SUPERVISOR'S RECOMMENDATION

The Internship Report entitled "Qiggz: Hire Home Service Pros" submitted by Mr. Sulav Parajuli (27306/077) of AIMS College, Biratnagar, Morang is prepared under the supervision of Er. Prashant Pokharel as per the procedure and format requirements prescribed by the Faculty of B.Sc. CSIT, Tribhuvan University, in partial fulfillment of the requirements for Bachelor of Science in Computer Science and Information Technology (B.Sc. CSIT). I therefore recommend this report for consideration.

ER. PRASHANT POKHAREL

Intern Supervisor

Faculty Coordinator, AIMS College

Department of Computer Science and IT

Biratnagar, Morang

Nepal

MENTOR'S RECOMMENDATION

This is to certify that the Internship Report titled "Qiggz: Hire Home Service Pros", submitted by Mr. Sulav Parajuli of AIMS College, Biratnagar, Morang, has been prepared under the guidance of Mr. Hayyan Sheikh. The report adheres to the guidelines and format specified by the Faculty of B.Sc. CSIT, Tribhuvan University, and fulfills the partial requirements for the Bachelor of Science in Computer Science and Information Technology (B.Sc. CSIT). I hereby recommend this report for further evaluation.

Mr. Hayyan Sheikh

Internship Mentor

Qiggz LLC

LETTER OF APPROVAL

This is to certify that **Mr. Sulav Parajuli**, the student of AIMS College has satisfactorily completed his internship entitled **"Qiggz: Hire Home Service Pros"** in partial fulfillment of requirements for Bachelor of Science in Computer Science and Information Technology.

The effort and endeavor on this program are entirely developed by him using various references and guidance. It has been found to be satisfactory and hereby approved for submission.

Er. Prashant Pokharel

Supervisor, AIMS College

Biratnagar, Nepal

Mr. Shashank Pokharel

Campus Chief, AIMS College

Biratnagar, Nepal

External Examiner

Central Department of CSIT

Tribhuvan University

Kathmandu, Nepal

DECLARATION

I hereby declare that the internship report on a project entitled Qiggz: Hire Home Service Pros submitted to the Faculty of Science and Technology, Tribhuvan University, Kathmandu is a collaborative effort undertaken during my internship at Qiggz LLC.

It is an original piece of work under the guidance of Mr. Hayyan Sheikh and supervision of Er. Prashant Pokharel and faculty members, AIMS College, Biratnagar.

This report is submitted in partial fulfillment of the requirements for the award of the degree of Bachelor of Science in Computer Science and Information Technology (Bsc.CSIT). This internship report has not been submitted to any other university or institution for the award of any degree or diploma.

Submitted By:
Sulav Parajuli (27306/077)
B.Sc. CSIT, 2077 Batch
AIMS College, Biratnagar

ACKNOWLEDGEMENT

I would like to express my deepest gratitude to everyone whose assistance and cooperation have contributed significantly, either directly or indirectly, to the compilation of this report.

First and foremost, I would like to express my gratitude to Qiggz LLC for allowing me to finish this internship and for providing the technical resources and experience I needed to write this report. Throughout my software development journey, I have received invaluable support and knowledgeable guidance from my internship mentor, Mr. Hayyan Sheikh, for which I am immensely thankful. His advice on full-stack development, payment processing, AI integration, and backend development has had a significant impact on my technical expertise. Additionally, I would like to thank the distinguished technical team at Qiggz LLC for generously sharing their time, technical know-how, and industry insights with me.

I am sincerely thankful to my academic supervisor, Er. Prashant Pokharel, for his unwavering support and wise counsel during this internship. His guidance was crucial in determining the course of my work, particularly in relating abstract ideas to real-world business applications. I also want to express my gratitude to the administration and faculty of AIMS College in Biratnagar, especially the Department of Computer Science, for approving this project and providing ongoing assistance. Their insightful advice and support significantly improved my capacity to apply what I had learned in the classroom to actual software development problems. I am also incredibly appreciative of my friends, whose support, cooperation, and encouragement enabled me to overcome many obstacles throughout this internship.

I owe a debt of gratitude to my parents, whose constant encouragement and support have been a rock during my time in college. Their unwavering faith in me has been crucial to the accomplishment of my internship and has had a significant impact on my academic career as a whole.

Sulav Parajuli (27306/077)

Bsc.CSIT 8th Semester

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ABSTRACT

This internship report details the activities I performed as a Software Development Intern at Qiggz LLC. Qiggz is focused on building a gig platform that connects job posters with service vendors across the United States. The project mainly focusses to make hiring for blue-collar jobs easier by creating a full-stack application with mobile and backend components. My internship centered on four main technical areas: mobile application development using Flutter, backend API development with Django, AI integration for content moderation and automation, and payment processing implementation.

The app features location-based job matching, AI-powered spam detection, weighted round robin vendor suggestions, real-time chat, notification systems, secure payment processing with Stripe, and automated vendor profile creation. The project also included implementing strong authentication systems, developing RESTful APIs, integrating AWS services like EC2, S3, and Bedrock, and creating automated testing frameworks using pytest for backend reliability.

The internship activities outline the duration, work schedule, and key responsibilities for developing both frontend and backend components of the platform. The conclusion and learning outcomes describe the results of the internship, including improved full-stack development skills, practical knowledge of real-world problem-solving, better project management abilities, experience with AI integration in production applications, and the adoption of professional software engineering practices.

Keywords: Flutter, Django, Qiggz LLC, Full-stack development, AI integration, AWS services, Payment processing, RESTful APIs, PostgreSQL, PostGIS, Real-time messaging, Location-based services

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LIST OF ABBREVATIONS

AI	Artificial Intelligence
AIMS	Advanced Institute of Management and Science
API	Application Programming Interface
APK	Android Package Kit
AWS	Amazon Web Services
B.Sc.	Bachelor of Science
CD	Continuous Deployment
CEO	Chief Executive Officer
CI	Continuous Integration
CMO	Chief Marketing Officer
CSIT	Computer Science and Information Technology
CTO	Chief Technology Officer
EC2	Elastic Compute Cloud
EOD	End of Day
EULA	End User License Agreement
JWT	JSON Web Token
LLC	Limited Liability Company
NGINX	Engine X (Web Server)
NLP	Natural Language Processing
ORM	Object-Relational Mapping

PAN	Permanent Account Number
PostGIS	PostgreSQL Geographic Information System
PR	Pull Request
QA	Quality Assurance
REST	Representational State Transfer
RESTful	REST-compliant
S3	Simple Storage Service
SDK	Software Development Kit
UI	User Interface
US	United States
UTC	Coordinated Universal Time
UX	User Experience
WRR	Weighted Round Robin

CHAPTER 1: INTRODUCTION

1.1. Introduction

This report documents my internship experience at Qiggz LLC, where I worked as a Software Development Intern for a period of 17 weeks. During this internship, I contributed to the development of Qiggz, an online platform that connects individuals seeking home services with skilled local professionals.

Qiggz is an online network which connects individuals seeking home services with skilled local professionals. User can either sign up as a job poster and post gigs via the Qiggz app or as a professional and apply to the jobs nearby them. The platform emphasizes on a user-friendly experience where job poster can describe their needs, review professionals' profile, and select the best fit. Professionals, in turn, benefit from the opportunity to apply for gigs that match their expertise.

There is integration of AI driven mechanism that filter out spam job posts and prevent bot vendor accounts. There is also a feature of real-time notification and messaging which facilitates direct communication between job posters and professionals.

The app is built using Flutter, making it cross platform which runs across Android, IOS and MacOS. The backend technology stack includes Django for the API, AWS EC2 for compute, AWS S3 for media storage, AWS Bedrock for AI, NGINX for reverse proxy management. A special port of Postgres SQL called PostGIS is used due to its support on working with locations and distances.

The work done during my internship period include development of Flutter app, integration of different features on backend, fixing of bugs and additions of new features in overall system.

1.2. Problem Statement

Traditionally, the home service industry has been fragmented, and homeowners have often had difficulty finding reliable, skilled professionals to complete a variety of tasks.

Common challenges include:

1. **Lack of Verification:** There is lack of proper verification of vendors and jobs resulting in high volume of fraud and spams in traditional system.
2. **Inefficient Matching:** Connecting homeowners with the right professionals based on location, skills, and availability is often weighty.
3. **Communication Barriers:** There is lack of direct and efficient communication between the vendor and job posters.
4. **Trust and Safety Concerns:** Both parties face risks regarding payment security, quality of work, and personal safety.
5. **Platform Development Challenges:** Developing cross-platform applications that manage real-time tasks, location services, and more presents significant technical challenges.

Qiggz aims to address these issues by adding spam detection using AI, filtering and matching two parties using location, skills and other metrices, giving support of clear chat communication with feature of media sharing for clarity, providing safe transactions and verification badges to enhance the user experience.

1.3. Objectives

The primary objectives of my internship were:

1. **Technology Proficiency:**

   To develop expertise in Flutter framework for developing cross-platform mobile app and Django for backend and api services.

2. **Feature Implementation:**

   To design and implement critical features including location services, chat archiving and unarchiving, notifications, and payment processing.

3. **AI Integration:**

   To add artificial intelligence for spam detection on user generated contents, content moderation, and automated vendor suggestions.

4. **User Experience Enhancement:**

To improve the applications user interface and user experience by ensuring smooth user flow and proper onboarding.

5. **Security Implementation:**

   To ensure secure user authentication, data protection, and transaction processing.

6. **Cross-Platform Compatibility:**

   To ensure consistent feature and functionality across multiple platforms due to cross-platform nature of Flutter apps.

7. **Problem-Solving Skills:**

   To develop the ability to identify, analyze, and resolve technical challenges in a production environment.

8. **Industry Experience:**

   To gain exposure to professional software development practices, collaboration tools, and agile methodologies.

1.4. Scope and Limitations

Scope:

- Development of user authentication and profile management features
- Implementation of location-based services using Mapbox
- Development of job posting and vendor suggestion algorithms
- Implementation of notification systems for various user actions
- Integration of payment processing with Stripe
- Development of AI components for spam detection and automated content generation
- Implementation of security features and data protection measures

Limitations:

- Limited support for international markets (primarily focused on US-based users)

- Certain proposed features (like app localization) were not implemented due to business decisions
- Memory constraints affecting some AI features, requiring optimization
- Time constraints due to the fixed internship duration
- Technical limitations of the chosen platforms and services

1.5. Report Organization

This report is organized into four chapters:

Chapter 1: Introduction - Provides an overview of the internship, project description, objectives, and scope.

Chapter 2: Organization Details and Literature Review - Details about Qiggz LLC, its organizational structure, working domains, and relevant literature on similar platforms.

Chapter 3: Internship Activities - Comprehensive documentation of my roles, responsibilities, weekly activities, and technical contributions.

Chapter 4: Conclusion and Learning Outcomes - Summarizes my internship experience, key learnings, and professional growth.

CHAPTER 2: ORGANIZATION DETAILS AND LITERATURE REVIEW

2.1. Introduction to Organization

Qiggz LLC is a product-based company focused on transforming traditional way of providing home services to a seamless digital experience through its app and website. Its core focus is to make ease the finding of qualified professionals for home services. Qiggz operates as a two-sided marketplace by connecting job posters with skilled professionals.

The primary vision of Qiggz is to create an ecosystem that is trusted so that home owners can easily find reliable professionals and professionals can easily build and expand their client base and operate their business seamlessly. Qiggz utilizes modern technology which includes mobile app, cloud services and artificial intelligence to achieve this vision.

Based in the United States, the company aims to address the fragmented nature of the home services market by providing a unified platform that facilitates discovery, communication, and transaction between parties.

Table 1 Contact Detail of Company

Company Name:	Qiggz LLC
PAN NO:	
Contact:	+1(425)6107233
Email:	inquiries@qiggz.com

2.2. Organization Hierarchy

The organizational structure of Qiggz LLC is hierarchical with clear reporting lines. At the top is the CEO, who oversees the entire organization. The CEO directly manages two C-level executives: the CTO (Chief Technology Officer) and the CMO (Chief Marketing Officer).

- Development Team (Mobile App and Backend)
- Design Team

- Quality Assurance (QA) Team
- Marketing Team

As an intern, I was positioned within the Development Team, reporting directly to the Manager. This hierarchy made it possible for efficient communication and regular feedback while providing great opportunity for learning and growing.

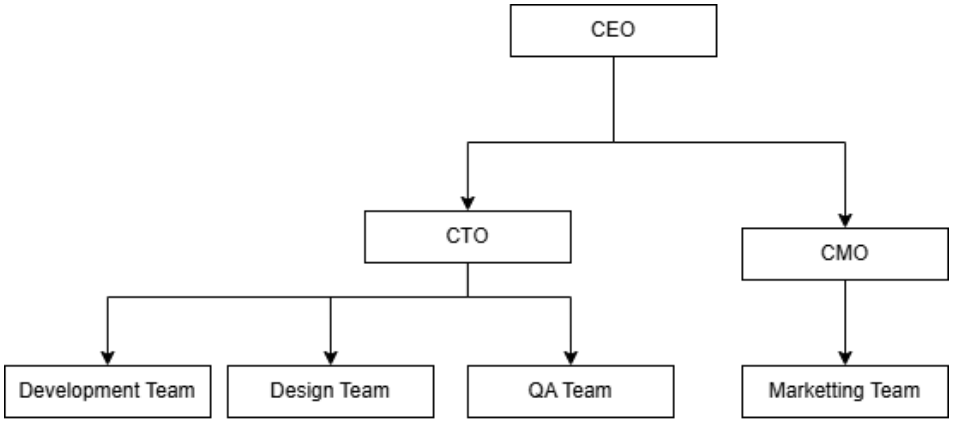

Figure 1 Organizational Hierarchy of Qiggz LLC.

2.3. Working Domains of Organization

Qiggz LLC operates across several technological domains:

1. Mobile Application Development:

- Cross-platform development using Flutter
- Native features optimization for Android and iOS
- UI/UX implementation and refinement

2. Backend Development:

- RESTful API development using Django
- Database management with PostgreSQL and PostGIS
- Microservices architecture and API integrations

3. Cloud Infrastructure:

- AWS EC2 for compute resources

- AWS S3 for media storage
- AWS Secret Manager for secure credential management
- AWS Bedrock for AI capabilities

4. Artificial Intelligence:

- Natural language processing for content moderation
- Recommendation systems for vendor suggestions
- Automated content generation for profiles and descriptions

5. DevOps and CI/CD:

- Continuous integration and deployment pipelines
- Infrastructure management and optimization
- Application monitoring and performance tuning

2.4. Description of Intern Department/Unit

I was placed within the Development Team, which is responsible for building and maintaining the core products of Qiggz. The team follows an Agile development methodology with one-week sprint cycles and daily stand-up meetings.

The team utilizes a feature-driven development approach, where features are broken down into manageable tasks tracked through Linear, a project management tool. Code reviews are conducted through GitHub pull requests, ensuring code quality and knowledge sharing.

Following tools and technologies are used by the development team for streamlining their activities.

- Version Control: Git with GitHub
- Project Management: Linear
- Design Collaboration: Figma
- Communication: Slack
- Documentation: Confluence

- Testing: Pytest for backend, Flutter test framework for frontend

The team operates in a collaborative remote environment with regular virtual meetings through slack. Development work is performed in local environments with configurations matching the production setup. Continuous integration ensures code quality through automated tests and linting before deployment.

Below is a tabulated summary of my internship involvement:

Table 2 Duration of Intern

Details	Information
Company Name	Qiggz LLC
Position	Software Engineering Intern
Start Date	January 1, 2025
End Date	April 30, 2025
Duration	17 Weeks
Mentor	Hayyan Sheikh

2.5. Literature Review / Related Study

According to Graham, Hjorth, and Lehdonvirta's analysis of the effects of digital platforms on the home service sector, these platforms have increased opportunities for independent professionals while decreasing the information asymmetry between clients and service providers. But they also brought attention to issues with algorithmic management, pressures from competitive pricing, and unequal power relations. (Graham, M., Hjorth, I., & Lehdonvirta, V., 2017)

Obe & Hsu documented the advantages of PostgreSQL with PostGIS extensions. Their analysis of spatial indexing techniques provides the foundation for Qiggz's implementation of efficient geospatial queries that power its location-based matching functionality. (Obe & Hsu, 2011)

TaskRabbit has evolved from a general task marketplace to focus significantly on home services. Their transparent rating system and tiered pricing model have established a benchmark for trust and quality assurance in digital service platforms. TaskRabbit's approach to handling location-based service matching provides valuable insights for implementing similar functionality. (TaskRabbit, n.d.)

CHAPTER 3: INTERNSHIP ACTIVITIES

3.1. Roles and Responsibilities

During my internship at Qiggz LLC, I had various roles and responsibilities that contributed to the development of the platform:

- Mobile Application Development:
    - Implementing UI components using Flutter framework
    - Developing functionality for user authentication and profile management
    - Creating location-based features using Mapbox integration
    - Adding various feature to real-time chat functionality
    - Implementing image handling and file upload features
    - Developing notification systems for user engagement
- Backend Development:
    - Creating and optimizing RESTful APIs using Django
    - Implementing database models and relationships
    - Developing AI-based spam detection systems
    - Creating automated testing for API endpoints
    - Implementing background task processing with Celery
    - Integrating third-party services like Stripe payments
- Quality Assurance:
    - Writing unit tests for backend code
    - Conducting code reviews and providing feedback
    - Troubleshooting and resolving reported bugs
    - Ensuring cross-platform compatibility
- DevOps and Deployment:

    - Setting up continuous integration pipelines
    - Working with environment variables and secrets management
    - Implementing feature flags for controlled deployment
    - Documenting setup and installation procedures
- Project Management:
    - Participating in sprint planning and daily stand-ups
    - Tracking task progress in Linear
    - Documenting technical decisions and implementations
    - Collaborating with design and QA teams

All these responsibilities provided me with adequate learning and experience of how a real-world software development team operates and collaborates with other functional team to deliver the product on time. I also gained practical exposure to market trends and learned that Software Engineering is not just about coding rather it's a mix of developing, coordinating, documenting.

3.2. Weekly Log

Below is a condensed version of my weekly activities throughout the internship period:

Week	Activities
Week 1	• Joined the project and set up development environment (Git, Figma access) • Implemented Location Input Field with user location detection and autocomplete functionality • Created comprehensive README documentation for the repository • Developed developer mode UI allowing runtime configuration changes
Week 2	• Implemented input field validations across the application

	• Created Image Carousel for Gig View to enhance user browsing experience • Added image upload limitations (max 5 images) • Integrated Mapbox API for mapping, geocoding and reverse geocoding functionality • Implemented system notifications for Terms of Service and Privacy Policy acceptance • Fixed home page to display only open jobs • Added login progress indication for better user feedback
Week 3	• Fixed Gig Details page in the Poster section • Implemented gig flagging feature for content moderation • Resolved various UI bugs and inconsistencies • Implemented spam and offensive text detection using transformer model • Added User Portfolio in settings • Enhanced UI with improved font sizing and enlarged hitboxes for better accessibility • Fixed location display to focus on zip code rather than exact location
Week 4	• Implemented chat archiving and unarchiving functionality • Added notification badges for new chat messages • Integrated Firebase for push notifications • Added feature to lock chats on gig completion
Week 5	• Resolved issues with chat locking and notification badges • Updated application branding with new company logo • Optimized system resources by removing AI processing that increased AWS costs • Created abstract notification manager for third-party notification service flexibility
Week 6	• Added gig view counter and user-friendly hints

	• Improved completed gig UI by removing vendor suggestions • Implemented cross-platform Firebase notifications for Android and iOS • Fixed critical null pointer exceptions causing gray screens in production • Added API versioning as suggested by backend team • Implemented support ticket system for user assistance • Added Firebase cleanup on logout for improved security
Week 7	• Implemented search functionality for chat • Migrated magic numbers and texts to constants file for better maintainability • Fixed bug to prevent editing of closed jobs • Added advanced filtering for vendor suggestions based on distance, licensing, and insurance status
Week 8	• Created app walkthrough tutorial with popup cards • Implemented automatic chat redirection on vendor invitation or gig application • Enhanced tutorial popup cards • Various UI improvements and bug fixes
Week 9	• Set up backend development environment (Git, Postman, Django) • Created ConfigManager class with caching and refresh mechanism • Added descriptive subtitles to settings screens • Implemented API testing for Job Recommendation using pytest • Added Firebase configuration support on backend • Created API tests for employee recommendations with distance parameters • Implemented limits on application and invitation

Week 10	• Enhanced job recommendation API with improved distance-based testing • Added feature flags for application and invitation limits • Implemented image attachment functionality in chat • Added geolocation restriction to allow only US-based user logins (backend)
Week 11	• Implemented keyword and location subscription system for job notifications • Updated application branding with new splash screen and logo • Integrated subscription notifications • Fixed profile picture update bugs • Added backend testing in GitHub Action CI pipeline
Week 12	• Integrated Google Analytics on the backend • Developed new landing page for the website • Implemented private jobs feature • Added proxy-based API for Mapbox integration • Created 404 error page for improved user experience
Week 13	• Added admin guarding on data population scripts • Fixed typewriter animation bug on landing page • Implemented Mapbox proxy API to remove direct frontend dependency • Added Husky for automated code scanning and formatting on PRs • Created CD pipeline for automated APK generation and Google Drive upload
Week 14	• Implemented Weighted Round Robin algorithm for vendor suggestions • Added state cleanup on logout • Implemented Django Signal for job post notifications • Enhanced CD pipeline with branch-based folder organization

	• Fixed distance calculation bugs • Added error handling for Mapbox API rate limiting
Week 15	• Improved chat archive functionality to affect only the archiving user • Enhanced signup confirmation emails with company branding • Added security headers (referer, origin) to API requests • Fixed nested job response distance calculations • Implemented business waitlist for users outside target regions • Standardized on UTC-based time configuration • Updated Google Analytics tracking
Week 16	• Added transactional consistency to job closing feature • Prepared first public version release • Updated EULA and Privacy Policy for app store compliance • Migrated API keys to AWS Secret Manager for enhanced security • Implemented account deletion request feature • Added CAPTCHA protection on forms • Completed Apple Sign-in integration with proper logging
Week 17	• Integrated Celery and Celery Beat for background task processing • Enhanced vendor model with weights/levels for improved WRR algorithm • Implemented EOD notification system for unread messages • Integrated Stripe payment system • Added profile view tracking system

3.3. Description of the Project

During my internship, I was primarily involved in the development of Qiggz on both its front facing mobile app and backend code. The project consisted of several interconnected components:

1. Mobile Application (Flutter):

   The cross-platform mobile application serves as the primary interface for both job posters and service providers. Built using Flutter, it delivers a consistent experience across Android, iOS, and macOS.

   Architecture:

   - State Management: Bloc
   - Navigation: Router-based navigation with nested navigation stacks
   - Storage: Shared Preferences for local data storage and caching.
   - Network: RESTful API client with token-based authentication
   - Real-time Features: WebSocket for messaging and Firebase for notifications

   Functional Requirements:

   - User Authentication: Multiple sign-in methods including email/password, Google, and Apple
   - Profile Management: User profiles with customizable details and portfolio
   - Job Posting: Intuitive interface for creating service requests with location, description, and images
   - Job Discovery: Location-based job search with filtering options
   - Chat System: Real-time messaging between job posters and professionals
   - Notifications: Push notifications for new messages, job invitations, and updates
   - Reviews: Rating system for completed jobs

2. Backend Services (Django):

The backend provides API endpoints, business logic, and data persistence for the platform.

Architecture:

- REST API: Django REST Framework for API endpoints
- Database: PostgreSQL with PostGIS extension for location queries
- Authentication: JWT-based authentication with refresh tokens
- Background Processing: Celery for asynchronous tasks
- Caching: Redis for performance optimization
- Monitoring: Custom logging and analytics integration

Functional Requirements:

- User Management: Account creation, verification, and management
- Job Management: Creation, update, and status tracking for jobs
- Recommendation Engine: Weighted Round Robin algorithm for vendor suggestions
- Location Services: Geocoding, reverse geocoding, and distance calculations
- Notification System: Multi-channel notifications (push, email, in-app)
- AI Integration: Spam detection, content moderation, and automated profiles
- Admin Portal: Administrative interface for platform management
- AI Components: Several AI-powered features enhance the platform's functionality:
- Content Moderation: Automated detection of inappropriate content in job descriptions and chat messages
- Vendor Description Generator: AI tool that creates professional descriptions based on service categories and experience
- Website Scraper: Automated extraction of business information from vendor websites

- Chatbot: AI-driven conversation system for simulating user interactions
- Text Analysis: Sentiment analysis and intent detection using AWS Bedrock Claude model
- Firebase: Messaging, analytics, and crash reporting
- Monitoring: Error tracking and performance monitoring

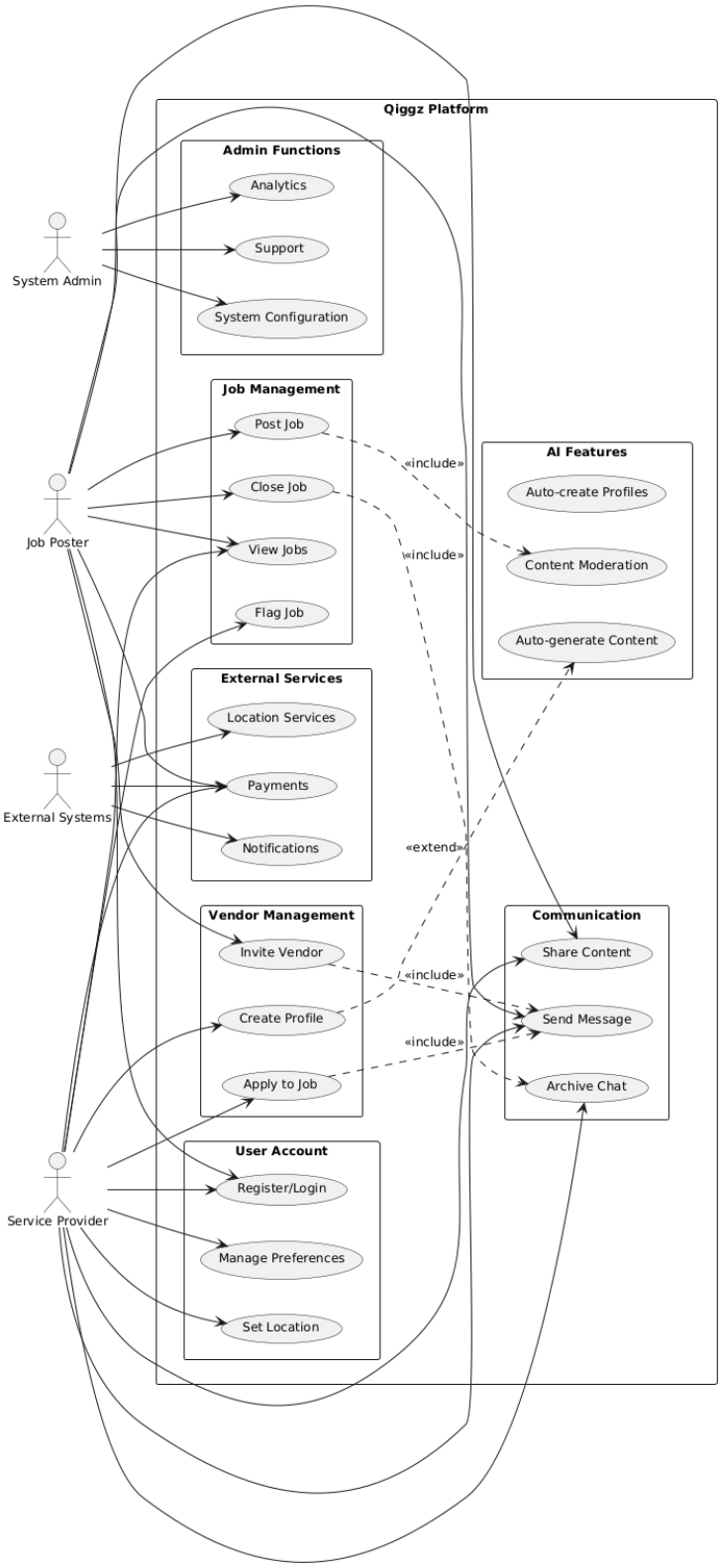

Figure 2 Use case diagram of Qiggz App

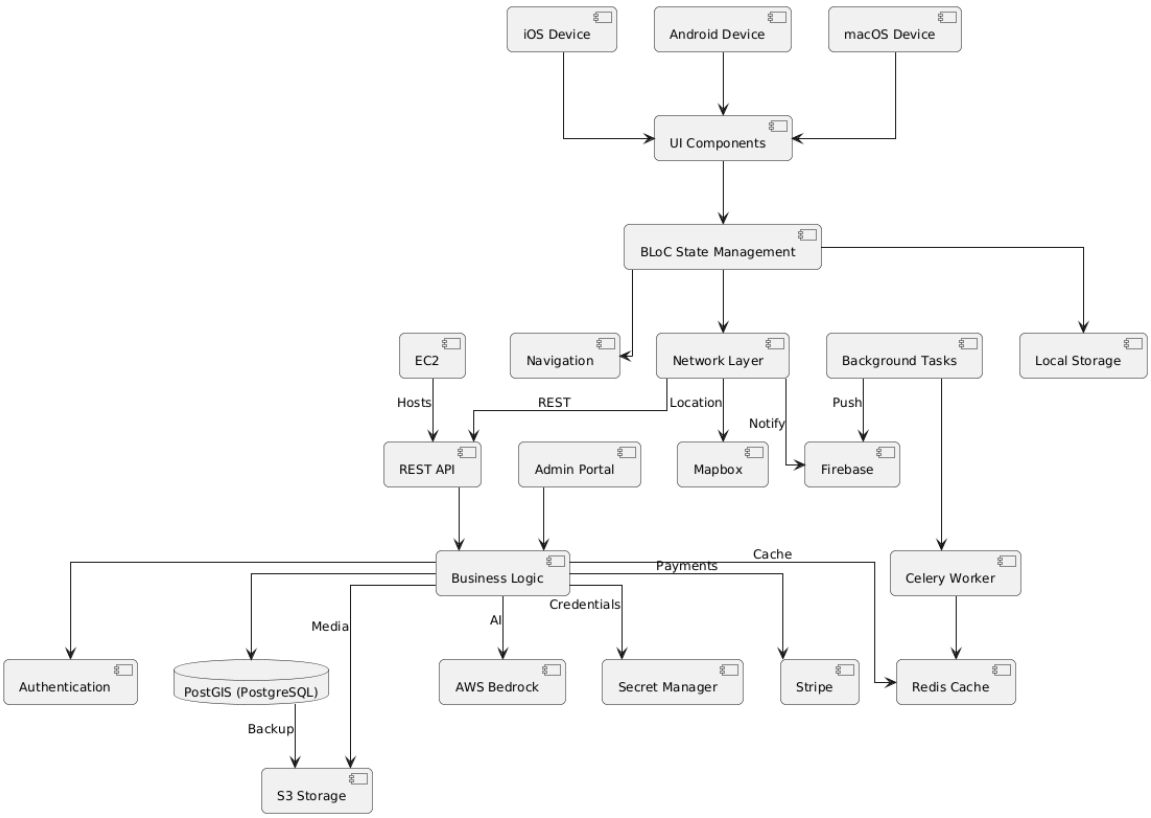

Figure 3 Qiggz Platform Architecture

3.4. Tasks / Activities Performed

Throughout my internship, I was involved in various technical tasks that contributed to the development of the Qiggz platform. Below are detailed descriptions of key activities and their technical implementations:

1. Location Services Implementation:

I integrated Mapbox into the Flutter application to provide location-based functionality:

- Implemented geocoding and reverse geocoding for address lookups
- Created a custom map widget with interactive markers
- Developed a location autocomplete feature
- Implemented a proxy-based API on the backend to secure Mapbox API keys
- Added distance calculation for job recommendations using PostGIS

- Created unit tests for distance-based recommendations

2. Real-time Chat System:

I worked in a comprehensive chat system with several features:

- Added image sharing capabilities with compression
- Implemented chat archiving and unarchiving
- Added chat badges for unread message indicators
- Created automatic chat locking for completed jobs
- Implemented EOD notifications for unread messages

3. AI-based Spam Detection:

I contributed to the development of a spam detection system:

- Implemented a transformer-based model for text classification
- Created an API endpoint for real-time content moderation
- Implemented user reporting and flagging system
- Added administrative tools for reviewing flagged content

4. User Authentication System:

I implemented a secure authentication system with multiple providers:

- Integrated Google Sign-In using Firebase Authentication
- Added Apple Sign-In with KID and logging
- Implemented JWT token management with refresh capabilities
- Created secure storage for authentication tokens
- Added location-based restrictions for US-only access

5. Weighted Round Robin Algorithm:

I implemented a sophisticated vendor suggestion algorithm:

- Developed a weighted round robin algorithm for fair distribution

- Added weight/level parameters to vendor model
- Implemented distance-based filtering of suggestions
- Created an API endpoint for vendor recommendations
- Wrote comprehensive tests for the algorithm
- Integrated with coupon system for weight adjustments

6. Notification System:

I developed a comprehensive notification system:

- Implemented Firebase Cloud Messaging for push notifications
- Created a Django Signal-based notification trigger
- Developed a Celery task for scheduled notifications
- Implemented in-app notification badges
- Added email notifications with company branding
- Created notification preferences for users
- Implemented notification for profile and job views

7. Automated Vendor Profile Creation:

I contributed to an AI-based vendor profile creation system:

- Created a description generator using AI
- Developed a wizard UI for guided profile creation
- Implemented keyword matching using ngram and edit distance
- Added orphan vendor system for automatic profile assignment
- Integrated with AWS Bedrock Claude for text analysis

8. Payment Integration:

I implemented a secure payment processing system using Stripe:

- Integrated Stripe SDK for payment processing

- Created a custom payment flow for service transactions
- Implemented webhook handlers for payment events

CHAPTER 4: CONCLUSION AND LEARNING OUTCOMES

4.1. Conclusion

My 17-week internship at Qiggz LLC have been a valuable experience for me as it helped me transform my academic learning into a professional practice. Throughout this period, I actively contributed to Qiggz app and backend which itself is a complex platform that connects professionals with home owners near them. I also gained a lot of exposure to modern software development practices.

This project presented a lot of technical challenges which ranged from real-time feature to integrating different kind of AI features to app, all of which required constant learning and keeping up with modern solutions. Working on mobile app, backend, AI, AWS all at once provided me with a holistic understanding of full stack development.

Key accomplishments during my internship include:

1. Successfully implementing location-based services that form the core of the platform's functionality
2. Added lot of features to real-time chat system
3. Creating an AI-driven vendor suggestion algorithm that improves matching efficiency
4. Implementing secure authentication with multiple providers and robust security measures
5. Contributing to the platform's payment processing capabilities
6. Optimizing performance through caching and background task processing
7. Enhancing user experience through intuitive UI design and guided workflows

The experience of working within an agile development team taught me the importance of collaboration, communication, and adaptability. Code reviews, sprint planning, and daily stand-ups provided structure to the development process while allowing for flexibility in addressing emerging requirements.

Working on a product that evolved from development to public release gave me insights into the complete software development lifecycle, including the challenges of preparing an application for production deployment and ensuring its reliability and security.

4.2. Learning Outcomes

My internship at Qiggz LLC has resulted in significant professional growth and numerous learning outcomes:

Technical Skills:

- I gained proficiency in Flutter for cross platform mobile app development.
- I developed skills in Django and Django REST Framework, including concept of RESTful API design, authentication, authorization, etc.
- I learned to work with PostgreSQL and PostGIS using Django own ORM system.
- I gained experience with AWS services including EC2, S3, Secret Manager, and Bedrock
- I learned to integrate AI capabilities into applications for content moderation and automated content generation
- I developed skills in implementing notification systems using Firebase
- I learned to implement secure payment workflows using Stripe
- I gained experience in writing unit tests and integration tests

Professional Skills:

- **Collaboration:** Learned to work effectively within a development team, coordinating with designers, QA engineers, and product managers
- **Code Quality:** Developed an appreciation for clean code, documentation, and adherence to coding standards
- **Problem-Solving:** Enhanced ability to troubleshoot issues and develop innovative solutions
- **Time Management:** Improved skills in prioritizing tasks and meeting deadlines

- **Adaptability:** Learned to adjust to changing requirements and technical constraints
- **Documentation:** Gained experience in writing technical documentation and knowledge sharing

Industry Knowledge:

- **Development Methodologies:** Gained practical experience with Agile development practices
- **DevOps:** Learned about CI/CD pipelines and their importance in modern software development
- **Security Best Practices:** Developed awareness of security considerations in application development
- **User Experience:** Gained insights into designing intuitive and accessible user interfaces
- **Market Awareness:** Developed understanding of the gig economy and service marketplace dynamics

Personal Growth:

- **Confidence:** Built confidence in my abilities as a software developer
- **Initiative:** Learned to take ownership of features and drive them to completion
- **Communication:** Improved ability to express technical concepts clearly
- **Resilience:** Developed perseverance in facing and overcoming technical challenges
- **Professional Identity:** Began to form a professional identity as a software engineer

This internship has significantly enhanced my employability by providing me with practical experience in modern software development technologies and methodologies. The skills and knowledge gained will serve as a strong foundation for my future career in the software industry.

The opportunity to work on a real-world application that solves genuine user problems has been incredibly rewarding and has reinforced my passion for software development. I am grateful to Qiggz LLC for providing this learning opportunity and to my mentors who guided me throughout this journey.

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