

AI-Enabled Gig Platforms and Workforce Management: Implications for Skill Development, Worker Protection, and Sustainable Employment in India

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Abstract

The gig economy is a dynamic and adaptable labour market characterised by short-term, project-based work, where people frequently work as independent contractors and use digital platforms to interact with customers. As industries and labour markets evolve, artificial intelligence (AI) is playing an important role in the gig economy's digital revolution. The traditional gig economy, characterised by efficiency, low-cost services and rapid scaling, is undergoing significant change due to the integration of AI technology. The AI-enabled gig economy aims to enhance productivity, quality control, personalised experience and sustainable employment. Along with various advancements, the use of AI also raises issues such as the need for upskilling, data privacy and job displacement. The study reviews the literature on how AI-driven gig platforms help gig workers develop their skills. Secondly, it will investigate the extent to which gig workers benefit from AI in terms of job security, income stability and safety. The study adopts a qualitative research methodology based on secondary data, and pertinent information was gathered from peer-reviewed journal papers on the AI-enabled gig economy and its impact on gig workers. The findings of the study assist policymakers in concentrating on sustainable employment for society in the AI-driven economy and will also guide in addressing issues such as worker classification based on improved skills, benefits and workers' protection, while implementing new tactics to capitalise on gig culture and upholding moral and legal requirements in a fast-paced workplace.

Keywords: Gig economy, Artificial Intelligence, Skill Development, Worker Protection, Sustainable employment.

INTRODUCTION

In the age of digitalisation, the gig economy's rise and spread have transformed conventional ideas of work, worker dynamics and reversed long-held economic theories. The global labour market views this economy as a disruptive force that has changed employment trends and economic prospects. The gig economy, powered by online platforms that link independent contractors with clients and businesses, is characterised by short-term, flexible, and freelance work arrangements. The freelance economy has expanded dramatically over the past ten years as more people opt for flexible job arrangements. Gig-based arrangements have replaced traditional employment patterns due to evolving customer tastes,

technological improvements, and workers' desire for autonomy. While supporters applaud the gig economy's capacity to offer flexibility and extra cash, detractors express worries about job insecurity, a lack of benefits, and the deterioration of labour rights.

In other words, while the gig economy offers workers a flexible approach to job profiles, it also poses serious challenges to social rights, job stability, and quality. In addition to facing obstacles to collective bargaining and labour rights, many gig workers also confront economic insecurity and lack access to basic benefits like health insurance and retirement savings. Furthermore, the growth of gig work may lead to a decline in traditional job connections, reducing chances for social mobility, career promotion, and skill development. Thus, policymakers, corporations, and society at large must comprehend how the gig economy affects workforce dynamics and economic resiliency.

In this context, the present study seeks to examine the implications of AI-enabled gig platforms on workforce management in India, focusing on skill development, worker protection and sustainable employment. The study aims to contribute to the growing discourse on the future of work by analysing the opportunities and challenges associated with AI-driven gig employment.

Review of Literature :

Mali (2020) analysed the growth and implications of the gig economy in India. It states that labour options, digital platforms, and technological developments drove the gig economy's explosive growth. With almost 15 million workers, India is second in the world for professional contributions made by independent contractors. Particularly in industries like e-commerce, food services, and information technology, the gig economy offers new job prospects, flexibility, and cost-effectiveness. However, obstacles that could impede sustained growth still exist, including a lack of legal protection, social security benefits, employment security, and management problems. The gig economy is growing in popularity in Indian labour markets and affects organisational and economic dynamics, even though it is not changing traditional employment.

Banik and Padalkar (2021) examined the growth and consequences of the gig economy, leading to temporary employment through online platforms that have changed labour markets around the world. According to the study, gig work features low entry barriers, platform-enabled partnerships, an on-demand nature, and consistent outcomes. It has been mentioned that, since the gig economy impacts income distribution, employment trends, labour productivity, organisational environments, etc., there is a need for legal obligations in India to achieve positive outcomes. The authors' model linked the scale of the gig economy to macroeconomic variables per capita income and the number of gig workers, which are negatively correlated, but technology infrastructure has a positive correlation. The study's conclusion calls for legislative measures for displaced workers and emphasises the need for research on the gig economy's unequal distribution across professions.

Pawar and Srivastava (2022) have investigated the employment rules about gig workers in India. It has been argued that legislative measures, such as regulating agencies and dispute resolution procedures, should be implemented to protect gig workers from employment insecurity, inconsistent income, and unclear legal status. The study stated that while nations like the United States, the United Kingdom, and Brazil have different strategies regarding gig workers, India needs comprehensive laws to formalise the rights of gig workers.

Thankachan (2024) investigated the gig economy's growth possibilities in India. The gig economy has expanded significantly worldwide and incorporates fixed-term contracts or payments made on a project-

by-project basis via internet platforms, while in India, too, the scope of the gig economy is expanding due to technology usage, employment prospects, urbanisation, shifting labour dynamics, and governmental laws. It has been highlighted that though opportunities like flexible work schedules, increasing consumption, entrepreneurship, short-term employment, and skill development are present in the gig culture, difficulties like inadequate legal frameworks, unstable income, a lack of social protection, labour exploitation, and market disruption need to be taken into account, and proper solutions need to be implemented. Although India's gig economy has room to grow, resolving the related issues is essential to balance worker security, productivity, and flexibility.

Dr. Jyotirmoy Koley (2025) has examined the gig economy in India and identified its complicated effects, revealing both opportunities and challenges. According to the study, the gig economy has grown significantly. The number of gig workers increased from 2.52 million in 2011–12 to 6.8 million in 2019–20, representing a compound annual growth rate of 16.78%. According to the probe, the researcher used NITI Aayog's data, which showed an anticipated 7.7 million gig workers in the fiscal year 2020–2021; the number is expected to rise to 23.5 million by 2029–2030. Positive effects of the gig economy include flexibility, autonomy, revenue streams, and opportunities for skill development; drawbacks include unstable employment, a lack of benefits and protection, and financial hardship during recessions. Regulatory issues have been raised, including the need for comprehensive regulatory frameworks to address worker categorisation, rights, and protection, gaps in the legal recognition and enforcement of gig workers' rights, and uncertainty regarding employment status and eligibility for benefits. It has been concluded that strict regulation and policy design are necessary to promote equitable and sustainable development, even if the gig economy presents significant prospects for employment generation and economic growth in India. Additionally, since this sector is still in its infancy, ongoing research and adaptable policy formulation will be crucial to addressing emerging problems and maximising benefits for all stakeholders.

The literature generally emphasises the gig economy's expansion and difficulties, but it pays little attention to AI-driven changes, which is why the current study is necessary.

Objectives

1. To review existing literature on the role of AI-driven gig platforms in facilitating skill development among gig workers.
2. To examine the challenges related to worker protection in AI-enabled gig work, focusing on job security, income stability and access to social protection

Research Gap -

Despite the growing body of research on the gig economy in India, several gaps remain unaddressed. First, most current research pays little attention to how artificial intelligence (AI) is reshaping gig platforms and instead focuses on the expansion, prospects, and challenges of gig employment. The impact of AI-driven processes on skill development and workforce management is not thoroughly examined, even though prior research has focused on employment flexibility and structural issues. Second, there is a lack of comprehensive research linking AI use to worker protection concerns such as access to social benefits, job security, and income stability. Third, the idea of sustainable employment in the context of AI-enabled gig platforms has received little attention. Although regulatory issues are

recognised, there isn't enough discussion on how AI can boost productivity while maintaining ethical labour standards and long-term workforce sustainability.

Therefore, the current study aims to bridge these gaps by providing a comprehensive overview of AI-enabled gig platforms and concentrating on skill development, worker protection, and sustainable employment in the Indian context. Below is a conceptual framework with a structured understanding of the study variables.

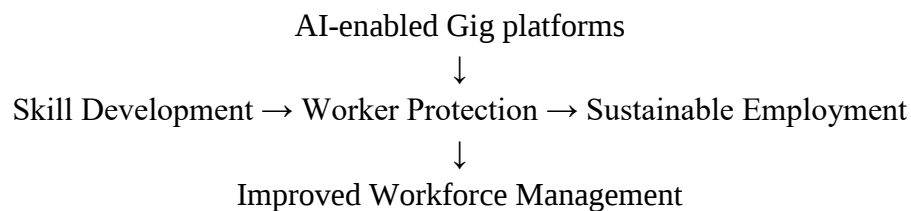


Figure 1: AI-Enabled Gig Economy Conceptual Framework and Workforce Outcomes

Research Methodology

The present research focuses on the effects of AI-enabled gig platforms on skill development, worker protection, and sustainable employment in India using a qualitative and descriptive research design solely on secondary data. Secondary sources include peer-reviewed journal articles and government reports. The study's data came from conference papers, NITI Aayog publications, and other academic works concerning artificial intelligence and the gig economy. A comprehensive review of the literature has been conducted to identify significant themes and trends about the evolving nature of gig employment.

The primary concerns- sustainable employment, worker protection, and AI-driven skill development- were categorised following data analysis. Although the Indian context is the study's main focus, it also includes global perspectives to make the research more comprehensive. However, because the study uses secondary data, its conclusions are constrained by the availability and interpretation of previously published material and lack empirical validation from primary data collection.

Analysis and Discussions

The analysis emphasises how AI-enabled gig platforms have revolutionised workforce management by promoting flexible employment options and skill development. However, in the developing gig economy, issues with worker protection, financial security, and long-term employment remain major problems.

1. Skill development in AI-Enabled Gig Platforms

Gig workers' skill development has been significantly influenced by the integration of Artificial Intelligence (AI) into gig platforms, creating a technologically advanced workplace that necessitates ongoing learning and flexibility. According to Mali (2020) and Banik & Padalkar (2021), AI-enabled systems provide effective job matching and tailored task allocation, enabling workers to engage in jobs aligned with their skills, thereby improving productivity and skill utilisation. Additionally, to stay competitive in the labour market, digital platforms motivate workers to learn new technical and soft skills (Thankachan, 2024). However, this shift also has drawbacks, as people with limited access to technology or digital literacy may find it difficult to engage in AI-driven gig labour. Therefore, even if AI promotes skill development, it also involves ongoing upskilling and reskilling to prevent technological exclusion.

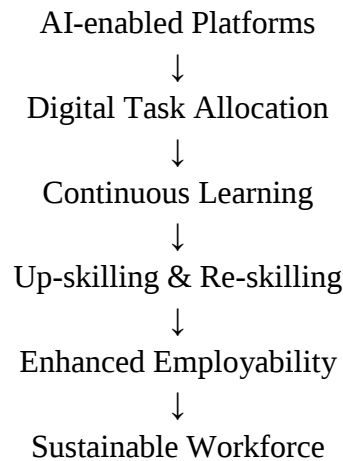


Figure 2: AI-Driven Skill Development Process in Gig Platforms

2. Worker Protection in AI-Driven Gig Economy

Despite the advancements brought by AI, worker protection remains a major concern in the gig economy. According to research, gig workers frequently experience employment insecurity, inconsistent pay, and limited access to basic social security benefits, including health insurance and retirement benefits (Pawar & Srivastava, 2022; Koley, 2025). Since decision-making processes regarding task distribution, performance reviews, and compensation are often opaque and outside of employees' control, algorithmic management has made this issue more challenging. This raises reliance on platform governance while decreasing transparency (Banik & Padalkar, 2021). Furthermore, gig workers' vulnerability is increased by the lack of clear legal recognition and regulatory frameworks, which gives them little bargaining power and protection against exploitation. As a result, even though AI improves operational efficiency, it also raises issues with worker rights, responsibility, and fairness.

Worker Protection Challenges

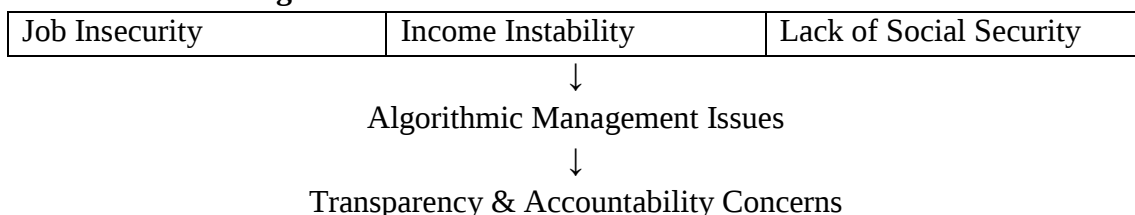


Figure 3: Major Worker Protection Challenges in AI-Driven Gig Work

3. Sustainable Employment in AI-Enabled Gig Economy

The concept of sustainable employment in the gig economy is closely linked to finding a balance between worker well-being and economic efficiency. AI-enabled platforms contribute to employment generation by creating flexible work opportunities and enabling scalability across various sectors (Mali, 2020; Koley, 2025). These platforms facilitate income generation and provide workers with autonomy, which can be advantageous in an economy. However, problems including unstable pay, a lack of long-term professional advancement, and insufficient social safety systems make such a job unsustainable (Thankachan, 2024). In addition, it is challenging to ensure inclusive and fair growth in the gig economy without robust policy frameworks. Achieving sustainable employment requires a comprehensive approach that combines technological innovation with regulatory support and ethical labour practices to

guarantee that the benefits of AI are distributed fairly throughout the workforce.

Findings

The findings of the study, derived from the analysis of existing literature, are organised into three main categories.

According to the study, AI-enabled gig platforms greatly improve workers' skills by encouraging ongoing learning and flexibility in a technologically-driven environment. To stay relevant in platform-based work systems, employees are urged to improve their professional and digital skills (Thankachan, 2024). However, not everyone benefits equally from this type of skill development because those with limited access to technology or lower digital literacy find it challenging to participate in the gig economy. In terms of worker protection, gig workers continue to experience considerable vulnerabilities, including unstable employment, inconsistent pay, and lack of access to social security benefits (Pawar & Srivastava, 2022; Koley, 2025). A power imbalance between platforms and employees results from the deployment of algorithmic management systems, which also raises concerns about accountability and transparency (Banik & Padalkar, 2021). The absence of comprehensive legal frameworks exacerbates these problems by offering gig workers inadequate protection.

Regarding sustainable employment, the results show that while AI-enabled gig platforms create flexible job options and support economic growth, the long-term viability of such employment remains uncertain. A stable and secure work environment is hampered by factors such as inconsistent pay, a lack of long-term professional advancement, and inadequate regulatory support (Mali, 2020; Thankachan, 2024). Therefore, even though AI increases productivity, without accompanying governmental measures, its role in guaranteeing sustainable employment is limited.

Suggestions

To boost the effectiveness of AI-enabled gig platforms, governments and platform providers should focus on promoting continuous skill development through easily accessible upskilling and digital training efforts. This will reduce the possibility of digital exclusion and guarantee that employees can adapt to evolving technological needs (Thankachan, 2024). At the same time, comprehensive labour laws that give gig workers legal recognition, social security benefits, stable income, and transparency in algorithmic decision-making are urgently needed to improve worker protection (Pawar & Srivastava, 2022; Koley, 2025).

Additionally, to guarantee sustainable employment, a human-centred and balanced approach to AI implementation should be adopted, integrating technological efficiency with fair compensation plans, ethical labour practices, and long-term workforce development strategies through cooperative efforts between academic institutions, business, and government (Mali, 2020; Banik & Padalkar, 2021).

Conclusions

In conclusion, AI-enabled gig platforms are transforming the labour sector by increasing flexibility, efficiency, and chances for skill development. However, these advantages come with serious worker protection issues, such as unstable employment, inconsistent income, and a lack of social security. Although these platforms contribute to job creation, their long-term viability is threatened by inadequate regulatory frameworks and limited opportunities for career growth. Therefore, a balanced strategy that combines technical innovation with robust regulatory support and ethical labour practices is necessary to

achieve sustainable employment in the gig economy, guaranteeing an inclusive and secure future of work.

Scope for future research

Future research may focus on empirical studies that include primary data to ascertain how AI-enabled gig platforms impact workers' pay, job satisfaction, and skill development in real time. Comparative studies across regions, sectors, or demographic groups can provide deeper insights into disparities within the gig economy. Additionally, further research can explore the effectiveness of emerging regulatory frameworks and the role of ethical AI in ensuring transparency, fairness, and sustainable employment outcomes in the gig workforce.

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