# **Business Requirements Document (BRD)**

**Project:** Loan Origination System (LOS) **Version:** 1.0 (October 30, 2025) **Purpose:** Define complete business requirements and developer-ready specifications for a configurable, enterprise‑grade LOS spanning lead intake to disbursement, with dashboards, masters, integrations, rules, and audit. This BRD consolidates and extends the attached materials and adds industry best practices so it can be handed directly to AI-driven development tools (e.g., Replit, Cursor) and engineering teams.

## 0. Document control

* **Prepared for:** Business, Product, Engineering, Risk, Operations
* **Prepared by:** LOS Program
* **Stakeholders:** Sales, Credit, Underwriting, Operations/Disbursement, Risk/Compliance, IT/Security, Audit, Legal
* **References (repository):** Solution & scope deck; feature lists; FSD/FRD drafts; block/architecture diagrams; MVP blueprint.

## 1. Executive summary

The LOS will digitize the end‑to‑end origination journey for retail (individual) and—optionally—corporate borrowers, including onboarding/KYC, application capture, document management, verifications, underwriting (rule engine), decisioning, offer/sanction, eSign, and disbursement to the Loan Management System (LMS). It supports dashboards, reporting, and a comprehensive masters/configuration layer for rates, products, fees, and workflow/rules. The design aligns to the provided solution diagrams, feature lists, and MVP/production‑ready functional specifications, extending them with best‑practice controls (maker‑checker, consent, FOIR/LTV/age-at‑maturity checks, AML/watchlists, idempotency, audit).

## 2. Objectives & success metrics

* **Reduce TAT** across stages (application→decision→disbursement) with STP where safe.
* **Increase compliance** (KYC/AML, auditability, consent) with immutable logs and role‑based access.
* **Improve credit quality** with configurable business rules/scorecards and bureau data usage.
* **Operational visibility** via dashboards for pipeline, TAT, bottlenecks, exceptions, and risk flags.

**Key KPIs:** Application STP %, average TAT by stage, approval ratio, rejection reasons coverage, % tasks breaching SLA, document defect rate, and compliance hits resolved. Dashboards and reports cover these dimensions.

## 3. Scope

### 3.1 In scope (phaseable)

1. **Lead & Sourcing** (Branch/DSA/Online/Mobile), Agency & Sales portals (optional), lead→application conversion with mapping/remapping of agents.
2. **Customer onboarding & KYC** (PAN/Aadhaar/CKYC; demographic profile; addresses; employment/income; co‑applicants/guarantors).
3. **Application capture** (loan & product details, sourcing info, references, fees, documents).
4. **Document management** with checklists, status (Uploaded/Verified/Rejected), OCR/auto‑tag (adapter), DMS integration.
5. **Verifications** (KYC/AML, bureau pull, residence/employment/income checks, FI/PD/TVR, dedupe).
6. **Eligibility & underwriting** via **Business Rule Engine (BRE)** (FOIR/LTV/score/risk band), manual overrides with approval matrix.
7. **Decision & sanction** (offer PDF, sanction letter, eSign support), acceptance tracking.
8. **Disbursement handoff** to **LMS/Core**; bank account verification, penny drop check, status reconciliation.
9. **Dashboards & reporting**; drill-down by date/user/branch/product/status; legal/technical summaries.
10. **Masters & configuration** (products, rates, fees, documents, interest types, assets, branches, roles), rule engine, maker‑checker governance.

### 3.2 Out of scope (initial)

* Collections/CLM beyond disbursement, advanced collateral registry filings, and complex co‑lending settlement—unless prioritized later. (Co‑lending hooks reserved in design.)

## 4. Stakeholders & user roles

* **Applicant / Co‑applicant / Guarantor (Customer Portal)**
* **Sales/DSA/Agency** (lead intake, application assistance, pipeline view)
* **Loan/Credit Officer (Maker)** (intake, docs, verifications)
* **Underwriter/Checker & Credit Manager (Approver)** (decision & overrides)
* **Operations/Disbursement** (account verification, LMS push)
* **Risk/Compliance** (KYC/AML hits, rule governance)
* **System Admin/Master Data Admin** (masters, RBAC, rule versions)
* **Auditor** (read‑only logs & reports)

## 5. Assumptions & dependencies

* Third‑party integrations (eKYC, PAN, bureau, bank statement analyzer, eSign, LMS) are adapter‑based and can operate in **mock/staging/production** mode with retry and back‑off.
* Consent captured prior to KYC/bureau/statement fetch; PII stored encrypted; PAN/Aadhaar masked in UI unless privileged.
* Product/rate/fee/rules are centrally configurable with maker‑checker approval.

## 6. High‑level process & workflow

**Draft → Submitted → (KYC/Bureau) → Verification → Underwriting → Sanctioned/Offer → Offer Accepted → Disbursement Requested → Disbursed (→ Rejected)** This aligns to the provided state machine and comprehensive “Basic→Comprehensive details→Verification→Decision→Sanction→LMS” journey.

## 7. Detailed business requirements (by module)

### 7.1 Lead, Agency & Sourcing (optional but recommended)

* **Channels:** Branch, DSA, Agency Portal, Online, Mobile; map/remap agents; validate agency credentials; convert lead→application.
* **Fields:** leadId (auto), channel, sourceId, agentId, customer name/mobile/email, product interest, branch, notes.
* **Rules:** duplicates (mobile+name) flagged; SLA for lead‑to‑app conversion; route by branch or agent load.

### 7.2 Customer onboarding & KYC

* **Identity:** PAN (format + provider validation), Aadhaar eKYC (masked; consented), CKYC fetch; corporate KYC via NSDL for entity flows. Store masked identifiers; encrypt full values.
* **Profile:** personal details, contacts, addresses (current/permanent/work), employment (salaried/self‑employed), monthly/annual income; co‑applicants/guarantors.
* **Validations:** age ≥ 18; pin code format; PAN regex; Aadhaar digits; email/mobile verification.
* **Outputs:** customerId, KYC status, consent record, duplicate check status.

### 7.3 Application capture

* **Basics:** applicationId (UUID), product code, requested amount & tenure (bound by product), purpose, sourcing details, references, processing fee entry, documents upload.
* **Real‑time checks:** PAN/Aadhaar/bank account validation; bureau pull for score/report; preliminary eligibility (rules).
* **Corporate option:** entity details, directors/UBOs, signatories, board resolutions (via NSDL/CKYC fields).

### 7.4 Document management & DMS

* **Checklist by product/property type:** KYC (PAN/Aadhaar), income proofs (ITR/salary slips), bank statements, property documents, valuation report, insurance.
* **Upload rules:** PDF/JPG/PNG; max size (10–15 MB per type); integrity hash; OCR metadata; versioning; verification status and remarks; virus scan.
* **UX:** Required/missing badges; drag‑and‑drop; preview; DigiLocker/auto‑fetch (where enabled).

### 7.5 Verifications & risk checks

* **Automated:** PAN/Aadhaar validation; bank account penny‑drop; AML/watchlist; dedupe; bureau pull; bank statement analysis (income stability, EMI obligations).
* **Manual/field:** Residence/employment verification (FI/TVR), Personal Discussion (PD/LIP) for higher amounts; FCU checks; vendor workflow.
* **Rules:** All mandatory verifications completed/overridden before underwriting; deviation triggers approvals.

### 7.6 Eligibility & underwriting (BRE)

* **Calculations:**
  + FOIR = (existing EMIs + proposed EMI) ÷ monthly income ≤ product.maxFOIR
  + LTV = requested amount ÷ property market value ≤ product/property max LTV
  + Age at maturity ≤ limit; minimum employment tenure; bureau score thresholds
* **Decisions:** Auto‑approve, Manual review, Auto‑reject; reasons and rule explanations captured.
* **Overrides:** Role‑based sanction limits; justification and attachment required; maker‑checker enforced.

### 7.7 Sanction, offer & acceptance

* **Sanction:** amount ≤ requested, tenure within bounds, rate assignment (matrix/score tier), EMI calculation; validity date.
* **Offer:** generate PDF; **eSign** integration; OTP acceptance fallback; signed artifact stored; status transitions recorded.

### 7.8 Fees, payments & disbursement

* **Processing fee:** compute per fee master (flat/%/slab), collect via payment gateway; receipt stored.
* **Disbursement:** beneficiary validation (IFSC/penny‑drop), partial/tranche (if product allows), idempotent push to LMS/core; reconciliation and callbacks.

### 7.9 LMS handover & integrations

* **Payload:** applicationId, customerId, sanctioned terms, schedule, signed docs, compliance flags.
* **Behaviour:** synchronous “accept” + async settlement webhook; retries with exponential back‑off; audit of request/response.

### 7.10 Dashboards, MIS & analytics

* **Tiles:** total apps, user‑assigned, cancelled, disbursed, technical/legal summaries; drill‑downs by date/user/location/product/status.
* **Reports:** pipeline, TAT by stage, rejection reasons, fee collections, compliance hits, verification aging; export CSV/PDF; role‑based visibility.

### 7.11 Masters & configuration (governed via maker‑checker)

* **Masters:** User/Role, Branch, Product Type, Scheme Group, Assets, Documents, Interest Type, Processing Fee, Personal Discussion templates, Business Rules.
* **Behaviour:** effective dating/versioning; draft→review→approved→expired lifecycle; audit of all changes.

## 8. Business rules (illustrative, configurable)

* **Age:** ≥ 18 at application; ≤ max age at maturity at loan end.
* **Amount/tenure:** within product min/max.
* **Bureau:** score < threshold → reject or manual review; multiple recent delinquencies → manual review.
* **FOIR:** thresholds by segment/product (e.g., ≤45% salaried; ≤50% self‑employed).
* **LTV:** by property type (e.g., ≤80% for residential RTM; configurable).
* **Deviations:** route to higher approver by amount/risk band; single active sanction per application.

## 9. User stories (samples, acceptance)

* **US‑001 Create application (Sales):** As Sales, I can create a draft application with product, amount, tenure, and basic customer details so that I can submit for verification. **AC:** validation errors shown; applicationId generated; status=Submitted upon submit.
* **US‑019 Verify documents (Verifier):** As Verifier, I can mark documents Verified/Rejected with remarks; rejection blocks move to underwriting until re‑upload. **AC:** audit entry; checklist all green before transition.
* **US‑031 Run underwriting (Underwriter):** As Underwriter, I can run BRE, view rule outcomes/FOIR/LTV, and approve/reject or raise deviation. **AC:** decision recorded with reasons; if approved, sanction created.
* **US‑044 Disburse (Ops):** As Ops, I can validate bank details and push to LMS; system enforces idempotency and stores cbsRef/status. **AC:** status flow Requested→Disbursed (or Failed) with integration log.

## 10. Data fields & validations (selected)

**Customer:** Name (2–200), DOB (≥18), Mobile (10 digits), Email (RFC), PAN ([A‑Z]{5}[0‑9]{4}[A‑Z}), Aadhaar (12 digits, masked), addresses (pin 6 digits). **Employment:** type, employer, monthly income ≥0. **Application:** productCode, requestedAmount (within product), tenure (within product), purpose, channel (Branch/DSA/Online/Mobile). **Status:** Draft/Submitted/Verification/Underwriting/Sanctioned/OfferSent/OfferAccepted/DisbursementRequested/Disbursed/Rejected. **Documents:** type, file (pdf/jpg/png), size ≤ 10 MB (property docs up to 15 MB), hash, OCR data (optional), verification status & remarks.

## 11. Integrations (adapters)

* **eKYC/Aadhaar, PAN validation, CKYC** (sync/async) with consent + masked storage.
* **Credit bureau (CIBIL/Experian)** pull (async webhook).
* **Bank statement analyzer** (e.g., Perfios) for income, anomalies; **penny‑drop** for account verification.
* **eSign** for offers/agreements; **Payment gateway** for fees.
* **LMS/Core** (Pennant or equivalent) for disbursement with idempotency and callbacks.

**Integration behaviours:** retry/back‑off, circuit‑breaker, signed webhooks, comprehensive IntegrationLog with redaction of sensitive fields.

## 12. Security, privacy, compliance

* **RBAC** with least privilege; maker‑checker where relevant.
* **PII protection:** field‑level encryption (PAN/Aadhaar/account), TLS in transit; masking by role; immutable audit (append‑only).
* **Consent:** timestamped records for KYC/bureau/statement access.
* **Data retention:** configurable per regulation; secure purge; WORM storage for critical audit if required.

## 13. Non‑functional requirements

* **Performance:** API p50 < 500 ms for non‑integrated calls; async tasks < 2 minutes typical.
* **Availability:** 99–99.9% tiered by component.
* **Scalability:** queue/worker model for OCR/bureau/eSign; horizontal scale of stateless services.
* **Observability:** metrics, tracing across integration calls; error budgets; quality gates in CI/CD.

## 14. Dashboards & reports (minimum set)

* **Operational:** pipeline by stage/product/branch; user‑assigned cases; SLA breaches; verification aging.
* **Risk & Quality:** auto‑approve %, refer %, decline %; top rule failures; document rejection reasons.
* **Finance:** fee collection, disbursed volumes; reconciliation statuses.
* **Compliance:** KYC/AML hits, PD/field outcomes, audit event counts.

## 15. Acceptance criteria (end‑to‑end)

* Can create → submit application with validations; documents uploaded & verified; verifications completed; BRE decision made; sanction generated and eSigned; LMS disbursement triggered with idempotency; dashboards reflect real‑time counts; full audit present.

## 16. Risks & mitigations

* **Third‑party outages:** degrade to manual review, queue retries, clear status “Pending External Check.”
* **Data quality issues:** OCR low confidence → manual QC; duplicate customers → fuzzy dedupe review.
* **Fraud:** FCU queue, Hunter‑style checks, anomaly rules; freeze on AML hits.

## 17. Phasing & release plan (suggested)

* **Phase 1 (MVP):** Application intake, masters, docs, basic workflow, manual verification, basic BRE, dashboards, audit.
* **Phase 2:** Integrations in mock → staging (eKYC, PAN, bureau, OCR, eSign, LMS); rule engine richer; valuation integration.
* **Phase 3:** Auto‑decisioning for low‑risk, advanced reports, SLA/escalations, multi‑product expansion. (8‑week sample plan provided in the MVP blueprint.)

## 18. Traceability to repository content (examples)

* **Modules & flow** (Basic→Comprehensive→Verification→Decision→Sanction→LMS) and **dashboards** align to the scope deck.
* **Field‑level validations, entities, APIs, workflow states** sourced from the basic & integration‑ready FSDs (Option A/B).
* **Integrations catalog** (Perfios/bank statements, penny‑drop, eSign, CIBIL, Pennant LMS) reflects the block diagram.
* **Masters, BRE & workflow governance** based on the home‑loan FSD and BRD prompts.
* **MVP architecture, sprinting & deployment blueprint** per the LOS MVP guide.

# Appendix A — **Developer‑ready specification (to feed Cursor/Replit)**

This appendix extracts developer‑oriented artifacts (entities, validations, APIs, state machine) expressed in an implementation‑neutral way. It is intentionally consistent with the repository FSDs so scaffolding tools can generate code from it.

### A1. Core entities (simplified)

* **Application**: applicationId: UUID, channel: enum('Branch','DSA','Online','Mobile'), productCode, requestedAmount, requestedTenureMonths, status: enum(...), applicantId, purpose, assignedTo, auditTrail[].
* **Applicant**: applicantId, firstName, lastName, dob, gender, mobile(verified), email, pan, aadhaar(masked), address{...}, employment{type,employer,income}.
* **Document**: docId, applicationId, docType enum, fileName, fileType, sizeBytes, uploadedBy, status enum, ocrData?, hash, signed?.
* **Sanction/Offer**: sanctionId, applicationId, sanctionedAmount, tenureMonths, rateAnnual%, emi, sanctionDate, validTill, status.
* **Disbursement**: disbursementId, applicationId, beneficiaryAccount, ifsc, amount, status, cbsRef?.
* **IntegrationLog**: id, type, request, response, status, timestamp, durationMs.

### A2. Validations (high value)

* PAN: ^[A-Z]{5}[0-9]{4}[A-Z]$; Aadhaar: 12 digits; Mobile: ^[6-9]\d{9}$; PIN: 6 digits; age ≥ 18; requestedAmount & tenure within product limits; file types pdf|jpg|png and size ≤ 10 MB (15 MB for property).

### A3. State machine

Draft → Submitted → (KYC\_InProgress/KYC\_Completed, CreditCheck\_InProgress) → Verification → Underwriting → Sanctioned/OfferSent → OfferAccepted → DisbursementRequested → Disbursed → (Rejected) with role‑gated transitions and audit.

### A4. Representative APIs

* **Auth:** POST /api/auth/login, POST /api/auth/refresh.
* **Applications:** POST /api/applications, GET /api/applications/{id}, PUT /api/applications/{id}/applicant, POST /api/applications/{id}/submit-for-verification, POST /.../sanction, POST /.../offer/accept, POST /.../disbursement.
* **Documents:** POST /api/applications/{id}/documents (multipart), GET /.../documents, POST /api/documents/{docId}/ocr.
* **Integrations:** POST /.../ekyc, GET /.../pan/validate?pan=, POST /.../bureau/pull + webhooks (/webhooks/bureau, /webhooks/esign, /webhooks/cbs).
* **BRE:** POST /api/applications/{id}/underwrite/evaluate → {decision, reasons, recommendedSanction}.

### A5. EMI formula

EMI = P \* r \* (1+r)^n / ((1+r)^n - 1); r = annualRate/12/100. Round to 2 decimals.

# Appendix B — **Masters (governance model)**

* **Product master:** code, min/max amount, min/max tenure, max LTV by property type, max FOIR, interest type (fixed/floating), processing fee structures, segments, age‑at‑maturity limit.
* **Rates matrix:** base rate + spread tiers (score/LTV/tenor bands); effective dates.
* **Charges & fees:** type, mode (flat/%/slab), taxable, refund policy.
* **Documents checklist:** by product/property; required/optional; expiry rules.
* **Branch & role masters:** approver limits, escalation paths.
* **Rule store:** versioned rules with maker‑checker.

# Appendix C — **Integrations catalogue (quick map)**

* **PAN (Karza/NSDL)**, **Aadhaar eKYC/vKYC**, **CKYC**, **CIBIL/Experian** (bureau), **Perfios** (bank statement), **Penny‑drop**, **eSign**, **DMS**, **Payment Gateway**, **LMS/Core (Pennant)**. Each adapter supports mock/staging/production + retries, idempotency, signed webhooks, and full IntegrationLog.

# Appendix D — **Dashboards & reports (starter list)**

* **Case overview** (by stage/user/branch/date); **disbursed cases**; **technical/legal summaries**; **user‑assigned cases**; filtered views & exports.

## Closing note

This BRD merges your repository artifacts into a single, comprehensive requirement set and strengthens them with industry‑standard controls for security, compliance, and credit governance. The appendices mirror the developer‑ready structure from the FSDs so engineering (or AI tooling) can immediately scaffold entities, validations, APIs, workflows, and tests consistent with the business intent.

If you want, I can also deliver this as a **Markdown BRD pack** with separate **OpenAPI** and **schema.sql** stubs extracted from Appendix A for direct import into your code workspace.