

10/3/2025

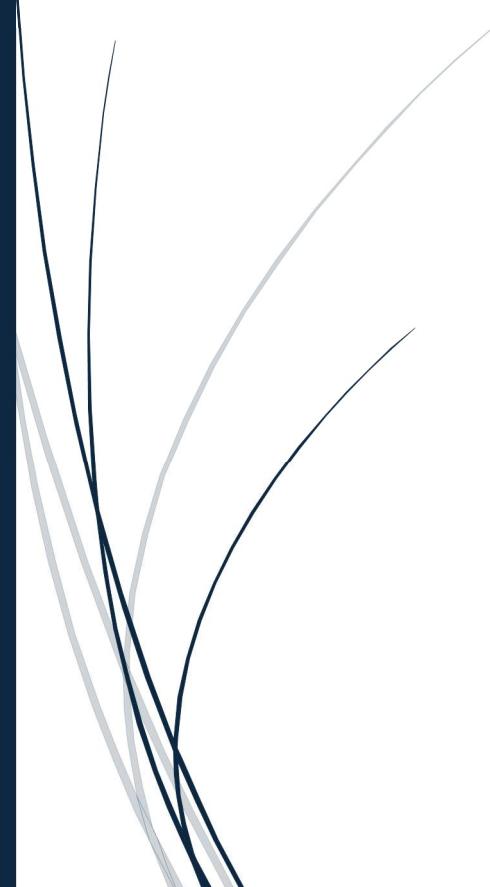
CACODEV – Congolese Association for Congo Development Management System

By

David Katembo

Fabrice Kadima

Pemphyle Nzuzi



Indiana University Southeast

CSCI P445: Capstone Project I Design Fall 2025

Professor Ronald Finkbine, Ph.D.

Breakdown of Contributions

David Katembo: Java (Spring Boot) backend development, database design, API implementation, and authentication system. Introduction

Fabrice Kadima: Frontend (Angular), UI/UX, Stripe integration. Overall

Description

Pemphyle Nzuzi: AWS deployment, Docker configuration, CI/CD pipelines, system security implementation. Specific Requirements

Open Source Software Selection Report

1. Are the open source license terms compatible with my business requirements?

The CACODEV Management System's open-source license conditions align with the organization's operational and business needs. Widely used open-source frameworks and platforms, such as Spring Boot, Angular, and PostgreSQL, which are released under permissive licenses like the Apache License 2.0, MIT License, and PostgreSQL License, are the foundation of CACODEV. Without requiring the disclosure of proprietary source code or limiting organizational usage, these licenses permit unrestricted use, modification, and deployment of the software. Because of this, CACODEV is able to legitimately run, maintain, and expand the system in order to further its nonprofit goals. Additionally, using permissively licensed components promotes long-term sustainability, flexibility, and cost effectiveness while reducing legal and compliance issues.

2. What is the strength of the community?

The Congolese Association for the Management System of Congo's Development aims to carry out actions on the ground, where it faces a community, in which its strength lies in the interconnection of its members who provide mutual support and identify thru sharing and the collective ability to overcome challenges. especially meager, this strength fosters a sense of belonging to a community that helps them be resilient and confident. This strength would also

qualify as open communication and equitable participation for the improvement of its well-being.

3. How well is the product adopted by users?

Our product targets specific users and will be used in areas with poor internet connectivity. The best approach is to go out into the field to promote it and communicate effectively with the target audience, including, of course, charitable organizations, as that is the whole point of our approach. Initially, we will use high-level marketing to encourage users to adopt our products.

4. Can I get a warranty or commercial support if I need it?

Yes, although CACODEV uses open-source technologies, it can still get commercial support and warranties if necessary. Commercial support alternatives are commonly accessible through third-party vendors and service providers, even though open-source software is usually supplied without guarantee under its licensing restrictions. For instance, professional service providers can offer enterprise-grade support contracts for Spring Boot and similar frameworks, managed database services or specialized vendors for PostgreSQL, and major cloud platforms for cloud infrastructure. These support arrangements can include service-level agreements (SLAs), security updates, performance optimization, and incident response. As a result, CACODEV is not restricted to community-based assistance and can decide to add paid warranties and expert support services to its open-source stack in order to satisfy criteria for availability, dependability, and risk management.

5. What quality assurance processes exist?

To guarantee dependability, security, and maintainability throughout the software lifecycle, the CACODEV Management System integrates a number of quality assurance procedures. The development and deployment pipeline incorporates both automated and human techniques to address quality assurance. The Spring Boot backend and Angular frontend's various components and subsystem interactions are checked for accuracy using automated unit tests and integration tests. By checking every change with tests, looking at the code without running it, and scanning for security issues, continuous integration pipelines help keep the code of good quality. Code reviews are done to ensure that people follow security rules, coding standards, and the overall

structure of the system. Testing at the system level and by users helps make sure everything works as it should and meets all the required standards. Finally, keeping an eye on the production process, tracking what happens, and regularly checking things helps ensure quality keeps going by finding problems early, like bugs, performance issues, and security risks.

6. How good is the documentation?

High-quality documentation is often tailored to both development and operational use, supporting the CACODEV management system and its underlying technologies. It should be noted that installation, configuration, security, performance optimization, and best practices are all covered in comprehensive official documentation, which is organized and regularly updated for the main frameworks and platforms used, including Spring Boot, Angular, PostgreSQL, and Docker. To promote maintainability and knowledge transfer, CACODEV maintains system-specific documentation in addition to external documentation on frameworks. This includes architectural descriptions, API specifications, database schemas, and deployment guides. Through the combination of authoritative external documentation and customized internal documentation, the system can be effectively understood, operated, and developed by developers, administrators, and future maintenance personnel, without undue reliance on the original developers.

7. How easily can the system be customized to my exact requirements?

Basically, the CACODEV Management System is super flexible and easy to customize because of how it's built. We employed a contemporary, tiered design utilizing dependable open-source resources. Consider it as a collection of LEGOs: every major function stands alone, so if you aim to replace or enhance a component (such as the reporting module), you won't unintentionally damage anything else that is unrelated.

From a technical perspective, altering elements is straightforward. The user interface (built with Angular) can be quickly changed or themed because it uses reusable components. And the brain of the system (the Spring Boot backend) lets us tweak how it works using simple configurations and interchangeable service parts. Even the database is structured so we can add new data points without causing a huge mess.

The bottom line is that CACODEV is ready for the long haul, it can easily grow and adapt as your organization's rules, processes, and needs change over time.

8. How is this project governed, and how easily can I influence the road map?

The organization and its assigned technical leadership oversee the governance of the CACODEV Management System, which offers a centralized and transparent decision-making framework. CACODEV exercises full authority over feature prioritization, release timelines, and architectural development since the system is internally managed and constructed using open-source technology. By means of requirement reviews, feedback sessions, and governance meetings, stakeholders such as administrators, board members, and end users can influence the direction of the project. Unlike proprietary software solutions, there are no outside vendors imposing deadlines or license limitations. CACODEV is able to retain accountability and transparency in decision-making while closely aligning system evolution with its goal, operational priorities, and community requirements thanks to this governance architecture..

9. Will the product scale to my enterprise's requirements?

Certainly, the Management System of the Congolese Association for Congo Development (CACODEV) is designed with a scalable, cloud-based, and modular framework that effectively accommodates the organization's expansion as a non-profit organization. The system is created to adapt smoothly as the count of users, members, and administrators rises, and as functional needs grow to encompass more services and features. The system is built to handle way more information—all those new members, events, and donor contributions—without slowing down or becoming unreliable. Because CACODEV is designed to work well on cloud infrastructure, and uses things like load balancing (to spread the work out) and its modular design, it can easily

grow as the organization does. This means it's ready to handle your operational needs now and far into the future.

10. Are there regular security patches?

While the system is still in development, we've formalized the security patching process for its production launch. We are committed to performing frequent updates across the application, server, and cloud to address any serious vulnerabilities as soon as they arise. Incorporating automated monitoring technologies allows us to actively discover and address vulnerabilities in our software, ensuring that the system works securely and follows to industry best practices right from the start.