Addis Ababa Science and Technology University

College of Engineering

Department of Software Engineering

Internet Programming

2025/26 Academic Year

I Semester

Documentation for IP Mini-Project (ETC Tech-Blog)

Group 3

Name	ID
Hanif Siraj	ETS0632/15
Lelisa Hailu	ETS0849/16
Ruth Demessew	ETS 1200/16
Sahleselase Asmamaw	ETS1210/16
Sami Siraj	ETS1214/16
Sefefe Dagne	ETS1252/16

Submitted to: Mr. Jerusalem Fetene

Submission Date: Jan 19, 2026

Contents

1.Context

Despite the growth of the technology ecosystem in Ethiopia over the past decade, where more and more developers, students, and tech enthusiasts are eager for knowledge-sharing, collaboration, and development, the current international platforms, although inclusive, still fail to address the distinct issues in the context of Ethiopia.

The technological community in Ethiopia has its own set of challenges that are not met by platforms like Medium.com. These include Internet connection downtime, electricity fluctuations, lack of bandwidth support, cost-conscious consumers, language support, and local examples. There is also a demand for platforms that are attuned to local working hours and practices in Ethiopia. The Ethiopian tech community also needs support platforms with an understanding of local university community needs.

The Ethiopian Tech Camp platform arises from the aforementioned needs. The platform is intended to be a one-stop technology community platform that harvests the best practices of article publication platforms such as Medium.Com combined with some special features customized specifically for the Ethiopian developer community. The platform acts as a hub through which Ethiopian developers are able to create articles.

This report will do a complete analysis of the ETC platform compared to Medium.com, which will be used as the existing standard solution. Medium.com will be a great comparison platform for ETC since it has the highest level of popularity worldwide in terms of a platform for sharing contents, with millions of users. However, as will be shown in this analysis, it has its deficiencies in catering to the needs of the tech community in Ethiopia that ETC will capitalize on.

The context in which this project exists revolves around the digital transformation initiatives being implemented in the Ethiopian environment through initiatives such as Digital Ethiopia 2025. The ETC platform fits within this broader context in that it enables the development of the necessary technology human resources by providing the necessary infrastructure support.

2.Motivation

There are several interrelated reasons why there is a need for an Ethiopian Tech Camp website, most of which can be grouped into technical, cultural, economic, and community-related justifications.

2.1 Technical Motivation

The challenge that Ethiopian developers face is a highly unsteady internet connection. Internet in Addis Ababa has average speed at 8-12 Mbps. Below 1 Mbps in many cases in the countryside. Sites such as Medium.com, developed for high-speed internet connections, become unrealiable or are non-functional in such environments. Power outages also contribute towards interrupting activities. ETC is developed out of the need for a robust platform that will function optimally in a low bandwidth environment that provides full functionality while offline or saved work that seamlessly resumes when internet connection resumes.

2.2 Cultural and Linguistic Motivation

Medium.com has limited support for Ethiopian languages like Amharic, Tigrinya, and Oromo. This means many developers do not have the luxury of being able to write or read technical information in

their language of choice. It also doesn't take into consideration the Ethiopian calendar system, holidays, and working practices. ETC wants to provide a locally grown experience with robust support for Amharic (and bilingual support) and an integrated dual calendar system that synchronizes with Ethiopian cultural cycles.

2.3 Economic Motivation

Data prices in Ethiopia are substantial, taking up a considerable amount of the average person's income, so an always-online and data-intensive platform such as Medium.com's design is not only pricey, as data is involved, but also not feasible, especially for students, as there is an additional paywall that is pricey too. ETC is compelled to provide an optimal, data-savvy, and totally free experience, where all features are completely free.

2.4 Community and Educational Motivation

There are plenty of computer science graduates in Ethiopia, although there is an apparent mismatch between education and job expertise. While Medium.com offers articles, it does not have learning courses, coding, mentorship, or local collaboration functionality. ETC fills the apparent mismatch between education and expertise, along with job requirements, through learning courses, coding, mentorship, and regional collaboration functionality.

2.5 National Development Motivation

Digital Ethiopia 2025 has emphasized developing a competent workforce and a strong digital economy. Alignment with Digital Ethiopia 2025 occurs because ETC provides the necessary infrastructure to promote knowledge sharing, skill building, and community formation, which will, in turn, help to retain Ethiopian talents and support the country's aspiration of becoming a technology hub for the whole of East Africa.

3. Problem Statement

Despite this growing interest and potential, there are a number of challenges for the Ethiopian community in utilizing such a global platform, such as Medium.com, for the sharing of knowledge, personal growth, and even the establishment of a community, to name but a few, that are basically fueled by the radical incongruence between the design principle of such a global service and the Ethiopian reality. This is premised upon the highly contents-overladen media-centric environment of Medium.com, whose design principle is based upon the necessities of assured, broad band internet speeds, an environment that is quite frustrating for Ethiopian IT professionals with internet speeds of only 8-12 Mbps in the urban areas and often below 1 Mbps and unpredictable shut-downs in the rural areas.

This infrastructure gap is then exacerbated by the complete and utter lack of offline functionality, causing readers to be forced to shut down any and all notions of reading, writing, and collaboration upon losing internet, and an overall data-hungry application which continues to increase an already exorbitant cost of mobile data, already a substantial burden to an average income. Furthermore, aside from infrastructural issues, the nature of said content provides wholly inappropriate and irrevelevant data in terms of developed world-infrastructure, cost of services, and developed-world entrepreneurial culture, providing Ethiopian developers with utterly useless information regarding developing world applications and pertinent infrastructural and economic data. Even an attempt to provide a sense of a community may be seen in follows, claps, and comments, which offer nothing to assist with developing world networking, mentor match, project collaboration, grouping, and event organization, which, in turn, offer developers a developed world professional insider networking experience, which Ethiopian developers utterly lack.

From an educational standpoint, while Medium.com contains a tremendous number of outstanding and current articles, it lacks any educational structure, coding exercises, progress monitoring, resource libraries, and supportive scaffolding for beginners, and as a result, students and young programmers alike must bridge the gap between the academic world and the professional world themselves. Accessibility and cost serve to exacerbate the problem, as while the best and most current articles appear behind a pay wall that few students and young professionals can afford, the active data requirements mean that students and young professionals simply can't afford to spend the data to view the platform, and in doing so, the platform's complete disregard for the Amharic, Tigrinya, and Oromo languages, as opposed to a complete focus on the English language, and lack of accounting for the country's different calendar system, holidays, work rhythms, and culture mean that simple tasks and activities, such as reading, writing, and participating fully, mean little to nothing to most, and as a result, they simply don't belong in the space in which they need to participate, simply through the merest basic quality and requirement of being an active member in the space.

4. Objectives

The Ethiopian Tech Camp platform should work on creating a holistic, context-aware community hub to address the needs of developers in Ethiopia while still providing high-quality tools for sharing knowledge, learning, and community building.

4.1 Primary Objectives

Infrastructure-Optimized Platform: Ensure predictable performance on low bandwidth, intermittent connectivity, and power outages by incorporating offline access, data optimization, progressive loading, and auto-save.

Locally Relevant Content: Encourage the creation and discovery of Ethiopia-relevant content, including local case studies, regional examples, and solutions relevant to the Ethiopian market and infrastructure.

Powerful Community of Developers: Build a robust, connected community of developers, students, and enthusiasts by providing networking features, mentorship, collaboration, and event organization.

Full-service Educational Resources: Provide structured learning paths, coding challenges, resource libraries, and tools to support skill development for users at all levels.

Accessibility & Affordability: Make core features free, optimize for low data usage, and design for users with limited resources and devices.

Local Languages & Culture: Provide full support for Amharic, bilingual options, and the integration of the Ethiopian calendar, holidays, and cultural practices in the region.

4.2 Secondary Objectives

Apart from these main goals, the project also seeks to:

Add to the Digital Ethiopia 2025 plan by ensuring an educated technology-savvy work force

Fill the gap that exists between academic education and the demands of the industry

Provide linkages for Ethiopian developers to tap into international market trends

Display Ethiopian technological innovation and successes

Foster local tech entrepreneurship & startup development Develop an enabling environment that can act as an example for other developing countries

5. Significance

The Ethiopian Tech Camp platform has profound, multi-layered significance, ranging well beyond being merely a platform for sharing information, because it has already proven to be a key tool for empowering people, developing institutions, building businesses, and moving Ethiopia forward through technology.

5.1 Significance for Individual Developers

For Ethiopian developers of every stripe, ETC provides access to knowledge, resources, and job opportunities that, up until now, have been hard to come by. This technology partnership provides a supportive community to learn, teach, and build relationships while opportunities grow, and to do so within an infrastructure system that Opti Code has ensured will be available to developers with low bandwidth, low-end computers, and unreliable internet connections. In doing so, by helping to simplify an isolation of geographical distance, particularly developers outside of Addis Ababa, developers with a sense of isolation, particularly in an overall country with poor digital infrastructure, can connect.

5.2 Implication for Learning Institutions

ETC provides universities, colleges, and training centers with an enabling set of complementary resources. The platform brings together industry-relevant content, hands-on tutorials, and structured materials that support formal curricula in helping bridge the gap that has been persistent between theory and practice. It also facilitates effective academia-industry linkage through student internship opportunities, collaborative projects, guest lectures, and further curriculum upgrading sensitive to the current market needs-developing students who will be employable, confident contributors to Ethiopia's tech sector.

5.3 Implication for Business and Startups

For Ethiopian tech companies and early-stage startups in particular, ETC acts as a good source of qualified human resources, a base of technical knowledge, and a supportive community. It makes it easier to find skilled developers, which will facilitate recruiting processes; knowledge exchange accelerates innovative processes while networking tools may help businesses grow. Visibility for startups, access to potential co-founders, mentors, and early adopters on the local market can often mean the difference between success and failure, especially at those stages of their development where companies are particularly vulnerable.

5.4 Significance to National Development

At the national level, ETC is directly contributing to Ethiopia’s ‘Digital Ethiopia 2025’ plan in that it is assisting in the development of a skilled and digitally competent workforce, which is one of the primary focuses of the country’s dream to build a vibrant digital economy. As previously stated, having a vibrant and integrated tech ecosystem in the country can lead to economic development and job creation. Another equally important aspect of ETC is that it retains local talent and therefore prevents brain drain in Ethiopia.

6. Feasibility

The Ethiopian Tech Camp (ETC) platform is highly viable from technical, economic, operational, as well as organizational perspectives, with a strong groundwork already established, minimal resource requirements, and feasible solutions for the challenges.

6.1 Technical Feasibility

The system relies on already well-established modern web tech stack (HTML5, CSS3, JavaScript) with no special infrastructure needs. The front end is already fully developed, thus technically proven. PHP/MySQL or Node.js/MongoDB solutions are simple and available for backend implementation. Infrastructure needs are minimal, and ETC's built-in optimization techniques actually help to reduce server needs and costs. The system is scalable with simple horizontal or vertical expansions based on its module-based architecture, and integration with social networks, payments systems, and third-party APIs is relatively simple.

6.2 Economic Feasibility

The development expenses are greatly reduced by the existing front end, and a limited team is able to manage the back end in a possible timeframe with the usage of free open-source platforms. Operations cost (hosting, maintenance, and support) is also remained low because of data and bandwidth optimizations, and partial community management for content and moderators. With equal emphasis on free core, the revenue streams include the desired alternative premium functionalities, the sponsored content, the job postings, and the partnerships. Indeed, the major advantages in terms of skill development, community development, and the nationwide outreach, greatly surpass the development cost.

6.3 Operational Feasibility

The current team for developing the software has the ability, and this has been shown by the completed frontend, and they have the requisite skills in Web development, design, and management. This is in addition to the ease in maintaining and updating the software, and the burden in content moderation and support for the software may decrease due to community participation. Strong demand for the software and participation by the community in the software have placed ETC on the success vector in terms of acceptance by the users.

7. Beneficiary

The Ethiopian Tech Camp platform offers different values for categories of beneficiaries: individuals, institutions, and society, so as to ensure wide-reaching impact for sustainability in the technology ecosystem of Ethiopia.

7.1 Primary Beneficiary

7.1.1 Ethiopian Software Developers

This will most help developers of all skills and phases in their careers-from beginners to experts. Technical information and training are provided to them. The low bandwidth and offline solutions ensure effective engagement of one and all. This is particularly helpful for the junior developers, who are given access to training and mentoring sessions and also have the ability to interact with and understand things from experts. The senior developers get to share their knowledge and contribute to the community's

growth in the process.

7.1.2 CSE Students

For students studying computer science, software engineering, and related fields at universities, ETC has become an integral part of their support structure beyond formal education. Students receive industry-relevant tutorials, practical examples, supplementary resources, and direct links to professionals in the field which works toward closing the gap between academic theory and industrial needs. Free access, coding challenges, project collaboration tools, and career guidance arm the student for preparation in the job market regardless of personal budgetary constraints.

7.1.3 Tech Enthusiasts and Hobbyists

Individuals interested in technology-even if not professionally-are afforded open learning materials, community interaction, and spaces to tinker around with ideas. ETC's design for inclusivity welcomes users of all skill levels into lifelong learning and casual engagement with the tech world.

7.2 Secondary Beneficiaries

7.2.1 Education Institutes

Universities, colleges, and technical institutions benefit from the additional resources, insights, and linkages provided by the partnership. This will allow for enhancements in the learning process, engagement, and internship and collaboration opportunities for a better link to the market.

7.2.2 Tech Companies and Start

Startups in the local technology industry gain from the growing talent base in terms of expertise and community support. The innovation hub connects the talent to innovation and ensures that startups are discovered and gain visibility through the innovation hub in the context of Ethiopia.

7.2.3 Mentors and Educators

Seasoned developers wanting to give back to the programming community find ETC an efficient platform to train and teach mentees. It provides favorable tools that help in easy interactions with mentees, creation of training sessions, and imparting valuable knowledge sessions to the next generation.

7.3 Tertiary Beneficiaries

7.3.1 Government Officials and Policy Makers

Government agencies and policy-making circles get helpful information with respect to trends of skill development, the health status of the ecosystem, and also the status of advancements towards the Digital Ethiopia 2025 visions.

7.3.2 International Organizations and Donors

Worldwide organizations participating in tech development in Ethiopia can also make use of ETC to assess impact, carry out initiatives, and measure outcomes. This project can also be used as a guide or model in developing nations.

7.3.3 General Public

The indirect beneficiaries in the broader Ethiopian community include the society as a whole, thanks to the positive contributions by the tech industry, including job and economic growth and development.

8. Existing System Overview (Medium.com)

Medium.com, launched in 2012 by Twitter co-founder Evan Williams, has grown into one of the world's leading online publishing platforms. It serves as the primary benchmark for comparison with the proposed Ethiopian Tech Camp (ETC) platform due to its proven model of long-form content creation, discovery, and community engagement. This section outlines Medium.com's core architecture, key features, technical foundation, scale, business model, strengths, and most importantly its limitations when viewed through the lens of the Ethiopian developer context.

Platform Architecture: At its heart, Medium.com functions as a hybrid between a content management system and a social discovery network. It blends the straightforward simplicity of traditional blogging with powerful algorithmic recommendations and social interaction tools. Users can easily publish long-form articles, explore content from others, and engage via follows, comments, recommendations (known as "claps"), and personalized feeds.

User Roles: The platform defines three main roles: Readers consume and interact with content by following writers or publications, clapping for articles, and leaving comments; Writers create and publish articles, grow audiences, and potentially earn income through the Medium Partner Program; Publications act as curated digital magazines, managed by editors who select, organize, and promote collections of articles from multiple contributors.

Content Model: Medium stresses the importance of well-structured and well-written articles. The articles on Medium are usually between 500 and 5,000 words. The articles on Medium are not categorized. Instead, there are tags associated with the articles. The articles are also associated with publications. The recommendations on Medium are also highly sophisticated.

Key Features: The publishing experience is seamless, with a robust WYSIWYG editor, markdown integration, image and media handling, draft versioning with history, publish scheduling, and SEO optimization. Sharing or discovery is handled through personalized feeds, trending pages, tagging, advanced search, and mail digests. Social features enable following, applause for recommending articles, comments with threading, sharing, reading lists, and bookmarks. Revenue is generated via the Medium Partner Program, whereby contributors earn a share of subscription revenue based on member engagement times.

Technical Infrastructure: Medium.com is designed around a modern and scalable infrastructure: a single-page application powered by React for the front end, a microservices infrastructure using Node.js for the back end, distributed databases for dealing with the scaling issues that come with growth, a worldwide CDN for quick distribution globally, and native mobile applications for platforms supporting the latest devices. It is designed for high-speed bandwidth and is compatible with the latest devices, but is not optimized for an environment that has intermittent or poor connectivity.

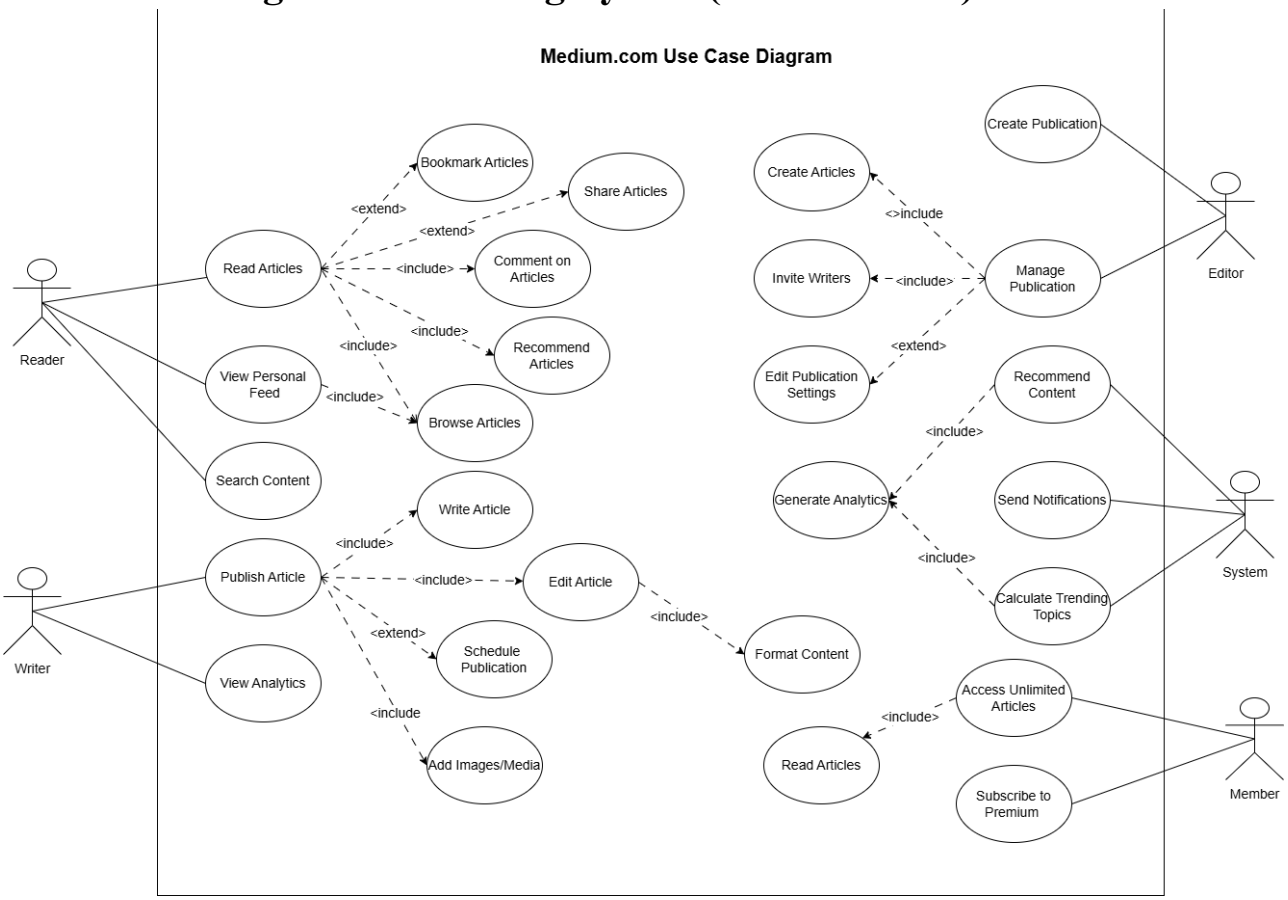
User Base and Scale Applicant: The reach of the platform has been astounding worldwide, with over 100 million monthly readers, hundreds of thousands of actively writing contributors, thousands of

published works, and content in multiple languages although it is predominantly in English. The audience base covers almost all countries in the world.

Business Model: Medium is a freemium service. The free service provides users with selective access to the best articles every month, and the subscription service provides users with unlimited access, no advertising, and the ability to support authors. The Partner Program provides authors with subscription revenue according to their level of engagement, as well as advertising income for non-subscribers.

Strengths of Medium: In many ways, Medium succeeds in a number of important areas, including an exemplary emphasis on high-quality writing, outstanding content discovery, a large and very diverse community of readers, professional-class tools, a solid brand, excellent mobile support, and a monetization system to compensate writers based upon reader interaction.

9. Usecase Diagram of Existing System(Medium.com)



10. Problems with Existing System (Medium.com)

The global design of sites like Medium.com poses serious challenges to developers in Ethiopia since it requires an efficient internet service, consistent power supply, and cheaper data, which are not applicable in their region.

Infrastructure Issues: Heavy media, JavaScript, and images: This is problematic on 8-12Mbps internet speeds for urban areas or less than 1Mbps for rural areas. It is completely unusable offline, with barely any functionality, and there's also no low-bandwidth mode that could improve current reliance on mobile internet.

Content & Relevance Problems: The content is largely global in nature, with examples from developed markets' pricing solutions that do not at all apply to the realities of Ethiopia. The interface is still largely English-dominated with minimal support for the Amharic, Tigrinya, or Oromo languages, not to mention the absence of the use of the Ethiopian calendar system.

Community Issues: Rather limited for follows, claps, and comments, Medium does not have functionality for direct messaging, mentorship, project collaboration, regional communities, and local events for connecting with local Ethiopian developers and planning events.

Educational Problems: Provides excellent articles, lacks learning paths, coding challenges, and any form of tracking or beginning guidance for students and newcomers to effectively apply academic learning in a real-world setting.

Economic & Accessibility Problems: The paywall system allows limited access to the articles freely every month. However, the cost of subscriptions is not affordable. The usage is also limited due to increased data cost.

Usability: Though the slick interface may be frustrating for a novice or those with a small mobile-phone screen (the primary way Ethiopians connect to the internet), it lacks any tools for organizing events, such as a calendar and RSVP system and ability to advertise.

Overall Impact: They affect accessibility, relevance, interaction, and development and hinder skills acquisition, the strength of local communities, and equality. This is more than sufficient reason to have a customized platform like Ethiopian Tech Camp that retains the effectiveness of Medium while dealing with Ethiopia’s issues.

11. Proposal for The New System

One proposed solution is called the Ethiopian Tech Camp, or ETC. ETC is suggested to be a specifically designed solution addressing directly the major flaws of Medium.com, at the same time retaining and further developing the best features, like clean blogging tools and good discovery, that made Medium so successful. ETC is suggested to be an inclusive service carefully designed specifically for the Ethiopian Tech community, taking into consideration not just good blogging functionality but also robust infrastructure, community functionality, learning, and event management.

11.1 Core Platform Concept

ETC combines the refined, writer-oriented publishing experience of medium.com with specialized levels that cater to the distinct needs of Ethiopia. ETC can be considered a one-stop shop for Ethiopian developers, incorporating long-form postings, resource information, social interaction, learning programs, and events, all designed with a focus that can function well regardless of the network connectivity.

11.2 Key Differences from Medium.com

Infrastructure Optimization: ETC is designed from the ground up for the Ethiopian environment: Automatic low-bandwidth network detection and optimization. Offline reading and draft editing (syncs

seamlessly). Progressive start-up for fast initial entry. Aggressive data compression (pictures, JS reduction, caching). Automatic saving that protects work in case of a loss of connection or power failure.

Local Relevance Features: The service incorporates the Ethiopian context in multiple ways, such as support for display in both Gregorian and Ethiopian calendar formats, consideration of content from local authors and examples, tagging on a regional level (by cities and regions), consideration of local business hours and holidays, and local currency support in Ethiopian Birr, in addition to USD.

Comprehensive Community: Aside from basic engagement, ETC offers such services: ETC's searchable membership directory of Ethiopian programmers, one-on-one direct messaging, discussion and question and answer forums organized around subjects, collaborative work areas for projects, an automated mentor match service, and city or geographical networks for linking ETC participants.

Educational Resources: For the sake of structured skill acquisition, ETC provides learning paths for different skill levels. There are also weekly coding challenges with different levels of difficulty, a resource library for tools, templates, and guides, progress tracking with achievements, and well-structured tutorials.

Event Management: It provides an integrated system for the display and creation of tech events, the promotion of events, the management of RSVPs, and the creation and management of the Ethiopian calendar. Even the support for the concept of a hybrid format helps in making the events as accessible as possible in the entire country.

Language Support: The UI translated in complete Amharic bilingual article support (English & Amharic articles), comments in code in Amharic, and an English to Amharic technical dictionary make sure that everything feels natural.

Technical Architecture: Frontend: Developed using HTML5, CSS3, JavaScript (ES6+), Progressive Web App capabilities, mobile-first design, service workers to provide offline support, and lazy loading/code splitting.

Backend (proposed):

RESTful APIs,

User authentication system,

Content management system,

User/articles/events/resources database (relational/NoSQL),

File storage

12. Usecase Diagram of the Proposed System