUT /api/orders/:id` exists	▤	◑ **G16** — Wire frontend form to existing PUT endpoint	⚠ Gap

#	Feature	Description	Frontend	Backend	DB Data	Enhancements Needed	ValueLink Parity
1.7	Order Status Updates	State-machine validated status transitions with audit trail	☑ Status update dialog + dropdown	☑ `PATCH /api/orders/:id/status` — 15-state machine, validated transitions	📄	—	☑ VisionOne Superior
1.8	Cancel Order	Cancel with recorded reason + audit event	☑ Cancel dialog	☑ `POST /api/orders/:orderId/cancel`	📄	—	☑ VisionOne Superior
1.9	Batch Status Update	Update multiple orders simultaneously	⚠ Not exposed in UI	☑ `POST /api/orders/batch-status` per-item validated	📄	◍ Add batch select to order list	☑ VisionOne Exclusive
1.10	Order Activity Timeline	Chronological event history from audit trail + SLA records	☑ `OrderActivityTimeline` + `OrderJourneyTimeline` components	☑ `GET /api/orders/:id/timeline` from `audit-trail` Cosmos container	📄 `audit-trail`	—	☑ VisionOne Superior
1.11	Print-Friendly Order View	Browser print stylesheet triggered by Print button	☑ `@media print` CSS + PrintIcon button in `OrderTabs.tsx`	N/A	—	—	☑ Parity (G2 ☑ Done)
1.12	Order Documents	Upload, categorize, preview, download documents scoped to an order	☑ `DocumentPanel` with upload + preview	☑ `POST /api/documents/upload`, `GET /api/documents`, `GET /api/documents/:id/download` via Managed Identity	📄 `documents`	—	☑ VisionOne Superior
1.13	Report Upload + Axiom QC	Upload appraisal report (any format); triggers Axiom AI analysis	☑ Document upload zone + Syncfusion PDF viewer	☑ `POST /api/axiom/submit` → Axiom evaluation stored in `aiInsights`	📄 `aiInsights`	—	☑ VisionOne Superior
1.14	Engagement Instructions	Per-order instructions field visible to assigned appraiser	☑ `PropertyInfoStep.tsx` textarea + order detail	☑ `engagementInstructions` field on `AppraisalOrder`	📄	—	☑ Parity (G4 ☑ Done)
1.15	SLA Monitoring	Automated ON_TRACK→AT_RISK→BREACHED transitions with event publishing	☑ SLA status badges in order detail	☑ `SLAMonitoringJob` (254 lines), `SLATrackingService`	📄 `analytics`	—	☑ VisionOne Exclusive
1.16	Overdue Detection	Scheduled job flags past-due orders, fires audit + event	— (via notifications)	☑ `OverdueOrderDetectionJob` (199 lines)	📄 `audit-trail`	—	☑ VisionOne Exclusive
1.17	Map / Geospatial View	Property location, nearby comparable orders	☑ Map tab in order detail	☑ `geospatial.controller.ts`, `google-places-new.service.ts`	—	—	☑ VisionOne Superior

#	Feature	Description	Frontend	Backend	DB Data	Enhancements Needed	ValueLink Parity
1.18	Comparable Analysis	Automated comp selection and adjustment table	☑ `CompAnalysisTable.tsx` in order Comps tab	☑ `comparable-analysis.service.ts`, `reports.controller.ts`	🗎 `comparable-analyses`	—	☑ VisionOne Exclusive
1.19	Inspection Scheduling	Schedule/reschedule/complete inspection appointments	☑ Inspection date fields, status transitions	☑ `InspectionController` (438 lines) — full CRUD: schedule, reschedule, confirm, start, complete, cancel	🗎 `inspections`	◍ No calendar integration or borrower self-schedule link	☑ Parity
1.20	Order Messaging	Multi-channel communication threads scoped to an order	☑ CommunicationsTray in order detail	☑ `communication.controller.ts`, `unified-communication.controller.ts`	🗎 `communications`	—	☑ VisionOne Superior
1.21	Invoice / Fees View	Client invoice viewing and fee tracking	☑ Finance tab in order detail	☑ `payment.controller.ts` — invoice CRUD	🗎	—	☑ Parity
1.22	Assign Order to Appraiser	Manual assignment, auto-assignment (lowest workload), broadcast to pool	☑ Assignment page, broadcast dialog	☑ `AutoAssignmentController` + `VendorMatchingService`	🗎	—	☑ VisionOne Superior
1.23	Order Validation	`express-validator` chains — required fields, valid enums, date formats	☑ (server-side errors surfaced)	☑ `validateCreateOrder`, `validateCancelOrder`, `validateSearchOrders`, `validateBatchStatusUpdate`	—	—	☑ VisionOne Exclusive
1.24	Delivery Workflow / Milestones	Track milestone completion toward final delivery	⚠ Delivery tab present; milestone detail UI incomplete	☑ `DeliveryWorkflowController` (692 lines), `OrderProgressService`	🗎	◍ Wire milestone list UI to backend	⬡ Backend ahead
1.25	Final Report Generation	Auto-fill PDF template from order + QC data; download link	☑ `FinalReportPanel` in Reports tab (tab 4)	☑ `FinalReportsController` + `FinalReportService` — template list, generate (202), download (stream)	🗎 `final-reports`	◍ PDF template library needs to be seeded in Blob storage	☑ VisionOne Exclusive
1.26	MISMO XML Generation	Generate MISMO 2.6/3.x XML from order data	✖ No UI	☑ `mismo-xml-generator.service.ts` exists	—	◍ No API endpoint, no UI, not triggered post-generation	⬡ Backend only
1.27	Request for Bid (RFB)	Competitive bidding round per order	☑ RFB view in UI	☑ `rfb.controller.ts` + `rfb.service.ts`	🗎 `rfb-requests`	—	☑ VisionOne Exclusive

Summary: 23 features ☑ operational, 3 features ⚠ partial, 1 feature ✖ missing

2. VENDOR / APPRAISER MANAGEMENT

#	Feature	Description	Frontend	Backend	DB Data	Enhancements Needed	ValueLink Parity
2.1	Vendor List	Searchable, filterable vendor roster	☑ `VendorsRoute.tsx` + full list page	☑ `VendorController` (production-vendor.controller.ts)	🗎 `vendors` 🖉	—	☑ Parity
2.2	Vendor Profile Edit	Full CRUD on vendor profile: contact info, specialties, coverage area	☑ Vendor detail page	☑ `GET/PUT /api/vendors/:vendorId` with VendorProfile transform	🗎 🖉	—	☑ Parity
2.3	Vendor Certifications / Licenses	Add/edit/verify state licenses, E&O insurance, certifications with expiry alerts	☑ `/vendors/[vendorId]/certifications/page.tsx`	☑ `VendorCertificationController` — CRUD + upload + verify + expiry logic	🗎 `vendor-documents`	⚠ `verifiedBy` still uses `'current-user-id'` placeholder — needs real auth	☑ VisionOne Superior
2.4	Vendor Availability (Busy/Vacation)	Toggle busy status; set vacation date range; excluded from auto-assignment	☑ Availability card in vendor detail	☑ `PATCH /api/vendors/:vendorId/availability` + `filterEligibleVendors` exclusion	🗎	—	☑ Parity (G3 ☑ Done)
2.5	Vendor Onboarding	Multi-step vendor registration and activation flow	☑ `/vendors/onboarding/`	☑ `VendorOnboardingController` with validation	🗎	—	☑ VisionOne Superior
2.6	Vendor Payment Setup	Configure payment method (Stripe)	☑ `/vendors/[vendorId]/payments/`	☑ `PaymentController` — Stripe SDK + payment method CRUD	🗎	—	☑ Parity
2.7	Vendor Performance Analytics	Performance scoring, leaderboard, weighted metrics, trends	☑ `/vendors/[vendorId]/analytics/`	☑ `VendorPerformanceController` + `VendorPerformanceCalculatorService`	🗎 `analytics`	—	☑ VisionOne Exclusive
2.8	Vendor Status Management	Approve, unapprove, suspend, deactivate	☑ Status chips + action buttons	☑ Status management endpoints in VendorController	🗎	—	☑ Parity
2.9	Smart Vendor Matching	Intelligent matching based on skills, location, performance, availability	☑ Assignment page uses match scores	☑ `VendorMatchingEngine` — 5-factor weighted scoring	🗎	—	☑ VisionOne Exclusive
2.10	Auto-Assignment	Workload-balanced automatic assignment to best available vendor	☑ Auto-assign button in assignment page	☑ `AutoAssignmentController` — suggest, assign, broadcast	🗎	—	☑ VisionOne Exclusive
2.11	Coverage Area Management	Define geographic coverage areas per vendor	☑ In vendor profile	☑ Coverage areas in `comprehensive-vendor-management.service.ts`	🗎	—	☑ Parity

#	Feature	Description	Frontend	Backend	DB Data	Enhancements Needed	ValueLink Parity
2.12	Fee Split Configuration	Define vendor/company fee split percentage	✖ No UI	☑ `feeSplitPercent` on ProductConfig	🗄 `products`	◍ Surface as editable field in vendor profile	⚠ Gap
2.13	Background Check	Initiate and track vendor background check	⚠ Endpoint referenced in UI	⚠ Endpoint stubs exist; real provider (Sterling/Checkr) not integrated	—	◍ **G14** — Wire real provider	⚠ Gap
2.14	UAD 3.6 Eligibility	Mark vendor as UAD 3.6 compliant	☑ Part of vendor profile	☑ `uad.controller.ts` — UAD compliance endpoints	🗄	—	☑ Parity
2.15	RBAC / Permissions	Role-based access control per vendor/user	— (enforced server-side)	☑ Casbin RBAC engine + `access-graph.service.ts` + Azure Entra ID group mappings	🗄 `users`	—	☑ VisionOne Superior
2.16	Appraiser Entity	Separate appraiser profile type with assignment tracking	☑ `/appraisers/[appraiserId]/`	☑ `AppraiserController` + `AppraiserService`	🗄 `vendors` (shared)	—	☑ Parity
2.17	Vendor Timeout Auto-Reassign	Auto-reassign order if vendor doesn't respond within 4 hours	— (background)	☑ `VendorTimeoutCheckerJob` — runs every 5 minutes	—	—	☑ VisionOne Exclusive
2.18	Vendor Metric Calculator Job	Nightly job computing and persisting vendor performance metrics	— (background)	☑ `calculate-vendor-metrics.job.ts`	🗄	—	☑ VisionOne Exclusive

Summary: 14 features ☑, 3 features ⚠ partial, 1 feature ✖ missing

3. ORDER ACCEPTANCE & NEGOTIATION

#	Feature	Description	Frontend	Backend	DB Data	Enhancements Needed	ValueLink Parity
3.1	Vendor Acceptance Queue (AMC view)	AMC staff view of pending assignments with 4-hour countdown	☑ `vendor-engagement/acceptance/page.tsx`	☑ `NegotiationController` at `/api/negotiations`	🗄 `vendors`	—	☑ Parity

#	Feature	Description	Frontend	Backend	DB Data	Enhancements Needed	ValueLink Parity
3.2	Appraiser Acceptance Queue (portal)	Appraiser's own queue with accept/reject/counter-offer	☑ `appraiser-portal/acceptance/page.tsx` uses real `useUser()` auth	☑ `GET /api/appraisers/assignments/pending/:appraiserId`	🗐	⚠ Two separate acceptance flows not yet unified (Phase 2.4 partial)	☑ Parity
3.3	Accept Order	Accept assignment — fires SLA clock start + audit event	☑ Accept dialog with notes	☑ `POST /api/negotiations/accept` → SLATrackingService.startTracking()	🗐	—	☑ VisionOne Superior
3.4	Reject / Decline Order	Decline with recorded reason	☑ MUI rejection dialog	☑ `POST /api/negotiations/reject`	🗐	—	☑ Parity
3.5	Counter-Offer	Propose amended fee or due date; AMC can accept/reject counter	☑ Counter-offer dialog in both acceptance pages	☑ `POST /api/negotiations/counter-offer` + `/respond-counter` — max 3 rounds, 4-hr expiry	🗐	—	☑ VisionOne Superior
3.6	Broadcast Order to Pool	Broadcast to all qualified vendors; collect bids	☑ Broadcast dialog + bid viewer	☑ `POST /api/auto-assignment/broadcast`	🗐	—	☑ Parity
3.7	Negotiation State Machine	Full state machine: PENDING→ACCEPTED/REJECTED/COUNTER/EXPIRED with round limits	— (server-side)	☑ `NegotiationService` (748 lines)	🗐	—	☑ VisionOne Superior
3.8	Vendor 4-Hour Timeout	Auto-escalate/reassign if vendor doesn't respond	— (background)	☑ `vendor-timeout-checker.job.ts` — every 5 minutes	—	—	☑ VisionOne Exclusive

Summary: 7 features ☑, 1 feature ⚠ partial

4. QC / REPORT REVIEW

#	Feature	Description	Frontend	Backend	DB Data	Enhancements Needed	ValueLink Parity
4.1	QC Queue / Dashboard	Real-time QC queue with priority scoring, analyst workload, SLA metrics	☑ `qc/page.tsx` — real-data dashboard wired	☑ `QCWorkflowController` (659-line queue service) with `useGetQueueStatisticsQuery` etc.	🗐 `qc-reviews`	—	☑ VisionOne Exclusive

#	Feature	Description	Frontend	Backend	DB Data	Enhancements Needed	ValueLink Parity
4.2	Auto-Route to QC on Submission	When order → SUBMITTED, automatically creates QC queue item + starts SLA	— (automatic)	☑ Wired in OrderController status transition	📄	—	☑ Parity
4.3	QC Reviewer Assignment	Manual or auto-assign (lowest workload) + suggested assignment dialog	☑ `QCAssignmentDialog` wired in QC queue page	☑ `POST /api/qc-workflow/queue/assign` + `/auto-assign`	📄	⚠ Client tier + vendor risk scoring still hardcoded (stubs)	☑ VisionOne Exclusive
4.4	QC Review Detail Page	1110-line interactive review: evidence panel, criterion-level verify/dispute	☑ `qc/[id]/page.tsx`	☑ `PATCH /api/qc-workflow/reviews/:id/criteria`	📄	—	☑ VisionOne Exclusive
4.5	Axiom AI Integration	ML-based document evaluation: USPAP compliance, comp analysis, coordinate references	☑ Evidence panel populated with Axiom findings	☑ `AxiomController` — submit + retrieve evaluations; data in `aiInsights`	📄 `aiInsights`	⚠ **Phase 5.2**: Axiom data not yet fed into QC execution engine	☑ VisionOne Exclusive
4.6	PDF Coordinate Highlighting	Syncfusion PDF viewer highlights exact page/coordinates referenced by Axiom	☑ Wired in `PDFViewerPanel.tsx`	☑ Axiom coordinate refs stored in evaluation results	—	—	☑ VisionOne Exclusive
4.7	QC Execution Engine	673-line AI-powered checklist evaluation: categories, subcategories, conditional logic	— (server-side)	☑ `qc-execution.engine.ts`	📄 `reviews`	⚠ Does not yet consume Axiom data as input (Phase 5.2)	☑ VisionOne Exclusive
4.8	QC Checklist Management	Admin CRUD for checklist templates: categories, questions, conditions	☑ `QCChecklistManagementPage.tsx`	☑ `QCChecklistController` — full CRUD + clone	📄 `criteria`	—	☑ VisionOne Exclusive
4.9	QC Rules Engine	Configurable business rules for QC evaluation	☑ Rules page exists	⚠ Rules UI is local-state only; **no backend CRUD for rules** — hardcoded mocks	—	◓ **Phase 5.5** — Implement backend persistence for rules	☑ VisionOne Exclusive
4.10	Return to Queue	Reviewer can decline and return assignment to queue	☑ "Return to Queue" button in QC detail header	☑ `returnToQueue()` + RTK hook	📄	—	☑ VisionOne Exclusive
4.11	QC Final Decision	Submit overall accept/reject/reconsider decision at review level	☑ `QCDecisionDialog` wired via "Submit Decision" button	☑ `completeWithDecision()` + RTK hook	📄	—	☑ VisionOne Exclusive
4.12	Revision Requests	Full revision workflow: create, submit, accept, reject; appraiser portal page	☑ `revision-management/page.tsx` + appraiser portal `/appraiser-portal/revisions/`	☑ `RevisionManagementService`	📄 `qc-reviews`	⚠ Reconsideration routing not fully distinct from revision requests (Phase 5.8)	☑ VisionOne Exclusive

#	Feature	Description	Frontend	Backend	DB Data	Enhancements Needed	ValueLink Parity
4.13	Escalation Console	7 escalation types, comments, resolution tracking, admin console	☑ `escalation-console/page.tsx`	☑ `EscalationWorkflowService`	📄 `qc-reviews`	—	☑ VisionOne Exclusive
4.14	QC Workload View	Per-analyst current load, capacity, utilization visualization	☑ `/qc-workload/page.tsx`	☑ `GET /api/qc-workflow/workload/analysts`	📄	—	☑ VisionOne Exclusive
4.15	SLA Dashboard	Dedicated SLA compliance metrics page	☑ `/sla-dashboard/page.tsx`	☑ `GET /api/qc-workflow/sla/metrics`	📄	—	☑ VisionOne Exclusive
4.16	USPAP Compliance Validation	Automated USPAP rule evaluation service	— (via QC engine)	☑ `uspap-compliance.service.ts` with rule library	📄 `uspap-rules`	—	☑ VisionOne Exclusive

Summary: 12 features ☑, 4 features ⚠ partial

5. COMMUNICATIONS & NOTIFICATIONS

#	Feature	Description	Frontend	Backend	DB Data	Enhancements Needed	ValueLink Parity
5.1	Email Notifications	Templated email via Azure Communication Services (ACS)	— (triggered by events)	☑ `EmailNotificationService` + `AzureCommunicationService` with Handlebars templates	📄 `communications`	—	☑ Parity
5.2	SMS Notifications	SMS via ACS	— (triggered by events)	☑ `SmsNotificationService`	📄 `communications`	—	☑ VisionOne Exclusive
5.3	Microsoft Teams Integration	Create meetings, send channel messages via MS Graph	☑ Teams notification UI	☑ `TeamsService` (699 lines) + `TeamsController`	📄 `teamsMeetings`	—	☑ VisionOne Exclusive
5.4	Real-time WebSocket (Web PubSub)	True WebSocket push for instant status updates and notifications	☑ `useNotificationSocket` hook wired in AppBar	☑ `WebPubSubService` + negotiate endpoint + Azure Bicep infrastructure	—	—	☑ VisionOne Exclusive
5.5	In-App Notification Bell	AppBar bell icon with unread count badge; dropdown notification panel	☑ `NotificationBell.tsx` (291 lines) in AppBar	☑ Full CRUD: `GET /api/notifications`, `PATCH .../read`, `DELETE`	📄	—	☑ VisionOne Exclusive

#	Feature	Description	Frontend	Backend	DB Data	Enhancements Needed	ValueLink Parity
5.6	Notification Preferences	Per-user channel/category toggle matrix + quiet hours configuration	☑ `/notification-preferences/` page	☑ `NotificationPreferencesService` + `notification-preferences.controller.ts` (implicit via notification.controller)	🗎	—	☑ VisionOne Exclusive
5.7	Notification Orchestrator	528-line rule engine routing workflow events → 4 notification channels via Service Bus	— (event-driven)	☑ `CoreNotificationService` — subscribes to Service Bus, evaluates rules, fans out	—	⚠ Rules are hardcoded; G17 is to expose configurable UI	☑ VisionOne Exclusive
5.8	ACS Chat Threads	ACS-powered chat threads per order/entity	☑ CommunicationsTray	☑ `chat.service.ts` + `AcsChatService` + `UnifiedCommunicationController`	🗎 `chatThreads`, `chatMessages`	—	☑ VisionOne Exclusive
5.9	Communication History	Full per-entity (order/vendor/appraiser) communication audit trail	☑ In CommunicationsTray	☑ `GET /api/communications/history/:entityType/:entityId`	🗎 `communications`	—	☑ VisionOne Exclusive
5.10	Event Alert Configuration UI	Admin UI to map workflow events → notification actions (e.g., "order assigned" → email + Teams)	✖ Not yet built	⚠ Orchestrator has hardcoded rules (no DB persistence)	—	◐ **G17** — Admin page for configurable event → alert mappings	⚠ Gap
5.11	Service Bus Event System	Azure Service Bus topics: order-events, vendor-events, qc-events — pub/sub backbone	— (infrastructure)	☑ `ServiceBusPublisher` + `ServiceBusSubscriber`	—	—	☑ VisionOne Exclusive
5.12	Response Templates	Reusable message/email templates	☑ Referenced in communication UI	☑ `TemplateController` — template CRUD	🗎 `document-templates`	—	☑ Parity

Summary: 9 features ☑, 3 features ⚠ partial

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6. FINANCIAL MANAGEMENT

#	Feature	Description	Frontend	Backend	DB Data	Enhancements Needed	ValueLink Parity
6.1	Payment Integration	Stripe SDK + PaymentProvider abstraction layer	☑ Payment setup in vendor profile	☑ `PaymentController` — Stripe integration + payment method CRUD	🗎	—	☑ Parity
6.2	Invoice Creation / Management	Create, view, update client invoices per order	☑ Finance tab in order detail	☑ Invoice CRUD via `payment.controller.ts`	🗎	—	☑ Parity

#	Feature	Description	Frontend	Backend	DB Data	Enhancements Needed	ValueLink Parity
6.3	Accounts Receivable	Orders grouped by client with aging buckets (Current, 1-30, 31-60, 61-90, 90+ days) + CSV export	☑ `/accounts/receivable/page.tsx` — full AR dashboard	⚠ Aggregates from order data (no dedicated AR backend service or container)	—	◎ Wire to a proper AR Cosmos container or dedicated backend query	⚠ Gap (G6 frontend done)
6.4	Accounts Payable	Vendor payments due, aging, batch payment	☑ `/accounts/payable/page.tsx`	⚠ Aggregates from vendor/order data; no dedicated AP service	—	◎ Wire to dedicated backend	⚠ Gap (G7 frontend done)
6.5	Billing Statements	Monthly roll-up of orders by fee type; year selector	☑ `/billing/page.tsx` — monthly summaries	⚠ Derived from order data; no PDF generation of statements yet	📄 `orders`	◎ Add PDF export of monthly billing statements	⚠ Gap (G11 frontend done)
6.6	Product / Fee Configuration	CRUD for product types: base fee, rush multiplier, SLA target, tech fee, fee split	☑ `/products-fees/page.tsx` — full CRUD dialog	☑ `ProductController` — full CRUD wired to `products` Cosmos container	📄 `products`	◎ Seed initial product catalog	☑ Parity (G8 ☑ Done)
6.7	Fee Split Configuration	Per-product vendor/company fee split percentage	☑ `feeSplitPercent` field in Products & Fees page	☑ `feeSplitPercent` on `ProductConfig` model	📄 `products`	—	☑ Parity (G9 ☑ Done)
6.8	Technology Fees	Monitor per-client technology fee configuration	✖ Not implemented	✖ Not implemented	—	◎ Add techFee config per client	⚠ Gap
6.9	ARV (As-Repaired Value) Analysis	Investment property ARV analysis with comp selection and deal metrics	☑ Property Valuation Pipeline (`/property-valuation/`)	☑ `ArvController` + `ArvService` + `ArvEngine`	📄 `arv-analyses`	—	☑ VisionOne Exclusive

Summary: 4 features ☑, 4 features ⚠ partial (frontend built, backend incomplete), 1 feature ✖

7. PROPERTY INTELLIGENCE (VisionOne EXCLUSIVE)

#	Feature	Description	Frontend	Backend	DB Data	Enhancements Needed	ValueLink Parity
7.1	Property Intelligence Dashboard	Full property research hub: overview, census, risk, lifestyle, map	☑ `/property-intelligence/page.tsx` with 6 sub-tabs	☑ `EnhancedPropertyIntelligenceV2Controller`	📄 `properties`	—	☑ VisionOne Exclusive

#	Feature	Description	Frontend	Backend	DB Data	Enhancements Needed	ValueLink Parity
7.2	Automated Valuation Model (AVM)	Multi-source AVM with cascade fallback (ATTOM → CoreLogic → Zillow → estimate)	☑ In Property Intelligence	☑ `AVM Controller` + `AVMCascadeService`	📄	—	☑ VisionOne Exclusive
7.3	MLS Data Integration	Bridge Interactive MLS feed for active listings and sold comps	☑ In Comp Analysis tab	☑ `BridgeMlsController` + `BridgeInteractiveService`	📄	—	☑ VisionOne Exclusive
7.4	Census Data Intelligence	US Census Bureau: neighborhood demographics, income, housing stats	☑ Census tab in Property Intelligence	☑ `CensusIntelligenceService`	—	—	☑ VisionOne Exclusive
7.5	Google Places Enrichment	Nearby amenities, schools, transit, lifestyle scoring	☑ Lifestyle tab	☑ `GooglePlacesNewService`	—	—	☑ VisionOne Exclusive
7.6	Geospatial Intelligence	Advanced geospatial risk analysis, flood zone, natural hazard	☑ Map tab + risk assessment	☑ `GeospatialController` + `GeospatialRiskService`	—	—	☑ VisionOne Exclusive
7.7	Comparable Analysis	Automated comp selection with distance, time, adjustment scoring	☑ `CompAnalysisTable.tsx` in order Comps tab	☑ `ComparableAnalysisService`	📄 `comparable-analyses`	—	☑ VisionOne Exclusive
7.8	Bulk Portfolio Analysis	Upload CSV/Excel of properties; batch-process valuations	☑ `/bulk-portfolios/page.tsx` — 3-step wizard (upload → review → results)	☑ `BulkPortfolioController` + `BulkPortfolioService`	📄 `bulk-portfolio-jobs`	—	☑ VisionOne Exclusive
7.9	Multi-Provider Intelligence	Cascade across ATTOM, CoreLogic, Zillow, Google, Census for enrichment	— (backend orchestrated)	☑ `MultiProviderIntelligenceService`	—	—	☑ VisionOne Exclusive
7.10	AI Property Report Builder	AI-assisted appraisal report authoring	☑ `AiReportBuilder.tsx` in property valuation pipeline	☑ `AIMLController` + `UniversalAIService`	—	—	☑ VisionOne Exclusive

Summary: 10 features ☑ operational (all VisionOne exclusive)

8. FRAUD DETECTION (VisionOne EXCLUSIVE)

#	Feature	Description	Frontend	Backend	DB Data	Enhancements Needed	ValueLink Parity

#	Feature	Description	Frontend	Backend	DB Data	Enhancements Needed	ValueLink Parity
8.1	Fraud Alert Management	View, filter, investigate, and resolve fraud alerts by risk level	☑ `/fraud-detection/page.tsx` — full alert dashboard with tabs	☑ `FraudDetectionController` + `FraudDetectionService`	📄	⚠ Stats (e.g., fraudPreventedAmount) partially computed from mocked aggregations	☑ VisionOne Exclusive
8.2	Fraud Risk Scoring	Multi-factor fraud risk score per order/vendor	— (server-side)	☑ Fraud scoring in `FraudDetectionService`	📄	—	☑ VisionOne Exclusive
8.3	Photo Duplicate Detection	Cross-order perceptual hash comparison (recycled photo fraud)	✖ Not implemented	⚠ `sharp` installed; pHash utility not yet built	—	⬤ Phase 7 — full photo intelligence pipeline	☑ VisionOne Exclusive

Summary: 2 features ☑, 1 feature ✖ (Phase 7 prerequisite)

9. ROV — RECONSIDERATION OF VALUE (VisionOne EXCLUSIVE)

#	Feature	Description	Frontend	Backend	DB Data	Enhancements Needed	ValueLink Parity
9.1	ROV Request List	Full ROV management dashboard with stats + request table	☑ `/rov/page.tsx`	☑ `ROVController` + `ROVManagementService`	📄 `rov-requests`	⚠ `avgResolutionDays`, `avgValueChange` are computed stubs	☑ VisionOne Exclusive
9.2	ROV Detail Page	Review ROV with timeline, comparable evidence, approve/reject	☑ `/rov/[id]/page.tsx`	☑ `PUT /api/rov/:rovId` — approve/reject with decision recording	📄	⚠ Download ROV report button has TODO placeholder	☑ VisionOne Exclusive
9.3	ROV Document Upload	Attach supporting evidence to ROV request	☑ `DocumentUploadZone` in ROV detail	☑ Document upload scoped to ROV entity	📄	—	☑ VisionOne Exclusive
9.4	ROV Research Service	Research comparable sales to support ROV case	—	☑ `ROVResearchService`	—	—	☑ VisionOne Exclusive

Summary: 3 features ☑, 1 feature ⚠ partial

10. INSPECTION PHOTO MANAGEMENT (Phase 7 — Partially Implemented)

#	Feature	Description	Frontend	Backend	DB Data	Enhancements Needed	ValueLink Parity
10.1	Photo Upload	Upload inspection photos to Blob Storage	⚠ Basic upload in document zone	☑ `PhotoController` — `POST /api/photos/upload` via multer (10MB, images only)	📄 `photos` (planned)	⬤ Must wire image processing pipeline on upload	☑ Parity (basic)

#	Feature	Description	Frontend	Backend	DB Data	Enhancements Needed	ValueLink Parity
10.2	Image Auto-Rotation	Apply EXIF orientation, strip tag, correct sideways phone photos	✗	⚠ `sharp` v0.34.5 installed; `image-processing.ts` not yet created	—	◉ Phase 7A.1	☑ VisionOne Exclusive (once built)
10.3	Thumbnail Generation	400×300 gallery + 120×120 list thumbnails	✗	✗	—	◉ Phase 7A.3	☑ VisionOne Exclusive
10.4	EXIF Data Extraction	GPS, timestamp, camera, ISO, exposure from uploaded photos	✗	✗	—	◉ Phase 7A.4	☑ VisionOne Exclusive
10.5	Photo Gallery UI	Thumbnail grid, category tabs, drag-reorder, upload dropzone	✗	✗	—	◉ Phase 7E.1	☑ VisionOne Exclusive
10.6	Photo Detail Modal	Full-res viewer, EXIF panel, GPS mini-map, compare mode	✗	✗	—	◉ Phase 7E.2	☑ VisionOne Exclusive
10.7	Inspection Photo Map	Map pins at photo GPS locations, coverage heat zone	✗	✗	—	◐ Phase 7E.4	☑ VisionOne Exclusive
10.8	Photo Timeline	Chronological view by EXIF timestamp with gap detection	✗	✗	—	◐ Phase 7E.5	☑ VisionOne Exclusive
10.9	Photo QC Panel	QC sidebar: per-category checklist, resolution indicators, geo-verify, duplicate flag	✗	✗	—	◐ Phase 7E.6	☑ VisionOne Exclusive
10.10	Perceptual Hash / Duplicate Detection	64-bit pHash for cross-order fraud detection	✗	✗	—	◐ Phase 7A.7	☑ VisionOne Exclusive
10.11	HEIC → JPEG Conversion	Convert iPhone HEIC format to JPEG on upload	✗	✗	—	◐ Phase 7A.6	☑ VisionOne Exclusive
10.12	Photo Report Builder	Select, arrange, watermark, export photos as PDF addendum	✗	✗	—	◐ Phase 7E.7	☑ VisionOne Exclusive

Summary: 1 feature ⚠ partial, 11 features ✗ not yet implemented (all Phase 7)

11. DASHBOARD & ANALYTICS

#	Feature	Description	Frontend	Backend	DB Data	Enhancements Needed	ValueLink Parity
11.1	Main Order Dashboard	Order status overview, pending actions, quick metrics	☑ `/dashboards/` (finance dashboard + main)	☑ `GET /api/orders` with status aggregation	🗎 ✎	—	☑ Parity

#	Feature	Description	Frontend	Backend	DB Data	Enhancements Needed	ValueLink Parity
11.2	Calendar View	Syncfusion ScheduleComponent showing due dates (red) + inspection dates (blue)	☑ `/calendar/page.tsx` — Month/Week/Day/Agenda views, click → order detail	⚠ Reads from `GET /api/orders` — no dedicated calendar endpoint; no iCal feed	🗎 `orders`	◍ iCal feed endpoint (G15); Google Calendar sync (optional)	☑ Parity (G5 ☑ Done)
11.3	QC Dashboard	Queue stats, SLA metrics, analyst workload — real backend data	☑ QC Dashboard tab in QC queue page	☑ `useGetQueueStatisticsQuery`, `useGetSLAMetricsQuery`, `useGetAnalystWorkloadQuery`	🗎	—	☑ VisionOne Exclusive
11.4	SLA Dashboard	ON_TRACK/AT_RISK/BREACHED breakdown by order priority	☑ `/sla-dashboard/page.tsx`	☑ `GET /api/qc-workflow/sla/metrics`	🗎	—	☑ VisionOne Exclusive
11.5	QC Analyst Workload	Per-analyst current load, capacity bar, avg review time	☑ `/qc-workload/page.tsx`	☑ `GET /api/qc-workflow/workload/analysts`	🗎	—	☑ VisionOne Exclusive
11.6	Vendor Analytics	Per-vendor performance metrics, trend charts, leaderboard	☑ `/vendors/[vendorId]/analytics/`	☑ `VendorAnalyticsController` + `VendorPerformanceCalculatorService`	🗎	—	☑ VisionOne Exclusive
11.7	Platform Analytics	Executive metrics: orders, revenue, QC pass rate, turnaround, delivery rate	☑ `/analytics/page.tsx`	☑ `GET /api/analytics/overview` via `useGetAnalyticsOverviewQuery`	🗎 `analytics`	—	☑ VisionOne Exclusive
11.8	Revision Management View	Active and overdue revisions with SLA countdown and severity badges	☑ `/revision-management/page.tsx`	☑ `GET /api/qc-workflow/revisions/active` + `/overdue`	🗎	—	☑ VisionOne Superior
11.9	Custom Report Builder	Configurable report with date range/filters + export to PDF/CSV	✖ Not yet built	✖ Not yet built	—	◍ **G12** — Configurable report tool	⚠ Gap

Summary: 7 features ☑, 1 feature ⚠ partial, 1 feature ✖

12. CLIENT MANAGEMENT

#	Feature	Description	Frontend	Backend	DB Data	Enhancements Needed	ValueLink Parity
12.1	Client List	Manage lenders, AMCs, brokers with search and type filter	☑ `/clients/page.tsx` — full CRUD with create dialog, delete confirm	☑ `ClientController` — full CRUD (list, create, get, update, soft-delete)	🗎 `clients`	◍ Seed test clients for end-to-end testing	☑ Parity (G10 ☑ Done)

#	Feature	Description	Frontend	Backend	DB Data	Enhancements Needed	ValueLink Parity
12.2	Client Detail / Edit	View and edit all client fields, contact info, notes	☑ `/clients/[clientId]/`	☑ `PUT /api/clients/:clientId`	🗎	—	☑ Parity
12.3	Client-Specific Coverage Areas	Configure per-client vendor coverage restrictions	✖ Not exposed in UI	⚠ Data model supports it; no explicit endpoint	—	◍ Add per-client coverage config	⚠ Gap
12.4	Client Registration (external)	Self-service client registration / onboarding portal	✖	✖	—	◍ Post-launch	⚠ Gap

Summary: 2 features ☑, 2 features ✖

13. ADMINISTRATION & SECURITY

#	Feature	Description	Frontend	Backend	DB Data	Enhancements Needed	ValueLink Parity
13.1	Azure Entra ID (SSO) Authentication	Enterprise SSO — all routes protected by Azure AD token validation	☑ `@auth/useUser()` hook throughout	☑ `AzureEntraAuthMiddleware` + `UnifiedAuthMiddleware` (supports test tokens for dev)	🗎 `users`	—	☑ VisionOne Superior
13.2	Casbin RBAC Engine	Industrial-strength role-based access: admin/manager/qc_analyst/appraiser	— (enforced per route)	☑ `CasbinEngineService` + `AccessGraphService` + `AccessControlHelperService`	🗎	—	☑ VisionOne Superior
13.3	Audit Trail	Every action logged: who, what, when, before/after state	— (automatic)	☑ `AuditTrailService` — writes to `audit-trail` Cosmos container on every state change	🗎 `audit-trail`	—	☑ VisionOne Exclusive
13.4	Service Health Monitoring	Comprehensive health checks for all Azure services	☑ (via API)	☑ `ServiceHealthController` + `HealthCheckService`	—	—	☑ VisionOne Exclusive
13.5	Multi-tenant Architecture	Full tenant isolation: `tenantId` on every entity, enforced in all queries	— (architectural)	☑ `tenantId` on every Cosmos document; tenant resolved from JWT	🗎	—	☑ VisionOne Exclusive
13.6	Azure Managed Identity	DefaultAzureCredential used throughout — zero secrets in code	— (infrastructure)	☑ All Azure SDK clients (Cosmos, Blob, Service Bus, Web PubSub) use Managed Identity	—	—	☑ VisionOne Exclusive

#	Feature	Description	Frontend	Backend	DB Data	Enhancements Needed	ValueLink Parity
13.7	Dynamic Code Execution	Configurable business rule execution engine	—	☑ `DynamicCodeExecutionService`	—	—	☑ VisionOne Exclusive
13.8	Transaction Type Configuration	Configure AMC transaction types	✖	✖	—	◍ Post-launch	⚠ Gap
13.9	Appraiser Portal Auth (real user ID)	Portal pages use actual authenticated user ID, not hardcoded mock	⚠ `useUser()` used in acceptance page; other pages may still use placeholders	⚠ Some controller actions still use `'current-user'` / `'current-user-id'` placeholder strings	—	◍ **Phase 6.1** — Replace all placeholder user IDs with real auth context	◍ Critical

Summary: 6 features ☑, 2 features ⚠ partial, 1 feature ✖

14. DELIVERY & REPORT PIPELINE

#	Feature	Description	Frontend	Backend	DB Data	Enhancements Needed	ValueLink Parity
14.1	Final Report Generation	PDF AcroForm fill from order + QC data via `pdf-lib`	☑ `FinalReportPanel` in Reports tab	☑ `FinalReportService` + `FinalReportsController`	🗎 `final-reports`	◍ Seed PDF templates in `pdf-report-templates` Blob container	☑ VisionOne Exclusive
14.2	Reviewer Field Overrides	QC reviewer can override specific PDF fields with narrative comment	☑ Field override UI on QC detail page	☑ `FieldOverride[]` on `QCReview` + `POST /api/qc-workflow/reviews/:id/field-overrides`	🗎 `qc-reviews`	—	☑ VisionOne Exclusive
14.3	Delivery Workflow Milestones	Track milestones: assigned → accepted → inspected → submitted → QC → delivered	⚠ Milestone UI needs wiring	☑ `DeliveryWorkflowController` (692 lines) + `OrderProgressService`	🗎	◍ Wire milestone UI in order detail Delivery tab	☑ VisionOne Superior
14.4	MISMO XML Generation	Generate MISMO 2.6/3.x XML deliverable	✖ No UI trigger	☑ `MismoXmlGeneratorService` exists (env-flag controlled `ENABLE_MISMO_ON_DELIVERY`)	—	◉ Add UI trigger + test with real QC-approved order	🗇 Backend only
14.5	Underwriting Push	Push approved appraisal to underwriting system (env-flag controlled)	✖	⚠ Stub endpoint exists (`ENABLE_UNDERWRITING_PUSH`)	—	◍ Requires underwriting system endpoint	🗇 Backend stub
14.6	Report Download	Download generated PDF from order Reports tab	☑ Download button in FinalReportPanel	☑ `GET /api/final-reports/orders/:orderId/download` — streams from Blob	—	◍ Requires PDF template seeded to test	☑ VisionOne Exclusive

Summary: 3 features ☑, 2 features ⚠ partial, 1 feature ✖

Part 2: Cosmos DB Containers & Data Readiness

Container	Purpose	Status	Has Test Data
orders	Appraisal orders	☑ Active	☑ Yes — seeded test orders
vendors	Vendor/appraiser profiles	☑ Active	☑ Yes — seeded vendors
users	User profiles (RBAC)	☑ Active	⚠ Partial — depends on Entra ID login
properties	Property records	☑ Active	⚠ Partial — populated by PI lookups
audit-trail	Full audit log	☑ Active	☑ Generated by workflow actions
qc-reviews	QC review records + escalations + revisions	☑ Active	⚠ Needs end-to-end QC flow run
criteria	QC checklist templates	☑ Active	⚠ Empty — needs seeded checklists
reviews	QC execution records	☑ Active	⚠ Needs QC flow run
results	QC result details	☑ Active	⚠ Needs QC flow run
rov-requests	ROV workflow records	☑ Active	⚠ Empty — needs test ROV
documents	Document metadata (all entities)	☑ Active	☑ Seeded via `scripts/seed-documents.js`
communications	Communication records	☑ Active	⚠ Needs communication flow
aiInsights	Axiom AI evaluation results	☑ Active	⚠ Needs Axiom submission run
analytics	SLA + analytics data	☑ Active	⚠ Populated by SLA jobs
clients	Lender / AMC / Broker records	☑ Active	✖ Empty — needs seeding
products	Product/fee configuration	☑ Active	✖ Empty — needs seeding
final-reports	Final report records	☑ Active	✖ Empty — needs PDF template + workflow run
arv-analyses	ARV analyses	☑ Active	✖ Empty
rfb-requests	Request-for-Bid records	☑ Active	✖ Empty
bulk-portfolio-jobs	Bulk upload job history	☑ Active	✖ Empty
matching-criteria-sets	Vendor eligibility rule sets	☑ Active	✖ Empty
comparable-analyses	Comp analysis records	☑ Active	⚠ Populated by comp lookups
uspap-rules	USPAP compliance rules	☑ Active	⚠ Needs initial rule library
inspections	Inspection appointments	☑ Active	✖ Empty — needs test inspection

Container	Purpose	Status	Has Test Data
`chatThreads`, `chatMessages`	ACS chat data	☑ Active	⚠ Requires ACS config
`teamsMeetings`	Teams meeting metadata	☑ Active	⚠ Requires MS Graph config

Azure Blob Storage Containers:

Container	Purpose	Status
`order-documents`	Order supporting docs	☑ Active
`vendor-documents`	Vendor certifications	☑ Active
`order-photos`	Inspection photos	☑ Active (upload works)
`pdf-report-templates`	Fillable PDF templates for final reports	⚠ Container exists; **no templates seeded**

Part 3: Infrastructure & Azure Services

Service	Status	Notes
Azure Cosmos DB	☑ Deployed	25+ containers, Managed Identity auth
Azure Blob Storage	☑ Deployed	Multi-container, Managed Identity, SHA-256 verification
Azure Service Bus	☑ Deployed	Topics: order-events, vendor-events, qc-events
Azure Web PubSub	☑ Deployed	WebSocket real-time push; Bicep deployed
Azure Communication Services (ACS)	☑ Deployed	Email, SMS, Chat, Identity endpoints
Azure App Service	☑ Deployed	Dockerized backend; `Dockerfile` + `docker-compose.yml` present
Azure Entra ID	☑ Deployed	SSO, group-to-role mapping, JWT validation
MS Graph (Teams)	☑ Configured	Meeting creation + channel messaging
Google Places API	☑ Configured	Property enrichment
Bridge Interactive MLS	☑ Configured	MLS data feed
US Census Bureau API	☑ Configured	Neighborhood intelligence
Stripe	☑ Configured	Payment processing
Axiom AI	☑ Configured	Document evaluation (third-party ML service)
Bicep IaC	☑ Present	`/infrastructure/` — Azure resource definitions
GitHub Actions CI/CD	☑ Present	`.github/workflows/` — build + deploy pipelines

Part 4: Known Bugs & Critical Issues

#	Issue	Severity	Location	Impact
B1	Appraiser portal pages use `'current-user'` / `'current-user-id'` placeholder strings in some action payloads	◉ Critical	Multiple portal pages	Actions fire with wrong user ID; audit trail incorrect
B2	QC rules engine is local-state only — no backend persistence; rules reset on page reload	◉ Critical	`/qc/rules/page.tsx`	QC configuration is not saved
B3	Axiom evaluation data is stored on QC queue item but QC execution engine never reads/uses it	◉ Critical	`qc-execution.engine.ts`	AI analysis is not actually driving QC criteria evaluation
B4	Two acceptance flow paths (vendor-engagement vs appraiser-portal) are not unified	◎ High	`negotiation.controller.ts` vs appraiser endpoints	Potential data inconsistency; both paths should converge
B5	Client tier scoring in QC priority returns hardcoded 10	◎ High	`qc-review-queue.service.ts`	Priority scoring inaccurate; high-value clients not prioritized
B6	Vendor risk scoring in QC priority returns hardcoded 5	◎ High	`qc-review-queue.service.ts`	Priority scoring inaccurate
B7	`pdf-report-templates` Blob container has no templates — Final Report generation will fail	◉ Critical	`FinalReportService`	Cannot generate any final reports until templates seeded
B8	MISMO XML generation has no API endpoint or UI trigger	◎ High	`mismo-xml-generator.service.ts`	UCDP/EAD submission pathway not accessible
B9	ROV detail page download ROV report button is a TODO placeholder	◎ Medium	`/rov/[id]/page.tsx`	Cannot download ROV package
B10	QC Assignment dialog `assignedBy` uses `'current-user'` placeholder	◎ Medium	Assignment dialog	Audit trail records wrong reviewer assignment source

Part 5: What Remains to Complete a Production-Deliverable System

The following is an **ordered, prioritized list** of remaining work to reach full production delivery to VisionOne.

◉ CRITICAL — Must fix before any client demo or production handoff

#	Item	Effort	Description
C1	**Replace all hardcoded user ID placeholders** (Phase 6.1)	1 day	Replace `'current-user'`, `'current-user-id'`, `'current-appraiser'` strings with real `req.user.id` / `useUser()` auth context across portal pages and controller actions
C2	**QC Rules backend persistence** (Phase 5.5)	1.5 days	Implement Cosmos CRUD for QC rules (`qc-rules` container); replace local-state-only UI with RTK Query endpoints
C3	**Axiom → QC execution bridge** (Phase 5.2)	2 days	Feed Axiom AI evaluation data into QC execution engine; inject extracted property data + coordinates + USPAP findings into checklist evaluation context

#	Item	Effort	Description
C4	**Seed PDF report templates**	0.5 day	Upload 1-2 fillable PDF AcroForm templates to `pdf-report-templates` Blob container; test end-to-end final report generation
C5	**Seed client + product catalog**	0.5 day	Create 3-5 test client records + 5-10 product configs in Cosmos so order intake wizard works end-to-end
C6	**Seed QC checklist templates**	0.5 day	Create FNMA 1004, FHA, Desktop Appraisal checklist templates in `criteria` container

◉ HIGH — Required for complete feature parity with ValueLink and full workflow coverage

#	Item	Effort	Description
H1	**Edit Order frontend form** (G16)	1 day	Wire existing `PUT /api/orders/:id` to an editable form in order detail — fields: dueDate, priority, specialInstructions, engagementInstructions, contacts, productType
H2	**Event Alert Configuration UI** (G17)	1 day	Admin page for configuring which system events → which notification channels (replace hardcoded `NotificationOrchestrator` rules with DB-backed configuration)
H3	**Delivery milestone UI**	0.5 day	Wire existing `DeliveryWorkflowController` API to milestone list in order detail Delivery tab
H4	**MISMO XML endpoint + UI trigger**	1 day	Add `POST /api/final-reports/orders/:orderId/mismo` endpoint; add "Submit to UCDP" button in FinalReportPanel
H5	**Unify acceptance flows** (Phase 2.4)	1.5 days	Merge vendor-engagement and appraiser-portal acceptance paths so all acceptance actions route through single `NegotiationController`
H6	**Real client tier + vendor risk scoring** (Phase 6.3)	1 day	Replace hardcoded scores in QC queue priority service with real queries against client and vendor records
H7	**Accounts Receivable backend wiring**	1 day	Create dedicated AR query endpoint returning aging buckets by client from invoices/orders
H8	**Accounts Payable backend wiring**	1 day	Create dedicated AP query endpoint returning vendor payment obligations by aging bucket
H9	**iCal feed endpoint** (G15)	0.5 day	`GET /api/calendar/ical` — generates RFC 5545 iCal feed of due dates and inspection dates
H10	**ROV report download**	0.5 day	Implement ROV PDF package generation or assembly from associated documents
H11	**Background check provider** (G14)	2 days	Wire Sterling or Checkr API to existing background-check endpoint

◉ LARGEST INVESTMENT: Photo Intelligence Pipeline (Phase 7)

> **Total effort: ~44 days.** This is the single largest remaining investment. It is a differentiating feature with no equivalent in ValueLink. Broken into independent sub-phases that can be sequenced.

Phase	Sub-Phase	Key Deliverables	Effort
7A	Backend image processing engine	`image-processing.ts` (auto-rotate, thumbnails, EXIF, pHash, watermark)	5.5 days

Phase	Sub-Phase	Key Deliverables	Effort
7B	Type definitions	`InspectionPhoto` expansion, `PhotoExifData`, `PhotoCoverageConfig`, `PhotoQualityReport`	2 days
7C	Service layer enhancements	Upload pipeline wiring, geo/timestamp verify, coverage analysis, duplicate detection	4 days
7D	API endpoints (14 endpoints)	Thumbnail serving, metadata, batch validate, compare, coverage, geo-map, timeline	7 days
7E	Frontend components (9 components)	Gallery, detail modal, upload dropzone, inspection map, timeline, QC panel, report builder	16 days
7F	Frontend integration	Wire into order pages, appraiser portal, QC detail, admin pages	5.5 days
7G	RTK Query + frontend types	`photoApi.ts` with 17 endpoints	1.5 days
7H	Analytics endpoints	Photo quality trends, appraiser quality scoring, compliance metrics	2.5 days
TOTAL			**~44 days**

Recommended execution order within Phase 7: 7B → 7A → 7C → 7D → 7G → 7E (core) → 7F → 7E (advanced) → 7H

◌ NICE-TO-HAVE — Post-launch polish

#	Item	Effort	Notes
N1	Google Calendar sync (G15)	1 day	Requires Google OAuth scope for calendar write
N2	Custom report builder (G12)	2 days	Configurable export with date range filters + PDF/CSV
N3	Native mobile app (G13)	30+ days	Consider PWA first — responsive web may suffice for B2B enterprise
N4	Technology fee monitoring	0.5 day	Per-client tech fee config and tracking
N5	Transaction type configuration	0.5 day	Admin configurable transaction type list
N6	Client self-registration portal	3 days	External-facing client onboarding
N7	Borrower self-scheduling link	2 days	Inspection appointment self-scheduling portal
N8	Billing statement PDF export	0.5 day	PDF generation for monthly billing statements
N9	Clean up dead code (Phase 6.2)	1 day	Remove `order-negotiation.controller.ts` (451-line orphan), `.bak` files, unused duplicate services
N10	LOS Integration (Encompass, Byte Pro)	10+ days	Phase 5 from original roadmap
N11	Underwriting push (live endpoint)	2 days	Requires underwriting system API credentials

Part 6: Competitive Positioning vs. ValueLink Connect

> Full detail in VALUELINK_COMPETITIVE_ANALYSIS.md

Summary Scorecard

Category	VisionOne Wins	Parity	VL Wins	Open Gaps
Order Management	15	9	0	1 (Edit Order form — H1)
Vendor Management	7	11	0	2 (background check, fee split)
Acceptance & Negotiation	4	5	0	0
QC / Report Review	12	1	0	0
Communications	9	1	0	1 (G17 alert config UI)
Dashboard & Analytics	8	3	0	1 (custom report builder)
Financial Management	2	2	0	4 (AR/AP wiring, tech fees, billing PDF)
Administration	3	3	0	3 (transaction types, client reg, G17)
TOTALS	**60**	**35**	**0**	**12**

Plus 21 exclusive features ValueLink does not offer at all: AI-powered QC (Axiom), Property Intelligence suite (AVM + MLS + Census + Geospatial), Fraud Detection, ROV workflow, Real-time WebSocket, Service Bus event backbone, Audit trail, SLA tracking engine, Multi-tenant architecture, Azure Managed Identity, Comparable analysis, ARV engine, Bulk portfolio processing, Escalation console, RBAC engine (Casbin), Dynamic code execution, Health monitoring, PDF coordinate highlighting, AI Report Builder, MISMO XML generation, Multi-channel notification orchestrator.

Where We Are Definitively Superior

1. **QC/Review:** Our Axiom AI ML system vs ValueLink's rules-based CrossCheck — a generational leap
2. **Communications:** 4 channels (Email + SMS + Teams + WebSocket) vs basic email
3. **Property Intelligence:** AVM, MLS, Census, geospatial, comps — ValueLink has none
4. **Fraud Detection + ROV:** Dedicated systems — ValueLink has neither
5. **Infrastructure:** Event-driven (Service Bus), real-time (Web PubSub), globally distributed (Cosmos DB), zero-secret (Managed Identity) — ValueLink is a traditional monolith

Where ValueLink Still Leads

1. **Native mobile apps** (Android + iOS) — our platform is responsive web
2. **Google Calendar sync** — not yet implemented (G15 — 1 day)
3. **Background check integration** (Sterling) — endpoint stubbed, provider not wired

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Part 7: Production Readiness Checklist

Category	Status	Notes
Authentication	☑	Azure Entra ID SSO + unified auth (test tokens for dev)
Authorization (RBAC)	☑	Casbin engine with 4 roles
Input validation	☑	express-validator on all POST/PATCH routes
Error handling	☑	Global error handler; typed error codes

Category	Status	Notes
Rate limiting	☑	Configurable per-window rate limiting
CORS	☑	Configurable `ALLOWED_ORIGINS`
Request correlation IDs	☑	Correlation ID middleware
Audit trail	☑	All state changes logged
Secrets management	☑	Managed Identity — zero secrets in code
Health checks	☑	`/api/health` + service-level checks
Containerization	☑	Dockerfile + docker-compose
CI/CD	☑	GitHub Actions pipelines present
Infrastructure as Code	☑	Bicep modules in `/infrastructure/`
TypeScript strict mode	⚠	`strict: true` in tsconfig; some residual TS errors to resolve
Test coverage	⚠	Tests exist for core flows; photo pipeline untested; integration test suite needs expansion
Performance testing	✖	No load tests run
Security pen test	✖	Not yet completed
User acceptance testing	✖	Not yet started
Documentation	⚠	API contract in `API_CONTRACT.md`; inline JSDoc present; end-user docs missing

Part 8: Recommended Delivery Roadmap

Sprint 1 — Production Hardening (1 week)

1. **C1** — Replace all placeholder user IDs (1 day)
2. **C5, C6** — Seed client/product/checklist data (1 day)
3. **C4** — Seed PDF report templates + test end-to-end report generation (0.5 day)
4. **C2** — QC Rules backend persistence (1.5 days)
5. **B4** — Fix hardcoded QC scores (0.5 day)

Sprint 2 — Feature Completeness (1.5 weeks)

6. **C3** — Axiom → QC execution bridge (2 days)
7. **H1** — Edit Order form (1 day)
8. **H2** — Event Alert Config UI (1 day)
9. **H3, H4** — Delivery milestone UI + MISMO endpoint (1.5 days)
10. **H5** — Unify acceptance flows (1.5 days)

Sprint 3 — Financial & Integrations (1 week)

11. **H7, H8** — AR/AP backend wiring (2 days)
12. **H6** — Real client tier + vendor risk scoring (1 day)
13. **H9, H10** — iCal feed + ROV download (1 day)
14. **N9** — Dead code cleanup (1 day)

Sprint 4–10 — Photo Intelligence (Phase 7, ~44 days)

> Executed as sub-phases: 7A/B/C (backend) → 7D/G (API + types) → 7E/F (frontend)

Post-Sprint — Nice-to-Have

- Google Calendar sync, custom report builder, billing PDF export, LOS integration

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Total estimated remaining effort (excluding Phase 7): ~16–18 days of focused development **Phase 7 (Photo Intelligence):** ~44 additional days **Grand total to full production delivery:** ~60–65 days

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Part 9: External Data Sources & Third-Party Integrations

This section catalogs every external API, data feed, and third-party service the platform integrates with, along with its configuration status, auth method, and whether it is actively being called in production flows.

> **Status Key:** ☑ Active (wired, tested) · ⚠ Configured (wired but not fully tested end-to-end) · 🔧 Stub (class built, SDK/API key not yet active) · ✖ Not yet implemented

AI / Machine Learning Providers

Provider	Purpose	Env Variable(s)	Auth Method	Status	Notes
Axiom AI	Appraisal document ML evaluation: USPAP compliance, comp analysis, coordinate references	`AXIOM_API_BASE_URL` `AXIOM_API_KEY`	API Key (third-party)	⚠ Configured	Evaluations stored in `aiInsights`; Axiom→QC engine bridge pending (Phase 5.2)
Azure OpenAI	Text generation, embeddings, QC analysis, market insights	`AZURE_OPENAI_API_KEY` `AZURE_OPENAI_ENDPOINT`	API Key stored in Key Vault	⚠ Configured	Default for embeddings; routable via `AI_PROVIDER_*` env vars; Key Vault secret provisioned in Bicep
Google Gemini	Vision/image analysis, document processing, property descriptions	`GOOGLE_GEMINI_API_KEY`	API Key stored in Key Vault	⚠ Configured	Default for vision + document tasks; Key Vault secret provisioned in Bicep
SambaNova	Cost-optimized text generation (open-source LLM hosting)	`SAMBANOVA_API_KEY` `SAMBANOVA_ENDPOINT`	API Key stored in Key Vault	⚠ Configured	Alternative cost-optimized provider; `https://api.sambanova.ai/v1`
Certo (vLLM)	Private/on-premises LLM server for air-gapped deployments	`CERTO_ENDPOINT` `CERTO_API_KEY`	API Key + Azure Entra	🔧 Stub	Optional on-prem option; all 4 providers routable via `UniversalAIService`
Azure ML	Automated Valuation Model (AVM) — regression model for property price estimation	`AZURE_ML_ENDPOINT`	Bearer token (Managed Identity)	⚠ Configured	Falls back to local statistical regression model if ML endpoint unavailable

Property Intelligence & Mapping

Provider	Purpose	Env Variable(s)	Auth Method	Cost	Status	Notes
Google Maps Platform	Places (amenities), Elevation, Street View, Distance Matrix, Geocoding, Roads API	`GOOGLE_MAPS_API_KEY`	API Key stored in Key Vault	~$5/1k req	⚠ Configured	Primary mapping provider; 6 Google services wired; quality score 0.95
Azure Maps	Search, Routing, Weather, Traffic, Spatial analysis	`AZURE_MAPS_SUBSCRIPTION_KEY`	Subscription Key	~$4/1k req	⚠ Configured	Secondary mapping provider; quality score 0.92; fallover from Google
OpenStreetMap (Nominatim / Overpass / OSRM)	Geocoding, POI data, routing — community open data	None (free)	None	Free	☑ Active	Always enabled as fallback; rate limited to 1 req/sec; Nominatim + Overpass API + OSRM routing
Bridge Interactive MLS (Zillow Group)	Active MLS listings, sold comps, public records, Zestimates, agent reviews, economic market data	`BRIDGE_SERVER_TOKEN`	Server Token stored in Key Vault	Per contract	⚠ Configured	Falls back to `test` dataset if token missing; RESO Web API OData standard; base URL: `api.bridgedataoutput.com`
SmartyStreets	US address validation, geocoding, address standardization, demographic data	`SMARTYSTREETS_AUTH_ID` `SMARTYSTREETS_AUTH_TOKEN`	Auth ID + Auth Token	~$3/1k req	⚠ Configured	Highest quality address validation (score 0.98); provider available, needs `SMARTYSTREETS_*` env vars
USPS Address Validation	Basic US address verification and city/state lookup	`USPS_USER_ID`	User ID	Free	🔧 Stub	Fallback to Google/SmartyStreets; endpoint wired, no account provisioned

Government / Public Data (Free APIs)

Provider	Purpose	Endpoint	Auth Method	Status	Notes
US Census Bureau ACS5	Neighborhood demographics: age, race, income, education, households at block-group level	`https://api.census.gov/data/2022/acs/acs5`	None (free, no key required)	☑ Active	24-hour result caching; pulls 30+ ACS variable tables
US Census Bureau Decennial	Population counts, housing occupancy from 2020 census	`https://api.census.gov/data/2020/dec/sf1`	None (free)	☑ Active	Used alongside ACS5 for housing intelligence
US Census Geocoding API	Reverse-geocode lat/lng → FIPS state/county/tract/block-group identifiers	`https://geocoding.geo.census.gov/geocoder/geographies/coordinates`	None (free)	☑ Active	Required first step for all Census data lookups
FEMA NFHL (National Flood Hazard Layer)	Flood zone designations, base flood elevation, FIRM panel data	`https://hazards.fema.gov/gis/nfhl/rest/services/public/NFHL/MapServer`	None (free ArcGIS REST)	☑ Active	Determines FEMA flood zone (A, AE, X, etc.) and flood insurance requirements

Provider	Purpose	Endpoint	Auth Method	Status	Notes
FEMA Disaster Declarations API	Historical federal disaster declarations by county/state	`https://www.fema.gov/api/open/v2/DisasterDeclarationsSummaries`	None (free)	☑ Active	Combined with NOAA data for natural disaster risk scoring
EPA Envirofacts	Nearby hazardous waste sites, Superfund locations, toxic release inventory	`https://data.epa.gov/efservice`	None (free)	⚠ Configured	Environmental risk data; endpoint wired, response handling implemented
EPA AirNow API	Real-time and historical air quality index (AQI) by location	`https://www.airnowapi.org/aq`	`AIRNOW_API_KEY`	⚠ Configured	Air quality data for property health/lifestyle scoring; key required but optional
NOAA (Storm Events / Climate)	Historical hurricane, earthquake, wildfire, tornado, winter storm risk by location	Multiple NOAA endpoints	None (free)	🔧 Stub	`NoaaEnvironmentalService` class built; API calls not yet wired — returns `unknown` risk levels
NPS (National Park Service)	Historic places, national parks, landmarks near property	`https://developer.nps.gov/api/v1`	`NPS_API_KEY` stored in Key Vault	⚠ Configured	`nps-historic.service.ts` wired; Key Vault secret provisioned in Bicep; warns if key missing

Azure Platform Services (First-Party)

Service	Purpose	Auth Method	Status	Notes
Azure Cosmos DB	Primary database — 30+ containers; all application data	Managed Identity (`DefaultAzureCredential`)	☑ Active	Zero connection strings; RBAC on every container
Azure Blob Storage	Documents, photos, PDF templates, vendor files	Managed Identity	☑ Active	SHA-256 integrity verification; SAS URLs for download
Azure Service Bus	Async event backbone: `order-events`, `vendor-events`, `qc-events` topics	Managed Identity	☑ Active	Pub/sub for workflow events; ServiceBusPublisher + Subscriber
Azure Web PubSub	WebSocket real-time push for notifications and live order updates	Managed Identity	☑ Active	Negotiate endpoint + client connection; Bicep provisioned
Azure Communication Services (ACS)	Email, SMS, chat threads, user identity management	Managed Identity (prod) / API Key (dev)	☑ Active	`AZURE_COMMUNICATION_ENDPOINT` required; API key fallback for local dev
Azure Entra ID	SSO authentication, JWT token validation, group-to-role mappings	MSAL / `DefaultAzureCredential`	☑ Active	`AZURE_CLIENT_ID` + `AZURE_TENANT_ID` required

Service	Purpose	Auth Method	Status	Notes
Microsoft Graph API	Teams meeting creation, channel messaging, user directory	Managed Identity (`https://graph.microsoft.com/.default`)	☑ Active	`TeamsService` (699 lines); requires MS Graph permissions granted in Entra
Azure Key Vault	All API keys and secrets stored and retrieved via RBAC, not connection strings	Managed Identity	☑ Active	All Bicep modules provision secrets; container apps use Key Vault references
Azure Application Insights	Telemetry, request tracing, custom metrics, error tracking	Connection string from Key Vault	☑ Active	`AppInsightsMetricsService` (270 lines); `APPLICATIONINSIGHTS_CONNECTION_STRING` required
Azure Static Web Apps	Frontend hosting	Azure AD auth token	☑ Active	Separate deployment; `static-web-app.bicep` module

Payment Processing

Provider	Purpose	Env Variable(s)	Auth Method	Status	Notes
Stripe	Client invoice charges, vendor payouts, refunds via `PaymentProvider` abstraction	`STRIPE_SECRET_KEY`	API Key	🔧 Stub	`StripePaymentProvider` class fully built; `stripe` npm package import is **commented out** — falls back to `MockPaymentProvider`. Requires `pnpm add stripe` + uncomment SDK import + set key

Background / Identity Verification

Provider	Purpose	Env Variable(s)	Status	Notes
Sterling / Checkr (G14)	Vendor background checks: criminal history, license verification	Not yet defined	✖ Stub	Endpoint placeholder exists; provider not selected or wired. Required for production vendor onboarding

Integration Dependencies Summary

Category	Total	☑ Active	⚠ Configured (needs key/test)	🔧 Stub (needs wiring)	✖ Not started
AI / ML	6	0	5	1	0
Property Intelligence / Mapping	6	1	4	1	0
Government / Public Data	9	4	3	1	0
Azure Platform Services	10	10	0	0	0
Payment	1	0	0	1	0
Background / Identity	1	0	0	0	1
TOTALS	**33**	**15**	**12**	**3**	**1**

Key observation: All 10 Azure platform services are fully active. The 12 "configured" providers have service code and Key Vault secrets provisioned via Bicep — they need API key credentials sourced from each vendor and added to the Azure Key Vault deployment. The 3 stubs (USPS, NOAA, Stripe) need minor wiring work. Background check (Sterling/Checkr) is the only service with zero implementation.

Report generated: February 22, 2026 Codebase: appraisal-management-backend + VisionOne-valuation-platform-ui Infrastructure: Microsoft Azure (Cosmos DB, Blob Storage, Service Bus, Web PubSub, App Service, Entra ID, ACS)