JOBTAKE - A GIG PLATFORM FOR JOBS USING HYBRID RECOMMENDATION SYSTEM

PROJECT PHASE I REPORT

Submitted by

MUHAMMED JAZIL (210701168)
PRAGADEESHWARAN S (210701190)

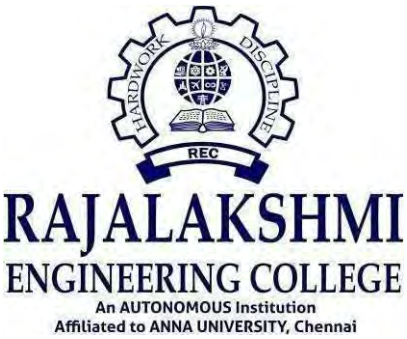
in partial fulfillment for the award of the

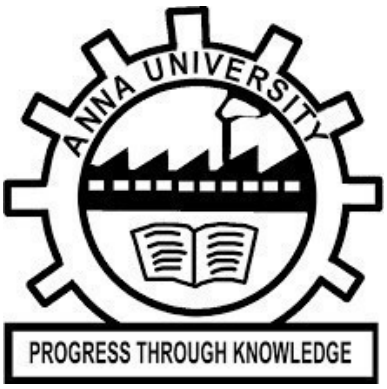
degree of

BACHELOR OF ENGINEERING

IN

COMPUTER SCIENCE AND ENGINEERING





RAJALAKSHMI ENGINEERING COLLEGE, CHENNAI

ANNA UNIVERSITY: CHENNAI 600 025

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SIGNATURE

Dr. P. Kumar, M.E., Ph.D.,

HEAD OF THE DEPARTMENT

Professor and Head,

Department of Computer Science and Engineering,

Rajalakshmi Engineering College,

Chennai – 602 105.

SIGNATURE

Dr. S. Anantha Sivaprakasam,

SUPERVISOR

Professor,

Department of Computer Science and Engineering,

Rajalakshmi Engineering College,

Chennai – 602 105.

Submitted to Project Viva-Voce Examination held on_____

Internal Examiner **External Examiner**

ABSTRACT

From 2018 to 2021, India's gig economy underwent substantial growth, increasing from 2-3% to an estimated 8-10% of the workforce, totaling almost 15 million people. This expansion was driven by enhanced digital infrastructure and the widespread adoption of smartphones, facilitating broader access to flexible employment options via digital platforms in industries such as transportation, food delivery, home services, and freelance digital labor. The COVID-19 pandemic expedited this trend as economic worries and evolving job requirements compelled more individuals, particularly younger, digitally proficient Gen Z workers, to adopt gig labor for financial security and flexibility. Numerous individuals shifted from conventional career trajectories to gig work, either due to necessity or as a lifestyle preference, in response to the burgeoning prospects inside the gig economy. This expansion is facilitated by sophisticated platform technologies that amalgamate marketing, finance, logistics, and client engagement functionalities, establishing a resilient ecosystem for gig workers to function autonomously. Enhanced governmental acknowledgment and the evolution of business models position these platforms to empower gig workers as entrepreneurs, promoting self-employment and widespread financial independence. This study investigates the potential of technology-enabled platforms to transform the Indian home remodeling industry, enabling gig workers to operate their own enterprises through adaptable and tailored gigs. This research underscores the revolutionary impact of the gig economy on work patterns, providing a sustainable alternative to conventional employment and fostering an entrepreneurial ethos within India's developing workforce.

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MUHAMMED JAZIL (210701168)

PRAGADEESHWARAN S (210701190)

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LIST OF ABBREVIATIONS

AI	-	Artificial Intelligence
ML	-	Machine learning
IoT	-	Internet of Things
AR	-	Augmented Reality
NLP	-	Natural Language Processing
P2P	-	Peer-to-Peer
4IR	-	Fourth Industrial Revolution
UI	-	User Interface
UX	-	User Experience

CHAPTER 1

1. INTRODUCTION

1.1 EMPOWERING GIG WORKFORCE

India's gig economy has seen substantial growth, rising from 2-3% of the workforce in 2018 to 8-10% by 2021, driven by advancements in digital infrastructure and the widespread use of smartphones. This shift has opened flexible work opportunities across sectors like home services, deliveries, and freelance digital work. The COVID-19 pandemic accelerated this trend, prompting many individuals, especially tech-savvy Gen Z workers, to pivot to gig roles for financial security and adaptability. However, existing platforms like Urban Company and Taskmo face limitations, such as rigid service categories, competitive bidding models, and lack of inclusivity for casual workers.

Our project addresses these challenges by introducing an inclusive gig platform designed to empower workers and clients through advanced technologies. The platform offers a broad range of gig opportunities, from home repair to tutoring, catering to diverse user needs without rigid schedules or professional certifications. Through geolocation services, users can connect with gigs within their vicinity, enabling hyperlocal fulfillment while minimizing costs and time.

A standout feature is the hybrid recommendation system, which combines collaborative and content-based filtering to suggest personalized gigs based on user preferences, skills, and location. This eliminates the need for competitive bidding, ensuring fair and efficient job matching.

To enhance user trust and engagement, the platform incorporates peer-to-peer connectivity, allowing gig workers and clients to interact securely in real-time. Feedback systems and performance-based rewards foster accountability and continuous improvement among workers.

By prioritizing flexibility, accessibility, and security, this platform redefines the gig economy, creating a user-centric ecosystem that promotes financial independence, entrepreneurship, and sustainable growth for students, homemakers, and part-time workers alike.

1.2 OBJECTIVE

The objective of this project is to develop an intelligent and interactive gig platform designed to provide personalized job recommendations, foster peer-to-peer connectivity, and support the financial needs of students and adults. The platform aims to:

1. **Integrate Hybrid Recommendation Models**

To suggest appropriate gig possibilities based on user profiles, preferences, and location within a specified radius, combine transformer-based architectures, collaborative filtering, and content-based filtering.

2. **Enable Real-Time Job and Profile Insights:**

Provide users with real-time access to gig opportunities and relevant peer data through APIs and secure datasets, ensuring informed decision-making for job selection and platform activities.

3. **Enhance User Engagement:**

Offer an intuitive and interactive UX through both web and mobile platforms, including features like photo verification for job acceptance and dynamic peer reviews, fostering trust and reliability.

4. **Ensure Location-Based Precision:**

Optimize the platform for hyperlocal gig opportunities by incorporating geolocation services to match users to jobs within a 3 km radius, ensuring relevance and accessibility.

5. **Integrate Performance Feedback and Ratings:**

Provide real-time feedback mechanisms where users can rate and review gigs and gig providers, fostering continuous improvement and transparency.

1.3 EXISTING SYSTEM

The gig economy has grown significantly in recent years, with platforms like Urban Company, Fiverr, TaskRabbit, and Swiggy Genie offering diverse services ranging from home repairs to freelance tasks and on-demand deliveries. While these platforms have succeeded in specific niches, they also face limitations that your proposed gig platform seeks to address by offering an inclusive, flexible, and user-friendly solution for students and adults aiming to earn extra income.

Urban Company specializes in professional home services such as cleaning and beauty care, offering verified providers and transparent pricing. However, it restricts workers to predefined categories and schedules, making it less appealing for casual gig workers or those with irregular availability. In contrast, our platform allows individuals from any background to access a wide range of gig opportunities within a 3 km radius. This open structure ensures users can work on their own terms, catering to dynamic lifestyles.

Platforms like Fiverr and Upwork focus on digital freelancing with a competitive bidding model, which often disadvantages inexperienced users. Our project improves this by leveraging a hybrid recommendation system that matches users with jobs based on preferences, skills, and location. This eliminates bidding, ensuring fairer and faster job assignments, empowering users to concentrate on their work rather than competing for tasks.

TaskRabbit emphasizes hyperlocal services for tasks like moving and furniture assembly but is limited to specific regions and rigid schedules. Building on its hyperlocal approach, our platform connects users to jobs nearby while offering a broader selection of gig types, such as tutoring and creative work. This ensures a more versatile experience for gig workers.

Platforms like Swiggy Genie and Dunzo excel in on-demand delivery but lack support for skill-based or long-term gigs. Our platform bridges this gap, offering a mix of immediate tasks and specialized opportunities such as tutoring or content creation, maximizing earning potential.

Many existing systems lack inclusivity and community-building features, focusing solely on task execution. Our platform incorporates peer-to-peer communication, enabling more efficient task management without unnecessary complications. Additionally, high commissions on platforms like Fiverr and rigid payment structures on others often reduce freelancers' earnings. Our platform introduces a secure, low-cost payment gateway with timely and transparent transactions, improving trust and satisfaction.

Features like loyalty programs and referral incentives enhance engagement, rewarding users for consistent participation and referrals. Moreover, the platform highlights socially responsible gigs, such as eco-friendly services or volunteering, promoting community welfare. Scalability is a key advantage of our platform. Starting with a 3 km radius, it can grow to include more locations, categories, and advanced features as the user base expands. This flexibility ensures long-term adaptability and relevance in the gig economy.

By addressing the shortcomings of existing platforms and introducing innovative features, this project sets a new standard in inclusivity, flexibility, and user-centric design, empowering students and adults to achieve financial independence while contributing to a sustainable gig economy.

1.4 PROPOSED SYSTEM

The proposed gig platform is a user-centric solution aimed at revolutionizing the gig economy by addressing limitations of existing platforms while introducing innovative features. Designed to serve students and adults, it offers flexibility, inclusivity, and diverse opportunities, enabling users to earn supplementary income while providing a seamless experience for clients seeking various services.

Unlike traditional platforms focused on predefined categories, this system accommodates a wide range of gigs, including tutoring, home repairs, and digital tasks. Users can choose their working hours and job type, tailored to their schedules and preferences. Geolocation services connect users to hyperlocal opportunities within a 3 km radius, minimizing travel time and costs. This approach ensures accessibility and convenience for gig workers and clients alike.

A hybrid recommendation engine powers the platform, combining collaborative filtering and advanced transformer-based models to personalize job suggestions. By aligning gigs with user skills, preferences, and activity history, the system eliminates the competitive bidding process, enabling faster, fairer job matches. Clients benefit from efficient worker selection, enhancing overall satisfaction and trust.

Security and transparency are prioritized through photo verification, encrypted communication, and blockchain technology. Blockchain ensures tamper-proof records of agreements and payments, while a secure payment gateway supports multiple methods. These features foster confidence among users, creating a trustworthy ecosystem for seamless transactions and interactions.

Peer-to-peer connectivity allows gig workers and clients to discuss tasks and expectations through real-time chat, ensuring clarity and efficiency. A loyalty program incentivizes consistent engagement by rewarding workers with benefits such as access to premium gigs and discounts. These features encourage high-quality service and sustained participation.

The platform offers robust support services, including an interactive dashboard for tracking earnings, compliance updates, and tax requirements. Data analytics provide actionable insights for gig workers to optimize their performance and for clients to assess worker suitability. Community-building tools, such as forums and instant messaging, promote collaboration and a sense of belonging, increasing user retention.

Built on a scalable cloud-based architecture, the platform is designed for adaptability, ensuring resilience and future-readiness as technology evolves. It also emphasizes social responsibility, highlighting eco-friendly and volunteering opportunities, fostering awareness and appealing to environmentally conscious clients.

By addressing the limitations of existing gig platforms, this project combines innovation, flexibility, and inclusivity. With features like a hybrid recommendation engine, robust security measures, and community-building tools, it empowers users to achieve financial independence while promoting meaningful connections. This future-proof solution sets new benchmarks in the gig economy, catering to diverse user needs and encouraging sustainable practices.

CHAPTER 2

2. LITERATURE SURVEY

In [1], R. S. Herman and N. Sen explore the rapid expansion of gig work, now comprising 35% of the U.S. workforce, driven by economic needs and flexibility. Technological advancements in AI, IoT, and 5G have transformed gig platforms like TaskRabbit, enabling efficient connections between workers and clients, especially in home improvement. Trust-building through AI-driven reviews and identity verification is essential for platform reliability. The paper highlights emerging hybrid models, such as Home Depot's Pro Program, which integrate traditional services with gig- based solutions, showcasing a new ecosystem for operational and economic shifts in various sectors.

In [2], Siddique et al. address challenges in project allocation on freelancing platforms, where traditional selection processes often lead to unawarded projects and mismatches between freelancers and employers. Prior research has shown that freelancing platforms face issues like budget estimation, skill mismatch, and ineffective recommendation systems. Studies on crowd sourcing and freelance platforms, such as Upwork, highlight the importance of data-driven budgeting and AI-driven recommendation systems to improve project fit. This paper further proposes a ML model to stream-line project allocation by analyzing freelancer attributes and preferences.

The gig economy has gained prominence in recent years, trans- forming the global labor market by offering flexible, short- term employment opportunities. While it provides individuals with autonomy and supplemental income. It also comes with difficulties including unstable income, inadequate benefits, and job instability. In Lessons [3], Bates et al. explore both the positive and negative aspects of gig work, focusing on how digital platforms influence labor rights and economic mobility. The paper suggests that the gig economy's future holds potential for innovation and inclusive growth, provided that platforms evolve to better protect workers.

The paper by A. Lee et al. [4] explores how user feedback can provide insights into the expectations and concerns of gig economy workers and customers. Using sentiment analysis, the study analyzes reviews and comments on various platforms to understand user sentiments. Key findings highlight that workers value flexibility, fair pay, and job security, while customers seek reliability and quality. The research underscores the significance of attending to these user requirements in order to improve the platform's overall success. The paper suggests that integrating sentiment analysis into platform design can lead to better alignment with user demands, fostering a more sustainable gig economy.

The gig economy, increasingly recognized as a significant employment model, is characterized by flexible, technology- driven jobs facilitated by platforms [5]. Studies highlight that technology, particularly mobile apps and automation, has been instrumental in expanding gig work by enhancing accessibility and UX [6]. In emerging markets like India, factors such as smartphone penetration and digital payment adoption have accelerated the gig economy, making it a viable option for diverse labor needs [7]. However, challenges remain regarding job security, benefits, and regulatory standards for gig workers

The paper by A. G. Anagnostakis et al. [9] explores the intersection of blockchain technology and the gig economy regarding the (4IR). It argues that blockchain can enhance transparency, trust, and security in gig labor platforms by providing decentralized, immutable records of transactions and work agreements. The study highlights how blockchain could ad- dress issues such as payment delays, fraud, and lack of worker protections. By enabling smart contracts and direct peer-to- peer transactions, blockchain offers the potential to transform gig work into a more efficient, equitable, and transparent labor market, ensuring fairer compensation and improved working conditions for gig workers.

The paper by T. Hossain et al. [10] presents a novel strategy for combining blockchain technology with the use of ML (ML) to improve Bangladeshi telemedicine platforms. It explores how blockchain technology can ensure secure, transparent transactions and patient data management while ML algorithms can optimize service delivery by predicting health out- comes and personalizing care. The study focuses on how this hybrid system can empower freelancers in the telemedicine field, offering them flexible work opportunities while addressing challenges like trust, data privacy, and payment delays. The paper proposes a scalable solution that could improve health- care accessibility and quality for underserved populations in Bangladesh.

The study by Kumar et al. [11] explores optimizing task scheduling in distributed systems using genetic algorithms (GA). It demonstrates how GA enhances resource allocation, minimizes latency, and improves throughput by simulating natural selection for optimal task-to-resource mapping. This approach is highly relevant to the proposed gig platform, where efficient task assignment is crucial. By incorporating GA principles, the platform can optimize job recommendations based on worker skills, location, and availability, ensuring seamless task distribution. Additionally, dynamic resource management inspired by the study ensures scalability and operational efficiency, enhancing user satisfaction.

The paper by L. Li and W. Wang [13] investigates how trust-building mechanisms like peer reviews, ratings, and profile verification influence trust among service providers in the sharing economy. These mechanisms are crucial for establishing reliability and fostering trust in platforms. For the proposed gig platform, incorporating similar trust-enhancing features such as photo verification, rating systems, and real-time feedback will be essential in building credibility. These mechanisms will not only boost provider confidence but also ensure higher engagement and trust between the gig workers and client.

The study by Mogaji et al. [14] examines the role of AI in creating personalized advertisements that emotionally connect with consumers. By leveraging user data, AI delivers tailored content to improve engagement and campaign effectiveness. This concept aligns with the proposed gig platform, where AI can be used to personalize job recommendations, promotional offers, and user interactions. Emotional and behavioral data analysis can enhance user engagement and loyalty by providing relevant, appealing experiences. This integration will foster stronger connections between users and the platform, driving retention and satisfaction in a competitive gig economy market.

The paper by Olorundare et al. [15] explores the impact of digital transformation on Nigeria’s gig economy. It highlights opportunities such as flexible work models and technology-driven platforms, alongside challenges like inadequate infrastructure, payment security, and regulatory gaps. This study is relevant to the proposed gig platform as it underscores the need for robust infrastructure, secure payment systems, and compliance with regulations. By addressing these challenges, the platform can enhance accessibility, reliability, and scalability, ensuring a more efficient and secure environment for gig workers and clients in emerging markets.

The study by P. K.K.D and A. Withaanarachchi [16] examines the well-being of online freelancers in Sri Lanka's gig economy. It explores factors like work flexibility, financial stability, and job satisfaction while highlighting challenges such as job insecurity and lack of benefits. This research is valuable for the proposed gig platform, as it emphasizes the importance of creating a supportive ecosystem. By offering features like loyalty programs, secure payments, and peer reviews, the platform can enhance gig workers' well-being, ensuring higher satisfaction and retention.

The paper by Musvosve et al. [17] explores how platform-based employment addresses youth unemployment in developing regions. It highlights the accessibility and scalability of digital platforms while discussing challenges like digital literacy gaps and inadequate infrastructure. This research is relevant to the proposed gig platform, which targets students and young adults. By incorporating localized features like peer-to-peer connectivity, AI-driven recommendations, and training modules for digital literacy, the platform can empower youth with flexible earning opportunities. Addressing infrastructural and digital divides ensures inclusivity, enhancing the platform's impact in underserved markets.

The paper by Fang et al. [18] explores gig workers' experiences, focusing on their motivations, emotional well-being, and perceptions of platform support. The study emphasizes the need for platforms to provide better incentives, emotional support, and transparent communication to enhance worker satisfaction. For the proposed gig platform, new features such as mental health resources, real-time customer support, and gamified milestones for task completion can be introduced. These additions will improve engagement, address emotional well-being, and create a more supportive ecosystem, enhancing the platform's appeal to gig workers and clients alike.

The paper by Aquib and Prashanth [19] discusses an optimized peer-to-peer (P2P) network model for enhancing blockchain connectivity. It emphasizes efficient data sharing, reduced latency, and improved scalability within decentralized systems. For the proposed gig platform, incorporating similar P2P connectivity can enhance user interactions by enabling direct communication and secure transactions between clients and gig workers. Features like decentralized user data storage and encrypted messaging ensure privacy and reliability. By leveraging these innovations, the platform can provide a seamless, trust-driven experience, fostering stronger collaboration and engagement in the gig economy ecosystem.

The paper by Kumar, Swetha, and Sundari [20] highlights the design of a secure web platform for alumni networking and data management. It focuses on features like data encryption, role-based access, and dynamic user interactions to ensure privacy and engagement. Inspired by this, the proposed gig platform can implement secure user authentication, encrypted transactions, and role-specific access for clients and workers. Additionally, features like a knowledge-sharing forum and event-based notifications can enhance user interaction. These elements create a trustworthy environment while fostering collaboration and providing robust data protection, crucial for a sustainable gig ecosystem.

The literature study emphasizes how technology is revolutionizing the gig economy and creating new opportunities, particularly in India. There are still a number of obstacles to overcome, though, especially in creating platforms that successfully serve a diverse workforce and provide equitable working conditions. Our research on technology-enabled gig labor, which seeks to offer inclusive, flexible employment alternatives, depends on these insights. To overcome these constraints and improve accessibility and sustainability in the gig economy, future research should concentrate on data security, sector-specific flexibility, and user-centered platform design**.**

CHAPTER 3

3. SYSTEM DESIGN

3.1 GENERAL

3.1.1 SYSTEM FLOW DIAGRAM

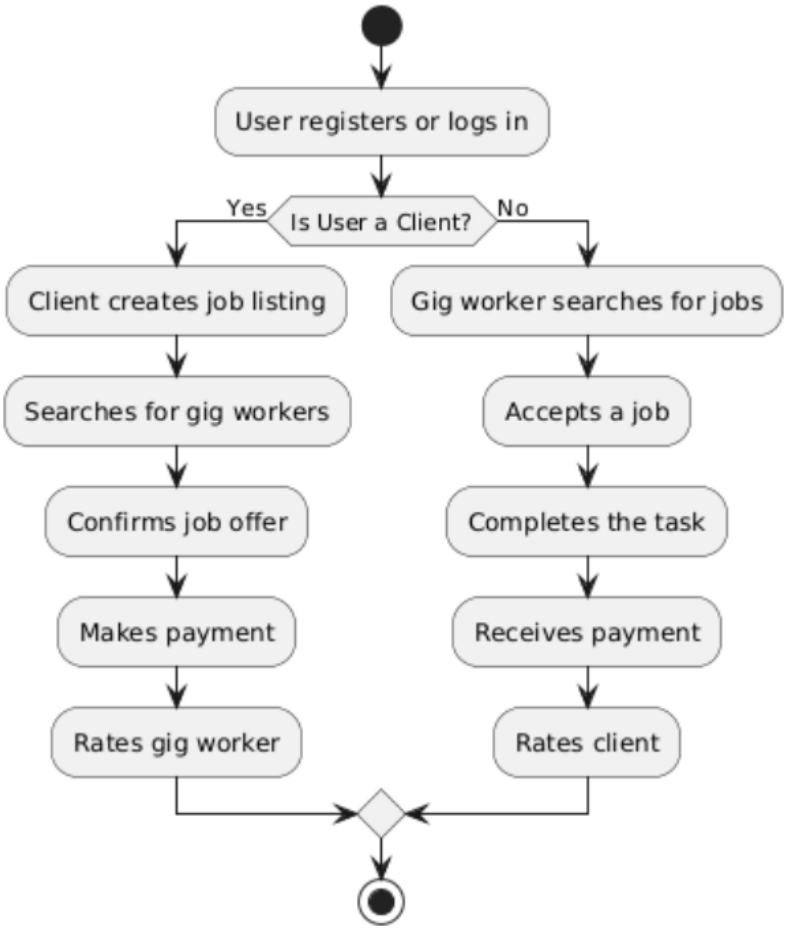

Figure 3.1.1
System Flow Diagram

3.1.2 SEQUENCE DIAGRAM

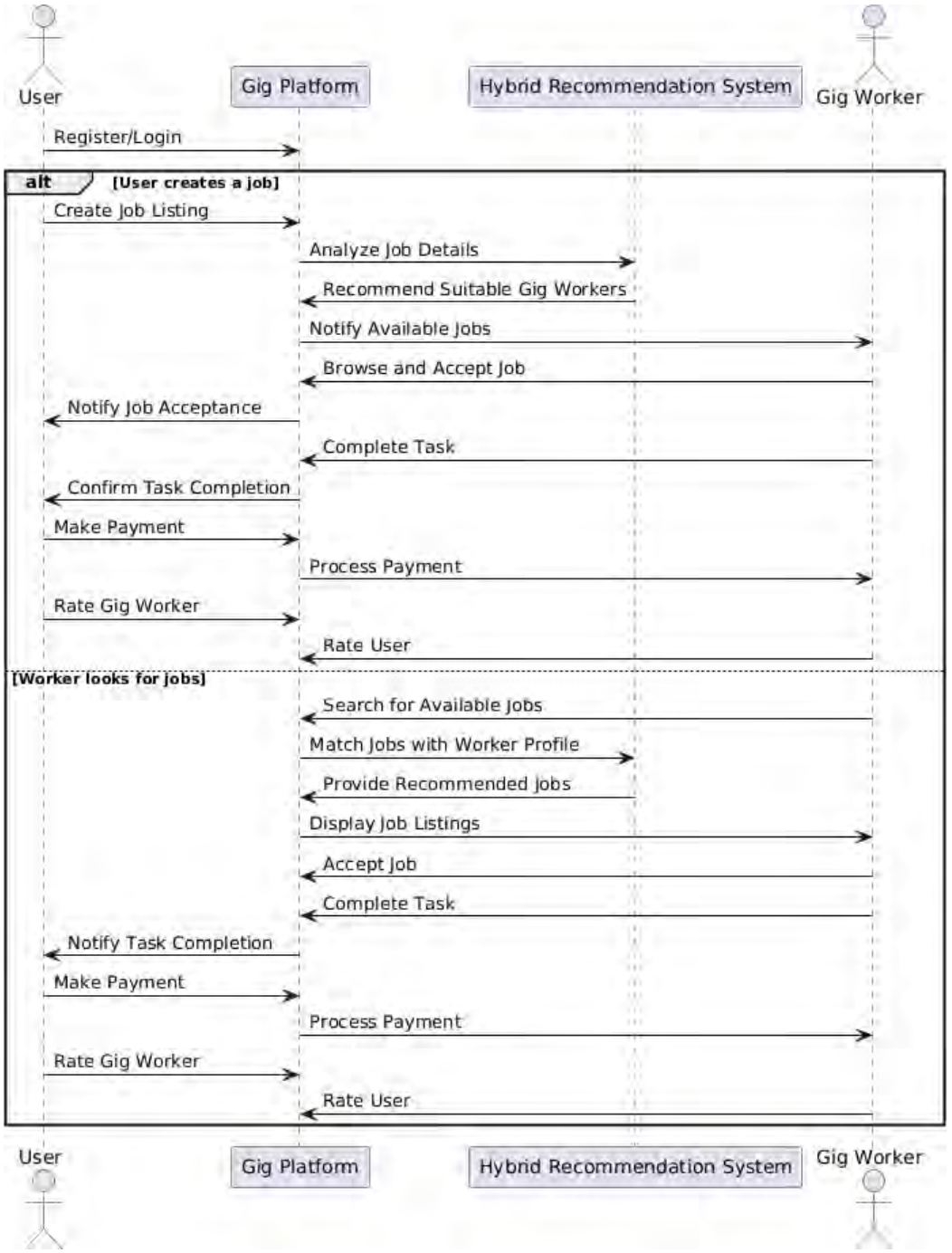

Figure 3.1.2
Sequence Diagram

3.1.3 CLASS DIAGRAM

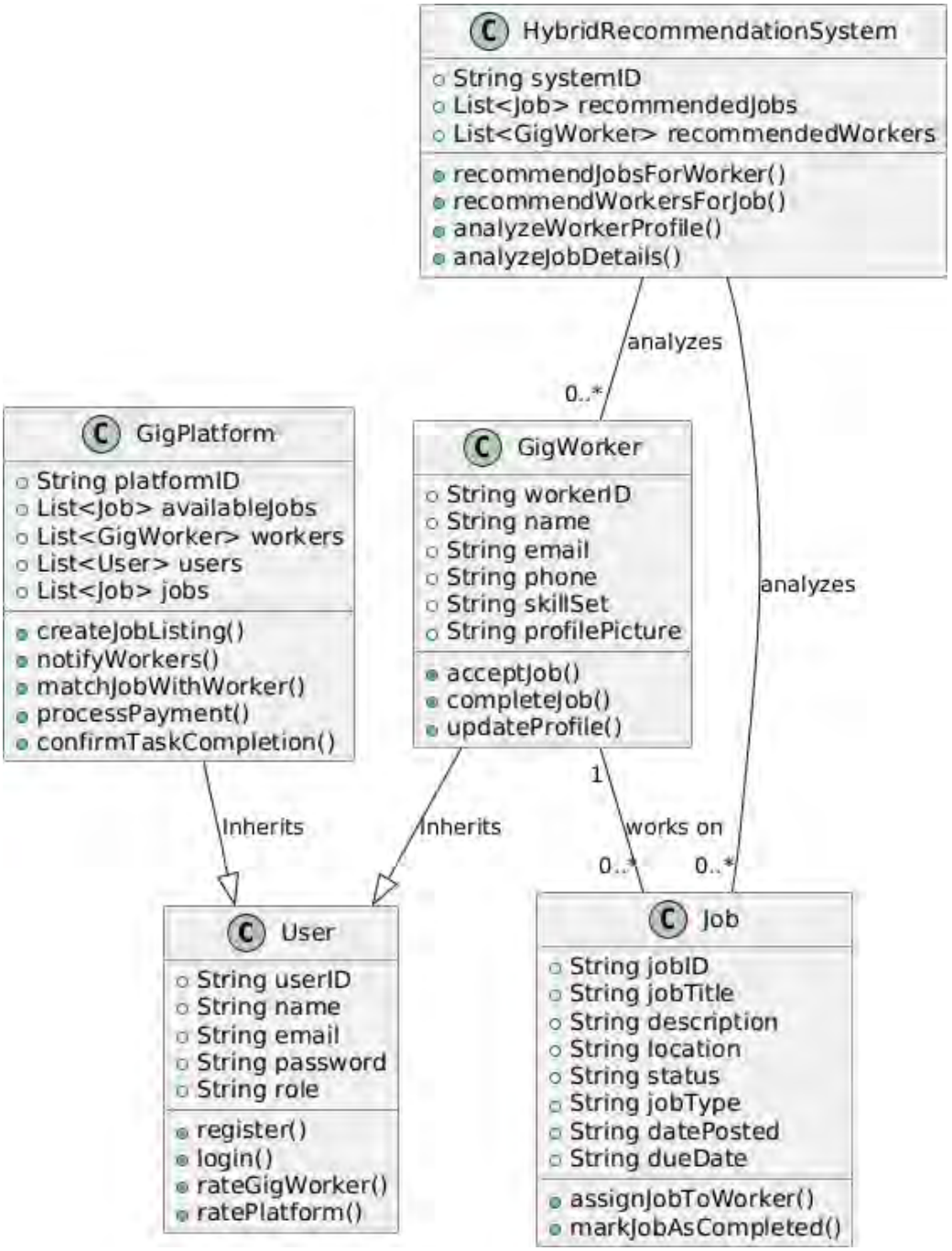

Figure 3.1.3
Class Diagram

3.1.4 USE CASE DIAGRAM

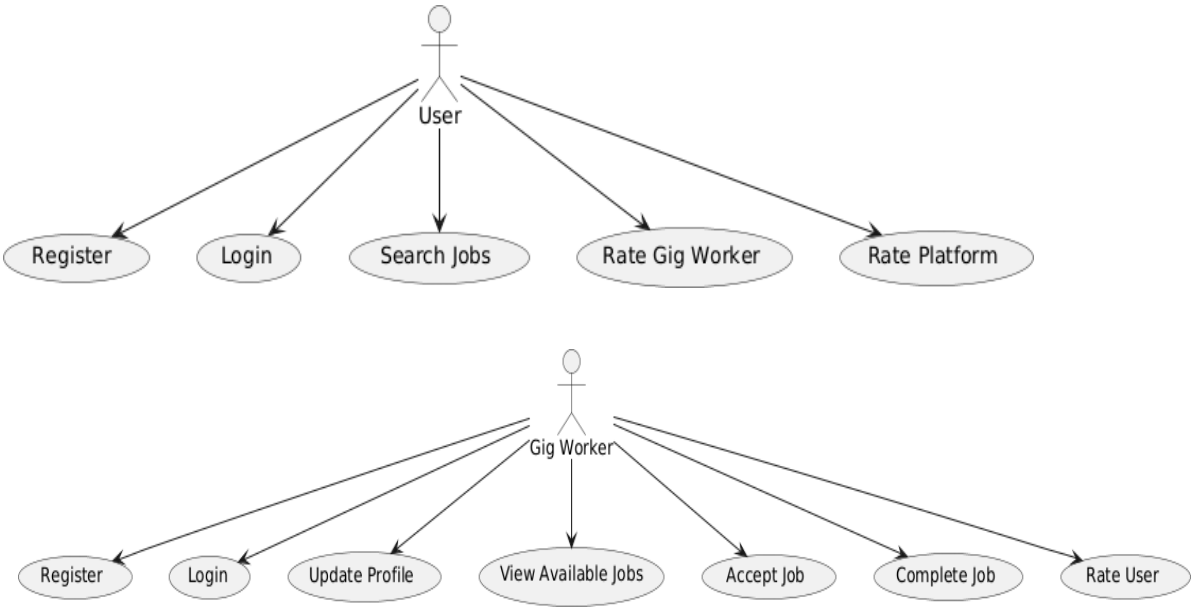

Figure 3.1.4
Use Case Diagram

3.1.5 ARCHITECTURE DIAGRAM

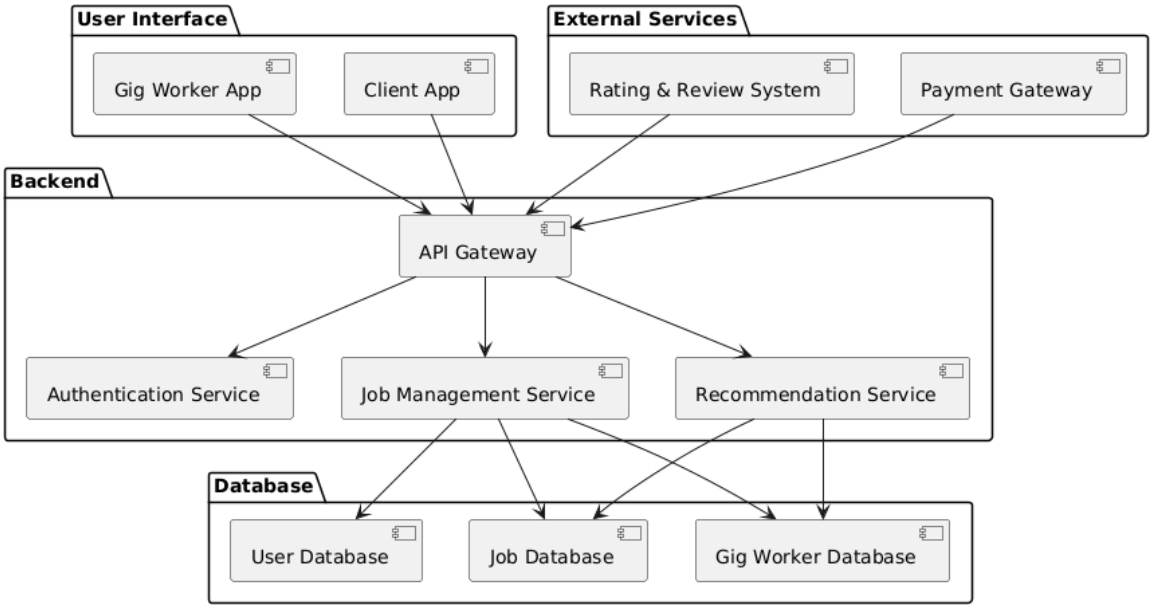

Figure 3.1.5
Architecture Diagram

3.1.6 ACTIVITY DIAGRAM

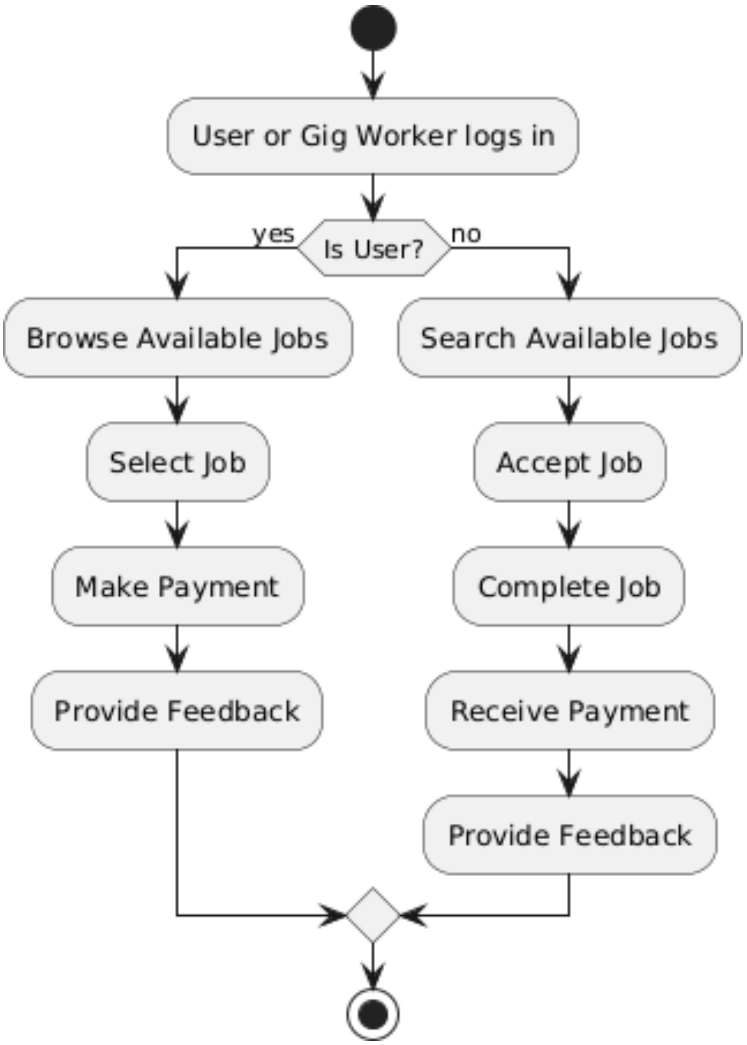

Figure 3.1.6
Activity Diagram

3.1.7 COMPONENT DIAGRAM

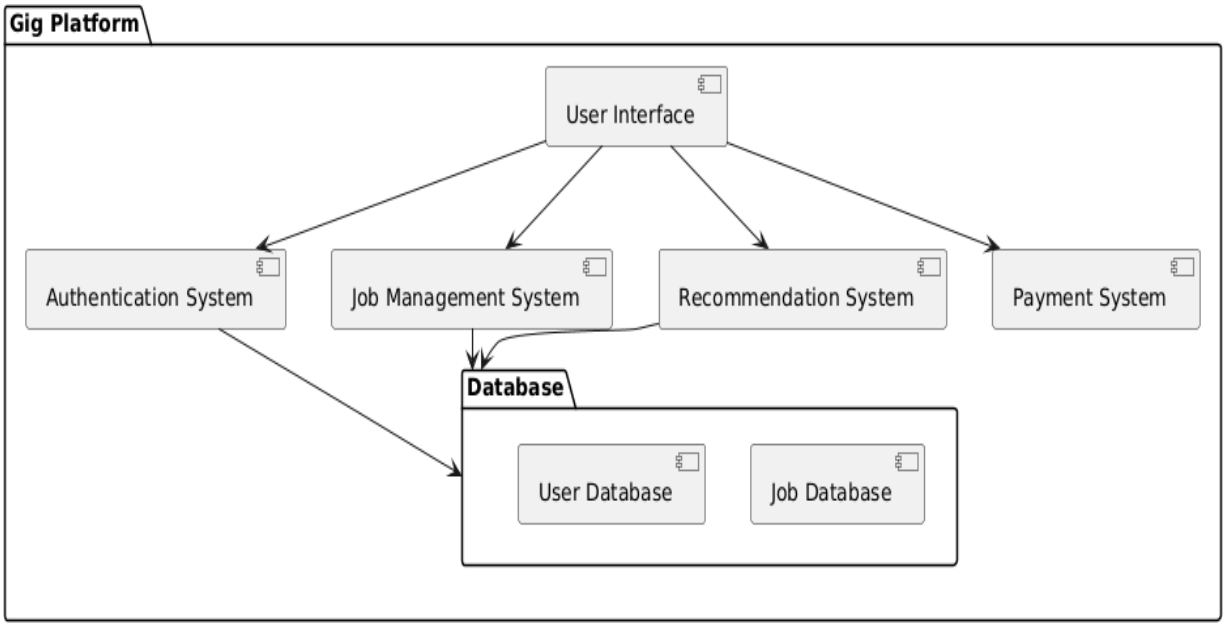

Figure 3.1.7
Component Diagram

3.1.8 COLLABORATION DIAGRAM

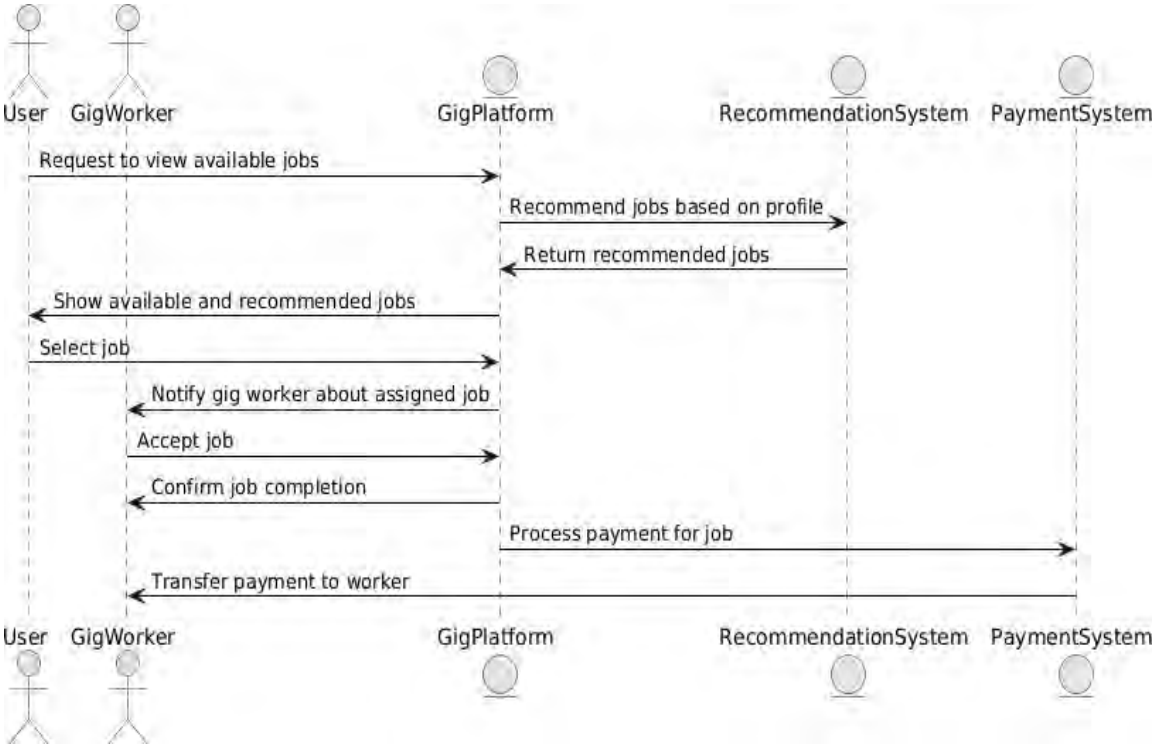

Figure 3.1.8
Collaboration Diagram

3.2 Development Environment

3.2.1 Hardware Requirements

The precise technical parameters and tangible parts required for a software system to be implemented and function properly are referred to as hardware requirements. These specifications list the hardware components required to support the software program. They specify the minimum and recommended hardware configurations to ensure the project's functionality and performance.

COMPONENT	SPECIFICATION
PROCESSOR	Intel Core i7
RAM	16 GB DDR5 RAM
GPU	NVIDIA RTX 3060Ti
HARD DISK	12 GB
PROCESSOR SPEED	MINIMUM 500MHZ

Figure 3.1.9
Hardware Requirement

3.2.2 Software Requirements

It is the software requirements document that contains the system specification. It is a thorough document that describes the functionality and intricate design of the program that has to be created. It acts as a guide for the software development process, making sure that everyone involved understands the needs, features and scope of the project.

- Anaconda Navigator
- Python 3.1.0
- Django

CHAPTER 4
PROJECT DESCRIPTION

4.1 METHODOLOGIES:

A hybrid recommendation-based system, the gig platform aims to connect gig workers who provide services with consumers who are in need of them. In contrast to traditional platforms, this method gives employees the freedom to select employment according to their tastes, abilities, and availability. A single interface is shared by gig workers and users, streamlining communication and preserving transparency. Peer-to-peer networking, secure payment processing, and AI-driven hybrid recommendations for employment matching are some of its key features. By allowing adults and students to earn additional money to meet their financial requirements, the platform fosters inclusion. To guarantee a controlled and localized launch phase, the device's placement is first intended to occur within a 3-kilometer radius of a selected place.

1. Input Handling via Rasa Actions

The single interface design is a cornerstone of the gig platform, ensuring a unified UX for both users and gig workers. By eliminating the need for separate interfaces, the design promotes simplicity, accessibility, and seamless navigation, making it more efficient for all participants. The interface is designed to cater to the distinct needs of users and gig workers while maintaining a cohesive structure.

For users, the interface provides intuitive features to create job postings, browse gig workers' profiles, and communicate with potential hires. These functionalities are accessible through a streamlined dashboard where users can manage their tasks, review job progress, and make payments securely. Filters, such as location, skillset, and availability, enable users to find the right gig workers quickly. Additionally, real-time notifications and chat options ensure efficient communication and timely updates about job status.

For gig workers, the same interface offers features like profile creation, job application, and skill management. They can view and accept job requests, update their availability, and interact with users through the platform's integrated.

The single interface employs a responsive design to ensure functionality across devices, including desktops, tablets, and smartphones. This flexibility makes the platform accessible to a broader audience, regardless of their preferred device. Security measures, such as encrypted communication and two-factor authentication, safeguard sensitive information like payment details and personal data.

The integration of both user and gig worker functionalities into a single interface reduces development complexity and fosters a cohesive ecosystem. It encourages engagement and improves user retention by eliminating confusion and creating a unified experience. This design approach ensures that all platform participants can efficiently fulfill their objectives while enjoying a hassle-free and intuitive interface.

2. Peer-to-Peer Connectivity

An essential component of the gig platform is peer-to-peer (P2P) connectivity, which makes it possible for users and gig workers to communicate directly and effectively. P2P networking guarantees a smooth interchange of data and services, improves platform scalability, and lessens dependency on central servers by facilitating decentralized communication. This strategy supports the platform's objective of offering a responsive and user-centric environment.

P2P networking allows for easier for users to locate and hire gig workers. The platform uses this connectivity to alert relevant gig workers within the designated radius when a task is posted. Through in-app chat, users can speak with possible candidates directly, facilitating speedy negotiations and clarifications. Decision-making is made more transparent and with fewer delays thanks to this direct communication.

Gig workers, on the other hand, benefit from immediate job notifications and real-time communication with users. P2P connectivity allows workers to discuss job details, negotiate terms, and confirm availability without waiting for intermediary

approval. This direct engagement empowers gig workers to take ownership of their tasks and ensures a faster response to user inquiries.

P2P connectivity is smoothly integrated with the hybrid recommendation engine, which improves job matching by recommending the best gig workers to users based on their location, preferences, and job requirements. To further streamline the matching process, gig workers are also given customized job recommendations based on their availability and skill set.

Additionally, P2P communication enhances platform dependability and security. The software speeds up communication and lowers the danger of data breaches by limiting data sharing via central servers. Sensitive information sent between users and gig workers is protected and kept secret thanks to encryption.

All things considered, P2P networking is essential to building an effective, open, and user-friendly ecosystem. It increases the platform's operating efficiency and gives users more control by encouraging open communication and lowering reliance on central mechanisms.

3. Reputation Management and Customer Feedback Systems

Systems for managing consumer feedback and reputation are essential for improving the gig platform's efficiency and legitimacy. These systems combine AI and ML technologies for assessing user reviews and create a dynamic gig worker ranking system. The platform may improve its assessment procedures and provide a comprehensive picture of gig worker performance by integrating data from independent sources like Yelp, TripAdvisor, and Zomato.

The feedback and trust system operates in two primary phases. Initially, it personalizes the gig worker's service to align with customer expectations. This involves identifying key attributes valued by customers, such as punctuality, cleanliness, or technical skill. Gig workers can then focus on these aspects, tailoring their service delivery to meet specific needs. For instance, if a customer prioritizes cleanliness, the gig worker can ensure an orderly and hygienic work environment throughout the task, enhancing customer satisfaction.

As a result, the platform encourages users to submit feedback using personalized metrics that are relevant to their preferences. After processing these inputs, an

integrated AI/ML engine analyzes the reviews' sentiment. When paired with numerical ratings, this approach aids in the classification of gig workers into performance levels. By establishing a merit-based ecosystem that incentivizes achievement, these tiers establish the caliber of work possibilities provided and the corresponding benefits.

The gig platform promotes openness and trust by incorporating data from reliable third-party review platforms. Gig workers gain from having explicit standards for improvement, and customers can rely on genuine assessments to make well-informed selections. This strategy fosters client loyalty through reliable, superior service, promotes mutual accountability, and inspires employees to uphold high standards.

Finally, the reputation management and feedback system create a competitive yet fair environment, enabling the creation of a strong and customer-centric gig economy.

4.1.1 RESULT DISCUSSION:

With its customized, hybrid recommendation-driven ecology, the gig platform created for this study seeks to transform the gig economy. As the platform addresses scalability, personalization, and trust-building, testing and evaluation reveal a number of crucial results and features that are essential to its efficacy in supporting gig labor.

1. Unified UI and Accessibility:

Both clients of services and gig workers can engage easily thanks to the single-interface design. The platform makes navigating easier and ensures usability for a wider audience by doing away with the demand for distinct UIs. With just one login, this unified system is intended to facilitate simple operations like job postings, applications, and payment processing.

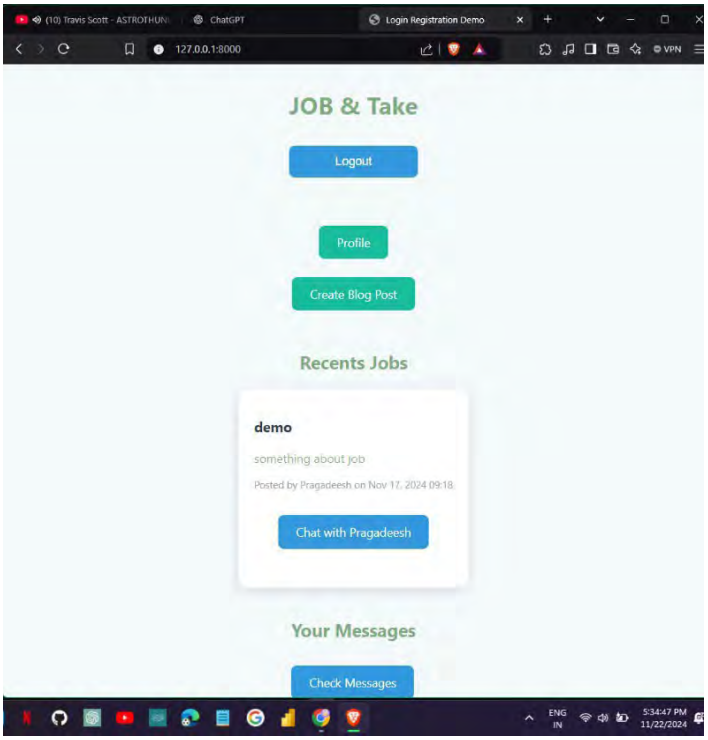

Figure 4.1.1
Unified UI

2. Trust and Reputation System Implementation:

The integration of reputation management and sentiment analysis establishes trust within the ecosystem. Feedback collected from third-party platforms is analyzed using AI, categorizing workers into tiers. This tiered system incentivizes high-quality service delivery, aligning with customer expectations and promoting a transparent merit-based environment.

3. Enhanced Peer-to-Peer Connectivity

Open communication between users and gig workers is emphasized by the site. It ensures transparent transactions by reducing the need for middlemen by facilitating smooth communication. By enabling users to speak to workers directly for clarifications and specific job requirements, this tool also promotes confidence. Better communication channels help gig workers, which can result in more pleased clients and greater client connections.

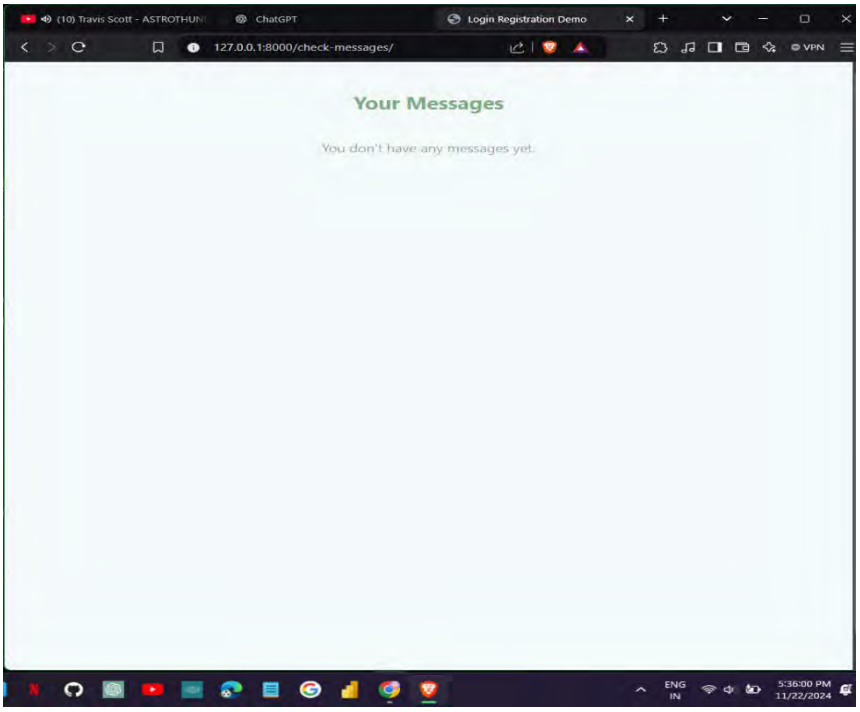

Figure 4.1.2
P2P Connectivity

4. Reputation Management and Feedback System

The platform has a strong reputation management system that allows users to provide comments and ratings for gig workers. This tool encourages employees to uphold excellent service standards while offering useful data to other users. Employees can use feedback analysis to enhance their offerings, creating a circle of accountability and ongoing progress.

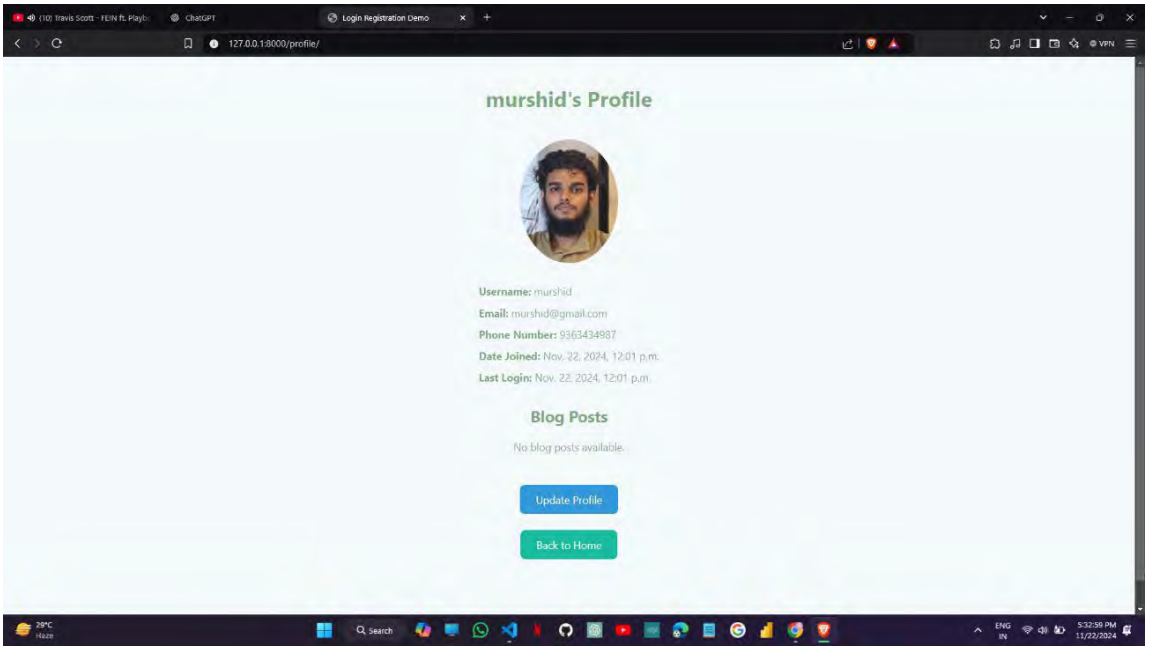

Figure 4.1.3
Reputation Management

5. Simplified Job Matching

A straightforward interface that matches gig worker abilities with user demands facilitates job matching. Time and effort are saved by this streamlined procedure, which guarantees that users are matched with employees who are most appropriate for their needs. This tool gives gig workers access to job options that match their skills, increasing job satisfaction.

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CHAPTER 5

5.1 CONCLUSION

The completion of Phase 1 of the gig platform project marks a significant milestone in creating a seamless and efficient solution for connecting gig workers with users. This phase successfully established the platform's core functionality, emphasizing user-friendliness and essential features to enhance the experience for both parties. A unified interface was developed, eliminating the need for separate platforms for gig workers and users. This design streamlines navigation, allowing both groups to interact easily within a single, intuitive environment. The job posting feature was designed to be straightforward and efficient, enabling users to post jobs with clear descriptions, criteria, and preferences. This simplicity ensures that users can quickly find suitable gig workers, improving overall user experience and expediting the job-matching process. Additionally, peer-to-peer connectivity was introduced, fostering direct communication between users and gig workers. This feature enhances trust and transparency by allowing real-time negotiation, job detail clarification, and progress updates. A basic feedback system was also integrated, enabling users to rate gig workers after job completion. This not only promotes accountability and high-quality service but also helps gig workers build a strong reputation over time. To further enhance interaction, a basic chat feature was incorporated, allowing seamless real-time communication. Through this feature, users and gig workers can discuss job specifics, resolve queries, and address concerns promptly. Phase 1 lays a solid foundation for future development, with plans to introduce advanced features such as personalized recommendations and enhanced job-matching algorithms. These enhancements will scale the system, boost user engagement, and adapt to the evolving needs of gig workers and users, ensuring a continuously improved platform experience in subsequent phases.

5.2 FOR PHASE 2

A major improvement will be made in phase two of the project, which is going to concentrate on integrating a localized service model and a hybrid recommendation system. The hybrid recommendation system will employ both collaborative and content-based filtering techniques, enabling more accurate and personalized job matching

between gig workers and users. The algorithm will make personalized recommendations by examining user preferences, work histories, and gig worker skills, guaranteeing that the right person is paired with the correct job.

The system will also incorporate a localized service function, initially focusing on a 3-kilometer radius surrounding the user's location. This will improve consumer convenience and guarantee a quicker, more effective experience by enabling gig workers to offer their services throughout a predetermined radius. The platform hopes to strengthen ties between communities by emphasizing localized services, which would enable gig workers develop a more dependable clientele and give customers faster access to services. The platform in question will become faster and dynamic as a result of these enhancements, opening the door to a gig economy and is more user-focused and efficient.

APPENDIX

IMPLEMENTATION CODE:

views.py

```
from django.contrib.auth.models import User
from django.urls import reverse_lazy
from django.shortcuts import render, redirect,get_object_or_404
from django.contrib.auth.decorators import login_required
from django.contrib.auth.views import LoginView, LogoutView
from .forms import CustomUserCreationForm, BlogPostForm, ProfileUpdateForm
from .models import BlogPost, ChatMessage

@login_required
def home(request):
    blog_posts = BlogPost.objects.all()  # Fetch all blog posts
    return render(request, "home.html", {"blog_posts": blog_posts})

@login_required
def profile(request):
    user = request.user  # Get the current logged-in user
    return render(request, 'profile.html', {'user': user})

def signup(request):
    if request.method == "POST":
        form = CustomUserCreationForm(request.POST, request.FILES)
        if form.is_valid():
            form.save()
            return redirect("app:login")  # Redirect to the login page after signup
    else:
        form = CustomUserCreationForm()
    return render(request, "registration/signup.html", {"form": form})

class CustomLoginView(LoginView):
    template_name = 'registration/login.html'

class CustomLogoutView(LogoutView):
    next_page = reverse_lazy('app:login')  # Use URL name for redirection

@login_required
```

```python
def create_blog_post(request):
    if request.method == "POST":
        form = BlogPostForm(request.POST)
        if form.is_valid():
            blog_post = form.save(commit=False)
            blog_post.author = request.user  # Set the author to the current user
            blog_post.save()
            return redirect('app:home')  # Redirect to home after saving
    else:
        form = BlogPostForm()

    return render(request, 'blog/create_blog_post.html', {'form': form})  # Ensure
correct path

@login_required
def update_profile(request):
    user = request.user  # Get the current logged-in user
    if request.method == "POST":
        form = ProfileUpdateForm(request.POST, request.FILES, instance=user)
        if form.is_valid():
            form.save()  # Save the updated user profile
            return redirect('app:profile')  # Redirect to profile page after saving
    else:
        form = ProfileUpdateForm(instance=user)

    return render(request, 'profile_update.html', {'form': form})


# Chat and messaging views
@login_required
def check_messages(request):
    user = request.user  # Logged-in user

    # Get all messages where the logged-in user is the receiver
    received_messages = ChatMessage.objects.filter(receiver=user)

    # Group messages by sender for easier display
    conversations = {}
    for message in received_messages:
        other_user = message.sender
        if other_user.username not in conversations:
```

```
            conversations[other_user.username] = []
        conversations[other_user.username].append(message)

    return render(request, 'check_messages.html', {'conversations': conversations})


@login_required
def send_message(request):
    if request.method == "POST":
        sender = request.user  # logged-in user
        receiver_username = request.POST.get('receiver_username')
        content = request.POST.get('content')

        # Ensure receiver exists
        try:
            receiver = User.objects.get(username=receiver_username)
        except User.DoesNotExist:
            return render(request, 'error.html', {'error': 'Receiver does not exist'})

        # Create and save the message
        message = ChatMessage(sender=sender, receiver=receiver, content=content)
        message.save()

        # Redirect back to the messages page with a success message
        return redirect('app:check_messages')

    return redirect('app:check_messages')  # If not a POST, redirect to the check
messages page

@login_required
def chat_room(request, user1, user2):
    # Get the logged-in user and the other user involved in the chat
    logged_in_user = request.user
    other_user = get_object_or_404(User, username=user2)

    # Check if the logged-in user is either of the two users
    if logged_in_user.username != user1 and logged_in_user.username != user2:
        return redirect('app:check_messages')  # Redirect to messages if not part of
the chat

    # Fetch all messages between the two users (sender and receiver)
    chat_messages = ChatMessage.objects.filter(
```

```
        sender__in=[logged_in_user, other_user],
        receiver__in=[logged_in_user, other_user]
    ).order_by('created_at')  # Order messages by creation time

    if request.method == "POST":
        content = request.POST.get('content')
        if content:
            # Send the message if there's content
            message = ChatMessage(sender=logged_in_user, receiver=other_user,
content=content)
            message.save()

            # Redirect to the same chat room after sending the message
            return redirect('app:chat_room', user1=user1, user2=user2)

    return render(request, 'chat/chat_room.html', {
        'other_user': other_user,
        'chat_messages': chat_messages,
    })
```

models.py

```
from django.contrib.auth.models import AbstractUser
from django.db import models

class CustomUser(AbstractUser):
    email = models.EmailField(unique=True)
    phone_number = models.CharField(max_length=15, blank=True, null=True)
    profile_photo = models.ImageField(upload_to='profile_pics/',
default='profile_pics/default.png')  # Update path to default image
    groups = models.ManyToManyField(
        'auth.Group',
        related_name='customuser_set',  # Custom related name to avoid conflict
        blank=True
    )
    user_permissions = models.ManyToManyField(
        'auth.Permission',
```

```
        related_name='customuser_permissions',  # Custom related name to avoid conflict
        blank=True
    )

    def __str__(self):
        return self.username

class BlogPost(models.Model):
    title = models.CharField(max_length=200)
    content = models.TextField()
    author = models.ForeignKey(CustomUser, on_delete=models.CASCADE)  # Use CustomUser here
    created_at = models.DateTimeField(auto_now_add=True)

    def __str__(self):
        return self.title

class ChatMessage(models.Model):
    sender = models.ForeignKey(CustomUser, related_name='sent_messages', on_delete=models.CASCADE)
    receiver = models.ForeignKey(CustomUser, related_name='received_messages', on_delete=models.CASCADE)
    content = models.TextField()
    created_at = models.DateTimeField(auto_now_add=True)

    def __str__(self):
        return f"From {self.sender.username} to {self.receiver.username} - {self.created_at}"

    class Meta:
```

```
    ordering = ['created_at']
```

FrontEnd Code:

```
{% extends "base.html" %}

{% block content %}
<div class="container homepage">
  <header>
    <h1>JOB & Take</h1>
    <form method="post" action="{% url 'app:logout' %}" class="logout-form">
      {% csrf_token %}
      <button type="submit" class="btn btn-primary">Logout</button>
    </form>
  </header>

  <div class="links">
    <a href="{% url 'app:profile' %}" class="btn btn-secondary">Profile</a>
    <a href="{% url 'app:create_blog_post' %}" class="btn btn-
secondary">Create Blog Post</a>
  </div>

  <section>
    <h2>Recents Jobs</h2>
    {% if blog_posts %}
    <ul class="blog-posts">
      {% for post in blog_posts %}
      <li class="blog-post">
        <h3>{{ post.title }}</h3>
        <p>{{ post.content }}</p>
        <small>Posted by {{ post.author.username }} on {{
post.created_at|date:"M d, Y H:i" }}</small>
```

```
            <div class="actions">
                <!-- Chat Button -->
                <a href="{% url 'app:chat_room' request.user.username
post.author.username %}"
                    class="btn btn-info">Chat with {{ post.author.username }}</a>

            </div>
        </li>
        {% endfor %}
    </ul>
    {% else %}
    <p>No blog posts available.</p>
    {% endif %}
  </section>

  <!-- New Section for Messages -->
  <section>
    <h2>Your Messages</h2>
    <!-- Check Messages Button -->
    <a href="{% url 'app:check_messages' %}" class="btn btn-primary">Check
Messages</a>
  </section>
</div>
{% endblock content %}
```

Profile.html

```
{% extends "base.html" %}

{% load static %}

{% block content %}
```

```
<div class="container profile">
  <header>
    <h1>{{ user.username }}'s Profile</h1>
  </header>

  <div class="profile-photo">
    {% if user.profile_photo %}
    <img src="{{ user.profile_photo.url }}" alt="{{ user.username }}'s Profile
Photo" class="img-thumbnail"
        style="max-width: 150px;">
    {% else %}
    <img src="{% static 'images/default.png' %}" alt="Default Profile Photo"
class="img-thumbnail"
        style="max-width: 150px;">
    {% endif %}
  </div>

  <section class="user-info">
    <p><strong>Username:</strong> {{ user.username }}</p>
    <p><strong>Email:</strong> {{ user.email }}</p>
    <p><strong>Phone Number:</strong> {{ user.phone_number }}</p>
    <p><strong>Date Joined:</strong> {{ user.date_joined }}</p>
    <p><strong>Last Login:</strong> {{ user.last_login }}</p>
  </section>

  <section>
    <h2>Blog Posts</h2>
    {% if user.blogpost_set.all %}
    <ul class="blog-list">
      {% for post in user.blogpost_set.all %}
      <li>
```

```
            <h3>{{ post.title }}</h3>
            <p>{{ post.content|truncatewords:30 }}</p>
            <p><strong>Created at:</strong> {{ post.created_at }}</p>
        </li>
        {% endfor %}
    </ul>
    {% else %}
    <p>No blog posts available.</p>
    {% endif %}
  </section>

  <div class="actions">
    <a href="{% url 'app:update_profile' %}" class="btn btn-primary">Update
Profile</a>
    <a href="{% url 'app:home' %}" class="btn btn-secondary">Back to
Home</a>
  </div>
</div>
{% endblock content %}
```

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PAPER PUBLICATION STATUS PHASE I

The paper titled "**JOBTAKE - A GIG PLATFORM FOR JOBS USING HYBRID RECOMANDATION SYSTEM**", authored by Dr. S. Anantha Sivaprakasam, Muhammed Jazil and Pragadeeshwaran S was submitted to the **INTERNATIONAL CONFERENCE ON EMERGING RESEARCH IN COMPUTATIONAL SCIENCE - 2024** in November 2024 and yet to be presented.

MODE OF PUBLICATION: Online

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Track Name: ICERCS2024

Paper ID: 1637

Paper Title: Revolutionizing the Gig Workforce: Technological Shifts and Emerging Opportunities

Abstract:
From 2018 to 2021, India's gig economy underwent substantial growth, increasing from 2-3% to an estimated 8- 10% of the workforce, totaling almost 15 million people. This expansion was driven by enhanced digital infrastructure and the widespread adoption of smartphones, facilitating broader access to flexible employment options via digital platforms in industries such as transportation, food delivery, home services, and freelance digital labor. The COVID-19 pandemic expedited this trend as economic worries and evolving job requirements compelled more individuals, particularly younger, digitally proficient Gen Z workers, to adopt gig labor for financial security and flexibility. Numerous individuals shifted from conventional career trajectories to gig work, either due to necessity or as a lifestyle preference, in response to the burgeoning prospects inside the gig economy. This expansion is facilitated by sophisticated platform technologies that amalgamate marketing, finance, logistics, and client engagement functionalities, establishing a resilient ecosystem for gig workers to function autonomously. Enhanced governmental acknowledgment and the evolution of business models position these platforms to empower gig workers as entrepreneurs, promoting self-employment and widespread financial independence. This study investigates the potential of technology-enabled platforms to transform the Indian home remodeling industry, enabling gig workers to operate their own enterprises through adaptable and tailored gigs. This research underscores the revolutionary impact of the gig economy on work patterns, providing a sustainable alternative to conventional employment and fostering an entrepreneurial ethos within India's developing workforce.

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Authors:
- jaziljayafarc@gmail.com (Primary)
- ananthasivaprakasam.s@rajalakshmi.edu.in
- 210701190@rajalakshmi.edu.in

Secondary Subject Areas: Not Entered

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Revolutionizing the Gig Workforce: Technological Shifts and Emerging Opportunities

Dr. Anantha Sivaprakasam
Department of CSE
Rajalakshmi Engineering College
Chennai, India
ananthasivaprakasam.s@rajalakshmi.edu.in

Muhammed Jazil
Department of CSE
Rajalakshmi Engineering College
Chennai, India
210701168@rajalakshmi.edu.in

Pragadeeshwaran S
Department of CSE
Rajalakshmi Engineering College
Chennai, India
210701190@rajalakshmi.edu.in

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***Index Terms*—Gig Economy India, Business Models in New Technologies, Technology Platforms, Indian Workforce, AI and Automation in Gig Economy, New Opportunities in Digital Commerce, Home Services.**

I. Introduction

Throughout the COVID-19 pandemic, individuals were predominantly restricted to their residences, resulting in a significant strain on domestic resources. Licensed professionals in the handyman sector encountered a distinctive challenge: they could no longer operate in conventional manners while maintaining competitiveness, due to the influx of non-traditional labor into the gig economy. These entrants, frequently recent graduates or workers transitioning from other sectors, have been compelled to choose alternative employment opportunities, including gig work, instead of conventional 9-to-5 positions. Many younger persons have been motivated to pursue careers in the home improvement sector through practical experiences such as repairing faucets or air conditioners. Due to restricted conventional employment opportunities during the pandemic, these individuals are now utilizing their practical abilities to undertake home repair tasks, providing adaptable solutions to address the rising needs of households.

This study analyzes the impact of disruptive technological advancements on the nature of work and emphasizes how future workers, including the unemployed and those yet to join the workforce, are reshaping traditional employment structures. We provide a marketplace technological platform that utilizes disruptive technologies, establishing a technical foundation to facilitate innovative business models inside the gig economy.

These technological platforms diminish obstacles for entrepreneurs and offer a flexible, AI-driven marketplace enhanced by automation and networking functionalities. In India, the gig economy has recently prospered, with platforms such as Urban Company, Housejoy, and Bro4u leading in home improvement and personal services. Furthermore, companies like Dunzo and Swiggy Genie provide gig positions for deliveries and errands, whilst Taskmo and GigIndia concentrate on digital and freelancing employment. These Indian platforms exemplify the proliferation of the gig economy, providing a diverse array of services that signify the worldwide advancement of gig employment across multiple sectors.

II. Literature Survey

In [1], the authors explore the rapid expansion of gig work, now comprising 35% of the U.S. workforce, driven by economic needs and flexibility. Technological advancements in AI, IoT, and 5G have transformed gig platforms like TaskRabbit, enabling efficient connections between workers and clients, especially in home improvement. Trust-building through AI-driven reviews and identity verification is essential for platform reliability. The paper highlights emerging hybrid models, such as Home Depot's Pro Program, which integrate traditional services with gig-based solutions, showcasing a new ecosystem for operational and economic shifts in various sectors.

In [2], the authors address challenges in project allocation on freelancing platforms, where traditional selection processes often lead to unawarded projects and mismatches between freelancers and employers. Prior research has shown that freelancing platforms face issues like budget estimation, skill mismatch, and ineffective recommendation systems. Studies on crowd sourcing and freelance platforms, such as Upwork, highlight the importance of data-driven budgeting and AI-driven recommendation systems to improve project fit. This paper further proposes a machine learning model to stream-line project allocation by analyzing freelancer attributes and preferences.

The gig economy has gained prominence in recent years, transforming the global labor market by offering flexible, short-term employment opportunities. While it provides individuals with autonomy and supplemental incomeIt also comes with difficulties i ncluding u nstable i ncome, i nadequate benefits, and job instability. In Lessons [3], the authors explore both the positive and negative aspects of gig work, focusing on how digital platforms influence l abor r ights a nd economic mobility. The paper suggests that the gig economy's future holds potential for innovation and inclusive growth, provided that platforms evolve to better protect workers.

The paper [4] explores how user feedback can provide insights into the expectations and concerns of gig economy workers and customers. Using sentiment analysis, the study analyzes reviews and comments on various platforms to understand user sentiments. Key findings h ighlight t hat w orkers value flexibility, f air p ay, a nd j ob s ecurity, w hile c ustomers seek reliability and quality. The research underscores the significance of attending to these user requirements in order to improve the platform's overall success. The paper suggests that integrating sentiment analysis into platform design can lead to better alignment with user demands, fostering a more sustainable gig economy.

The gig economy, increasingly recognized as a significant employment model, is characterized by flexible, technology-driven jobs facilitated by platforms [5]. Studies highlight that technology, particularly mobile apps and automation, has been instrumental in expanding gig work by enhancing accessibility and user experience [6]. In emerging markets like India, factors such as smartphone penetration and digital payment adoption have accelerated the gig economy, making it a viable option for diverse labor needs [7]. However, challenges remain regarding job security, benefits, and regulatory standards for gig workers.

The paper [9] explores the intersection of blockchain technology and the gig economy regarding the Fourth Industrial Revolution (4IR). It argues that blockchain can enhance transparency, trust, and security in gig labor platforms by providing decentralized, immutable records of transactions and work agreements. The study highlights how blockchain could address issues such as payment delays, fraud, and lack of worker protections. By enabling smart contracts and direct peer-to-peer transactions, blockchain offers the potential to transform gig work into a more efficient, equitable, and transparent labor market, ensuring fairer compensation and improved working conditions for gig workers.

The paper [10] presents a novel strategy for combining blockchain technology with the use of machine learning (ML) to improve Bangladeshi telemedicine platforms. It explores how blockchain technology can ensure secure, transparent transactions and patient data management while ML algorithms can optimize service delivery by predicting health outcomes and personalizing care. The study focuses on how this hybrid system can empower freelancers in the telemedicine field, offering them flexible work opportunities while addressing challenges like trust, data privacy, and payment delays. The paper proposes a scalable solution that could improve healthcare accessibility and quality for underserved populations in Bangladesh.

The literature study emphasizes how technology is revolutionizing the gig economy and creating new opportunities, particularly in India. There are still a number of obstacles to overcome, though, especially in creating platforms that successfully serve a diverse workforce and provide equitable working conditions. Our research on technology-enabled gig labor, which seeks to offer inclusive, flexible employment alternatives, depends on these insights. To overcome these constraints and improve accessibility and sustainability in the gig economy, future research should concentrate on data security, sector-specific flexibility, and user-centered platform design.

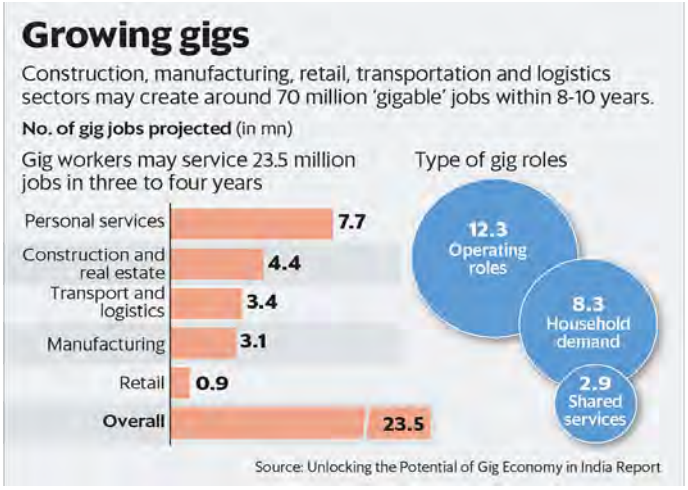

Fig. 1. Gig Market Opportunity

III. MARKET POTENTIAL

Not every industry sector has had the same rate of growth in India's online gig economy. Diverse variables influence the varying rates of adoption across sectors. The evolution of food delivery, the hospitality industry, and transportation in the Indian gig economy is evident to consumers via prominent

platforms such as Zomato, Swiggy, Ola, and Uber. A swiftly growing sector in this domain is house improvement, illustrated by platforms such as Urban Company. The COVID-19 epidemic necessitated remote employment for numerous consumers, resulting in heightened attention to home remodeling initiatives. This increased interest has amplified the demand for skilled labor, which the gig economy is poised to satisfy. Thus, the combination of pandemic-induced demand and the increasing proficiency within the gig economy is instigating a transformative change in the delivery of home remodeling services, akin to trends noted in other segments of the gig economy.

Before the home improvement and other gig economy sectors may become widely popular, a number of outdated or inadequate competencies need to be addressed. In an essay for Construction Business Owner, Greg Barnett, Ph.D. [11], identifies various maturity challenges that must be resolved for gig workers to gain widespread acceptance as a service source for the public. Critical concerns like trust, quality, reliability, liability indemnity, marketing, and financing necessitate substantial improvement. Technological advancements can provide a whole range of capabilities, resulting in the creation of strong service platforms that promote market stability by efficiently balancing demand as well as supply.

Major residential remodeling merchandisers in India are progressively acknowledging that a mixed business model, integrating online platforms with physical locations, produces a superior return on investment relative to conventional store-only strategies. Retailers such as Home Center and Reliance Home have instituted professional programs bolstered by web, mobile, and a laptop applications, markedly improving their sales success. Although professionals constitute a minor fraction of the client base, they significantly impact total sales. In the instance of Home Center, professionals constitute a significant share of sales, highlighting the increasing relevance of this segment in the retail sector. Reliance Home has indicated that its professional sales have emerged as a crucial element of its revenue, demonstrating the efficacy of a blended strategy in fostering growth within the Indian market.

According to a market estimate released in December 2021, the Indian home remodeling market is anticipated to grow between 2021 and 2024, from 3.5 trillion to 6 trillion, representing a growth rate of roughly 71%. This prediction anticipates around 1.75 trillion from retail hardware sales, with the remaining 1.75 trillion derived from services and fees. The professional contracting sector has undergone a substantial decrease, decreasing by 50% from 2014 to 2019. Should this tendency persist with the growth of the gig economy, we may project an addressable market of over 875 billion over the forthcoming four years.

Upon examining the principal segments within the gig economy, it is evident that home improvement constitutes the second-largest growing category, comprising almost 10% of the total 3 trillion market in India. This indicates a reachable target market of approximately 300 billion for gig economy platforms. By merging creative business models with nimble technical elements, these platforms are set to challenge conventional views of work and transform the home renovation sector.

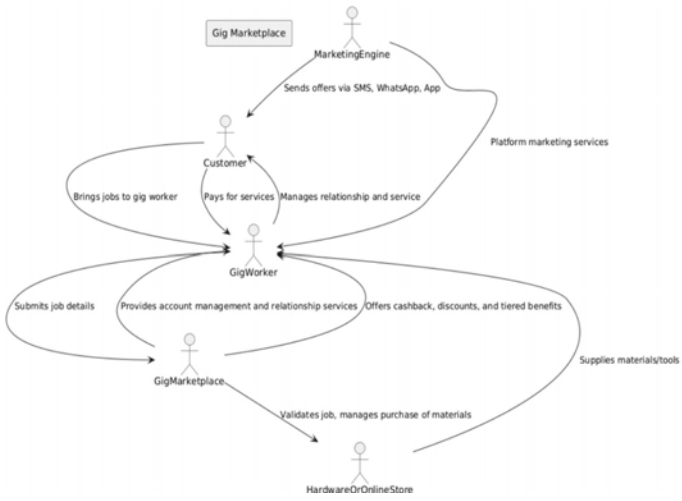

Fig. 2. Gig Economy Business Model

IV. METHODOLOGY

This article presents an innovative business concept aimed at leveraging the burgeoning Gig Economy potential, as described in Section II. 'Pro' programs are currently offered by home improvement stores to contractors. By participating in these schemes, professional contractors obtain access to a reservoir of employment prospects provided by the retailer. These 'Pro' programs utilize technological platforms that efficiently a lign p rojects w ith c ontractors a ccording to their talents, locations, and other pertinent characteristics. Contractors possess the discretion to accept or reject offered assignments. Participants are assessed via an evaluation system and can obtain tiered perks aligned with their qualifications in the 'Pro' program. These advantages may encompass job matching tailored to their tastes, higher-paying employment chances, superior discounts, expanded financing a nd leasing options, and advantageous return trade policies. Moreover, home improvement stores obtain a commission on the profits created by these gig services, in addition to income from the sale of products utilized for the tasks.

In India, many home improvement merchants exhibit a more robust physical presence in large urban centers, whereas others are predominantly found in suburban locales, with a select few achieving a balance throughout diverse places. We offer an innovative business strategy to motivate gig economy workers, regardless of their experience level, to generate revenue for home improvement merchants, thereby establishing them as ambassadors for the brand.

Individuals frequently depend on regional workers for these jobs.The advantage of our approach is its ability to generate additional revenue from projects that local contractors submit

to the platform, which may not be available to a residence improvement retailer. In light of the existing economic environment, numerous local contractors increasingly embody the gig economy workers previously mentioned in this study.

Figure.2 depicts this structure and the relationships among its principal elements. The Gig Marketplace serves as the technology foundation of our business model, using sophisticated technologies and organizational procedures to facilitate an effortless workflow for both gig workers and clients. Consumers approach the Gig Marketplace via mobile, tablet, or online applications, each providing numerous commercial operations akin to those at real retail establishments. The figure delineates a possible series of interactions among gig workers, consumers and traders, presented in numbered steps. This sequence is adaptable, permitting the integration of supplementary business operations and sub-steps as required.

Gig economy workers establish accounts on a home improvement retailer's online marketplace and may choose to enroll in the retailer's 'Pro' program if they satisfy the eligibility requirements. Upon registration and approval, they may post sourced jobs to the platform and establish projects to fulfill these jobs. These tasks frequently necessitate resources, which employees can purchase from the retailer's portfolio while taking advantage of the portal's features and 'Pro' membership. Projects may be completed alone or in collaboration among gig workers or site professionals, or perhaps include subcontracting. The platform suggests appropriate matches by correlating the requisite skills as well as expertise for the job with available personnel in a specified vicinity of the working site. The platform facilitates gig workers in establishing social relationships inside the marketplace, akin to a LinkedIn-style platform for gig economy participants, bolstered by consumer ratings.

The job profile employs an evaluation, rating, and feedback system akin to Indian platforms such as Ola, Swiggy, and UrbanClap. End customers assess the tasks accomplished by gig workers, and the platform utilizes these evaluations and comments, employing machines learning (ML) to align jobs with pertinent skills, worker experience, compensation, and additional criteria. This AI-powered approach facilitates the marketplace in suggesting ideal job pairings for gig employees.

Additionally, gig workers can manage their own targeting, customization, marketing, and advertising campaigns aimed at both end users and other gig employees on the network thanks to the marketplace. This method resembles the business structure of Indian platforms such as Meesho, enabling gig workers to develop customized marketing aimed at prospective customers and collaborators in their local vicinity.

This model of operation enables gig workers to leverage their desire to become entrepreneurs by managing their personal mini-businesses on the network. This arrangement enables them to create a digital presence without the costs associated with developing and sustaining an independent platform from the beginning.

Additionally, this internet marketplace will increase foot traffic to physical businesses, as workers from the gig economy utilize these sites for their requirements. Home renovation retailers can gain from supplementary revenue streams produced by diverse aspects of this business strategy.

V. Enablement-Driven Design Approach

The revolutionary business model described in Section III for merchants is operationalized through the design strategy of the Gig Software technology, which is examined in this section. The marketplace design is shown in Figure 3, emphasizing the use of advanced services and technologies.

This analysis predicts a future gig employee who is highly motivated to engage closely with a specific home improvement merchant through an incentive scheme, even though the present gig worker may be an expert in home renovation. This section outlines the technology and commercial ecosystems necessary for establishing a mutually advantageous agreement for both the gig person and the store.

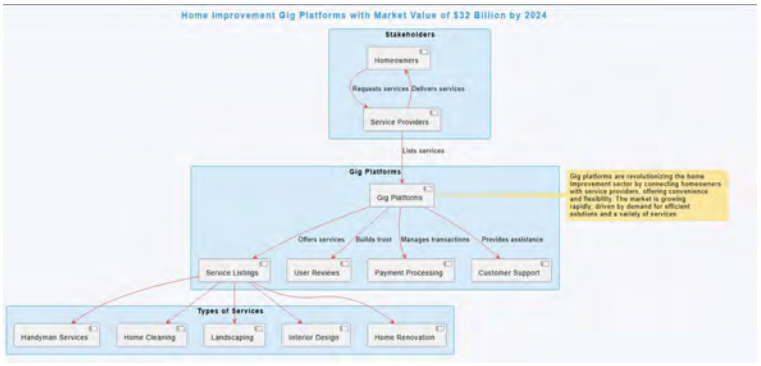

Fig. 3. Concept Design

The freelance worker frequently purchases goods from a specific home improvement store. The gig worker has a tiered pricing structure that rewards recorded loyalty, with higher expenditures yielding larger savings. Additional benefits, like logistics services, may be unavailable to unregistered workers. In future generations, gig workers will offer their skills to potential clients and secure assignments by leveraging the home improvement company's marketing abilities.. They can accomplish this more economically via the marketplace's marketing engine, potentially in collaboration with platforms such as Facebook or Google, thus drawing a broader consumer base.

The forthcoming gig worker will employ the 'Gig Platform' for goods acquisitions and task fulfillment. The platform will provide extensive security measures, guaranteeing security for both the employee and the client. Clients employing gig workers will be granted the capacity to evaluate their performance and provide reviews, promoting authentic interaction inside the platform.In order to promote trust and ease platform growth,

the gig worker's 'Incentive and Recognition' program will be connected to the ratings and reviews.

The Gig Marketplace provides a variety of services to gig workers in exchange for the employment they bring in. These services include:

1. **Incentives and Recognition Program:** The Gig Platform would set up a tiered system of services and non-linear rewards so that users can move up the ranks depending on how often and how much they buy and how much they interact with gig workers through the platform. When ratings and reviews are regularly great, you may also be promoted to higher tiers. Later in this part, we'll talk about how ratings, feedback, and loyalty all function together. The use of Zapper and TapMango, two third-party systems, gives gig workers peace of mind that their commitment is being acknowledged by the right people. In order to determine the most important loyalty vectors, the AI/ML engine developed for specific audience loyalty will examine comments made by a wide variety of consumers. With this data, employees can better target their marketing efforts and bring in new members who share their appreciation for the features and advantages offered by the loyalty program.

2. **Payment, Finances, Insurance, and Theft Activity Services:** The Gig Platform fosters different methods of payment, including the ability to redeem rewards. Having a payment gateway that is constantly available ensures that there are no delays or worries about timely payments for both gig workers and clients. The reliability and availability of payment platforms will be much improved with 5G speeds. When applied to the problem of fraud, AI and ML will produce far fewer errors than current methods.

3. **Security, Access Control, and Regulatory Service:** Enhancing the security of transactions and encouraging repeat business, placing transactions through platform affiliated with a respected store provides regulatory compliance services, controls access, and ensures the safety of financial transactions. To guarantee a higher degree of compliance, the Gig Platform will follow regulatory requirements for data transfer and encryption. The cloud platform's managed services will make managing identities and credentials a breeze. Reduced login times and greater edge processing capabilities will improve the user experience, and users will be able to access functionalities from wherever they are, especially job sites, thanks to the fast speeds and dependability of 5G connections.

4. **Services for Engagement** (a) creating a community where gig workers and customers can openly work together on similar pursuits through communities and conversation threads; and (b) using instant messaging platforms like WhatsApp for business. This method will increase customer engagement and improve collaboration among gig workers, making the retailer's affiliated gig workers more appealing and reliable.

5. **Professional Networking and Collaboration Services:** Gig workers can advertise and market their services using this program, which offers professional connections and team-building tools. Several home improvement stores have begun advertising on social media, including Lowe's and Home Depot. The sophisticated networking and collaboration features will be adapted to the unique requirements of gig workers; it will operate similarly to a LinkedIn platform created for home improvement gig workers. A home improvement retailer will incorporate the teaming service into their Gig Marketplace. It will use AI and ML algorithms to find the best collaborators according to a variety of configurable criteria, including location, talents, reviews, customisation, and more. By utilizing artificial intelligence and machine learning, retailers may create matching algorithms that examine their digital footprint (including microsites, social media channels, and websites) to identify client pain points. This will help them match clients with gig workers who are a good fit for their needs and budget so that they can use the retailer's products and services to their full potential.

6. **Administrative Management Services:** Gig workers produce taxable income, and because to the government's diverse approaches to the pandemic, remaining educated about new rules is essential for ensuring compliance. The government regularly modifies regulations in reaction to societal requests. Ensuring compliance might be difficult if operations are not efficiently optimized. An interactive dashboard exclusive to the Gig platform will provide real-time updates on all applicable compliance and regulatory standards, including government mandates. A compliance meter that shows the gig worker's status in terms of color-coding will be part of this dashboard. If the gig worker's performance drops below the predetermined thresholds, certain features or the entire program can be temporarily disabled as they take the necessary actions to get back into compliance.

7. **Reputation Management and Customer Feedback Systems:** Third-party review platforms like Yelp, TripAdvisor, and Zomato are progressively utilizing AI and ML to enhance their evaluation methodologies. As consumers increasingly depend on these platforms for their buying choices, they are bound to develop loyalty towards particular gig workers. Two steps will be taken by the Feedback, Reviews, and Trust Services engine: initially, it will customize the gig worker's services to align with the primary aspects that appeal to customers; subsequently, it will motivate customers to provide feedback utilizing relevant metrics that are significant to them. If a client values order, worker can emphasize attention to maintaining an orderly workstation, proactively ensure a hygienic environment, and regularly reaffirm their dedication to

cleanliness. This concentrated emphasis throughout service delivery is expected to improve the likelihood of obtaining favorable ratings that align with the customer's fundamental values.The Gig Platform will utilize third-party businesses, such Zomato and TripAdvisor, to obtain ratings and reviews. The collected comments will be subjected to sentiment analysis by an integrated AI/ML engine, which will then combine the results with the ratings to assign the gig worker to a specific tier. The quality of gigs acquired from the store and the benefits associated with that tier will be determined by this tier classification.

8. **Peer to Peer Connectivity:** The Gig Platform incorporates a peer-to-peer connectivity system that facilitates seamless communication and secure transactions between clients and gig workers. Through an integrated chat feature, clients can directly interact with gig workers to discuss project details, expectations, and progress. This real-time communication is encrypted to ensure privacy and data security. Additionally, the platform offers a built-in payment gateway, enabling clients to make secure payments directly to gig workers without involving third-party apps. This streamlined process fosters trust and reliability while minimizing payment delays and potential disputes. The combination of encrypted chat and a secure payment system ensures that both parties can interact confidently, enhancing overall user satisfaction and platform credibility.

9. **Geo-location Services:** Mobility services comprise a variety of emerging technologies that are still not broadly available in all markets within India. The advent of 5G and forthcoming mobile technologies will enable the platform to deliver high-bandwidth applications, including video conferencing, augmented reality (AR), location services tracking, and cloud-based storage solutions, readily accessible to consumers. In the Gig Platform, hardware shops and gig workers will each have their own login choices. By employing a powered by the cloud archive for government records and document scanning, it will make it easier for new gig workers to register online. The platform's Augmented Reality (AR) capabilities will be used by both gig workers and retail professionals to improve consumer visualization and demonstration. This will make it easier for customers to understand what they need, get interactive answers to their questions, verify their selections in their environment, and ultimately make a purchase. Due to AR's function in confirming product selections and organizing the supply of certain hardware and materials to building sites, chances for upselling and cross-selling will also present themselves. In the long run, augmented reality services will cut down on returns and wasted time by making sure that customers get what they expect from the things they buy. The Indian government's implementation of legislation for drone operations will eliminate the need for gig workers to make lengthy journeys to collect forgotten things, such as screws.Small and medium-sized items can be delivered directly to gig workers' locations or other specified locations using drones. This method provides a practical substitute for traditional in-store pickups, reducing travel time and allowing gig workers to concentrate more efficiently on their tasks.

10. **Personalization Services:** Gig workers can use the Marketing Services offered on the Gig Hub platform to advertise their services and notify clients of deals and promotions. The platform would enable customized functionality, like delivery timing and employment matching according to user preferences. An "emotionally engaging" experience might be offered to customers during product searches in order to induce a speedy purchase. But there is a long way to go before the existing technologies are put into practice. The Gig Marketplace aims to close this gap by incorporating state-of-the-art technologies like 5G, the Internet of Things (IoT), artificial intelligence (AI), and machine learning.

VI. Conclusion

Presently, numerous home improvement businesses employ a business model in which clients directly present projects to them, engaging 'Pro' contractors to execute the work. Conversely, the business we propose model incentivize gig workers to contribute jobs to the retailer's business environment, thereby functioning as brand ambassadors. As a result, the marketing and services offered by the marketplace hub mentioned in Section IV benefit these gig workers. By using this tactic, retailers can reach customers in areas where their physical presence and brand recognition are low, creating new sources of income.

We argue that groundbreaking business models, like the one we've suggested, backed by cutting-edge tech platforms, can revolutionize the home renovation industry's operations and tap into the growing global Gig Economy workforce. The home remodeling sector is the primary focus of this study, but the potential presented by the Gig Economy are vast and relevant to many other sectors as well. The development of these new models will be greatly influenced by government regulations that safeguard the needs of gig economy workers and consumers as well as by cultural factors and trust.

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ORIGINALITY REPORT

14%	6%	12%	6%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	Shubhadip Ray, Norbert Herman, Indrajit Sen. "Disruptive Transformation Fueling Gig Economies", 2021 IEEE Technology & Engineering Management Conference - Europe (TEMSCON-EUR), 2021 Publication	8
2	link.springer.com Internet Source	1%
3	research.chalmers.se Internet Source	1%
4	Submitted to University of Illinois at Urbana-Champaign Student Paper	1
5	Muhammad Zohaib Siddique, Muhammad Basit, Iqra Fatima. "Empirical Study for Improving Project Allocation on Freelancing Platform", 2022 International Conference on Innovation and Intelligence for Informatics, Computing, and Technologies (3ICT), 2022 Publication	1

CO-PO Mapping

PROJECT WORK COURSE OUTCOME (COS):

CO1: On completion the students capable of execute the proposed plan and become aware of and overcome the bottlenecks throughout every stage.

CO2: On completion of the project work students could be in a role to take in any difficult sensible issues and locate answer through formulating right methodology.

CO3: Students will attain a hands-on revel in in changing a small novel idea/ method right into an operating model / prototype related to multi-disciplinary abilities and/or understanding and operating in at team.

CO4: Students will be able to interpret the outcome of their project. Students will take on the challenges of teamwork, prepare a presentation in a professional manner, and document all aspects of design work

CO5: Students will be able to publish or release the project to society.

PROGRAM OUTCOMES (POs):

PO1: **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2: **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3: **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8: **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10: **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES (PSOS)

PSO1: **Foundation Skills:** Ability to understand, analyze and develop computer programs in the areas related to algorithms, system software, web design, machine learning, data analytics, and networking for efficient design of computer-based systems of varying complexity. Familiarity and practical competence with a broad range of programming language and open-source platforms.

PSO2: **Problem-Solving Skills:** Ability to apply mathematical methodologies to solve computational task, model real world problem using appropriate data structure and suitable algorithm. To understand the Standard practices and strategies in software project development using open-ended programming environments to deliver a quality product.

PSO3: **Successful Progression:** Ability to apply knowledge in various domains to identify research gaps and to provide solution to new ideas, inculcate passion towards higher studies, creating innovative career paths to be an entrepreneur and evolve as an ethically socially responsible computer science professional.

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	2	2	1	3	1		2	2	1	1	1	-	2	3	2
CO 2	3	3	2	2	2		1	1	1	-	-	2	3	2	1
CO 3	2	2	2	3	1		1	2	1	-	-	2	2	3	2
CO 4	3	3	2	2	2		1	1	2	1	-	2	3	2	1
CO 5	3	2	2	3	2		2	1	-		-	3	3	2	1
Average	2.8	2.6	2.4	1.8	2.6	1.6	1.4	1.4	1	0.4	0.2	0.4	2.6	2.4	1.4