# Functional Requirement

### 1.1 Asset Registration Function

\*\*Function Number: FR-01\*\*

\*\*Description:\*\* Administrators can enter information for new assets. The system automatically generates a unique asset code, verifies the data format and integrity, and ultimately persists the storage in the database.

\*\*Input:\*\* Asset name, type, specifications, purchase date, voucher documents (supporting PDF/JPG/PNG formats, up to 20MB).

\*\*Output:\*\* Asset master record and related附属 records, operation log records (operator, time, content), asset overview view updated.

### 1.2 Asset Information Management Function

\*\*Function Number: FR-02\*\*

\*\*Description:\*\* Administrators can query, modify, and update asset information. The system verifies data version consistency and modification permissions, updates the asset master record, and generates a change history.

\*\*Input:\*\* Asset code, asset name, type, status, and other query conditions, modification fields (such as status, description, related files).

\*\*Output:\*\* Asset master record and related records updated, operation log records (operation type, comparison of values before and after modification), asset detail view refreshed, report analysis data updated.

### 1.3 Asset Detail View Function

\*\*Function Number: FR-03\*\*

\*\*Description:\*\* Administrators can view the complete file of a specific asset, including basic information, usage records, transfer records, return records, and approval process history.

\*\*Input:\*\* Asset code or filtering conditions (such as name, type, status), permission verification parameters.

\*\*Output:\*\* Asset file details (basic information, lifecycle trajectory, approval process history, permission allocation status), visual data view (status timeline, location transition map), operation log records (viewing behavior), access statistics information updated.

### 1.4 Asset Scrapping Function

\*\*Function Number: FR-04\*\*

\*\*Description:\*\* Administrators can apply for asset scrapping. The system verifies whether the asset status meets the scrapping conditions, generates a scrapping application record, and initiates a multi-level approval process.

\*\*Input:\*\* Asset code or QR code, reason for scrapping, disposal method, estimated residual value, scrapping appraisal documents (supporting PDF format, up to 50MB).

\*\*Output:\*\* Asset status updated to "Scrapped," scrapping record chain generated, ledger updated, relevant personnel notified, operation log records, report analysis data updated.

### 1.5 Asset Usage Application Function

\*\*Function Number: FR-05\*\*

\*\*Description:\*\* Users can apply to use assets. The system verifies whether the asset status is "Idle" or "Assignable," generates a usage application record, and initiates an approval process.

\*\*Input:\*\* Target asset code, purpose of use, estimated duration, usage location, approval route selection (regular/urgent).

\*\*Output:\*\* Usage application record generated, asset status updated to "Application under review," approval process initiated, to-do task notification, operation log records, report analysis data updated.

### 1.6 Usage Application Approval Function

\*\*Function Number: FR-06\*\*

\*\*Description:\*\* Approvers can approve asset usage applications. The system verifies approval permissions and performs compliance checks, with the approval result updating the asset status.

\*\*Input:\*\* Approval application number, approval comments, electronic signature.

\*\*Output:\*\* Approval result (approved/rejected), asset status updated (in use/available for application), approval record generated, operation log records, report analysis data updated, blockchain evidence record.

### 1.7 Usage Record Query Function

\*\*Function Number: FR-07\*\*

\*\*Description:\*\* Users or administrators can query asset usage records. The system supports multi-dimensional filtering (time, assets, personnel, status) and provides an export function.

\*\*Input:\*\* Query conditions (time, asset code, personnel, status), export format (PDF/Excel).

\*\*Output:\*\* Usage record list and detail view (application process, usage trajectory, related files), access log records, report analysis data updated, export file (format compatibility verification).

### 1.8 Asset Transfer Initiation Function

\*\*Function Number: FR-08\*\*

\*\*Description:\*\* Users can initiate asset transfer applications. The system verifies whether the asset status is "Transferable" or "Pending reallocation," generates a transfer application record, and starts the approval process.

\*\*Input:\*\* Target asset code, recipient information, reason for transfer, handover time, transfer proof documents (supporting PDF format).

\*\*Output:\*\* Transfer application record generated, asset status updated to "Transfer under review," approval process initiated, to-do task notification, operation log records, report analysis data updated.

### 1.9 Asset Transfer Approval Function

\*\*Function Number: FR-09\*\*

\*\*Description:\*\* Approvers can approve asset transfer applications. The system verifies approval permissions and compliance, with the approval result updating asset information and recipient status.

\*\*Input:\*\* Transfer application number, approval comments, electronic signature.

\*\*Output:\*\* Approval result (approved/rejected), asset status updated (custodian, location), approval record generated, operation log records, report analysis data updated, blockchain evidence record.

### 1.10 Transfer Record Query Function

\*\*Function Number: FR-10\*\*

\*\*Description:\*\* Users or administrators can query asset transfer records. The system supports multi-dimensional filtering (time, asset code, original custodian, recipient) and provides an export function.

\*\*Input:\*\* Query conditions (time, asset code, personnel, status), export format (PDF/Excel).

\*\*Output:\*\* Transfer record list and detail view (application, approval, execution, acceptance stages), access log records, report analysis data updated, export file (format compatibility verification).

### 1.11 Asset Return Request Function

\*\*Function Number: FR-11\*\*

\*\*Description:\*\* Users can submit asset return requests. The system verifies whether the asset status is "In use" or "Lent out," generates a return application record, and initiates a multi-dimensional approval process.

\*\*Input:\*\* Asset code, return time, asset condition description (normal/damaged/parts missing), return proof documents (supporting photo/video formats).

\*\*Output:\*\* Return application record generated, asset status updated to "Return under review," approval process initiated, to-do task notification, operation log records, report analysis data updated.

### 1.12 Asset Return Confirmation Function

\*\*Function Number: FR-12\*\*

\*\*Description:\*\* Administrators can confirm asset returns. The system verifies the consistency between the physical asset and the application description, and updates the asset status.

\*\*Input:\*\* Return application number, physical verification result, electronic signature.

\*\*Output:\*\* Asset status updated to "Returned," return record closed, operation log records, report analysis data updated, blockchain evidence record.

### 1.13 Return Record Query Function

\*\*Function Number: FR-13\*\*

\*\*Description:\*\* Users or administrators can query asset return records. The system supports multi-dimensional filtering (time, asset code, return status) and provides an export function.

\*\*Input:\*\* Query conditions (time, asset code, personnel, status), export format (PDF/Excel).

\*\*Output:\*\* Return record list and detail view (application, approval, acceptance stages), access log records, report analysis data updated, export file (format compatibility verification).

### 1.14 Approval Process Initiation Function

\*\*Function Number: FR-14\*\*

\*\*Description:\*\* Users or administrators can initiate approval processes for asset-related business (scrapping, transfer, usage, procurement). The system verifies the status of the business object and permissions, and generates an approval instance.

\*\*Input:\*\* Business type (scrapping/transfer/usage/procurement), business object (e.g., asset code), approval form data (application reason, urgency level, expected completion time), supporting documents (e.g., inspection reports, contract scans).

\*\*Output:\*\* Approval process instance generated, business object status updated to "Under review," approval record created, to-do task notification, operation log records, blockchain evidence record.

### 1.15 Approval History Query Function

\*\*Function Number: FR-15\*\*

\*\*Description:\*\* Users or administrators can query approval process history. The system supports multi-dimensional filtering (approval type, time, status) and provides in-depth analysis functions.

\*\*Input:\*\* Query conditions (approval type, time range, approval status, business object), export format (PDF/Excel).

\*\*Output:\*\* Approval record list and detail view (application, approval, conclusion), access log records, report analysis data updated, export file (format compatibility verification).

### 1.16 User Permission Management Function

\*\*Function Number: FR-16\*\*

\*\*Description:\*\* System administrators can assign or revoke user permissions. The system verifies permission compliance (least privilege, separation of duties) and generates permission change records.

\*\*Input:\*\* Target user information (ID, name, department), permission operation (grant/revoke/modify), permission type (functional permissions, data permissions, operational permissions), additional explanation (e.g., business basis, approval number).

\*\*Output:\*\* Permission change effective, permission allocation record generated, operation log records, permission matrix view updated, report analysis data updated, blockchain evidence record.

### 1.17 Approval Node Configuration Function

\*\*Function Number: FR-17\*\*

\*\*Description:\*\* System administrators can define approval process nodes. The system verifies node logic integrity and permission mapping, and generates node configuration records.

\*\*Input:\*\* Approval process template, node type (approval, co-signature, gateway, automatic decision), node attributes (approval role, condition expressions, attachment requirements), node connection relationships.

\*\*Output:\*\* Approval node configuration persistently stored, process definition updated, operation log records, report analysis data updated, blockchain evidence record.

### 1.18 Asset Classification Management Function

\*\*Function Number: FR-18\*\*

\*\*Description:\*\* System administrators can define or adjust asset classifications. The system verifies code uniqueness and rule rationality, and generates classification change records.

\*\*Input:\*\* Classification name, coding rules, depreciation parameters, inspection standards, operation type (add/modify/deactivate).

\*\*Output:\*\* Asset classification tree updated, related asset information updated, operation log records, report analysis data updated, blockchain evidence record.

### 1.19 Asset Location Management Function

\*\*Function Number: FR-19\*\*

\*\*Description:\*\* System administrators can configure asset storage locations. The system verifies location code uniqueness and capacity rationality, and generates location change records.

\*\*Input:\*\* Location name, code, physical coordinates (GPS or relative coordinates), storage conditions (temperature and humidity, security level, capacity threshold).

\*\*Output:\*\* Asset location information updated, location topology map updated, operation log records, report analysis data updated, blockchain evidence record.

### 1.20 Asset Status Management Function

\*\*Function Number: FR-20\*\*

\*\*Description:\*\* System administrators can set asset status transition rules. The system verifies state logic compliance and generates status change records.

\*\*Input:\*\* Status name (available/in use/under maintenance/scrapped), transition rules (status change conditions), operation type (add/modify).

\*\*Output:\*\* Asset status rules updated, asset status change effective, operation log records, report analysis data updated, blockchain evidence record.

### 1.21 Operation Log Viewing Function

\*\*Function Number: FR-21\*\*

\*\*Description:\*\* Administrators or users can view operation logs. The system supports multi-dimensional filtering (time, operation type, executor, affected entity) and provides an export function.

\*\*Input:\*\* Query conditions (time, operation type, executor, affected entity), export format (PDF/Excel/JSON).

\*\*Output:\*\* Operation log list and detail view (operation parameters, results, affected data), access log records, report analysis data updated, export file (format compatibility verification).

### 1.22 Operation Log Audit Function

\*\*Function Number: FR-22\*\*

\*\*Description:\*\* Audit administrators can perform in-depth analysis of system operation logs. The system applies risk models to detect abnormal behavior and generates audit reports.

\*\*Input:\*\* Audit period, operation type, executor, risk level.

\*\*Output:\*\* Audit report (risk score, abnormal summary, improvement suggestions), blockchain evidence record, security posture assessment updated, rectification task sheet generated.

### 1.23 Asset Report Generation Function

\*\*Function Number: FR-23\*\*

\*\*Description:\*\* Administrators can generate asset reports (inventory, flow analysis, status distribution, etc.). The system verifies data integrity and generates structured report files.

\*\*Input:\*\* Report type (comprehensive inventory/flow trajectory/depreciation calculation/security audit), filtering conditions (time, asset classification, status, department), output format (PDF/Excel/interactive dashboard).

\*\*Output:\*\* Report file generated, metadata index updated, operation log records, report analysis data updated, blockchain evidence record.

### 1.24 Asset Inventory Export Function

\*\*Function Number: FR-24\*\*

\*\*Description:\*\* Administrators can export asset inventories. The system verifies export permissions and data scope, and generates structured files.

\*\*Input:\*\* Export conditions (status, time range, classification), export format (Excel/PDF/CSV), sensitive field handling method (encryption/desensitization).

\*\*Output:\*\* Asset inventory file generated, access log records, report analysis data updated, blockchain evidence record, file transfer monitoring.

### 1.25 User Registration Function

\*\*Function Number: FR-25\*\*

\*\*Description:\*\* Users can register system accounts. The system verifies the uniqueness of the username and password strength, and generates user records.

\*\*Input:\*\* User type (regular user/auditor/department administrator), basic information (name, employee ID, department), identity credentials (account, password), security information (phone number, email, secondary verification method).

\*\*Output:\*\* User master record generated, permissions initialized, operation log records, welcome notification sent, report analysis data updated.

### 1.26 User Login Function

\*\*Function Number: FR-26\*\*

\*\*Description:\*\* Users can log in to the system. The system verifies identity and loads the permission context, recording login behavior.

\*\*Input:\*\* User account, authentication method (password, mobile verification code, UKey), login device information (IP, browser, geographical location).

\*\*Output:\*\* Access token generated, permission matrix loaded, login log records, personalized dashboard redirection, report analysis data updated.

### 1.27 User Password Reset Function

\*\*Function Number: FR-27\*\*

\*\*Description:\*\* Users or administrators can reset passwords. The system verifies account status and verification code validity, and updates the password hash value.

\*\*Input:\*\* Username, email, phone number, verification code, new password (complies with strength policy).

\*\*Output:\*\* Password hash value updated, session token invalidated, operation log records, security notification sent, report analysis data updated.

### 1.28 Account Cancellation Function

\*\*Function Number: FR-28\*\*

\*\*Description:\*\* System administrators can cancel user accounts. The system verifies account status and associated business data, and generates account cancellation records.

\*\*Input:\*\* User identifier (employee ID, phone number, email), cancellation reason (resignation, transfer, violation).

\*\*Output:\*\* Account status changed to "Cancelled," permissions revoked, business data archived, blockchain evidence record, report analysis data updated.

### 1.29 Permission Allocation Review Function

\*\*Function Number: FR-29\*\*

\*\*Description:\*\* System administrators can review permission allocations. The system verifies the separation of duties principle and permission rationality, and generates review records.

\*\*Input:\*\* Permission configuration (functional permissions, data permissions, operational permissions), review comments, electronic signature.

\*\*Output:\*\* Permission review result (approved/rejected), permission records updated, operation log records, report analysis data updated, blockchain evidence record.

### 1.30 System Role Management Function

\*\*Function Number: FR-30\*\*

\*\*Description:\*\* System administrators can create, modify, and disable system roles, and configure permission sets.

\*\*Input:\*\* Role name, code, permission set, applicable department, validity period.

\*\*Output:\*\* Role master record updated, permission allocation rules changed, operation log records, report analysis data updated, blockchain evidence record.

### 1.31 Data Backup Function

\*\*Function Number: FR-31\*\*

\*\*Description:\*\* System administrators can perform system data backups. The system verifies the storage path and integrity, and generates backup files.

\*\*Input:\*\* Backup scope (asset data, approval records, operation logs), backup type (full/incremental), encryption method (AES-256/national cryptographic algorithm), storage location (local NAS/cloud storage/disaster recovery).

\*\*Output:\*\* Backup file generated, backup directory updated, operation log records, blockchain evidence record, data verification report generated.

### 1.32 Data Recovery Function

\*\*Function Number: FR-32\*\*

\*\*Description:\*\* System administrators can restore historical data. The system verifies the validity of the recovery point and data integrity, and generates recovery records.

\*\*Input:\*\* Recovery time point (full backup or differential backup), recovery scope (full/selective), management key, electronic signature.

\*\*Output:\*\* Data restored to production environment, recovery report generated, operation log records, blockchain evidence record, report analysis data updated.

### 1.33 System Maintenance and Log Management Function

\*\*Function Number: FR-33\*\*

\*\*Description:\*\* System administrators can maintain system operation status, including log cleanup, data repair, version updates, etc.

\*\*Input:\*\* Maintenance type (log cleanup/data repair/version update), cleanup scope (log time, data version), maintenance parameters.

\*\*Output:\*\* System status updated, operation log records, report analysis data updated, blockchain evidence record.

### 1.34 Approval Process Definition Function

\*\*Function Number: FR-34\*\*

\*\*Description:\*\* System administrators can define approval process templates. The system verifies process closure and compliance, and generates process definition records.

\*\*Input:\*\* Approval type (scrapping/transfer/usage/procurement), process node definition, condition branch logic, approver rules.

\*\*Output:\*\* Approval process template stored, process topology map updated, operation log records, report analysis data updated, blockchain evidence record.

### 1.35 Asset Location Configuration Function

\*\*Function Number: FR-35\*\*

\*\*Description:\*\* System administrators can configure asset storage locations. The system verifies location code uniqueness and storage conditions, and generates location configuration records.

\*\*Input:\*\* Location name, code, coordinates, storage conditions, related warehouse information.

\*\*Output:\*\* Location master record updated, asset location map refreshed, operation log records, report analysis data updated, blockchain evidence record.

### 1.36 Asset Status Change Function

\*\*Function Number: FR-36\*\*

\*\*Description:\*\* System administrators can modify asset status. The system verifies status change logic and related business rules, and generates status change records.

\*\*Input:\*\* Asset code, target status (in use/under maintenance/scrapped), reason for change, additional files.

\*\*Output:\*\* Asset status updated, operation log records, report analysis data updated, blockchain evidence record.

### 1.37 User Information Management Function

\*\*Function Number: FR-37\*\*

\*\*Description:\*\* System administrators can manage basic user information, including adding, modifying, and disabling operations, and generate user management records.

\*\*Input:\*\* User identifier (ID, name, employee ID), operation type (add/modify/disable), modified fields (department, position, contact information), permission adjustment information.

\*\*Output:\*\* User records updated, permissions synchronized, operation log records, report analysis data updated, blockchain evidence record.

### 1.38 System Role Permission Management Function

\*\*Function Number: FR-38\*\*

\*\*Description:\*\* System administrators can manage role permissions. The system verifies permission compliance and separation of duties principle, and generates role change records.

\*\*Input:\*\* Role identifier (code, name), operation type (create/modify/deactivate), permission set (functional, data, operational permissions).

\*\*Output:\*\* Role permission records updated, permission matrix refreshed, operation log records, report analysis data updated, blockchain evidence record.