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# Chirin Ivatan: A Community-Based Information System for Language and Folklore Conservation

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# INTRODUCTION

## Background of the project

The Ivatan language and folklore are integral components of the cultural identity and heritage of the Ivatan people in the northernmost province of Batanes, Philippines (Hornedo, 2000). These intangible cultural elements—ranging from oral traditions, proverbs, and stories to unique lexical structures—are essential carriers of ancestral knowledge, values, and worldviews /(UNESCO, 2003). . However, modernization, the growing dominance of mainstream languages like Filipino and English, and the widening generational gap in cultural transmission have placed Ivatan language and other indigenous languages at serious risk of extinction (Obligar, 2024).

Globally, indigenous languages and oral traditions are disappearing at an alarming rate. According to UNESCO, nearly half of the world's approximately 6,000 languages are endangered, with one language disappearing every two weeks (Evans, 2009). When a language is lost, a rich collection of indigenous wisdom, history, and identity disappears as along with it. In the case of the Ivatan community, younger generations are becoming less fluent due to limited exposure and use of the language in schools, media, and digital spaces. As fewer native speakers remain, the intergenerational transmission of the Ivatan language and folklore continues to decline. Without proactive intervention, important aspects of the Ivatan culture, including the terms, proverbs, and folklore, may be permanently lost and may no longer be passed to the future generations of Ivatans.

Another critical factor threatening the preservation and transmission of the Ivatan language is the recent shift in the Philippine educational policy regarding the use of the mother tongue in early education. On October 2024, Republic Act No. 12027 was enacted, which discontinues the use of the mother tongue as the primary medium of instruction from kindergarten to Grade 3. The new legislation mandates a return to using Filipino and English as the primary languages of instruction, relegating regional and indigenous languages, such as Ivatan, to auxiliary or optional roles. This policy shift poses a significant

risk to the survival of native languages because early childhood education is a crucial period for language acquisition and cultural transmission.

The problem is further compounded by the lack of accessible, participatory, and technologically driven platforms for cultural preservation. While there have been commendable efforts to document Ivatan language and traditions through printed dictionaries such as the blue book or the Ivatan-English-Filipino Dictionary by Hidalgo and ethnographic research bu UP Archeological Studies, these resources remain fragmented, static, and difficult to access—particularly for non-academic users and the youth. Existing solutions are largely limited to traditional media, which do not leverage modern information and communication technologies to foster deeper engagement or community participation. The absence of such a system may hinder the effective transmission of cultural knowledge and prevent interested learners from easily accessing and engaging with linguistic and folklore resources.

Recognizing this challenge, this capstone project aims for the development of Chirin Ivatan: A Community-Based Information System for Language and Folklore Conservation. This web-based application is envisioned as an innovative digital solution that aims to preserve and revitalize the Ivatan language. This includes a digital dictionary, folklore archive, and community-driven content submission features. Unlike other projects, the Chirin Ivatan will take advantage of modern web technologies to create a user-friendly and sustainable platform that encourages participation from the community. It aims to ensure that the transmission of linguistic and cultural knowledge continues.

The proposed system will consist of three core components designed to address both preservation and engagement goals. First, it will include a comprehensive digital English-Ivatan dictionary enriched with audio pronunciations to aid in the accurate learning and revitalization of the language. Second, an interactive folklore archive will serve as a digital repository for Ivatan traditions, legends, proverbs, and oral stories, making them easily accessible and systematically organized for exploration and study. Third, the system will feature a community-driven content submission mechanism, enabling verified contributors—particularly elders, educators, and cultural bearers—to actively participate in the documentation and validation of language and folklore materials.

The proposed system will be developed using React.js for the frontend and Django with Python for the backend. PostgreSQL will serve as the main database to handle structured data like dictionary entries, folklore content, and user profiles. The system will feature audio pronunciation on the dictionary pages. User-centered design principles will be applied to ensure accessibility and ease of use. Partnerships with cultural organizations such as the Ivatan Heritage Society, local educators, and Ivatan community members will also be central to the content validation and sustainability of the project. The final outcome is a functional, community-driven web platform.

The ultimate goal of this project is to create a functional, sustainable, and inclusive digital platform for preserving the Ivatan language and folklore. It aims to deliver a working web application that is accessible to users of all ages and technical backgrounds, encouraging greater community participation in cultural preservation. The platform is expected to raise awareness and support learning, especially among younger generations, while offering a model that can be adapted for other endangered languages and communities. Chirin Ivatan is more than just a website—it is a cultural preservation effort grounded in community collaboration and powered by modern technology. The project aims to keep the Ivatan's linguistic and folkloric heritage thriving in the digital age.

## Objectives

To design and develop a community-based web application that facilitates the preservation and promotion of the Ivatan language and folklore through digital tools that enable documentation, learning, and community participation.

- To develop a user-friendly English-Ivatan digital dictionary with audio pronunciation feature
- To implement a folklore documentation module that archives at least 50 Ivatan stories, myths, and proverbs in text and audio formats, enabling browsing, submission, and community validation
- To build a contribution and moderation system that allows verified cultural

stakeholders to submit and review content, with at least 3 active reviewers testing the system by the end of the development phase.

- To ensure the platform's accessibility and usability through user-centered design, targeting users across varying levels of digital literacy and collecting feedback from at least 10 test users.
- To release the system as an open-source project by April 2026, providing documentation that allow other ethnolinguistic communities to replicate and adapt the platform for their own language preservation efforts.

## Scope and Limitations

### Scope

The project's primary scope includes the design, development, and partial deployment of a web-based application featuring three main modules: a community contribution system, an Ivatan-English digital dictionary with audio, and a folklore documentation archive.

This study will specifically cover the following:

- User Interface Design using React.js to ensure accessibility and ease of use for a wide range of users, including Ivatan elders, students, educators, and cultural researchers.
- Back-End Development using Django, Python, and PostgreSQL
- Community Participation Tools, including submission forms and moderation workflows
- Collaboration with Local Stakeholders, such as schools and non-profit organizations to ensure cultural relevance and encourage community involvement.

By clearly defining these boundaries, the project remains focused on building a functional prototype that demonstrates the potential of information systems in addressing cultural

preservation challenges. It does not extend into full nationwide deployment, mobile app development, or real-time collaboration tools, which may be considered in future iterations.

**Limitations**

Despite the project's ambition to digitally preserve the Ivatan language and folklore, several limitations, primarily due to technical, logistical, and contextual constraints, are acknowledged.

First, the system's initial content will depend heavily on the availability and willingness of local contributors, such as elders and educators, to share and validate linguistic and folkloric data. This could result in limited entries during the early stages of development.

Second, due to the project proponent's current beginner-level programming skills, the system may initially rely on simplified implementations or external frameworks like Firebase before transitioning to Django with PostgreSQL. This learning curve may impact the development timeline and feature completeness.

Third, the platform's reach and testing will be limited primarily to users with internet access and basic digital literacy, potentially excluding some members of the Ivatan community. Due to geographical isolation and internet connectivity issues in Batanes, real-time collaboration with native speakers and local contributors may be limited. The system is designed with asynchronous contributions in mind, but the richness of content depends heavily on user input. Furthermore, audio features and real-time interactions depend on users' device compatibility and bandwidth, which may vary across locations.

Lastly, cultural validation is subject to the availability of experts and community reviewers, which may affect the speed and consistency of content moderation.

These limitations are recognized to maintain realistic expectations and will be addressed progressively through partnerships, iterative updates, and future developments that may be beyond the scope of this capstone.

## REVIEW OF EXISTING ALTERNATIVES

As globalization and limited digital access continue to affect communities, the preservation of indigenous languages and folklore has also become a growing concern around the world (UNESCO, 2011). This is also true for the Ivatan language and folklore, which are endangered by gaps in generational knowledge and a dearth of easily accessible and cooperative platforms for preservation. Oral transmission, written dictionaries, and ethnographic publications have historically been the main methods used to preserve the Ivatan language and traditions. Despite their value, these approaches are not sustainable because of urban migration, modernization, and language loss between generations. There are not many thorough and detailed resources available to younger Ivatans, particularly those who were raised in cities or outside of Batanes, that would enable them to connect with their linguistic and cultural history. Although there have been various attempts to document and archive Ivatan cultural heritage, these initiatives remain fragmented and limited in their accessibility. This chapter explores existing alternatives, evaluates their effectiveness, and highlights the unique contributions of the Chirin Ivatan.

Several strategies have been implemented to preserve indigenous languages and folklore, ranging from traditional documentation methods to digital initiatives.

### Printed and Academic Documentation

The Ivatan language together with other Philippine ethnolinguistic languages has received attention through printed dictionaries and linguistic study as well as folklore compilations. The general public don't have easy access to these resources because they are hard to find and most are written in academic language.

The Ivatan language has received extensive documentation especially regarding its vocabulary and grammatical structure. The Ivatan-Filipino-English Dictionary by Cesar A. Hidalgo stands as one of the most recognized works after its publication by the Academics Foundation in March 1998. The comprehensive reference functions as a primary academic resource while delivering valuable linguistic information. The printed format of this resource

restricts its accessibility and user engagement because younger generations prefer digital interactive platforms which characterize many traditional language products.

The Ivatan Language Packets also represent a vital resource that the public can access since their publication in 1993. The resources exist to provide Peace Corps volunteers with language instruction when they serve in Batanes. The resources contain essential information about language communication and cultural traditions. These packets existed for practical language learning purposes but lacked the intention to maintain their use beyond short-term educational needs. The resources remain unavailable for modern educational purposes because they have not received updates or digital transformations.

Ethnographic studies have also focused on Ivatan oral traditions, stories, and customs, contributing to the growing body of information that is still preserved in academic circles. However, only researchers have access to these works since they are often housed in university libraries or research archives; community members, especially younger generations, who would benefit from a more approachable and interesting manner to learn about their past, are left out.

## Community-Driven Language Revitalization Programs

Various schools and cultural centers, particularly the National Commission on Indigenous People, have initiated community-based programs to encourage younger generations to learn their native languages through traditional storytelling, songs, and cultural activities (NCIP, 2019). These efforts recognize the importance of early exposure to indigenous languages in maintaining cultural identity.

However, the removal of the Mother Tongue-Based Multilingual Education (MTB-MLE) subject from the primary education curriculum poses a significant setback to these revitalization efforts. Without structured language instruction in schools, it becomes more uncertain whether younger generations can retain fluency in their native tongue.

Additionally, Ivatan unities have long relied on elders as cultural bearers, transmitting knowledge and traditions through oral storytelling. While this intergenerational approach

remains valuable, it is increasingly challenged by the dwindling number of fluent native speakers and the growing preference among youth for digital forms of content and learning. These limitations highlight the urgent need for digital tools that can complement traditional methods and adapt to contemporary learning preferences.

## Existing Digital Initiatives

Technological developments have made it possible for digital platforms dedicated to protecting endangered languages and cultural assets to arise (Harrison, 2010). Data on endangered languages, including vocabulary, grammar, and pronunciation, can be accessed online thanks to initiatives like the Endangered Languages Project and digital repositories like FirstVoices and Living Dictionaries. The potential of digital involvement in language retention has been demonstrated by the incorporation of indigenous languages into gamified learning methods by apps such as Duolingo.

However, while they are helpful, most of these options are not made specifically for Ivatan and do not include its unique language or oral traditions. Moreover, many global platforms are limited to linguistic documentation and lack integrated folklore modules or mechanisms for community-driven contributions which are also key elements for holistic cultural preservation.

In the Philippine context, Project Marayum stands out as a significant initiative for indigenous language preservation. Spearheaded by the University of the Philippines, the project focuses on developing web-based dictionaries for endangered Philippine languages, providing an accessible digital platform for communities to document and share their native tongues. Its collaborative model allows local language experts, educators, and community members to contribute directly to the creation of these resources, empowering grassroots participation in linguistic preservation.

Project Marayum inspired this project's goal to use technology for community-based language preservation. While the platform already includes some Northern Luzon languages such as Itneg and Kankanaey, Ivatan has yet to be formally represented. This highlights a clear opportunity for Chirin Ivatan to fill a critical gap by dedicating a focused

platform to the Ivatan language and folklore, expanding on Marayum's foundational approach with added features such as folklore documentation, audio pronunciation, and interactive learning tools.

Several initiatives have been developed to address the needs of indigenous language preservation documenting ivatan terms:

- SIL Philippines: Ibatan-English Dictionary- SIL Philippines has played a crucial role in documenting the languages of minority communities across the archipelago, including the Ivatan and Ibatan languages spoken in the Batanes and Babuyan islands. One of their most significant contributions is the Ibatan-English Dictionary, a linguistically grounded compilation of Ibatan vocabulary, developed through extensive fieldwork and collaboration with native speakers. The dictionary includes an Ivatan index with 1,703 entries. However, the dictionary is static and text-heavy, primarily designed for linguistic research rather than public engagement.

- Glosbe: Dictionary English – Ivatan- Glosbe is an open, collaborative multilingual dictionary platform that includes an English–Ivatan section. While it currently contains only a limited number of Ivatan terms and example phrases, it reflects initial efforts to digitize Ivatan vocabulary in an accessible online environment. However, the platform lacks pronunciation support, grammar explanations, and community engagement features, limiting its use for language learners or cultural advocates.

- Ivatan Language Wikipedia Page- The Ivatan language page on Wikipedia offers a brief overview of the language's structure, including its phonology, basic grammar rules, and pronoun system. This page serves as a useful introduction to Ivatan for linguists and language enthusiasts, and can act as a starting point for deeper research. However, it remains a basic reference that lacks comprehensive vocabulary, context-rich usage examples, and multimedia support such as audio clips or oral storytelling.

## How Chirin Ivatan Stands Out

The global and local landscape of digital language preservation has introduced a variety of platforms and tools that offer important lessons for designing effective, culturally responsive systems. However, despite these strengths, existing solutions often fall short in critical areas.

This is where Chirin Ivatan emerges as a transformative alternative. Unlike other models that focus solely on linguistic documentation or static dictionary creation, Chirin Ivatan offers a comprehensive, community-driven digital platform that intertwines language preservation with cultural storytelling. The platform enables native Ivatan speakers, educators, and cultural advocates to collaboratively contribute and review content, ensuring authenticity and inclusivity. It features a digital Ivatan-English dictionary enhanced with phonetic transcriptions and a dedicated folklore module will document myths, legends, proverbs, and songs—helping to preserve not just the language, but also the values, worldview, and identity embedded in Ivatan oral traditions. The platform is planned to incorporate interactive and gamified learning elements such as quizzes and leaderboards. While these features will be implemented progressively, they are an important component in attracting and retaining users, especially among younger generations.

In conclusion, whereas current digital projects have established crucial foundations for language preservation, their reach, interactivity, and cultural depth are frequently constrained. By combining several features—language documentation, folklore preservation, and interactive learning—into a single user-friendly platform, Chirin Ivatan overcomes these constraints. It adapts its methodology to the unique requirements of the Ivatan community while building on the advantages of earlier models. Chirin Ivatan hopes to leave a lasting impact on the revival and preservation of Ivatan culture and language.

# PROJECT DETAILS

## Overview

Chirin Ivatan is a web-based Community-Based Information System (CBIS) designed to document, preserve, and promote the Ivatan language and folklore. This chapter presents an overview of the proposed system. Designed especially for the Ivatan community and future generations, Chirin Ivatan will be built using mostly free, open-source tools to ensure that it remains affordable and sustainable. This chapter outlines the overall structure of the project, the technologies to be used, the system's design, and the step-by-step plan for building and implementing it. By integrating modern technology, the system ensures the preservation of linguistic and cultural heritage while engaging younger generations through gamified learning experiences and community contributions.

## Project Framework

The project framework provides a structured approach ensure that the project's objectives align with its implementation, ensuring that all aspects are coherent and systematically managed.

The Chirin Ivatan project follows a user-centered design approach. This means that the system is being developed with a strong focus on the people who will actually use it—especially the Ivatan community. From the early planning stages through to the final product, the preferences, needs, and feedback of users will help guide the design and features of the platform. This is important because the project is not just about creating a website; it's about building a meaningful and useful platform for the Ivatan people and researchers.

To make this process organized and flexible, the project will use the Agile Software Development method. Agile is a way of managing projects that focuses on building the

system step by step instead of trying to complete everything all at once (Beck, 2001). The work is divided into shorter time periods focusing on one part of the system at a time such as the dictionary module, audio features, or folklore archive. After each part, the progress will be tested for feedback. Agile is a good fit for this project because it allows for adjustments along the way, which is especially helpful since development is expected to be slower and because community input is a key part of the system's success.

The framework is composed of the following key components:

**Project Objectives and Design**

The main goal of Chirin Ivatan is to create an easy-to-use, sustainable digital platform that preserves and promotes the Ivatan language and folklore. The project will focus on building four main features:an Ivatan-English dictionary with audio pronunciation, a section for documenting folklore such as stories, proverbs, and songs, and user accounts that allow people to contribute and review content.

This stage also includes identifying user needs, designing how the system will work, and making sure the layout and interface are friendly and accessible for all users, especially those with limited tech experience or internet access.

**Development Phase and Technology Strategy**

The development will begin with building the basic features using beginner-friendly and cost-effective tools. The frontend will use React.js to build the interface. The platform will be using Django (Python) and PostgreSQL for better data handling and more advanced features.

**Testing and Refinement**

After developing each part or module of the system, tests will be done to check if everything works as expected and is easy to use. Feedback will be gathered from 10 tentative users to modify or improve it before moving forward.

**Deployment and Community Participation**

Once the platform is ready, it will be launched and shared with local institutions, schools, and cultural groups in Batanes. A big part of this project is community involvement. Native Ivatan speakers, teachers, and culture bearers will be encouraged to add entries, check the accuracy of content, and suggest improvements. Regular feedback from the community will help to ensure that the platform reflects the language and the published stories accurately. The following are tentative agencys bthat are planned to be presented to and asked for feedback:

- The Department of Education Division Office of Batanes through the Education Program Supervisor incharge of Indigenous People Education, Mr. Jay V. Gonzales
- The Batanes State College
- The Batanes Heritage Foundation Inc. through its current President Ms. Catherine de Mata
- The Provincial Tourism Office of Batanes through the Provincial Tourism Officer Ms. Hegel B. Valones

**Knowledge Management and Documentation**

All steps of the project—from building the platform to uploading content—will be carefully documented using GitHub, this manuscript, system documentation, and a user guide. Special attention will be given to ethical archiving practices to protect and respect Ivatan cultural heritage, especially when handling oral traditions, stories, and community-contributed content. By openly sharing the project's methods, challenges, and solutions, Chirin Ivatan aims to become a valuable benchmark for other indigenous communities and digital heritage projects. The framework can be adapted by similar initiatives looking to preserve their own languages and traditions using accessible technologies and community-driven strategies. In this way, Chirin Ivatan is not only a local

tool for preservation, but also a model that can inspire and guide others working toward cultural sustainability in the digital age.

### Evaluation and Sustainability Planning

The project will track its progress through measurable indicators like the number of visitors, contributions made, and how often the platform is used. Feedback will be collected often to guide improvements. To ensure the project lasts beyond the initial development, possible partnerships or even turnover will be explored with NGOs that support indigenous heritage. More than it is feature driven, the main goal is to keep the platform active and reliable for as long as possible so keeping it well documented and low maintenance is key.

The Chirin Ivatan project framework provides an adaptive structure that integrates community involvement, iterative development, and cultural sensitivity. It ensures that the platform is not only a technological product but also a living, evolving initiative rooted in service to the Ivatan people.

## Materials/Technologies Used

The following selection of technologies for Chirin Ivatan is grounded in accessibility, scalability, and open-source availability. The goal is to use free or low-cost tools where possible while still laying the foundation for a long-term sustainable platform. The approach also supports a progressive learning path, wherein the proponent gains familiarity with the full-stack development tools needed for the system's actual implementation.

- Frontend Framework- Basic web technologies such as HTML, CSS, and JavaScript will be used initially to build static pages and interactive elements. React.js may be incorporated to create a more responsive and engaging user experience.
- Web Framework- Django will be used to structure the backend of the platform. Django promotes development and clean, pragmatic design, which is ideal for a solo

developer with limited prior experience. It also includes built-in features such as user authentication, admin interface, and Object-Relational Mapping, reducing the need for manually coding common web development components. This will allow the developer to focus more on building core functionalities such as the dictionary module, folklore database, and content contribution system.

- Database System- PostgreSQL will be essential for handling more complex queries, user contributions, and metadata associated with folklore entries and audio files.
- Version Control- Version control will be managed using Git hosted on GitHub. This ensures proper documentation, tracking of changes, and future collaboration opportunities with fellow developers or community contributors.
- Hosting and Domain Services (To Be Determined)- Development will initially occur in a local environment but deployment for public access will require hosting and domain services. Hosting and domain will likely be the only paid components of the system, as all other technologies are free or open-source.

The development of Chirin Ivatan will strategically utilize free and beginner-friendly technologies while progressively integrating more advanced tools as the proponent's technical capacity improves. This approach ensures that the platform can be developed sustainably while meeting the project's objective and the community needs.

## System Design

The following outlines both the functional and non-functional requirements of the platform, as well as the proposed architecture, user interactions, and database schema. As a community-based information system, the design emphasizes simplicity, scalability, and user-friendliness to serve both native Ivatan contributors and general users seeking to explore the language.

## Users

### Visitors (General Users)

Visitors are users who access the Chirin Ivatan platform without registering for an account. They can freely browse and explore publicly approved content, including Ivatan-English dictionary entries with their definitions, translations, usage examples, and audio pronunciation. Visitors can also view the folklore archive, which includes categorized entries such as myths, legends, proverbs, idioms, and songs. As general users,their interaction with the platform is limited to viewing and listening, which encourages broader access to Ivatan cultural resources. They can register for an account should they wish to contribute or edit entries to the site.

### Contributors (Registered Users)

Contributors are users who have registered an account on the platform and are immediately granted the ability to submit content. These users can contribute dictionary entries, which includes Ivatan terms, English meanings, example sentences, and pronunciation audio. They may also upload folklore entries in text, audio, or video format. Contributors can track the status of their submissions—whether pending, approved, or rejected—and may edit their previously submitted content. While contributors can submit entries, their content must be approved by one reviewer before it becomes publicly visible. To maintain quality and prevent misuse, a daily limit may be placed on submissions and users with repeated rejections are flagged for further review by administrators.

### Reviewers

Reviewers are selected cultural experts or educators entrusted with content validation. Their primary role is to evaluate user-submitted entries for accuracy, cultural appropriateness, and completeness. They have access to a moderation/ review dashboard, where they can approve, reject, or comment and suggest revisions to submitted dictionary and folklore entries. Reviewers also assess audio pronunciations to ensure its correctness. They can also add entries as contributors to the folklore and dictionary module but will need approval from another reviewer for it to be published live.

### Administrators

The administrator role oversees the entire platform's operation. They are responsible for user management, content moderation, and overall maintenance. Administrators can change user roles, manage flagged users or submissions, and delete or archive content. They also monitor system activity to ensure consistent quality and ethical content management. The administrator are able to do tasks that reviewers and contributors can do on the system.

**Functional Requirements**

These are the core features and capabilities that the system must perform to meet user needs:

- Registration and Authentication- Guest users or general site visitors will be able to view and navigate the dictionary and folklote archives. Users can register as contributor or reviewer , log in, and log out securely. There will be roles such as contributor, reviewer, and administrator. To prevent abuse, basic protections such as email verification and CAPTCHA will be implemented during registration. User sessions will automatically expire after a period of inactivity.

- Dictionary Module- This provides visitors with access to a searchable database of Ivatan words and phrases. Each entry includes the Ivatan term, its English translation, a brief definition, sample sentence usage, and if available an audio pronunciation. Visitors can use search functions to explore the dictionary. Contributors can suggest new words or request edits, which are subject to review before being published to the live dictionary.

- Folklore Module- This serves as a digital archive of Ivatan literature and traditions. Users can browse content grouped into categories such as myths, legends, proverbs, idioms, and traditional songs. These entries help preserve the cultural narratives and wisdom passed down through generations. Each folklore entry can be presented in various formats—text, audio, or video—depending on how it was submitted by contributors.

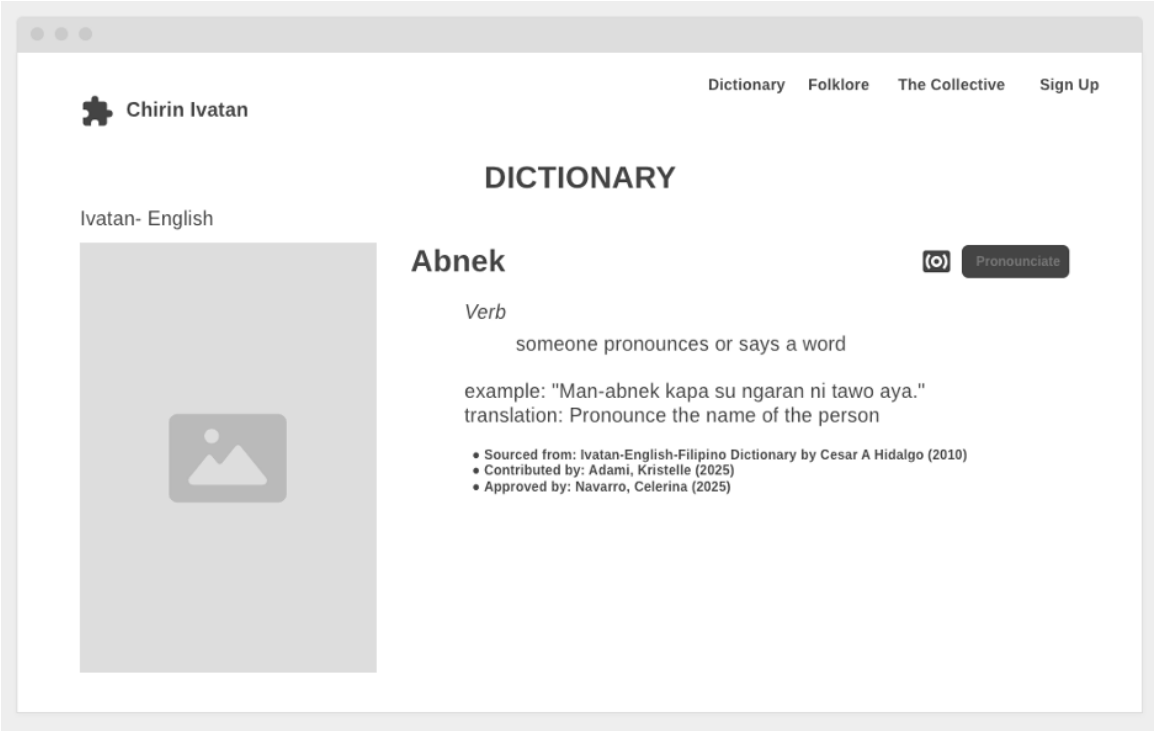



Figure 1. Dictionary Page Wireframe

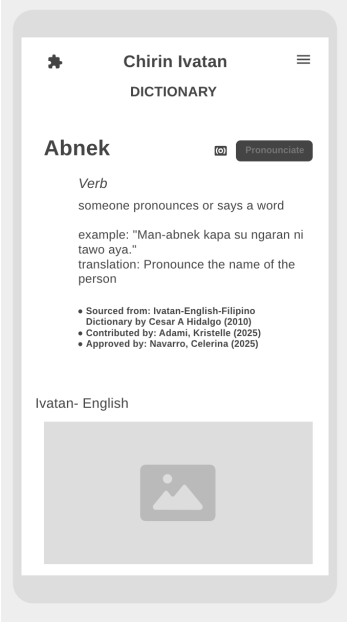



Figure 2. Dictionary Page Mobile

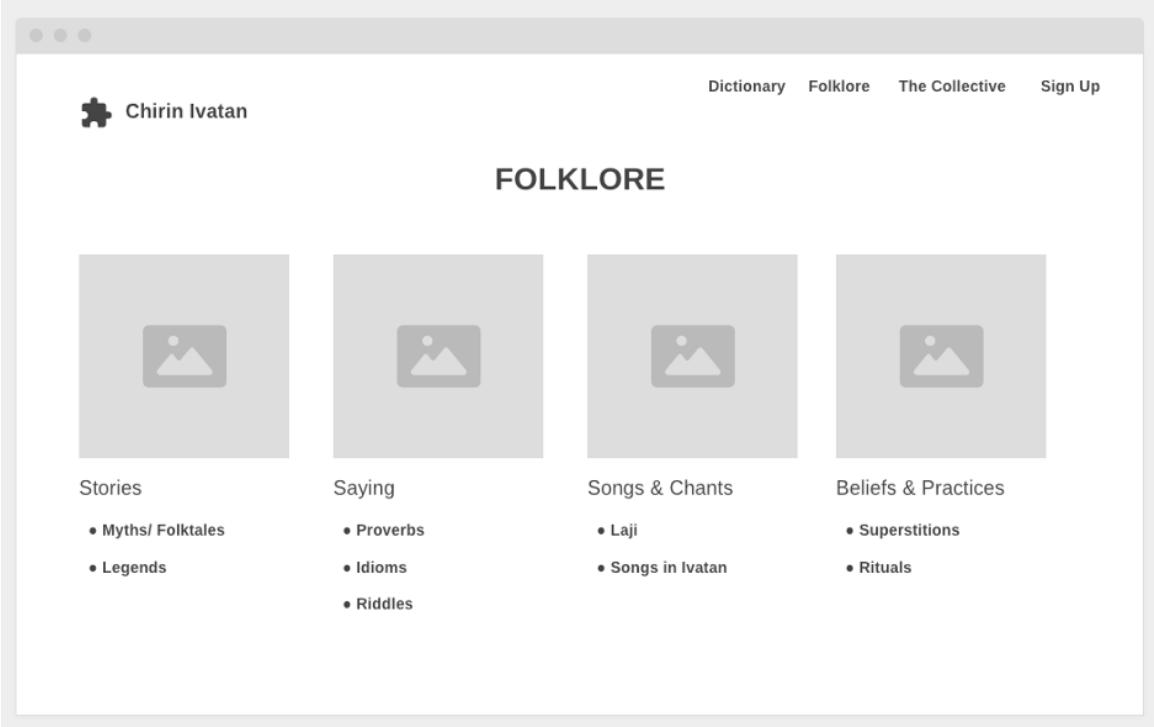



Figure 3. Folklore Page Wireframe

- Content Contribution/ Review System- Contributors can submit dictionary and folklore entries using a simple form. Submissions must include required fields such as terms, definition, examples, source and pass content validation checks. Before a user can submit a dictionary or folklore entry, the platform will automatically check if the input meets basic content rules. These will verify that all required fields are filled out properly and block offensive or inappropriate terms. This prevents accidental or spam-like submissions. The integration of automated content moderation APIs like Google's Perspective API or other NLP-based services can be explored on the development phase as a practical enhancement for when the platform grows in users and submissions.

- Content Moderation and Review- Reviewers and administrator will retain the final decision-making role. They can approve, reject, or suggest edits to submitted content. To prevent spam or manipulation, limits will be implemented.

  - Dictionary: Only one approved submission per user per term will be allowed unless

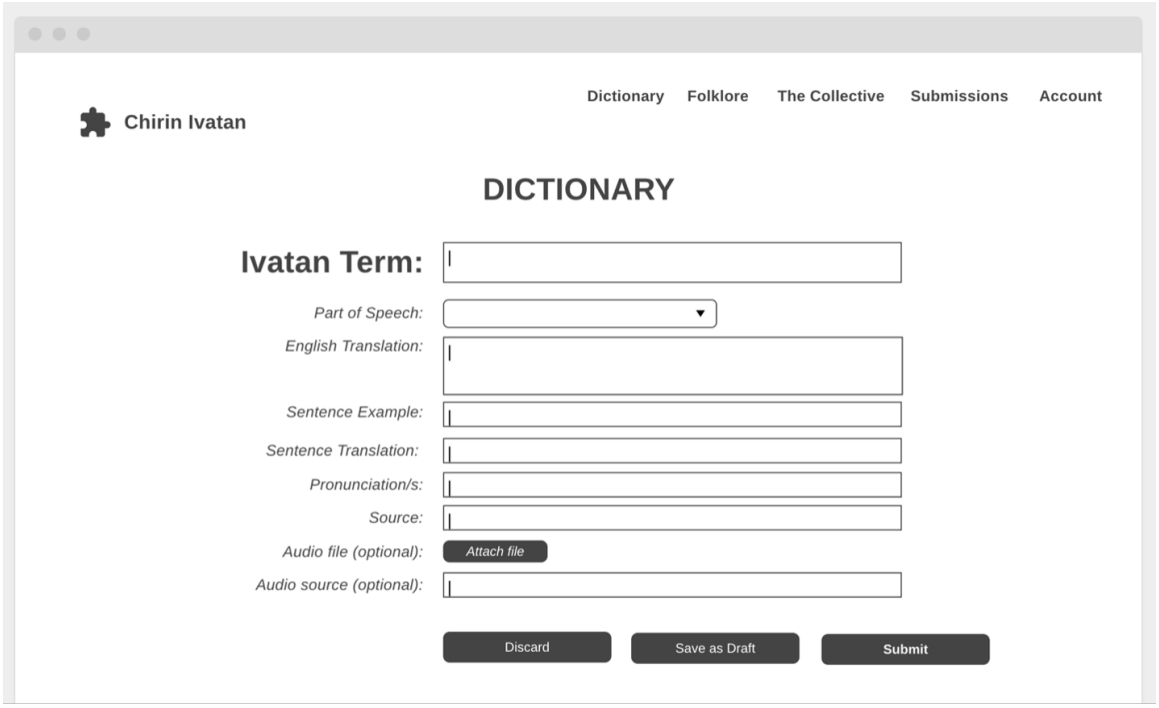



Figure 4. Dictionary Submission Form

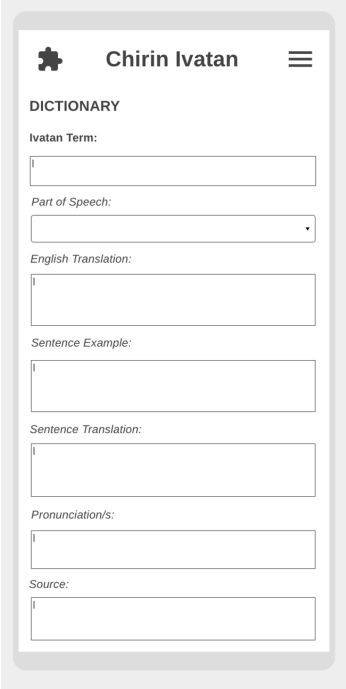



Figure 5. Dictionary Submission for Mobile

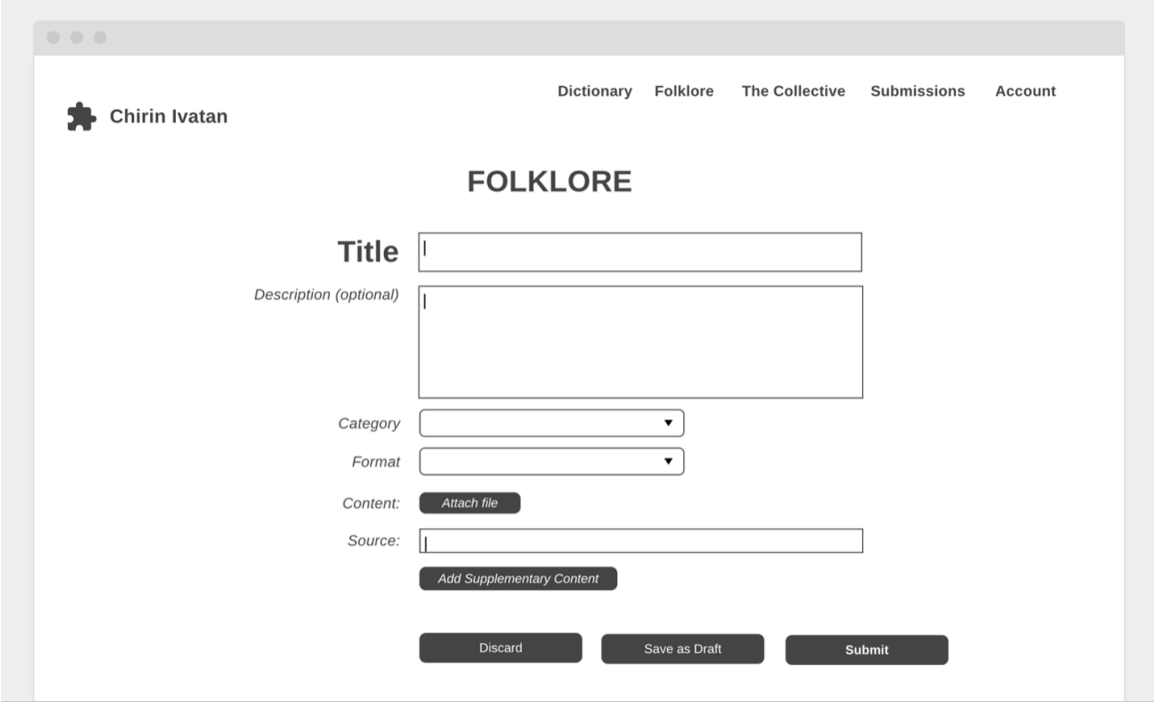



Figure 6. Folklore Submission Form

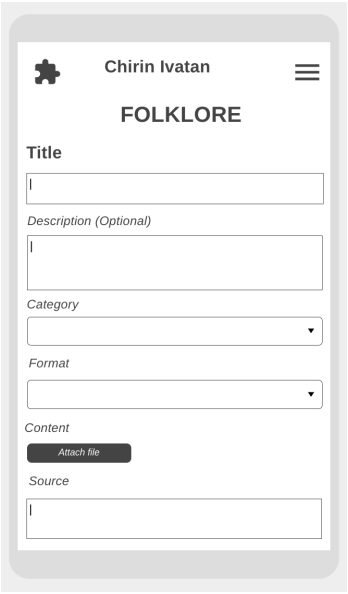



Figure 7. Folklore Submission for Mobile

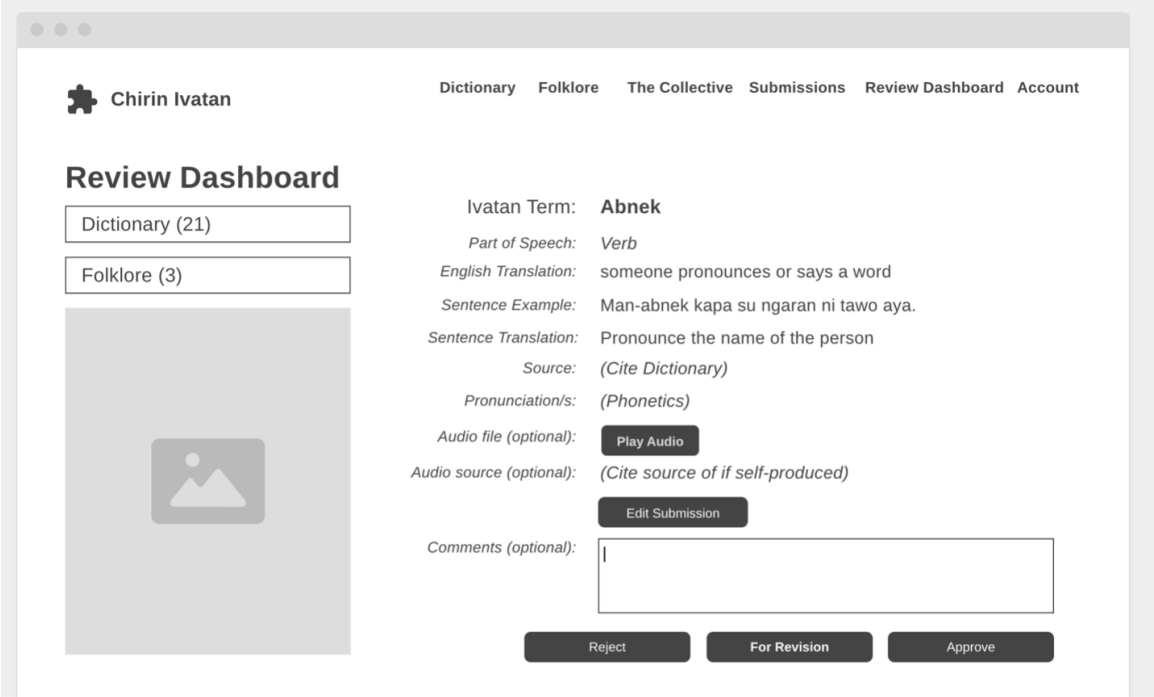



Figure 8. Reviewer Dashboard

updated or corrected. One approval from a registered reviewer is required for an item to be published to the live dictionary. Limits on submissions will be implemented such as 50 entries per user per day.

- Folklore: Limits on submissions for folklore can also be implemented such as 10 entries per user per day. One approval from a reviewer will also be needed for it to be published, after which will automatically reflect live once approved.

Reviewers will be able to add feedback or revision suggestions to the entries for contributores to check. Review logs are maintained for accountability. Admins may flag, archive, or delete inappropriate submissions or accounts. reCAPTCHA will be used on the forms such as dictionary and folklore contribution pages. Multiple rejected entries will be flagged and the user account will be reviewed by the administrator for proper action. This ensures that only real users can submit content, reducing the risk of spam entries.

- Mobile-Friendly Interface- As a web-based application instead of a downloadable mobile application, the platform must be readable on mobile devices and desktops

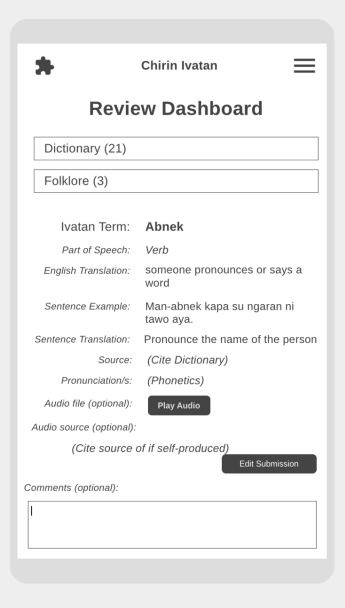



Figure 9. Review Dashboard Mobile

with varying screen sizes and connection speeds.

**Non-Functional Requirements**

These define how the system should perform:

- Scalability- The system should be able to handle more users and content as the platform grows. It will use Django with PostgreSQL to support a larger database and better suited features.
- Maintainability- The codebase should be organized and so that updates, bug fixes, or changes can be made easily. Clear comments and consistent naming conventions will be useful to keep this. The project will use version control through Git and be hosted on GitHub to keep track of changes and allow easy rollback when needed. The system will be built using a modular architecture, with each part—like user authentication, dictionary, and folklore modules—will be separated, making it easier to manage and modify. A documentations and developer guide will also be included to help others understand how the system works and how to contribute.

- Performance- The platform should load and respond to user actions (like searching or clicking through pages) within 2–5 seconds- which is ambitious but possible because of connectivity challenges in the islands of Batanes where most users reside. Lightweight design and optimized queries will be used to achieve this.
- Security- Basic security features will be implemented to protect user data and the integrity of the content. These include password hashing, role-based access control and proper input validation to avoid common vulnerabilities.
- Accessibility- The platform will be easy to use and designed with users in mind who may not be tech-savvy or have strong internet connections. It will work well on mobile devices and offer intuitive navigation.
- Cost-Efficiency- To keep the project affordable, most tools and services used will be free or open-source. Paid services will be limited to essentials like hosting, a domain name, or others when needed. This makes the system sustainable even with limited funding.

**Use Cases**

**1. View and Search Dictionary**

**Actors:** All Users

Users can browse and search the digital Ivatan-English dictionary to view word entries, their meanings, translations, and associated details. From the homepage or navigation bar, users click on the “Dictionary” tab. They are presented with a searchable list of Ivatan terms. Clicking on a word expands its entry, showing the Ivatan term, English translation, meaning, example usage, and available audio pronunciation. Source of the entry are shown below the entry.

**2. Listen to Pronunciations**

**Actors:** All Users

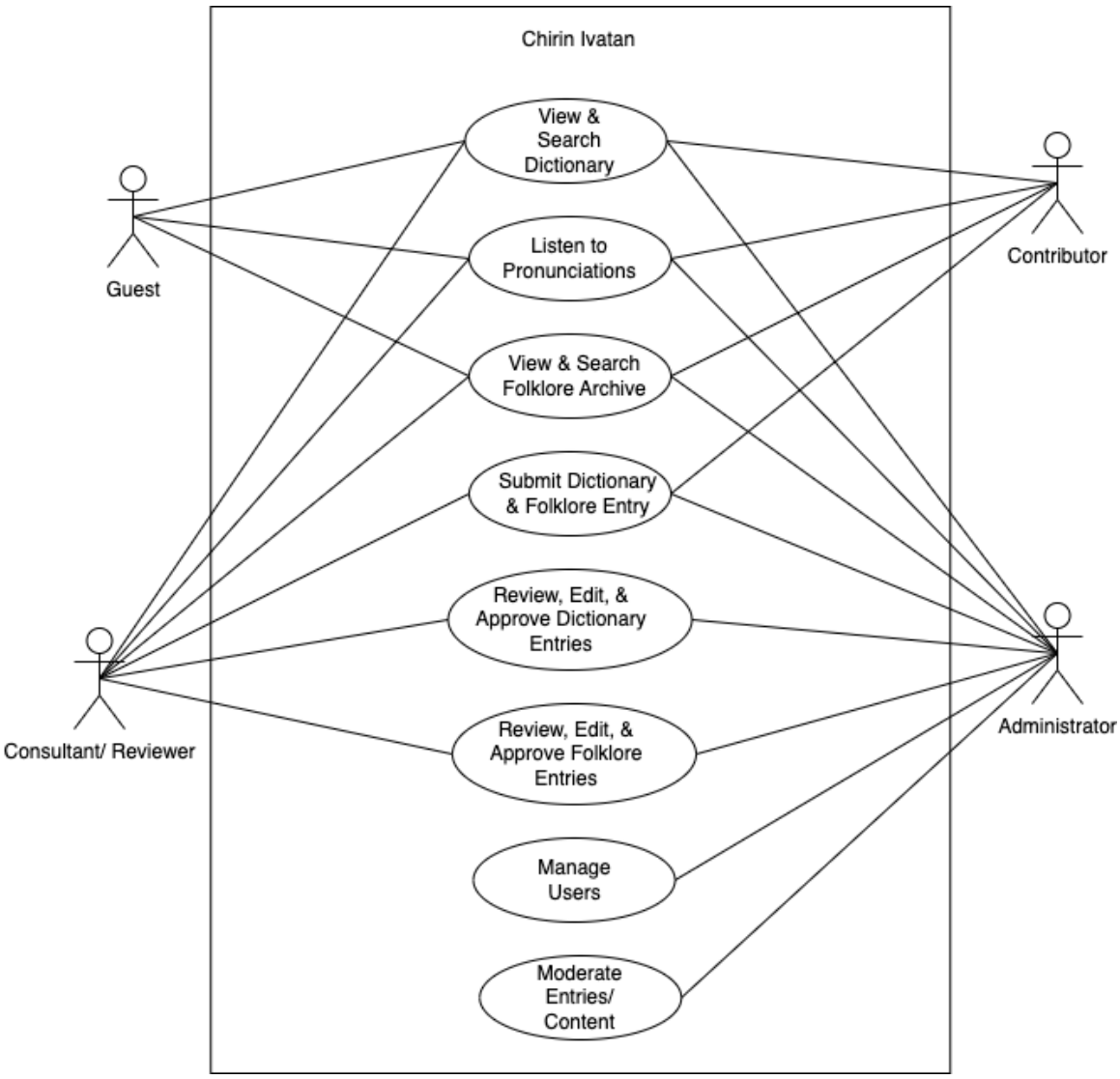



Figure 10. Use Cases

Users can play audio recordings attached to dictionary entries to learn correct pronunciation of Ivatan words. This feature enhances learning for auditory learners and reinforces phonological memory. When users click on a dictionary entry, they can press a speaker icon next to the Ivatan word to hear its pronunciation. If no audio is available for a term, contributors have the option to submit an audio file for the entry.

**3. View and Search Folklore Archive**

**Actors:** All Users

Users can explore the collection of myths, legends, proverbs, idioms, and songs submitted to the system. The archive allows keyword search and browsing by folklore type. It supports text, audio, and video formats. Users navigate to the “Folklore” tab, which displays entries sorted by category (e.g., Myths, Proverbs, Legends, Songs, Idioms). Each entry displays a title and a brief description if available. Clicking expands the full text or opens an embedded audio/video player if media is included. Users can view metadata such as the contributor’s name, date posted, and sources.

**4. Submit Dictionary and Folklore Entry**

**Actors:** Contributors, Reviewers, Administrator

Contributors including reviewers and administrator, can submit new dictionary entries or folklore content. Dictionary submissions include the Ivatan word, English meaning, usage, and optionally an audio file. Folklore entries can be submitted in text, audio, or video format, and are tagged for type and theme. After logging in, contributors access their dashboard via the top-right user menu.

- **Dictionary Submissions**: Contributors fill out a form with fields for Ivatan word, English translation, definition, usage in a sentence, and optional audio upload.
- **Folklore Submissions**: Contributors select a category (e.g., proverb, myth), enter the story or phrase in text or optionally upload media.

After submission, entries are marked as “Pending Review.” Contributors can view the status of their submissions and comments of the reviewers on their dashboard.

**5. Review, Edit, and Approve Dictionary Entries**

**Actors:** Consultants/Reviewers, Administrator

Reviewers and administrator can evaluate user-submitted dictionary entries. They check for linguistic accuracy, cultural relevance, and clarity. They can edit content, add suggestions, approve for publication, or reject submissions with feedback. From their reviewer dashboard, consultants click on the pending dictionary entries. Each submission is displayed with content fields, contributor info, and action buttons: Edit, Approve, Reject. Reviewers can edit the text directly in-line or listen to the audio to verify pronunciation. Approving the entry moves it to the live dictionary, while rejecting it prompts a feedback form that is sent to the contributor.

**6. Review, Edit, and Approve Folklore Entries**

**Actors:** Consultants/Reviewers, Administrator

Similar to dictionary review, this allows reviewers to validate folklore submissions. They may collaborate with elders or experts to ensure cultural authenticity. This step is essential to maintaining the quality and credibility of the archive. Similar to the dictionary review, folklore entries appear in a separate moderation tab. Reviewers can read the text, listen or watch media, and determine accuracy and cultural appropriateness. Reviewers can add notes, suggest edits. Once approved, entries appear in the public archive.

**7. Manage Users**

**Actors:** Administrators

Admins can create, update, or deactivate user accounts. They monitor activity logs, and ensure community guidelines are followed. Admins can change roles, deactivate accounts, or reset passwords. They can also track user activity logs to identify top

contributors or address flagged behavior.

**8. Moderate Entries and Content**

**Actors:** Administrator

Admins oversee all published content to manage reported entries, correct errors, or archive outdated items. This function ensures platform integrity and prevents inappropriate or inaccurate content from remaining live. In the moderation section, administrators can see all published and pending content flagged by reviewers.

**Database Design**

**Users**

The Users table holds information about all registered users, including their username, email, encrypted password, assigned role, and the date they joined the platform. The role field determines the level of access and functionality available to a user. Roles may include ”contributor”, ”reviewer”, ”admin”, or ”guest”. This role-based system supports access control and feature visibility throughout the application.

**Dictionary Entries**

This table stores Ivatan-English vocabulary submissions. Each entry includes fields for the Ivatan term, English translation, definition, part of speech, example sentence, and metadata such as status, contributor, and approved_by. The status field tracks whether an entry is pending, approved, or rejected. This structure allows content to go through a review process before being displayed publicly.

**Folklore Entries**

Folklore submissions are stored in a separate table to reflect their narrative nature. Each entry includes the title, content, category, format (text, audio, video), and contributor details. Like dictionary entries, folklore submissions are associated with approval and review metadata.

**Pronunciation Table**

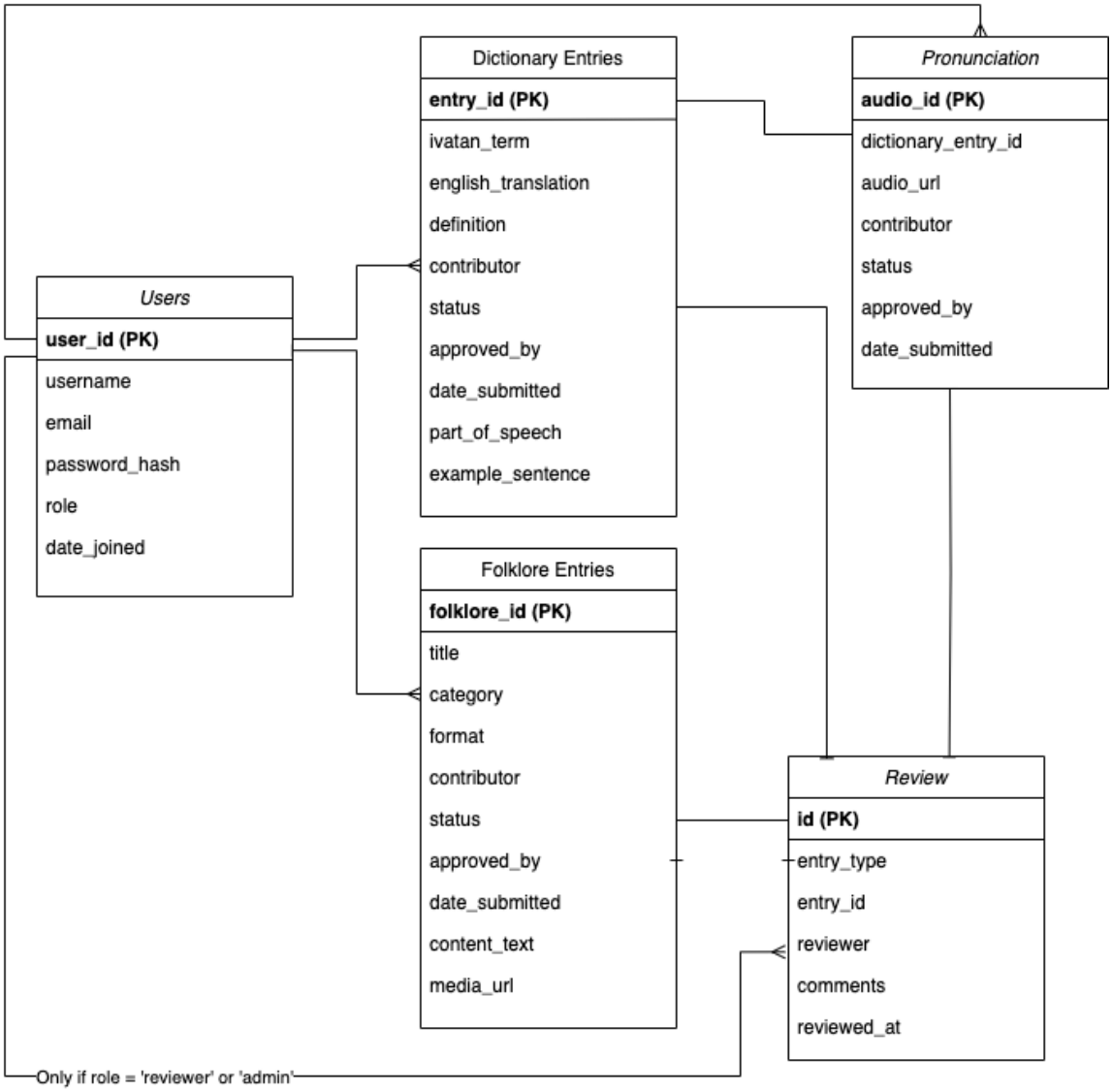



Figure 11. Database Design for Chirin Ivatan

The Pronunciation table is linked to specific dictionary entries and stores the audio file URL and metadata for pronunciation recordings. Each audio file is contributed by a user and must be reviewed before it is made public.

**Review**

The Review table stores metadata on content moderation activities. It logs which entry (dictionary, folklore, or pronunciation) was reviewed, who reviewed it, the comments provided, and the date of review. The entry_type and entry_id fields allow flexible referencing across multiple content types. While all users are stored in the Users table, only users with the role of ”reviewer” or ”admin” are allowed to perform review actions. This ensures that only qualified or trusted users can assess and approve content submissions.

## Implementation

The implementation follows a structured, phased approach that considers both the academic schedule of the IS295 course sequence and the proponents current capacity. The months before full system development will focus on skill-building, early content gathering, and community engagement. Full development, testing, and deployment are scheduled between October and April 2026, during IS295B to allow enough time for testing of user-contributed content and system features.

### Pre-Implementation (Preparation and Capacity Building) Phase

This six-month phase is focused on preparation, learning, planning, and gathering of initial content. This will also allow time for the proponent to gain the needed skills for implementation. The main goals are to build foundational technical skills, outline system features, and begin early engagement with users and content contributors.

- Design and User Flow Planning (July 2025)- Wireframes and simple user flows will be created using Figma. This will help visualize how users navigate through the platform and interact with features.
- Prototype and Feature Planning (August – October 2025)- A basic prototype will

be developed using Firebase or static HTML templates. This phase focuses on experimenting with layouts, testing basic features and finalizing core modules and data structures.

- Initial Content Collection (October 2025)- The proponent will begin collecting Ivatan vocabulary and folklore materials like myths and proverbs from existing sources and personal outreach. This will form the initial content for the platform—populated before user submissions begin.
- User Research and Early Collaboration (October 2025)- Consulations with the listed agency's and with potential users such as Ivatan educators, students, and cultural advocates will be conducted. Their feedback will inform design decisions and help ensure the system is culturally respectful and easy to use.

**Development and Implementation Phase**

This phase marks the formal development and rollout of the Chirin Ivatan platform during IS295B.

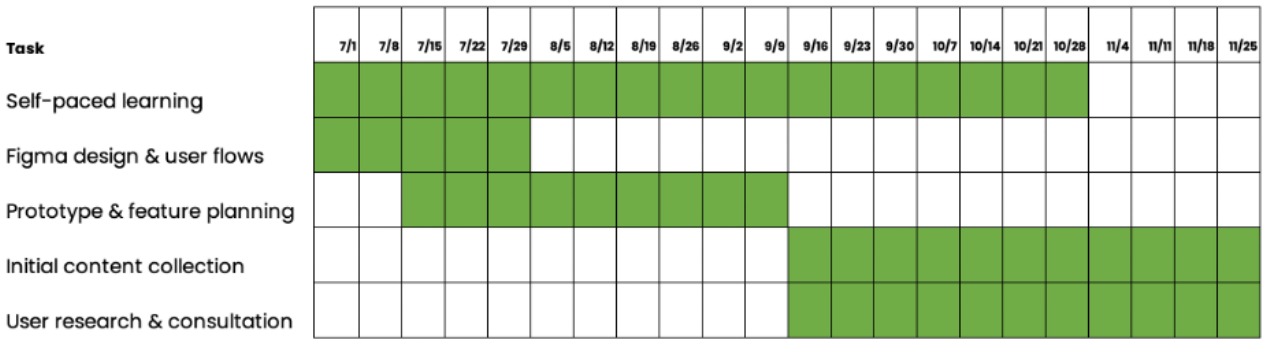
- Backend Development (October – February 2026)- Using Django backend features such as user registration, content submission, moderation tools, and dictionary management will be built.
- Frontend Development (October– February 2026)- The user interface will be developed using HTML, CSS, and JavaScript. Interactive parts (like the games or quizzes) will be enhanced using React.js.
- Database Integration (October– February 2026)- Development will begin using PostgreSQL.
- Testing and Debugging (December – February 2026)- Each system module will undergo functionality and usability testing. This will be used to identify bugs and make improvements before launch.

- Deployment (February 2026)- The final system will be deployed using a budget-friendly hosting service. Costs will be limited to essentials like hosting and a domain name. This phase also marks the start of data collection from real users contributing to the knowledge base.

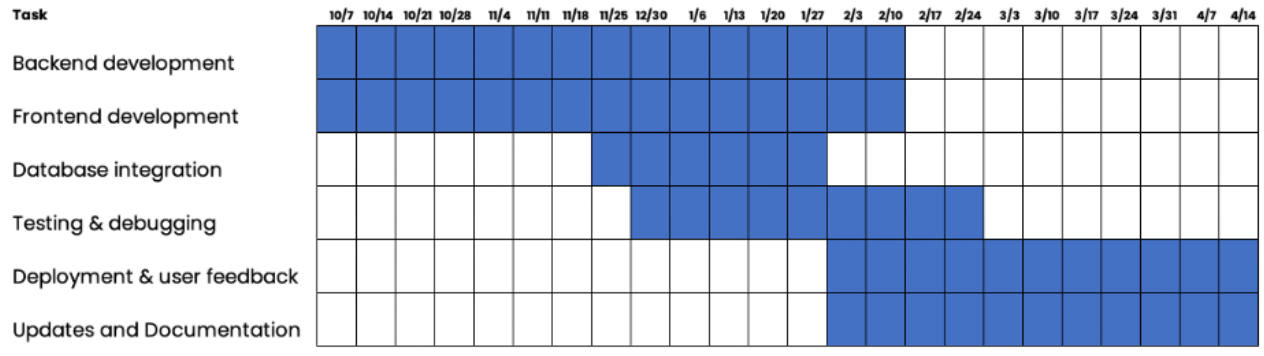
*This section will be completed with actual results and screenshots during IS295B after the final system is built and tested.*

The following are gantt charts for each of the 2 major stages:

**Pre-Implementation**




**Development and Deployment**



## Project Assessment

### User Testing

This part of the project will check if the system functions well, is easy to use, and meets the needs of its intended users. The following testing process is planned:
10 initial users will be invited to try out the system as test Participants. These may include a mix of students, educators, and community members familiar with Ivatan language and folklore.

- Functional testing: Each major feature—such as browsing dictionary entries, submitting folklore stories, playing pronunciation audio, and using search—will be tested to ensure they function as expected. Selenium, a free tool for automating browser actions (SeleniumHQ, 2023), will be used to simulate common activities like logging in, submitting content, or navigating the site. This helps save time by avoiding repetitive manual testing, especially after fixing bugs.

- Usability testing: Participants will be asked to complete a few tasks like playing audio or submitting media and then give feedback. This will help identify if anything is confusing, hard to find, or too technical. Their suggestions will be used to improve the layout and user experience.

- After testing, participants will fill out the System Usability Scale (SUS). This is a standard 10-question survey used to measure how easy a system is to use. Each question is answered on a 5-point scale, from “Strongly Disagree” to “Strongly Agree.” The total score will help understand how users feel about using the system. This will be collected through an online form and printed forms. To calculate the final SUS score, each participant’s responses are converted into a numeric score using the standard method developed by John Brooke (1986). For odd-numbered items, 1 is subtracted from the respondent’s score. For even-numbered items, the score is subtracted from 5. These adjusted scores are then summed and multiplied by 2.5

to convert the result into a scale of 0 to 100. According to Bangor, Kortum, and Miller (2009), a SUS score of 68 can be interpreted as the average. Scores above 68 indicate above-average usability, while scores below 68 suggest usability problems that may require improvements.

- After any changes or fixes are done, the affected features and related parts of the system will be tested again to make sure nothing else broke during the fixes.

### Security Testing

Security testing will be done after the system is developed to check for common vulnerabilities that could affect user data and content contributions. It will be conducted during the IS295B development phase (January–March 2026) using Django's built-in security features and possible external tools.

Planned security considerations include:

- **Password Protection:** User passwords will be securely stored using hashing algorithms
- **Input Validation:** The system will include input checks to prevent invalid or dangerous data that could lead to broken functionality.
- **Role-Based Access:** Different access levels will be assigned to users, such as contributors and reviewers, to restrict sensitive actions like deleting or approving content.
- **CSRF Protection:** All forms and POST requests will be protected using Django's Cross-Site Request Forgery tokens.
- **Secure Hosting:** The platform will be hosted using services that offer HTTPS encryption to protect data in transit.
- **Security Testing Tools:** Django Debug Toolbar will be explored to detect vulnerabilities. Weaknesses found will be documented and addressed, followed by regression testing to ensure fixes are effective and persistent.

Project: **Chirin Ivatan**

Participant Name/ID: _____

Date: _____

# System Usability Scale

*For each statement, choose the number that best reflects your immediate response based on your experience with the system. The scale ranges from 1 (Strongly Disagree) to 5 (Strongly Agree).*

| No. | Statement | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| 1 | I think I would like to use this system frequently. | | | | | |
| 2 | I found the system unnecessarily complex. | | | | | |
| 3 | I thought the system was easy to use. | | | | | |
| 4 | I think I would need help from a technical person to use this system. | | | | | |
| 5 | I found the features well integrated. | | | | | |
| 6 | I thought there was too much inconsistency in the system. | | | | | |
| 7 | would learn to use this system quickly. | | | | | |
| 8 | I found the system very awkward to use. | | | | | |
| 9 | I felt confident using the system. | | | | | |
| 10 | I needed to learn a lot before I could use the system. | | | | | |

Figure 12. SUS Form

## LITERATURE CITED


BANGOR, A., KORTUM, P. T., & MILLER, J. T. (2009). Determining what individual sus scores mean: Adding an adjective rating scale. *Journal of Usability Studies*, *4*(3), 114–123.

BECK, K., BEEDLE, M., VAN BENNEKUM, A., COCKBURN, A., CUNNINGHAM, W., FOWLER, M., ... THOMAS, D. (2001). *Manifesto for agile software development.* Retrieved from `http://agilemanifesto.org/` (Accessed: 2025-05-21)

BROOKE, J. (1996). Sus: A quick and dirty usability scale. In P. W. Jordan, B. Thomas, B. A. Weerdmeester, & A. L. McClelland (Eds.), *Usability evaluation in industry* (pp. 189–194). London: Taylor & Francis. (Original work developed in 1986)

CRESCENZI, P., & KANN, V. (1997). Approximation on the web: A compendium of np optimization problems. In *Random'97* (p. 111-118).

GALACE, J. (2021). *Project marayum and the digitization of philippine indigenous languages.* `https://marayum.ph`. (University of the Philippines Center for Ethnomusicology)

HARRISON, K. D. (2010). *The last speakers: The quest to save the world's most endangered languages*. National Geographic Society.

HIDALGO, C. A. (1998). *Ivatan-filipino-english dictionary*. Quezon City: Academics Foundation.

HORNEDO, F. H. (2000). *The ivatan cultural values and oral tradition*. Manila: University of Santo Tomas Publishing House.

NATIONAL COMMISSION ON INDIGENOUS PEOPLES. (2019). *Programs for indigenous cultural communities/indigenous peoples.* Retrieved from `https://ncip.gov.ph` (Accessed: 2025-05-15)

OBLIGAR, J. (2024). *The state of philippine indigenous languages in contemporary education.* (Unpublished manuscript or report)

REPUBLIC OF THE PHILIPPINES. (2024). *Republic act no. 12027: An act discounting the use of the mother tongue as medium of instruction from kindergarten to grade 3.* Retrieved from `https://www.officialgazette.gov.ph` (Enacted October 10, 2024)

SELENIUMHQ. (2023). *Selenium documentation.* Retrieved from `https://www.selenium.dev/documentation/` (Accessed: 2025-05-15)

SHIRALI, S., & VASUDEVA, H. L. (2005). *Metric spaces*. Springer.

SIL PHILIPPINES. (n.d.). *Ibatan-english dictionary.* Retrieved from https://philippines.sil.org/resources/archives/ibatan-dictionary (Accessed: 2025-05-15)

UNESCO. (2003). *Convention for the safeguarding of intangible cultural heritage.* Retrieved from https://ich.unesco.org/en/convention (Accessed: 2025-05-15)

UNESCO. (2011). *Atlas of the world's languages in danger* (3rd ed.). United Nations Educational, Scientific and Cultural Organization. Retrieved from http://www.unesco.org/languages-atlas/