

The Gig Economy and Gender: Opportunities and Challenges for Women's Economic Empowerment

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Abstract: This research paper looks at the gig economy and the competent female workers who operate within it. The purpose and inspiration behind this topic are to identify the ways in which women working gigs are more content and at ease with their jobs than those working traditional 6–8-hour shifts. As a result, a few facts were gathered to examine the degree of engagement and involvement of professional women working gigs in the gig economy, as well as to identify and evaluate the opportunities and challenges faced by skilled women working gigs in the education sector in the study area. Such as independent contractors, web design and branding, online marketing, computer programming and coding, content creation and tech-related services. This study collects data from skilled and ongoing training women in order to investigate the impact of training for women's empowerment in the workplace. The machine learning techniques Artificial Neural Networks (ANN), Support Vector Machines (SVM), Naive Bayes (NB), Random Forest (RF) and Decision Trees (DT) were employed here to evaluate the impact of skill-oriented courses on employability. An assessment that was more accurate was carried out using the ANN algorithm.

Keywords: Gig Economy, Gender, Opportunity, Challenges, Women Empowerment

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INTRODUCTION

Considering Flipkart was the first internet marketplace in India in 2010, the gig economy has grown significantly Dutta and Bhat [1]. Since then, the industry has been overtaken by a plethora of digital companies that offer services like meal delivery, makeup and housework. Because of its flexibility, the economy of platforms has drawn a lot of female providers of services. Nonetheless, there are still institutional obstacles preventing women from participating in the gig economy. This quick study examines five Indian marketplaces that serve gig workers who are "low skilled," specifically women. It identifies some of the structural gender problems that beset India's gig economy and offers solutions Kasiwal [2]. With over 15 million freelance professionals, India is the as the second-big freelance professional market globally, after the United States with approximately 53 million Mehta [3].

According to the Noble House Report 2019, a significant proportion of the major firms surveyed, namely 81%, stated that they have used gig workers to address at least one important organizational issue in the previous year. In the following year, the Indian Ministry of Labour and Employment introduced the Code on Social Security Bill Pushpendra and Singh [4], which established procedures to give gig social security benefits and platform workers as well as

their initial recognition. Although this was a positive step, insufficient data regarding gig workers has made it difficult to put into practice. While many nations have already begun investing in data collection, the assessment is typically more difficult because gig labor is still only used by many as a supplemental source of income.

Instead of treating the workers as employees, these organizations refer to them as independent contractors, partners, or professionals. The platforms serve as middlemen between clients and customers, allowing them to request specific tasks or gigs. When an employee completes the task allocated to them, the platform charges a fee. Hence, the gig economy is a term used to describe the quickly expanding labor markets that link "workers" and "requesters" to enable on-demand employment, which is expanding and thriving on a global scale. The term "gig economy" refers, in essence, to labor market activities that are organized through digital platforms. Instead of owning the means of production, the platform establishes the method of communication. The platform economy's capability to remove trade obstacles through enhanced information sharing and data circulation amongst participants is what gives it its power. As a result, there is far more user participation in an economic system that is far more open [5]. The post-Fordism era, which promotes work flexibility and a dilution of the connection between employers and workers to contractual an independent contractor conditions of employment, has yielded the most profits for businesses and the least profitable for employees [6].

Fordism placed a strong emphasis on "mass manufacturing and mass consumption." Large data sets of employees and clients are compiled by gig platforms like Uber using algorithm-based techniques that the employees cannot access. According to Zwick and Jarrahi *et al.* [7], workers experience increased precarity and unpredictability because of service providers adapting their profit-earning tactics to meet market demand. The term "structural asymmetry" refers to this situation, which Heeks [6], terms as "where workers have the least control and algorithm-dependent systems have access to all worker and customer data in addition to the ability to alter or manipulate the systems."

It has been suggested that the rise in gig employment is the result of businesses using business models that cut costs significantly by eliminating the need to pay for typical employee perks, salary and insurance. Hunt *et al.* [8], because they don't often engage with other employees, businesses, or clients, these workers are much more invisible, which makes collectivization more difficult [9]. While the platform economy is sometimes praised for its adaptability, it is also frequently accused of dehumanizing and "commoditizing" workers, as the growing informal labor market relieves businesses of some of the legal obligations imposed by labor laws because of the imprecise word for platform employees [9]. As a result, businesses become less liable to their employees. Often mentioned to as "independent employees" or freelance, platform workers typically receive either part-time employment or no formal agreement at all, which contributes to the unemployment of labor. This is a major factor in keeping them outside the purview of labor regulations. The burden of providing fair salary, benefits, training, as well as security now rests with the discrete worker instead of the employer because of this "individualization" of the workforce. A loosely exploitative technique is the uncertainty surrounding the level of independence and control that the firm exercises over its employees [8].

Literature Review

India's Gig and Platform Economy Is Booming, NITI Aayog, [10], provides a thorough, rigorous methodology to estimating the extent of the gig economy now and its potential to create jobs. It tracks the success and strategy of the gig and platform economies and offers worldwide stringent guidelines for social safety net initiatives. The goal of the examination was to understand the meaning, the introduction of employment and the recommended approaches to promote employment within the quarter. Chaudhary [11], has elucidated the reasons behind women's token involvement and employment prospects in the gig economy. The author has discovered that women's Labor Force Participation Rate (LFPR) is extremely low and that there is a significant disparity in India, where it is at an all-time low. In Mukherjee *et al.* [12], with the help of independent individuals, the study has examined the mechanism that produces professional identity above organizational identity and has assessed the impact of learning flexibility on expert identity while participating in the gig economy. The study [13], examined how employees perceived and paid attention to gig gadgets. The writers also examined the issues raised and a few skill solutions. They've discovered that the Gig machine allows for greater networking both within and outside of the company and it also doesn't impose any restrictions on knowledge. Banwari [14], considering the developing trend of the gig economy, which is mainly centered on technology platforms and is immediately expanding in every industry across the board. The author has noted that this financial system offers potential benefits and obstacles that, with cooperation from the government and educational institutions might become opportunities. Caza *et al.* [15]. Examining the Gig Economy trend, it is evident that the rapidly expanding Gig economy which is entirely dependent on technological platforms is expanding throughout every industry in the

United States. The author has concluded that this financial tool can bring both chances and challenges that, with the cooperation of the government and educational institutions could become blessings.

In India, the majority of female workers are employed in the unorganized sector, implying that they have limited access to social security, protection, or just compensation. Consequently, there has been a concerted effort to improve the skills of women, albeit in conventional industries like tailoring, zardosi work, food preparation and cosmetics. The gender wage gap, women's unpaid caregiving responsibilities, prevalent gender norms and a lack of employment options all contribute to the difficulty of skilling women. In September 2019, Union Finance Minister Nirmala Sitharaman released a report titled "Status of Women in India." The report highlights that women are not gaining from the skills development schemes and initiatives of the Narendra Modi government and that specific measures are required to equip them with the necessary skills and employment opportunities. Women are falling behind men in "acquiring employable skills," according to a survey that particularly evaluates the effects of various government programs on them Ghosh *et al.* [16].

The lack of quality job, sociocultural norms surrounding women's mobility, shifting household income due to unequal household obligations and other factors are all considered to be contributing factors to the gender gap in women's employment [17]. Therefore, due to gender norms, the primary responsibility of caring for others, running the home, cooking, cleaning and tending to the sick, elderly and children's tasks that are frequently overlooked as economically viable labor is socially viewed as the domain of women [8]. Globally, women make up a disproportionately larger share of the unpaid care load compared to males, particularly in situations where access to state-run or other institutional care facilities is either impossible or too expensive [18]. A McKinsey [19], analysis states that whereas 32% of men and 68% of women worldwide are engaged in caregiving, home chores and other unpaid labor, in India, women make up 87% of the unpaid labor force compared to 13% of men. According to the Cheng *et al.*, [19], Indian women spend up to 352 minutes a day on domestic duties, which is at least 40% more than that of women in China (234 mins) and the Republic of South Africa (250 minutes) and 57% more than that of men (52 minutes). Women will therefore probably devote more time and resources to unpaid labor, particularly if there are fewer possibilities for paid work or if they work longer hours [8]. This uneven distribution of caregiving duties is further supported by data from the most recent Pan India Time Use Survey (TUS), which was conducted by the National Sample Survey Organization (NSSO). In India, women devote an average of 19.5% of their time to unpaid caregiving or household chores, whereas men only devote 2.5% of a 24-hour period to these tasks. Men spend a greater percentage of their daily lives than women in every other category of activities, including work, education, socializing, leisure and self-care tasks like eating and sleeping, Lentz *et al.* [20].

At first look, the gig economy could seem like a gender-neutral segment of the job market, run by algorithms free from the discriminatory practices and (mindful or unintentional) gender bias that many human managers and employers exhibit, even if they are problematic in other ways. Therefore, according to Jill Rubery [21], this new technology offers "a chance to reconsider the organization of labor and employment as well as realign our institutions and structures to match a more gender-equal society." However, it appears from our research and the few other studies on the subject that this chance has not yet been seized. According to the Gig Economy Data Hub, women are more inclined than men to be employed part-time on platforms; additionally, men typically earn more than women do so, with the differences being like those in the labor market overall [22]. Though marginally less so than in regular employment, gender-specific job segregation is nonetheless widespread. The gig economy "reflects the continuation (and in certain instances, deepening) of longstanding structural and gendered, inequalities" [8], despite the ostensibly algorithms that organize platform labor without regard to gender. This conclusion was drawn from a recent literature review.

MATERIALS AND METHODS

Data Collection

Alumni associations from every university, but especially from women's institutions in India, gathered a substantial amount of data. The women have either finished their graduate or undergraduate studies. According to their technical skills, Bai and Hira [23] estimated the employability of the students using the institution databases. This study discovered a relationship between classes that focus on skills and general education and employment. The employment statistics show a higher likelihood of employment for individuals with a background in skill-oriented programs. The firsthand accounts of employed women suggest that technical education is crucial for career progression. Those women who have received vocational training perform better than other women when it comes to incomes, freedom and standard of living highlights the significance of developing abilities in empowering women. This important information illustrated how important skill development is to women's empowerment.

Machine Learning Model

By employing a variety of statistical information on feature selection, such as job abilities, traits and professional experience, the authors in Reddy *et al.* [24], created a framework to forecast candidate selection using multiple machine learning algorithms. A Machine Learning (ML) model cannot be created without first preparing its data, as it is difficult for a machine to comprehend raw data and provide the appropriate outcomes Rahman *et al.* [25]. The pre-processed data was utilized in five different machine learning approaches, which include Artificial Neural Networks (ANN), RF, SVM, Naive Bayes and DT.

ANN

With 96.38% accuracy, it is the algorithm that produced the best results. Artificial neurons function as computational units, just like the neurons in the human nervous system. The layers that are hidden, input and output make up the bulk of the ANN model. The ANN was implemented using dense layers and sequential modeling. The notation 14/6/1 indicates that there are fourteen factors in the input layer of the network; Six node hidden levels are followed by a single node output layer. The selected attributes are provided as input. The optimizer function is called Adam, while the activation function is called Relu. There are six layers with 0.5 as the starting weight. The binary cross entropy loss function, which was employed in this investigation, displays the difference between the expected and actual output. When the batch level was 10 and the verbose was 1, the ANN produced the best results over 100 epochs.

DT

It is an understandable supervised ML technique. The DT received the following instruction optimal settings in this case: minimum samples leaf = 5, maximum depth = 3, number of random states = 100 and criteria selected = "gini." This resulted in an overall accuracy of 96.1 percent using 10-fold cross-validation.

RF

In this study, it is applied as a supervised learning strategy. Regression and classification can also be done with it. If a data collection has x features, the first feature chosen at random is referred to as y. Subsequently, the algorithm tries to combine trees by utilizing the voting procedure and anticipated outcome. With n estimators equal to 100, the Random Forest Classifier produced accurate predictions in 96.24% of cases. In this study, it is applied as a supervised learning strategy. Regression as well as classification can also be done with it. If a data collection has x features, the first feature chosen at random is referred to as y. The program then tries to combine trees according to the voting process and outcome prediction. With n estimators equal to 100, the Random Forest Classifier produced 96.21% accurate predictions.

SVM

With the dataset provided, SVM makes use of predefined categories to classify the objects. It classifies transactions by assigning them to any number of classes to improve the precision of performance Casuat *et al.* [26]. In this case, a linear support vector classification, or SVC, is used. The accuracy offered by the linear kernel's type was 91.34%.

NB

Gaussian Naive Bayes is a different of the Naive Bayes algorithm. It is a chance-based machine learning (ML) method that is connected to the Bayes theorem and applied to a range of classification applications. Predictors are firmly assumed to be separate from one another. The parameters are estimated using the maximum likelihood technique. This algorithm's accuracy was the lowest, at 86.55%.

RESULTS

The five machine learning algorithms are DT, RF, SVM, NB and Artificial Neural Networks (ANN) used in this study. Their respective accuracy rates are 96.38%, 96.10%, 91.34%, 86.55% and 96.45%. True positive rate (recall) and model accuracy (f1-score) and precision (rate of precise accuracy) are the three main approaches for determining accuracy measurements. Precision can be defined as the ratio of correctly predicted positive incidences to all favourably predicted instances. The accuracy metrics for the several the algorithms used in this investigation are displayed in Table 1.

Table 1: ANN, DT, RF, SVM and NB Performance Metrics

Models	Accuracy (%)	Recall (%)	Precision (%)	F1-Score (%)
ANN	96.38	98.13	98.13	98.13
RF	96.1	97.36	98.67	98.13
DT	96.45	97.36	98.67	98.13
SVM	91.34	96.33	95.14	96.25
NB	86.55	90.15	95.25	92.13

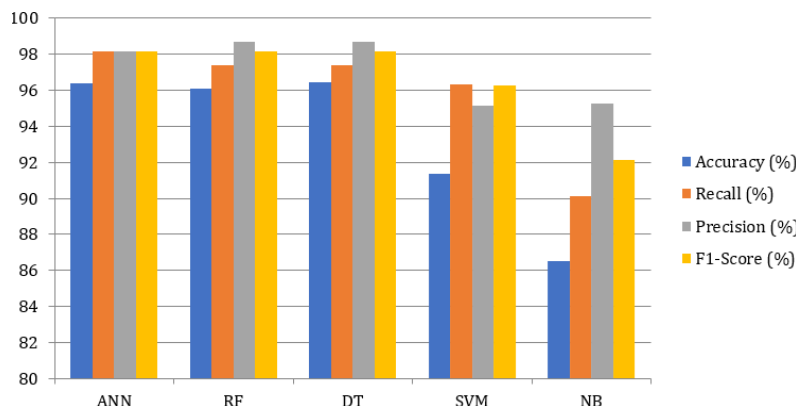


Figure 1: Performance Evaluation of ML Models

The greatest accuracy attained by the ANN in this study. Therefore, it suggests that courses taken for graduation or after graduation that focus on occupational skills have a good impact on employment, as shown in Figure 1.

CONCLUSION

It is noteworthy that female gig workers are predominantly employed in the traditionally feminine fields of beauty and household services. Women were underrepresented in the delivery food sector and challenging to reach since they avoided the "hubs" where males were more likely to congregate. There is a concerted attempt to increase the number of female taxi drivers in the industry thanks to the actions of several people and groups as Sakha, TaxShe and Koala Kabs. Women taxi drivers were usually employed to transport women passengers or children to school, but it's also crucial to remember that became a part of making maternal characteristics exclusively feminine, cautious and courteous (as opposed to males). The methods that have been put into practice are useful and efficient in helping the higher education sector develop qualified, long-term, systematic plans for women empowerment who possess a strong skill set and content knowledge and fulfill industrial criteria. The government can create a fresh approach to education with improved vocational training if they can pinpoint the shortcomings of the current educational system. The ANN obtained 96.38% accuracy according to the accuracy measurement. The optimal method is ANN, which has a ROC index of 0.96. An autonomous population is the cornerstone of India's development. Education, steady employment and the ability to weather difficult times are key factors in the success of women. Even though India is making advancements in terms of literacy, women still face many obstacles, one of which being unemployment. To identify answers due to their joblessness problems and the mismatch among the abilities they possess and what the job market demands, it is imperative to evaluate the existing situation.

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