INTEGRATION OF GAMIFICATION OVER GIG ECONOMY FOR EFFICIENT ENGAGEMENT OF CROWDSOURCING USING BIGDATA

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Abstract- For employees, the gig economy offers minimal obstacles to entry, making it possible for them to participate in flexible work arrangements and engage in contingent employment whenever and wherever they want. According to some, the emergence of the gig economy may have been aided by technological advancements. A large number of the world's greatest ideas are already functioning as gig workers due to the broad and rising popularity of this work model. Lack of constant involvement amongst employees in the gig economy has resulted in a large dropout rate. The study aims to fill a critical research gap on gig worker dropouts by using a Gamification strategy on online platforms to combat the problem. On the basis of structural change theory and self-determination theory, we came up with several ideas. 500 replies were gathered from white-collar gig workers who performed assignments on one or more gig platforms over the last two years. We may test our hypotheses by using Bayesian partial least squares equation modeling (BPLS-EM). Results show that gamifying the web platform will help gig workers feel more satisfied and productive, reducing the likelihood of them abandoning gig employment. According to the researchers ' findings, gig workers' desire to leave is not significantly influenced by high-performance work systems. Online gig platforms may be improved by adding a layer of gamified artifacts to keep employees engaged. Worker online project bidding activity will increase dramatically as a consequence. According to our estimates, the number of county residents actively working online on the platform will rise by 21.8 percent.

Index Terms-Gamification, Gig Work, Bayesian partial least square equation modeling

I.   INTRODUCTION

On-demand internet platforms that allow for flexible work hours, often referred to as the "gig economy," have just witnessed rapid growth in the last few years. More than a hundred million individuals have benefited from new work arrangements made possible by digital platforms like Uber, Thumbtack, and Freelancer. In the US, according to recent studies, the "gig economy" is made up of around a third of the total workforce and is characterized by on-demand, digital, service-based platforms that allow for flexible work schedules. Platforms like Uber and Lyft span a broad range of services from ridesharing to food delivery to general labor, such as TaskRabbit and ThumbTack. Freelancer and Upwork are only two examples of online labor platforms that are part of the "gig economy," which includes online marketplaces for specialized labor. In recent years, online labor platforms have flourished and have become a significant part of the gig economy. More than 25 million registered workers and businesses have completed over 12 million assignments on Freelancer by the end of October 2017. An obvious issue is why online labor platforms have seen such rapid growth and what this development means for the gig economy. Due to the low entry hurdles and virtual nature of online labor platforms, people may engage in flexible, transitory, ad hoc working arrangements from any place at any time. As a result, these platforms seem to have the potential to draw a large number of employees away from established employment models (Economist 2010). There are trade-offs associated with work in the gig economy. Two key contrasts exist between the gig economy and the traditional workplace. Some newcomers to the online labor market may be apprehensive about interacting with an unknown business . For starters, it's not always easy for employees in developed nations, where the cost of living is often greater, to make it in a competitive online labor market. Gig workers do not have access to standard benefits like health insurance or other legal safeguards that are available to those who work in traditional jobs. Many people are against the gig economy's contract-based structure. Critics say that allowing companies to shift the risk of economic instability onto gig workers raises the possibility of creating "a Dickensian world" where people are exploited and society suffers. As a result, many people may continue to favor stable, long-term work. As a result of these discussions, the California Assembly recently passed a bill to safeguard the rights of gig workers. Here, we turn to a second, supplementary reason for workers' participation into the gig economy: the existence of a gamification labor market. This means that people who are out of work or underemployed in the traditional workforce are more inclined to try out a different sort of work, which will have a significant impact on online marketplaces' ability to provide workers. Personnel must be laid off during economic downturns, and the unemployed have a tough time finding new work. Normal downturns in the economy led people to step up their local job searches or relocate altogether in an attempt to discover new work opportunities. Employees have access to a wider range of work options because to modern technology and internet options.

The following questions are the focus of our research:

- To what degree is joblessness in the local, off-line labor market a driving force behind employees' engagement in the gig economy and online labor marketplaces in particular?

- What causes this link to be heightened or diminished?

In order to gather the answers, it needs, this study relies on the National Bureau of Economic Research (NBER), the US Department of Agriculture's Economic Research Service (ERS), and the Federal Communications Commission (FCC). As well as the data from a well-known online labor market and many other publicly available sources, we also incorporated information from (from Facebook Research). We examine the relationship between county unemployment and the number of active workers and the total number of linked bids in the same county, as measured by the number of connected bids. There are several advantages to doing our research in an online labor market like Freelancer or Upwork. First and foremost, the gig economy is made up of platforms such as online labor marketplaces. In order to participate in the online labor market, employees need merely create an account and begin bidding on projects offered by employers. A further benefit of these platforms is the ability for employees to work at their own pace after a contract has been granted. However, the most significant advantage of online labor markets is that, unlike other gig economy platforms established in physical reality (such as Uber), they are genuinely borderless, allowing workers and employers to be matched globally, from anywhere. Since a lack of job possibilities in a local, offline economy does not necessarily translate to a lack of international employment options on the online labor market, online labor markets are ideal for our study. We are looking for a plausible exogenous variance in county-level unemployment rates. Factors such as population demographics, geographic distribution of social connections among county people, and the geographic environment all come into play when trying to figure out how online gig economy labor supply and demand are intertwined in the real world (e.g., internet connectivity). As a result of these moderating variables, we can better understand how unemployment and online labor markets are linked. A number of important contributions have been made to past studies on the gig economy through our work.

- Starting with digital platforms like Uber and TaskRabbit, which offer a novel alternative for workers who would otherwise have to endure longer periods of unemployment or relocate in search of job opportunities, we examine how these digital platforms can absorb shocks from the offline unemployment market.
- Factors affecting the gig workers job engagement
- Implementation of gamification on gig economy for improving the job satisfaction of the gig workers.

The remainder of the paper might be structured in the following manner: The paper is organized as follows: In Section 2 we review the existing papers regarding gig economy. In section 3 the issues over the gig economy were illustrated. In section 4 the integrated gamification methodology over gig economy was evaluated. The expressed impact over gamification was illustrated on section 5. Section 6 concludes the paper.

II. RELATED WORKS

A number of areas of study into the gig economy have lately seen significant progress. Workers' benefits and legal protections have been eliminated in the gig economy, according to the study [1] that looks at the ethical and moral implications of this kind of labor. Other researchers have looked at customer behavior ([2]) and market design concerns ([3]). More study has been done on the socioeconomic ramifications of the gig economy, according to [4] and [5], and this research has shown some benefits for society, including a reduction in alcohol-related car accidents and congestion ([6]). In recent years, researchers have started to investigate the sources and potential motivations of job seekers who find work via online labor markets. The characteristics and incentives of gig workers may have an effect on the long-term growth and sustainability of these markets. This discipline has been dominated by surveys, reports, and case studies since the beginning of its existence ([7]). There are an estimated $160+$ million people working in the gig economy across the United States and the European Union, according to [8] descriptive statistics on the participants of the gig economy. These people are broadly classified into a two-by-two matrix, with primary and secondary (supplemental) incomes from the gig economy. Some 30% of the workforce relies on gig labour as a means of generating a living, according to the study (because of a lack of better employment options). But econometric methodologies are also being used in a lesser number of recent research to analyze especially the link between salaries and labor supply in today's "gig economy" ([9]). According to [10], local entrepreneurial activity is affected by the emergence of gig economy job opportunities in a local market and the influence this has on local entrepreneurial activity. A lack of better job opportunities may have driven some people to start their own businesses in the first place, according to those authors. Their study expands this work in a variety of ways. It is important to note that, although [10] propose a link between gig-economy engagement and a lack of conventional employment opportunities, this relationship is the main subject of their research. According to [11], layoffs have a positive impact for IT-related enterprises, but not non-IT sectors, since most online labor platforms focus on jobs that can be easily outsourced and provided over the Internet. The author [12] investigates this question by examining how African gig workers in the gig economy use their agency to earn and sustain a life. As a consequence of the threats they face, such as unstable working conditions and algorithmic monitoring of their workplaces, gig workers have very little bargaining power and autonomy. [13] examines how the gig economy is affecting African workers. Authors say workers in Africa are more exposed to precarity and vulnerability due to the expansion of platform-based remote work. There should be a continuity between the working conditions and lives of workers in the gig

economy, according to them. Here, in [10] the author investigates the effect of gig-economy services on small-town businesses. Entrepreneurship may be discouraged by platforms that provide permanent jobs for those who are unemployed or underpaid. It is possible that platforms like this might aid in the development of new businesses by giving work flexibility that allows entrepreneurs the ability to reallocate resources strategically. Look at the debut of Uber X in local areas as a possible answer to this issue. Entrepreneurial activity is measured in this research through a Kickstarter campaign and self-employment rates from the Current Population Survey. In [14] the author seeks to demonstrate why a regulatory framework and suitable policy responses are necessary for what here we characterize as a platform 'society' and to highlight its important 'collective' qualities. Collective bargaining and representation, as well as the state's participation in public policy, are examples of these rights being respected. In light of an in-depth investigation of the social consequences of the gig economy for labor and employment, these views are expanded here. "The decision-making process preceding foreign entry, notably in the Middle Eastern environment," the author says in "[15." While much study has investigated the substance and antecedents of the internationalization choice of corporations, relatively less attention has been dedicated to how SMEs decide on worldwide market access.

III. PROBLEM STATEMENT

Companies prefer to use independent contractors and freelancers rather than full-time workers under a free-market system known as the "gig economy." Traditionally, full-time employees seldom switch jobs, undermining the conventional economy in favor of long-term careers. However, the Gig economy does have its drawbacks, such as,

- Worker security and social security benefits such as pensions and gratuities are severely lacking because of the lack of regulation.
- Lower employee negotiating power: Employees' bargaining power is restricted unless they are very gifted. Employees' unionization will be challenging.
- Workers in the gig economy will face a lack of opportunities for skill up-gradation, since firms consistently spend in educating their personnel. As a result, employee happiness and commitment at work declined.
- Workers have less access to credit because financial institutions are less likely to lend loans if they cannot guarantee a stable income. Wages in the labor market may fluctuate due to a lack of supply and demand.
- In the lack of legal protection, corporations like Uber lay the same demands on its drivers as any other full-time employer, but without any benefits or safety. It is claimed by Uber that its drivers are not employees, but rather self-employed individuals.
- This means that employees are paid dependent on how many tasks they do each week or month, which means that their overall earnings are not predictable.
- The duties of workers aren't as flexible as they seem, since they are urged or pushed to work when companies need them.

IV. PROPOSED WORK

Online labor platforms can assist workers in a variety of ways. Virtual employment, telecommuting, and online employment sites have grown more widespread in recent years, but the physical location barrier remains a fundamental obstacle to employment in offline labor markets. Depending on the worker's stage of life, relocation may include anything from selling and buying a house to searching for a spouse's new job or moving children to a new school. In both a financial and societal sense, these behaviors are expensive. As a consequence, migration is only probable if the anticipated benefit of choosing a job is exceedingly large. With online labor marketplaces, on the other hand, getting started is a simple matter of signing up for an account. As a result, posting job offers requires just a little amount of extra time and work. When compared to traditional employment, on-demand work offers a lot more freedom and adaptability. Because of the low cost of entrance and participation, many individuals may choose to join an online labor platform in the short term after they lose their employment. When fresh employment prospects are found in the offline labor market for people who prefer to work online, they may opt to return there instead. According to the McKinsey Global Institute, the majority of employees using online labor platforms see their work as transitory and a way to supplement their regular day jobs. As a result, workers' motivation to do their jobs may be diminished.".

When it comes to attracting students and employees, educational institutions and businesses alike have turned to gamification, or the incorporation of game elements into the learning process. As shown in figure 2, a growing body of data suggests that gamification may be an effective technique for increasing workers' commitment to their jobs and, as a result, their productivity. Game-based marketing is being used by businesses both internally and externally in an effort to enhance the digital experience of both present and future consumers. In contrast to the word "gamification," in which game concepts are applied to non-game settings, advertisements are included into entertainment games. In the marketing literature, gamification is often characterized as a technique that "upgrades a service with affordances allowing gamefic experiences in order to enhance consumers' overall value generation. Even though the discipline of gamification as a whole is very new, practically every major book on the subject starts with an effort to define it. There are two ways to define it: one is more formal, while the other is based on personal experience and hence more expansive. This makes conducting gamification studies challenging since there is no agreed-upon definition. The first step in coming up with a decent definition of gamification is to identify the features of a good definition. As stated by Locke, a description of a notion "completes two things":

(a) it ties the concept to reality, and
(b) it distinguishes the concept from other concepts"
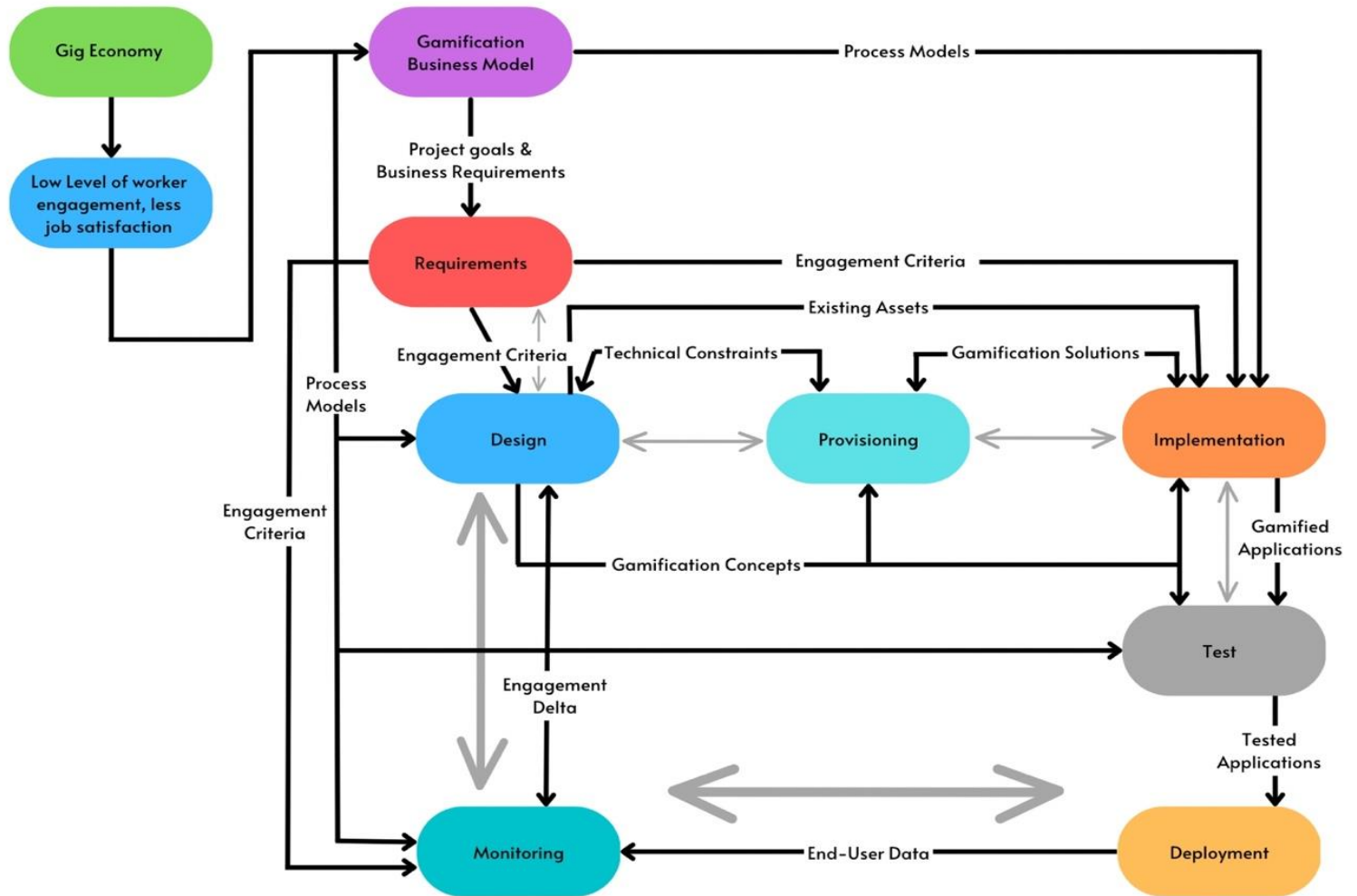
According to this research, gamification may be defined as a software development approach that relies on the Rational Unified Process (RUP) (RUP). Figure 1 depicts the experimental process. Boxes in the diagram indicate work flows, each of which includes a variety of activities and functions. Artifacts move between work flows as seen by the thin arrows. As you can see, there are many different jobs and responsibilities represented by the grey arrows. The following positions are taken into consideration:

Gamification is a shared experience for the group of individuals who will ultimately benefit from it. They will be more inclined to engage in a set of established business procedures once gamification has been put into effect. A company's end users might be either workers (B2E) or customers (B2C) who participate in internal or external activities, depending on the context. Another kind of gamification expert is someone who has a lot of experience in coming up with innovative and fun game or gamification concepts. These people should have a thorough understanding both of psychological models and general game creation approaches and tools, ideally. People in this position have also already created a few successful gamification apps. In addition, domain experts are those who have a deep understanding of the target business processes and the people who will utilize those processes. Domain specialists should be well-versed in the positives and negatives of the target business processes as experienced by end users. Furthermore, the ideal candidate for this position is accountable for the processes and, as a result, is eager to improve them. Finally, business specialists are those who are in charge of the project's budget, timelines, and stakeholders, as well as the work's overall success. These people are ultimately accountable for the project's success and achieving its original aims. On the fifth point: Gig professionals should have extensive experience developing, constructing and delivering large-scale IT systems. These individuals have a thorough understanding of the company's current environment and are in charge of ensuring that new components and technologies are seamlessly integrated into the existing setup. Experts in the fields of business and gamification also assist in the selection of appropriate software components and tools for the implementation of the gamification solution on top of current business practices.

A. Gamification business modeling

The RUP's purpose is the same as that of the business modeling work flow. All other stakeholders, excluding the end users, are given an explanation of the gamified business processes by the domain experts. Goal: This phase aims at establishing a common knowledge of business operations across all gig employers. As a last step, it is necessary to identify the project's overall goals. Customers, staff, and other external stakeholders are all examples of end users that should be included in the process. Finally, all Gig members are made aware of their responsibilities. Except for the end user, everyone in a given job is involved in this process.

B. Needed variables

Based on the project's aims, use cases are explored in the requirement phase. In addition, users' motivations, involvement, and participation in the intended processes must be assessed. Qualitative and quantitative methods may be used for this investigation, such as via interviews or surveys. It is critical that the analysis contain at the very least what the target group is already or is typically motivated to engage in the activities under consideration, as well as the reasons why they may or may not join. There should be a list of reasons for and against the method, as well as considerations for the people involved. Experts in business, domain, and gamification must agree on the intended scenario and metrics, as well as conduct a study of the current situation . Real time gig workers may thus benefit from the gamification strategy. As a result, the hypotheses outlined below may be satisfied by this research:

Hypothesis 1 (H1). It has been shown that gamification has a favorable impact on employee satisfaction at work locations.

Hypothesis 2 (H2). It has been shown that gamification improves the quality of work flow experience

Hypothesis 3 (H3). Gamification helps students learn about the gig economy in a good way.

Hypothesis 4 (H4). Flow encourages people to stick around in the gig economy.

Hypothesis 5 (H5) The use of gamification in the workplace has a favorable influence on employee engagement.

Hypothesis 6 (H6) Gamification has a good impact on increasing employee contentment and productivity at work.

We derived these hypotheses based on Self-determination theory and Structural change theory

Table 1 Hypothesis testing

Theory	Related Findings
Self-determination theory	Users' sense of competence, social connectedness, and autonomy are favorably influenced by achievement and social interactions in the gamified system, leading to good behavior toward value cocreation intents.
Structural change theory	Incentives for participation in the gamified system and subsequent co-creation activities with the brand are positively affected by users' enjoyment and satisfaction.

C. Statistical analysis

The Bayesian partial least squares equation modeling was used to determine the amount of gig workers' happiness with the gamification process. Bayesian statistics models assume that each parameter has a distribution that drives the parameter value with a lack of confidence. Prior to evaluating the data, this kind of distribution is frequently discussed, which causes (un)certainty in regard to parameters (step 1). A prior distribution is a distribution that has been predetermined in advance. After constructing the likelihood function for the data (in step 2), the prior distribution is merged with the likelihood function for the data to get the posterior distribution (in step 3). These three phases are followed by the formal statement of Bayes' theorem.

$$\alpha_k^{*\prime} = P\left[{}^{\alpha}/\text{dot}_i(a,b) \sum_{s=1}^{z^{(t+1)}} \propto_k^* \right]$$

The distinction between Bayesian and frequentist statistics may be shown using this partial lease square equation as the basis for Bayesian statistics. The posterior probabilities of the parameters theoretically yield the data, $p(a,b)$ stays in line with the probability, and $p(t+1)$, data providing the parameters is increased by the probability of the parameters themselves, $p(s)$. Here, $p(k)$ represents the border probability. The related parameters can be calculated below,

$$\text{Labor Involvement}_{j,p} = \beta_0 + \beta_1 \times \text{Unemployment Rate}_{j,p-1} + \beta_2 \times \text{Works}_{j,p} +$$

$$\tau_p + \alpha_j + \alpha_j \times \text{Trend}_p + \varepsilon j, p$$

$$\text{Work satisfaction}_{j,p} = \gamma_0 + \gamma_1 \times \text{CrisisLevel}_j \times \text{AfterCrisis}_p + \gamma_2 \times \text{Projects}_{j,p} + \tau_p + \alpha_j + \alpha_j \times \text{Trend}_p + \varepsilon j, p$$

$$\text{Bidding capacity}_{j,p} = \gamma_1 \times T_p + \gamma_2 \times \text{Crisis\_evel}_j + \gamma_3 \times \text{Projects}_{j,p} + \tau_p + \alpha_j + \alpha_j \times \text{Trend}_p + \varepsilon j, p$$

V. Performance analysis

Using a stratified random selection procedure, 500 white collar gig workers from India were chosen as the participants of this research. Because most people who use gamified applications are in their twenties, it makes sense to employ online workers as a representative sample.

Table 2. Descriptive Statistics

"Variable"	"Mean"	"Std. Dev."	"Min"	"Max"
"Unemployment Rate"	06.73	02.68	02.4	016.8
"Unemployment Change"	03.07	01.01	1	06
"Submitted Bids"	0416.84	0547.45	0	3947
"New Worker Registrations"	086.69	0122.09	0	1035
"Active Workers" "Work completed"	0117.66	0205.19	0	1480
The key var.59	076.98	0	574	

The key variables are illustrated in the table 1.

Table 3. New Worker Registrations estimation				
	"(1)"	"(2)"	"(3)"	"(4)"
	"New Workers"	"New Workers"	"New Workers" Workers"	
"Crisis_Level"	1.209	−	...	...
	(0.774)			
"After"	−0.905	0.347	...	...
	(3.806)	(5.879)		
"Crisis_Level × After"	6.108***	5.384 **	5.221 **	5.306**
	(1.236)	(2.086)	(2.123)	(2.175)
"Num_Projects"	0.572****	0.614 ***	0.598 ***	0.598***
	(0.011)	(0.051)	(0.053)	(0.056)
"Constant"	6.044****	5.461	3.754	3.791
	(2.261)	(5.186)	(4.572)	(4.752)
"State FE"	$N.A$	✓	✓	✓
"Year-month Dummies"	$N.A$	$N.A$	✓	✓
"State Specific Linear Trend"	$N.A$	$N.A$	✓	✓
"Observations"	1,195	1,195	1,195	1,195
"R-squared"	0.948	0.760	0.798	0.805
"Number of States"	−	52	52	52
"Notes: Cluster-robust standard errors in parentheses. ****p<0.01,**p<0.05,"p<0.1. Within R-squared reported for fixed effects models."				

The new worker registration statistics were shown in Table 3 . Following the financial crisis, the phrase Crisis Level * AfterCrisis is an intriguing interaction term that assesses the influence on labor supply of job market movements (the number of new workers who register on the platform, the total number of workers who are actively looking for work, and the total number of bids submitted by these workers).

Table 4. Relative Time Analysis

	"(1)"	"(2)"	"(3)"
	New Workers	Active Workers	Num Bids
2019Q3 × CrisisLevel	2.899 (3.678)	0.679 (2.245)	8.769 (32.939)
2019Q4 × CrisisLevel	1.727 (3.139)	0.210 (1.811)	4.024 (28.698)
2020Q1 × CrisisLevel	3.754 (3.141)	0.797(1.773)	4.759 (24.659)
2020Q2 × CrisisLevel	4.908 (3.559)	2.268 (2.033)	-7.052 (20.049)
2020Q3 × CrisisLevel	2.143 (3.225)	0.871 (1.798)	-12.144 (21.011)
2020Q4 × CrisisLevel	2.151 (2.945)	0.752 (1.618)	-9.127 (22.236)
2021Q1 × CrisisLevel	2.609 (2.301)	1.897 (1.253)	2.678 (11.408)
2021Q2 × CrisisLevel		Baseline (Omitted)	
2021Q3 × CrisisLevel	6.74 * (3.408)	4.807 ** (1.832)	18.843 (11.885)
2020Q4 × CrisisLevel	8.454** (3.654)	7.592***(2.288)	46.257*** (16.994)
2022Q1 × CrisisLevel	5.444 (3.880)	5.196** (2.460)	47.662** (20.614)
2022Q2 × CrisisLevel	4.182 (3.571)	4.819**(2.235)	44.897** (22.190)
2022Q3 × CrisisLevel	11.896 *** (4.160)	8.829***(2.420)	70.304*** (22.215)
2022Q4×CrisisLevel	5.084 (3.795)	6522**(2.467)	54.557**(22.028)
"Num_Projects"	0.593***(0.018)	0.3398***(0.017)	2.213*** (0.170)
"Constant"	5.932* (3.506)	16.476***(2.084)	116.881***(22.912)
"State FE"	✓	✓	✓
"Year-month Dummies"	✓	✓	✓
"State Specific Linear Trend"	✓	✓	✓
"Observations"	2226	2226	2226
"R-squared"	0.882	0.857	0.657
"Number of States"	52	52	52
"Notes: Cluster-robust standard errors in parentheses. ***p<0.01,**p<0.05.*p<0.1."			

Table 4 shows that the predicted impacts peaked around a year following the financial crisis, according to the estimates. This shows that the impacts are likely to be short-lived, as the unemployment rate falls and the local labor market improves, people on online labor platforms begin to depart and look for more lucrative chances in the real world.

Table 5. Estimation of the Unemployment Rate depends on the Number of Bids

	"(1)"	"(2)"	"(3)"	"(4)"
	"Num Bids"	"Num Bids"	"Num Bids"	"Num Bids"
"Unemployment Rate"	13.918*** (2.993)	17.08***(6.936)	49.26**(17.28)	49.97**(17.39)
"Num Projects"	2.425***(0.057)	2.498***(0.368)	2.388***(0.374)	2.417***(0.382)
"Constant"	40.059**(16.995)	11.56 (48.03)	-160.7 (95.98)	-172.4* (97.26)
"State FE"	N.A	✓	✓	✓
"Year-month Dummies"	N.A	N.A	✓	✓
"State Specific Linear Trend"	N.A	N.A	N.A	✓
"Observations"	1.107	1.107	1.107	1.107
"R-squared"	0.863	0.561	0.605	0.618
"Number of States"		52	52	52

"Notes: Cluster-robust standard errors in parentheses

***$p<001$ **$p<0.05$.*$p<0.1$. Within R-squared reported for fixed

effects models.

Table 6. Estimates Using Unemployment Rate (Number of Active Workers)

	"(1)"	"(2)"	"(3)"	"(4)"
	"Active Workers"	"Active Workers"	"Active Workers"	"Active Workers"
"Unemployment Rate"	2.434*** (0.383)	3.146***(0.623)	3.968**(1.623)	4.042**(1.684)
"Num Projects"	0.346***(0.009)	0.384***(0.033)	0.366***(0.034)	0.368*** (0.035)
"Constant"	6.331***(2.184)	-2.922 (3.356)	-12.588 (7.767)	-12.215 (7.814)
"State FE"	N.A	✓	✓	✓
"Year-month Dummies"	N.A	N.A	✓	✓
"State Specific Linear Trend"	N.A	N.A	N.A	✓
"Observations"	1.107	1.107	1.107	1.107
"R-squared"	0.882	0.714	0.781	0.792

"Number of States"		52	52	52
"Notes: Cluster-robust standard errors in parentheses. ***p<0.01,**p<0.05,*p<0.1. Within R-squared reported for fixed effects models."				

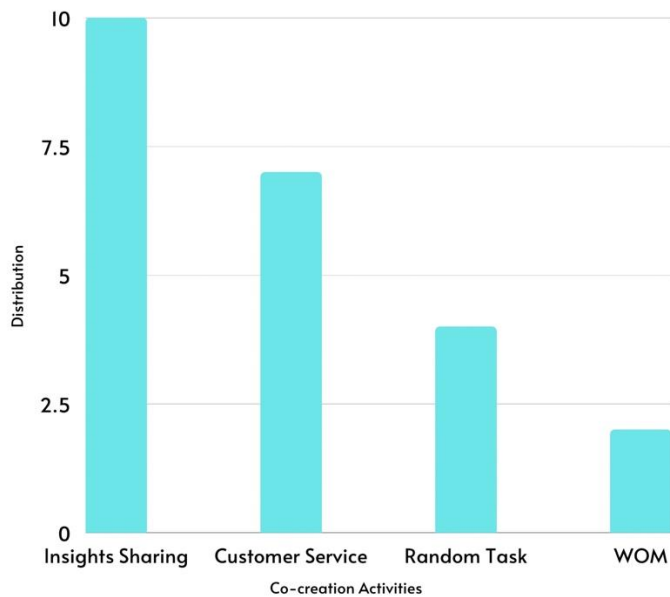The actual unemployment rate along with the work biding rate and the total active workers mean was depicted in table 5,6.

Figure 3 Co-creation Activities Vs. Distribution

Figure 3 depicts the most common forms of co-creation as "customer service" and "insights sharing."

- Word-of-mouth (WOM): Online endorsements may take several forms, from recommending that people join a "Gig work" team to sharing information about the company and/or the products or services it offers. .
- Insights sharing: Allowing a corporation to have access to a wealth of information from its customers Surveys, voting on ideas, and real-time data sharing are all examples of systemized chores.
- Customer service: Involved in a wide range of activities such as answering inquiries, addressing technical difficulties, and providing useful feedback on goods and services for other internet users.
- Random task: This includes everything except "word-of-mouth," "information exchange," and "customer service." In the context of crowdsourcing and the sharing economy, these jobs are generally referred to as "on-demand.".
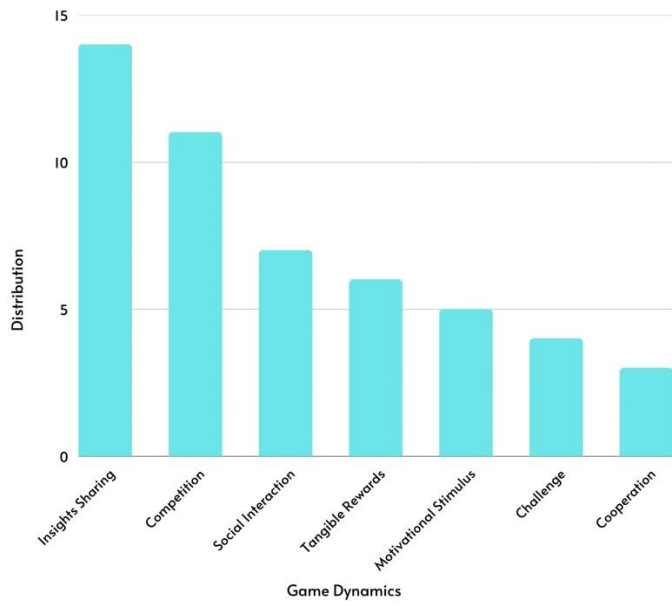
Figure 4 Game Dynamics

Intangible incentives, like as points and badges, are the most important game mechanic for enhancing workers' motivation to work, according to the data in
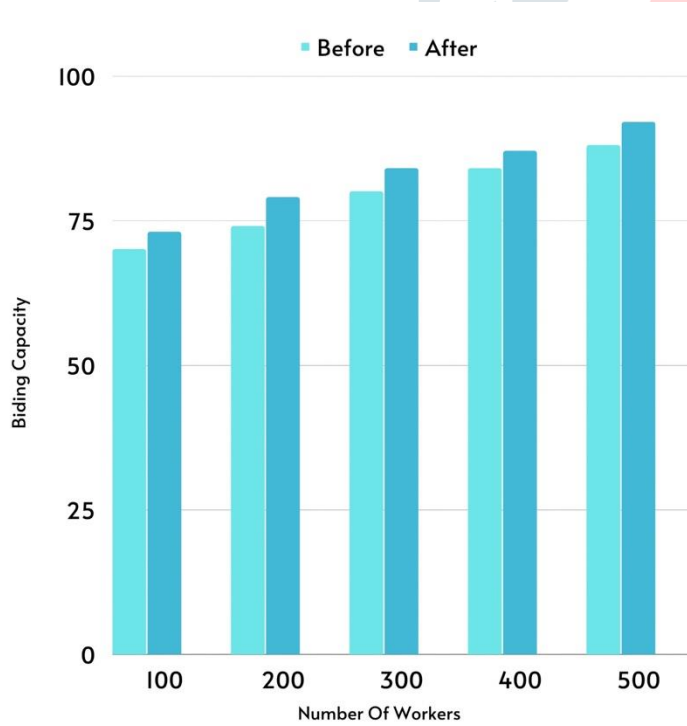

Figure 5 Number of Workers Vs. Biding Capacity

As of from figure 5 the work bidding capacity of the gig workers was highly improved after the implementation of the gamification concept.
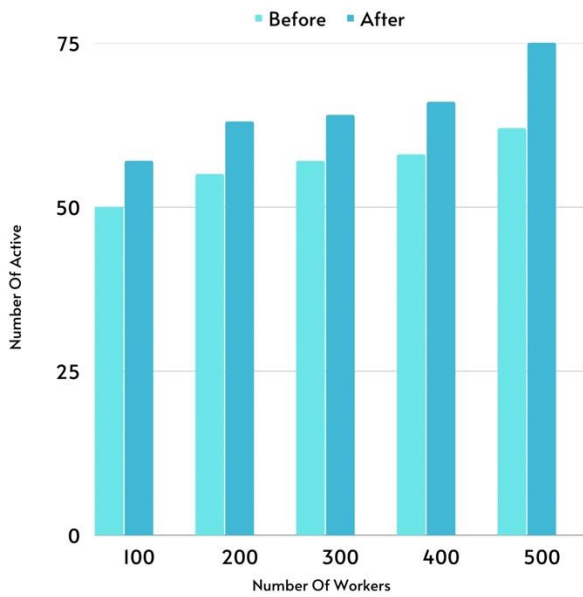

Figure 6 Number of Workers Vs. Number of Active

As of from figure 6 the number of the active gig workers was highly improved after the implementation of the gamification concept.
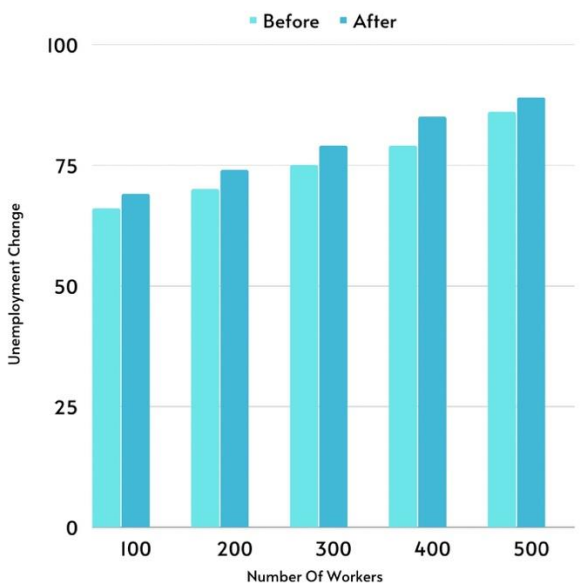

Figure 7 Number of Workers Vs. Unemployment Change

As of from figure 7 the unemployment change was highly reduced after the implementation of the gamification concept
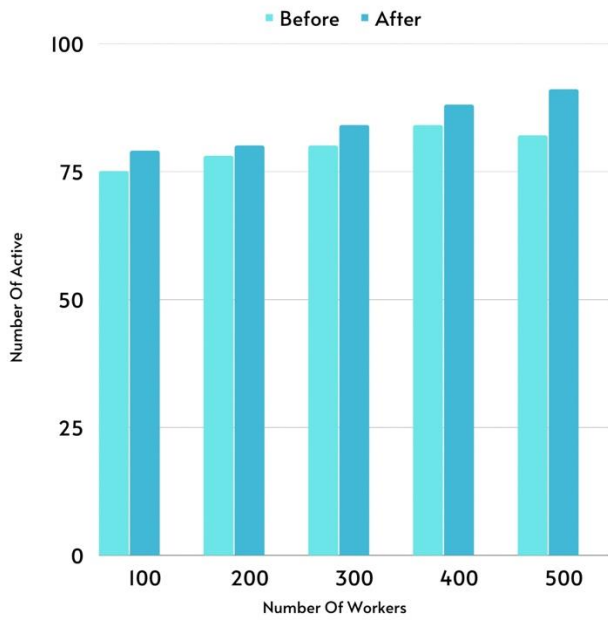
Figure 8 Number of Workers Vs. Work Satisfaction

As of from figure 8 the work satisfaction of the gig workers was highly improved after the implementation of the gamification concept
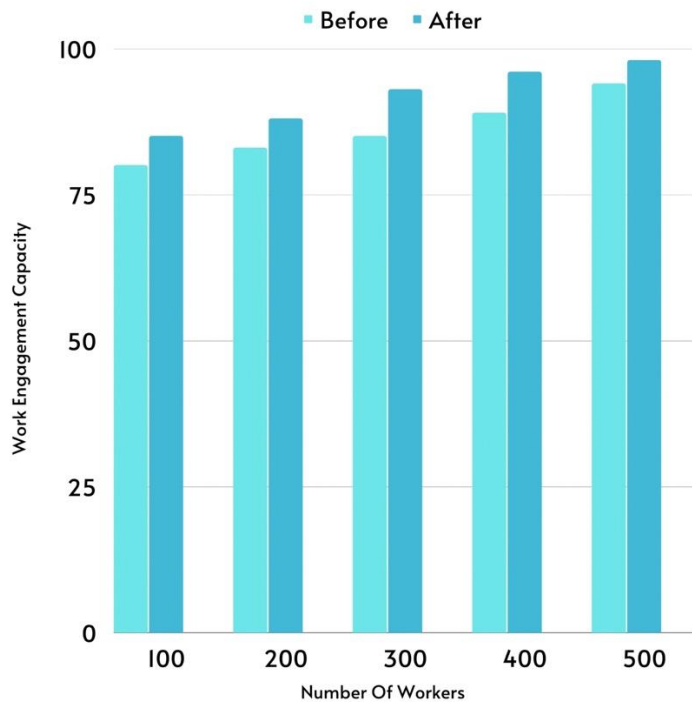

Figure 9 Number of Workers Vs. Work Engagement Capacity

As of from figure 9 the work engagement of the gig workers was highly improved after the implementation of the gamification concept. Thus, from the result obtained the gamification concept can improving the work environment of the gig workers in a precise manner.

VI. Conclusion

In this article, we discuss the use of gamification in the creation of software. In addition, we've identified four different types of gamification solutions that may be used in information systems. We've outlined the abstract functionality of each class, as well as the resulting benefits and drawbacks. There are several factors to take into account when deciding what kind of tech to utilize in a certain situation. When it comes to planning, this technique prevents issues early on since it is integrated. Gig economy gamification projects are best served by generic gamification platforms because of their greater flexibility, reuse, and decoupling of functionality and technology, according to our actual expertise in developing and implementing gamification.

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