# Green-Cricle - Backend Blueprint

## Project Overview

**Project Name:** Green Circle  
**Type:** Public-Private Digital Platform  
**Ownership Model:** Founder-Owned & Government-Partnered  
**Mission:** Centralized digital hub for Ethiopian startups, investors, government bodies, and ecosystem builders.

## 1. Entities & Database Design

### 1.1 Users Collection

**Purpose:** Stores all user accounts including founders, co-founders, investors, collaborators, and government/admin users.

| Field | Type | Notes |
| --- | --- | --- |
| id | UUID / ObjectId | Primary key |
| name | string | Full name |
| email | string | Unique, login identifier |
| passwordHash | string | For authentication |
| role | enum | founder, cofounder, investor, collaborator, government |
| phone | string | Optional |
| profilePic | URL | Optional |
| verified | bool | Indicates verified investor or government |
| startupIds | array of IDs | Startups associated with user |
| notifications | array of IDs | References notifications |
| createdAt | timestamp | Record creation |
| updatedAt | timestamp | Last update |

**Notes:** Founders and co-founders share a startup but have individual accounts to receive notifications and manage their own login.

### 1.2 Startups Collection

**Purpose:** Represents startup profiles.

| Field | Type | Notes |
| --- | --- | --- |
| id | UUID / ObjectId | Primary key |
| name | string | Startup name |
| website | string | Shared website for startup |
| sector | string | E.g., AgriTech, FinTech |
| location | string | City/region |
| description | string | Short description |
| pitchDeckUrl | string | Link to pitch deck PDF |
| stage | enum | idea, prototype, growth, scaling |
| teamIds | array of User IDs | Founders/co-founders IDs |
| employees | int | Current employee count |
| revenue | float | Annual revenue |
| verificationStatus | enum | pending, approved, rejected |
| rejectionReason | string | Visible only to startup team |
| investorAccess | array of User IDs | Optional restricted investor view |
| createdAt | timestamp | Record creation |
| updatedAt | timestamp | Last update |

**Notes:** Only approved startups are visible to the public and investors; rejected startups visible only to team members.

### 1.3 VerificationRequests Collection

**Purpose:** Tracks government verification requests.

| Field | Type | Notes |
| --- | --- | --- |
| id | UUID | Primary key |
| startupId | UUID | Links to startup |
| status | enum | pending, approved, rejected |
| reviewedBy | UserID | Admin reviewing the request |
| rejectionReason | string | Optional, for rejected startups |
| createdAt | timestamp | Record creation |
| updatedAt | timestamp | Last update |

**Workflow:** Startup submits → Admin reviews → Approved/Rejected → Notification sent to all founders/co-founders.

### 1.4 Notifications Collection

**Purpose:** Stores all notifications for users.

| Field | Type | Notes |
| --- | --- | --- |
| id | UUID | Primary key |
| userId | UUID | Recipient user ID |
| type | enum | startupApproved, startupRejected, newInvestorMatch, etc. |
| message | string | Human-readable content |
| link | string | Optional link to related page |
| read | bool | True if seen |
| createdAt | timestamp | Record creation |

**Notes:** Notifications are triggered on verification updates, investment matches, and program invitations.

### 1.5 Programs / Incubators Collection

**Purpose:** Collaboration entities (incubators, accelerators, universities).

| Field | Type | Notes |
| --- | --- | --- |
| id | UUID | Primary key |
| name | string | Program name |
| description | string | Details about program |
| startupIds | array of IDs | Startups enrolled in program |
| createdAt | timestamp | Record creation |
| updatedAt | timestamp | Last update |

**Notes:** Startups can be in multiple programs; programs can manage cohorts.

### 1.6 Relationships

* **Users ↔ Startups:** Many-to-many (founders/co-founders) via teamIds.
* **Startups ↔ VerificationRequests:** One-to-many (historical verification).
* **Users ↔ Notifications:** One-to-many (each user has many notifications).
* **Startups ↔ Programs:** Many-to-many via startupIds in Programs.

## 2. Roles & Access Control (RBAC)

| Role | Access |
| --- | --- |
| Founder / Co-Founder | Manage own startup, submit verification requests, view notifications, access programs, see rejected startups only if part of team |
| Investor | View approved startups, filter by sector/stage/location, receive notifications on matched startups |
| Collaborator | Manage programs, view enrolled startups, track cohort success |
| Government/Admin | Full visibility, approve/reject verification requests, analytics dashboard, track ecosystem metrics |
| Public User | View approved startups only |

## 3. Filtering & Search Mechanism

* Filter by: sector, stage, location, employees, revenue, verificationStatus
* Query params in GET requests:
* GET /startups?sector=AgriTech&minEmployees=10&verificationStatus=approved
* Backend dynamically builds DB query based on supplied filters.
* Important indexes: sector, location, stage, verificationStatus, createdAt
* Optional full-text search on name and description.

## 4. Verification Workflow

1. Startup submits verification request → status = pending
2. Admin reviews request → Approve or Reject
3. Notification sent to all teamIds
4. Rejected startups only visible to startup team
5. Approved startups visible to public, investors, and collaborators

## 5. Notifications Workflow

* Event triggers: verification result, investor match, program invitation
* Notification linked to userId
* Fields: type, message, link, read
* Allows personal tracking per user

## 6. ER Diagram (Conceptual)

Users <----> Startups  
 | 1:N  
 | each startup can have multiple founders/co-founders  
 |  
 v  
TeamMembers (embedded via teamIds)  
  
Startup <----> VerificationRequests  
 | 1:1 or 1:N over time  
 |  
 v  
  
Startup <----> Investors  
 | N:M  
 |  
 v  
  
Startup <----> Programs / Incubators  
 | N:M  
 |  
 v  
Notifications (linked to Users)

**Notes:** - Crow’s foot notation indicates many-to-many relationships. - Dynamic filtering applies on approved startups only.

## 7. Suggested API Endpoints

### Public / User

* POST /register → create user account
* POST /login → login
* GET /startups → list approved startups with filters
* GET /startups/:id → view approved startup details

### Founder / Co-Founder

* POST /startups → create startup
* PUT /startups/:id → update startup (team only)
* POST /startups/:id/verification → submit verification request
* GET /notifications → view notifications
* GET /startups/:id → view own startup (even rejected)

### Investor

* GET /startups?filters... → list approved startups with dynamic filtering
* GET /notifications → match alerts

### Admin / Government

* GET /startups?all=true → list all startups
* PUT /verificationRequests/:id → approve/reject verification
* GET /analytics → sector trends, employment, revenue stats
* GET /notifications → system alerts

### Programs / Collaborators

* POST /programs → create program
* GET /programs/:id/startups → view startups in program
* PUT /programs/:id → update program details

## 8. Analytics & Logs

* **Activity Logs**: track startup creation, updates, verification requests
* **Metrics**: sector distribution, startup growth, verification success, investor matches
* **Optional**: integrate ELK stack or analytics DB for dashboards

## 9. Summary of Principles

1. Separation of concerns: Users, Startups, Verification, Notifications, Programs
2. Role-based access control (RBAC)
3. Multiple founders per startup with shared visibility
4. Notifications for key events
5. Dynamic filtering & search
6. Verified startups visible to public/investors; rejected only to team
7. Scalable architecture with N:M relationships where needed
8. Full admin dashboard for analytics and verification management

**This document serves as the complete backend blueprint for Green CCircle, covering data structure, relationships, roles, access control, filtering, notifications, verification workflow, and API endpoints.**