Exploring the Mediating Role of Job Security and Career Development in Digital Technology's Influence on Gig Worker Engagement

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Abstract

This study examines the effects of Digital Literacy and Job Security on Employee Participation in the Gig Economy, incorporating Pattern in Gig Economy (uncertainty), Career Growth, and Job Autonomy as mediators, and Managerial Support as a moderating construct. Data were collected from employees in Pakistan and analyzed using SPSS for descriptive and preliminary analysis, followed by Partial Least Squares Structural Equation Modeling (PLS-SEM) for hypothesis testing. Results indicate that Digital Literacy significantly enhances Career Growth and reduces uncertainty, while Job Security strengthens Job Autonomy and mitigates uncertainty. Both Career Growth and Job Autonomy positively influence participation, whereas uncertainty exerts a negative effect. Mediation and moderation analyses confirm indirect effects and the amplifying role of Managerial Support. The findings extend the Self-Determination Theory and suggest practical measures such as digital up skilling, job security initiatives, and supportive management. Policy recommendations include increased investment in education and vocational training, as demonstrated by China's success in reducing youth unemployment, to curb unemployment, poverty, and economic instability in Pakistan.

Keywords: Digital Literacy, Gig Economy, Job Security, Career Growth, Job Autonomy, Managerial Support, PLS-SEM, Pakistan.

I.   Introduction:

In recent years, the gig economy has emerged as a transformative force, reshaping labor markets globally by redefining how work is structured and performed. The gig economy refers to a labor market characterized by temporary, flexible jobs, where individuals engage as freelancers or independent contractors rather than through traditional employment arrangements (Azhar et al., 2024). The rapid development of information and digital technologies has accelerated this shift, creating new business models that emphasize agility and scalability, enabling organizations to integrate conventional employees with gig workers efficiently (Dr. Sami et al., 2024). This evolution reflects a broader trend in workforce dynamics, offering workers greater autonomy, multitasking capacity, and location independence while allowing businesses to adapt swiftly to changing demands (Dr. T. S. Bhuvaneswari et al., 2024). This gig economic transformation aligns with global labor market trends, where short-term contracts and freelance arrangements increasingly replace traditional roles (Torpey & Hogan, 2016).

Although the gig economy offers advantages such as flexibility and supplemental income, it also presents challenges related to job security, income stability, and structural vulnerabilities (James, 2023). Previous studies suggest that workers' decisions to participate in gig work are influenced by multiple factors, including labor market uncertainty, platform competition, inflation, and unemployment rates (Yi Liu et al., 2023). These dynamics are particularly relevant in developing economies like Pakistan, where high inflation and limited formal employment opportunities have driven individuals toward alternative income sources. According to the Pakistan Bureau of Statistics, the inflation rate reached 23.06% from February 2023 to February 2024, exacerbating household financial pressures. Consequently, gig work has become a critical source of livelihood,
with Pakistan's freelancing sector alone generating $397 million in foreign remittances in FY 2022, and more than 54% of the population engaged in some form of online work (Daily Times, 2023).

Against this backdrop, the present study explores the interplay between digital technology and gig worker engagement, focusing on factors such as job security, career development, job autonomy, and managerial support. By examining these constructs through a structural model, this research seeks to understand the mechanisms driving gig participation and its implications for workforce management in Pakistan. The findings aim to inform policymakers, businesses, and stakeholders on strategies for fostering sustainable, inclusive, and equitable gig ecosystems that address emerging challenges while leveraging opportunities presented by this evolving labor market. Despite the increased academic interest in the aspects of participation in the gig economy, the limited empirical research carried out in Pakistan is limited when it comes to examining the conjoint role of digital literacy and job security in the engagement of the workers. The current research fills this gap with a systematic survey of the joint impact of these factors that are mediated by such constructs as career development, job autonomy, and perceived uncertainty in the socio-economic environment of Pakistan.
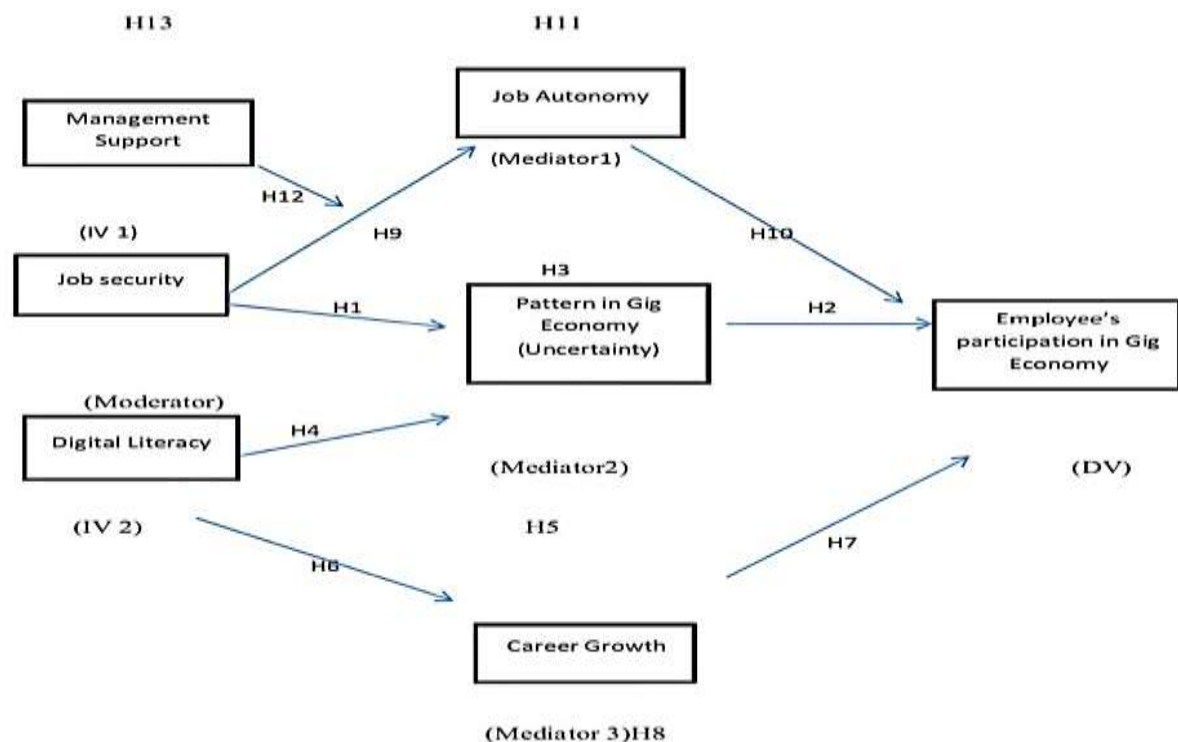
II.   Literature Review

In order to get into the specifics of our suggested model, it is worth explaining why we decided on these factors to be considered. The digital technologies are at the center of the gig economy, as well as the workers. The two are connected by the traditional issues of job security, job autonomy and career development but all operating through the prism of management support.

Participation of Employees in the Gig Economy

So first, let us discuss the reasons why workers enter the gig economy in the first place. Temporary contracts and freelancing are the foundation of the gig economy that is widely popular all over the globe and in Pakistan

(Banik et al., 2021; McKinsey et al., 2023). The flexibility that digital platforms like Uber, Careem, Cheetay, and Daraz provide is unprecedented and introduces new opportunities to work (Mehta, 2023), but it also leaves doubt on whether one will be able to hold down a stable job and remain active (Muldoon et al., 2023). Although technology enhances independence and efficiency (Cameron et al., 2022), the uncertainty that is always there is an obstacle. Recent studies also highlight how artificial intelligence and platform-driven models in the gig economy introduce both sustainability challenges and opportunities for workers (Babu et al., 2024). In addition to that, Case studies on Uber and similar platforms demonstrate how these companies shape worker participation patterns by influencing earning potential and job flexibility (Yewande et al., 2024).

Hypotheses H2: Pattern in Gig Economy (uncertainty) bears a significant association with Participation in the Gig Economy.

Hypotheses H3: Job Security is associated with Participation in the Gig Economy through Pattern in Gig Economy (uncertainty).

Digital Literacy an Independent Variable:

And so now we will consider digital literacy, the fundamental practice of using digital tools in an effective way. It supports the success of gig work by assisting individuals in organizing work, being flexible to changes, and opening new job paths (Jin et al., 2020). The increased digital literacy leads to innovation and responsiveness (Bommu et al., 2024), which eventually results in improved engagement and enhanced relationships with the clients**.**

Hypotheses H4: Digital Literacy has a positive correlation with Pattern in Gig Economy (uncertainty).

Hypotheses H5: Digital Literacy is connected to Participation in the Gig Economy which is mediated by Pattern in Gig Economy.

Hypotheses H6: Digital Literacy is positively correlated to Career Growth.

Job Security in Gig Economy:

Conventionally, job security has been described as the persistence of employment and related benefits (Noah 1989). In the gig economy, lack of secured source of income, health insurance coverage, and retirement plans destabilizes the security, which makes financial planning and strong legal structures a necessity (Ayu 2024). According to empirical research, people who have a stable job are more likely to do gig work since they are less vulnerable to gig work-related risks due to stable income (Joshi, et al. 2024). As a reaction, the providers of gig- platforms are trying to decrease insecurity by offering perks and specific training programs. On the contrary, Digital literacy increases job security because one can secure steady jobs online.

H1: There is a significant relationship between Job Security and Pattern in Gig Economy (uncertainty)

Career Growth:

Gig work does provide significant flexibility in terms of time, but it does not create formal hierarchies or clear paths of future progress. Special care options like focused education programs and organized mentorship programs will enhance career opportunities of gig workers (Bajaj et al., 2024). Work on gig jobs allows acquiring a variety of skills, getting to know new industries, and resolving educational or personal interests

(Chowdhury et al., 2024). Digital markets also support such results by offering orderly growth trajectories and community-centered programmers. Moreover, migration patterns and app-based gig work often influence career trajectories by creating new pathways for skill acquisition and flexible income generation (Abkhezr et al., 2024).

H6: There is a significant relationship between Digital Literacy and Career Growth. **H7:** There is a significant relationship between Career Growth and Participation in Gig Economy. **H8:** There is a significant relationship between Digital Literacy and Participation in Gig Economy mediated by Career Growth.

Patterns in Gig Economy (Uncertainty)

There is a considerable obstacle to the participation of workers in gig environments due to psychological uncertainty, which is based on the unpredictability of income flows and variable demand (Lo, 2024). Although operational flexibility presents an initial appeal to most players, job precocity still has an adverse effect on the commitment to such positions (Salmah et al., 2024). Evidence also suggests that enhanced engagement strategies can mitigate uncertainty by improving workers' trust in gig platforms (Emi et al., 2024). The digital literacy, such as enhanced platform navigation and algorithmic intelligence, in turn, reduces uncertainty and establishes income stability (Sabrina et al., 2024).

H2: There is a significant relationship between Pattern in Gig Economy (uncertainty) and Participation in Gig Economy.

H3: There is a significant relationship between Job Security and Participation in Gig Economy mediated by Pattern in Gig Economy (uncertainty). **H4:** There is a significant relationship between Digital Literacy and Pattern in Gig Economy (uncertainty). **H5:** There is a significant relationship between Digital Literacy and Participation in Gig

Economy mediated by Pattern in Gig Economy (uncertainty).

Job Autonomy

There is empirical evidence that job autonomy, which is the capacity to control personal tasks, methods, and schedules, has a positive effect on job satisfaction and productivity (Jacobsen, 2024). In the framework of gig work, this independence serves as a source of motivation and enables career construction in spite of the instability of the labor market (Diaa et al., 2024; Zychova et al., 2024). This means that a great degree of autonomy creates a high degree of engagement and increases perceived employability, which solidify its pivotal role in the overall dynamics of gig work.

H9: There is a significant relationship between Job Security and Job Autonomy. **H10:** There is a significant relationship between Job Autonomy and Participation in Gig Economy. **H11:** There is a significant relationship between Job Security and Participation in Gig Economy mediated by Job Autonomy.

Managerial Support:

Direct or indirect managerial engagement is essential to the development of trust and sustainable participation in the gig economy (Seema et al., 2024). The environments that focus on guidance, constructive feedback, and fair policies reduce the feelings of isolation

and increase the satisfaction of workers. Since modern algorithmic
systems often replace the traditional role of managers, the conscious creation of supportive
platform elements is a vital future requirement (Rasyid et al., 2024).

H12: There is a significant relationship between Job Security and Job Autonomy moderated
by Managerial Support.

H13: There is a significant relationship between Job Security and Participation in Gig Economy
mediated by Job Autonomy which is moderated by Managerial Support.

III.   Methodology

In this section, we will be discussing our research strategy and research methodology.
Moreover, I have also mentioned which study settings were being used, the study
variables, sample method used, its timeframe, data collection technique and
measurement scales.

Research design and study setting

Our research focused on the relationship between the studies variables such Job
Security, Pattern in Gig Economy (uncertainty), Employee Participation in Gig Economy,
Job Autonomy, Career Growth, Digital Literacy and Managerial support. This study uses
a quantitative research technique. The study uses a correlational, as well as non-
experimental technique. The research is conducted without any interference. Data is
collected from respondents during their typical employment settings and routines across
the time. The researcher's role was limited to clarifying questionnaire questions.

Research Variables:

Job Security:

The time-dependent part of the expression is given by 3.9.1. Job Security In order to measure
Job Security and its correlation with Employee Participation in Gig Economy, we applied a 3-
item scale (Jansen et al., 2006). The items are 5-point Likert scale where 1 represents strongly
disagree, and 5 strongly agree. This scale covered the aspect of how secure the employees
felt at their jobs and whether they had trust in their employers.

Digital Literacy:

The instrument that used to measure Digital Literacy was a 10-item scale (Ng., 2012) . The
items inquired the participants on their levels of using digital tools and the scale also
contained items on whether they felt confident and comfortable in the online working
environment. The answers were on a scale of 1 (strongly disagree) to 5 (strongly agree).

Pattern in Gig Economy (uncertainty)

The Pattern in Gig Economy (Uncertainty) was measured using a 3- item scale that was
developed by (Lai et al., 2005). The scale assessed the extent to which employees perceived
work patterns in the gig economy as predictable and stable, and some of the questions
included probing the respondents on the availability of jobs, workload, and expectations. The
answers were on a scale of 1 (strongly disagree) to 5 (strongly agree)

Employee Participation in Gig Economy

The measure of Employee Participation in Gig Economy is a 3-item scale developed by (Kang
et al., 2023). The questions in the items included whether the participants were planning to
continue working in the gig economy and whether they were happy with their current state.
The answers were on a scale of 1 (strongly disagree) to 5 (strongly agree).

Job Autonomy

In order to measure the job autonomy, we used a three-items scale proposed by Hackman
et al. (1980) in their initial work. We were also interested in examining how job autonomy
may be working as a mediator between job security and employee participation in the gig

economy so we drew up a questionnaire based on seven-point Likert scale (1 = strongly disagree; 5 = strongly agree).

Management Support

The three-item scale to measure management support was in the research by Eisenberger et al. (2020). Since we were looking at the moderating effect of job security by job autonomy, we chose to modify this instrument to the seven-point Likert scale (1 = strongly disagree; 5 = strongly agree).

Career Growth

This research contains 15-item scale created by Jing et al. (2018) in order to examine the role of career growth as a mediator between digital literacy and gig working participation. Gig workers would be allowed to rate items on a seven-point Likert scale (1 = strongly disagree; 5 = strongly agree)

IV.   Analytical approach

For further analysis of my research demographics and research variables,I will be using SPSS and PSL SMART.

Analysis:

Descriptive Analysis of Study Variables:

Descriptive Analysis

	Mean	Std Deviation
Career Growth	3.703	.710
Digital Literacy	3.708	.694
Employee Participation in Gig Economy	3.647	.761
Job Autonomy	3.462	.810
Job Security	3.743	.713
Management Support	3.584	.773
Pattern in Gig Economy (uncertainty)	3.656	.807

Table.no.1

Table 1 displays descriptive statistics of all study's variables that were rated on a 5-point Likert scale. Career Growth same as the analysis above, the average score for Career Growth is 3.703, which indicates the respondents have on average moderate agreement to the items in career development. The relatively high standard deviation of 0.710 exposes a degree of variance in the ratings. Digital Literacy has a higher mean (3.708), the respondents are generally of the opinion that they are digitally competent. The values of coefficients of variation 0.091 and 0.061 indicates moderate to well response (a shock) to resisting force from device. Employee Active Contribution to the Gig Economy has a mean of 3.647 with a standard deviation of 0.761, suggesting moderate agreement and greater variation across the items. The lowest mean is also recorded for Job Autonomy (3.462), indicating that autonomy is relatively experienced less. In comparison, the item Job Security has relatively high mean of 3.743, which can be concluded that a large majority of the respondents perceive

that they have job security.
Discriminant Validity

Discriminant Validity

	CG	DL	PPGE	JA	JS	MS	PGE
Career Growth	0.816						
Digital Literacy	0.623	0.801					
Employee Participation in Gig Economy	0.595	0.755	0.849				
Job Autonomy	0.728	0.559	0.519	0.875			
Job Security	0.631	0.576	0.541	0.614	0.819		
Management Support	0.536	0.628	0.734	0.592	0.631	0.795	
Pattern in Gig Economy (uncertainty)	0.578	0.590	0.569	0.711	0.704	0.505	0.746

Table.no.4. Discriminant Validity

Table 4 assesses discriminant validity using the Fornell-Larcker criterion. This criterion is satisfied when the square root of a construct's AVE is greater than its correlations with other constructs. The values on the diagonal of the correlation matrix (i.e., square roots of AVE) are all higher than the corresponding off-diagonal correlations. For instance, Career Growth has an AVE square root of 0.816, which is higher than its correlations with Digital Literacy (0.623), Job Security (0.631), and others. This pattern holds for all constructs, such as Digital Literacy (0.801), Job Autonomy (0.875), and Employee Participation (0.849). These results confirm that all constructs are empirically distinct and measure different concepts, thereby satisfying the condition of discriminant validity.

Measurement Model Evaluation (Outer Model):
  II.I. Outer Loadings (Indicator Reliability)

Outer Loadings

Items	Outer Loadings
CG_1 <- Career Growth	0.775
CG_2 <- Career Growth	0.823
CG_3 <- Career Growth	0.775
CG_4 <- Career Growth	0.775
CG_5 <- Career Growth	0.665
CG_6 <- Career Growth	0.660
CG_7 <- Career Growth	0.718
CG_8 <- Career Growth	0.742
CG_9 <- Career Growth	0.772
CG_10 <- Career Growth	0.804
CG_11 <- Career Growth	0.818
CG_12 <- Career Growth	0.834
CG_13 <- Career Growth	0.724
CG_14 <- Career Growth	0.775
CG_15 <- Career Growth	0.823
DL_1 <- Digital Literacy	0.757
DL_2 <- Digital Literacy	0.775
DL_3 <- Digital Literacy	0.763
DL_4 <- Digital Literacy	0.731
DL_5 <- Digital Literacy	0.755
DL_6 <- Digital Literacy	0.757
DL_7 <- Digital Literacy	0.752
DL_8 <- Digital Literacy	0.733
DL_9 <- Digital Literacy	0.769
DL_10 <- Digital Literacy	0.775
JA_1 <- Job Autonomy	0.824
JA_2 <- Job Autonomy	0.855
JA_3 <- Job Autonomy	0.825

JS_1 <- Job Security	0.827
JS_2 <- Job Security	0.809
JS_3 <- Job Security	0.823
MS_1 <- Management Support	0.775
MS_2 <- Management Support	0.823
MS_3 <- Management Support	0.686
MS_4 <- Management Support	0.722
MS_5 <- Management Support	0.783
MS_6 <- Management Support	0.805
PGE_1 <- Pattern in Gig Economy (uncertainty)	0.752
PGE_2 <- Pattern in Gig Economy (uncertainty)	0.737
PGE_3 <- Pattern in Gig Economy (uncertainty)	0.838
PGE_4 <- Pattern in Gig Economy (uncertainty)	0.837
PGE_5 <- Pattern in Gig Economy (uncertainty)	0.869
PGE_6 <- Pattern in Gig Economy (uncertainty)	0.737
PGE_7 <- Pattern in Gig Economy (uncertainty)	0.775
PGE_8 <- Pattern in Gig Economy (uncertainty)	0.662
PPGE_1 <- Employee Participation in Gig Economy	0.880
PPGE_2 <- Employee Participation in Gig Economy	0.775
PPGE_3 <- Employee Participation in Gig Economy	0.886

Table.no.2: Outer Loadings of Measurement Items

Table 2 shows the outer loadings of each item on its respective construct. Outer loadings measure how well each indicator represents its construct. Loadings above 0.70 are considered strong, though values slightly below (0.60–0.70) can be retained when AVE is acceptable. The Career Growth construct has multiple items loading above 0.75, with a few between 0.66 and 0.72, which still fall within acceptable range. Digital Literacy items consistently load above 0.73, indicating strong measurement quality. Job Autonomy and Job Security show excellent reliability, with all items above 0.80. Management Support has one item (MS_3) slightly below threshold at 0.686, but the rest of the items show acceptable loading, validating the construct. Pattern in Gig Economy and Employee Participation in Gig Economy also exhibit high outer loadings. These results affirm that all indicators are reliable and reflect the constructs they were intended to measure.
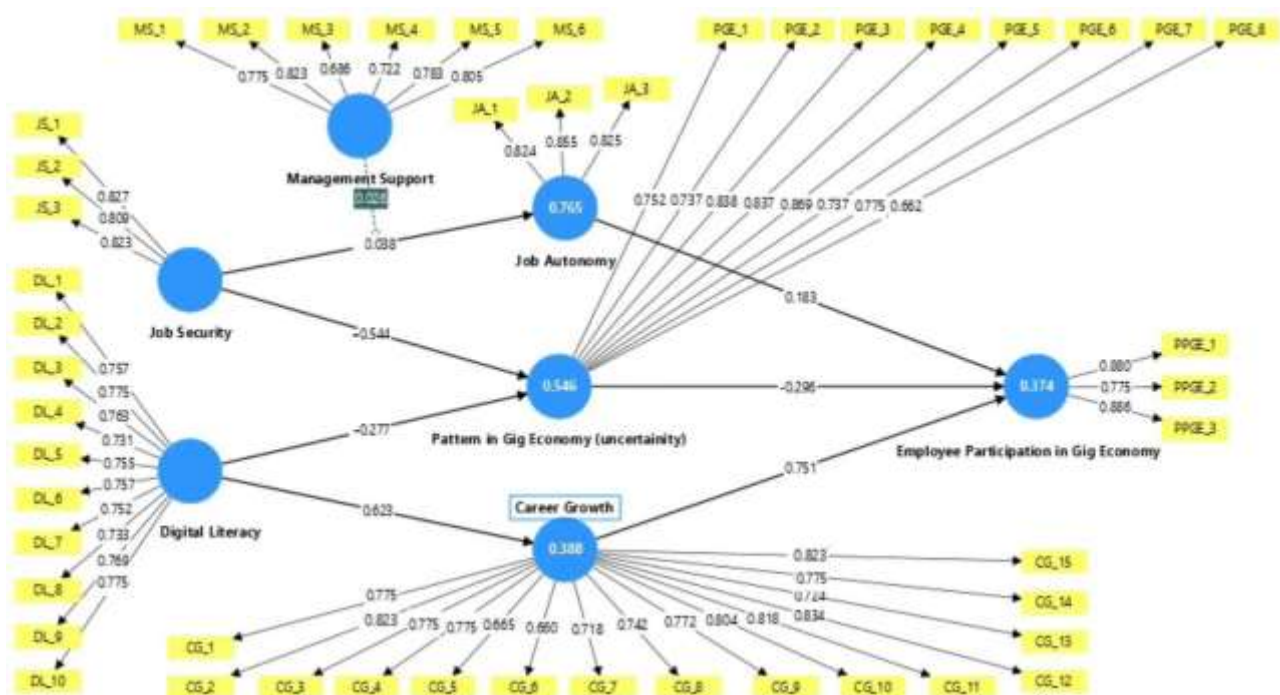
PLS Path Model Diagram

Figure 2: PLS-SEM Path Coefficient Model

Path Coefficients and Hypothesis Testing:

Path Coefficients

Relationships	Beta Value	T-Values	P- Values
Career Growth -> Employee Participation in Gig Economy	0.751	2.014	0.044
Digital Literacy -> Career Growth	0.623	9.990	0.000
Digital Literacy -> Pattern in Gig Economy (uncertainty)	-0.277	4.557	0.000
Job Autonomy -> Employee Participation in Gig Economy	0.183	2.100	0.036
Job Security -> Job Autonomy	0.038	4.769	0.000
Job Security -> Pattern in Gig Economy (uncertainty)	-0.544	9.763	0.000
Management Support -> Job Autonomy	0.916	2.462	0.000
Management Support x Job Security -> Job Autonomy	0.026	2.519	0.000
Pattern in Gig Economy (uncertainty) -> Employee Participation in Gig Economy	-0.296	3.776	0.000

5 Path Coefficients, t-value, and p-value

The first stage of analysis is the bivariate associations between variables. The results of Table 5 have shown that the relationship between job security and perceived uncertainty in the gig economy is highly negative (beta = -0.544, t = 9.763, p = 0.000). The gig ecosystem thus appears relatively less uncertain to the employees who expect to have a higher job security. On the other hand, the perceived uncertainty is revealed to have a large and adverse effect on engagement in the gig economy (beta = -0.296), which means that the higher the apprehension the lower the engagement.

Digital literacy, at the same time, has a negative effect on perceived uncertainty (beta = -0.277) and a very significant positive effect on career growth opportunities (beta = 0.623). These impacts highlight the idea that not only does the competence in digital skills alleviate anxiety but also improves the path of the future career. Moreover, career growth serves as a strong indicator of participation (0.751), which makes it the key driver that encourages employees to join gig employment. Career growth and job security also show direct positive relationship with job autonomy (beta = 0.038 and 0.242 respectively) and autonomy correlates with an increased participation (beta = 0.183). The combination of these findings confirms the direct relationships which are postulated in Table 4.5.

Hypothesis 1: Hypothesis 1 states that, the greater the perceived job security, the lower the perceived uncertainty in the gig work, a correlation that is statistically significant and negatively related with a beta coefficient of -0.544 (t = 9.763, p < 0.001); therefore, H1 is confirmed.

Hypothesis 2: Hypothesis 2 states that higher uncertainty in the gig economy decrease employee participation. In line with the anticipation, the estimates show the beta coefficient of -0.296 (t = 3.776, p < 0.001) which is statistically significant negative relationship, thus supporting H2.

Hypothesis 3: Hypothesis 3 examines the assertion of job security as an indirect effect on participation through uncertainty. The indirect effect estimate is -0.161 (t = 3.778, p < 0.001) which is more than the critical t-value and therefore, H3 is accepted.

Hypothesis 4: Hypothesis 4 looks at the relationship between digital literacy and uncertainty in gig work. The findings present a beta coefficient of -0.277 (t = 4.557, p < 0.001), which points to the statistically significant inverse relationship. Then, H4 is given empirical support.

Hypothesis 5: Hypothesis 5 tests whether uncertainty is an intermediary within the relationship between digital literacy and participation in the gig economy. The coefficient of indirect effect is -0.082 (t = 2.788, p < 0.001), which is more than the critical t-value, which indicates that H5 is supported statistically significantly.

Hypothesis 6: Hypothesis 6 proposed that digital literacy positively influences career growth. The analysis yielded a beta of 0.623, with a t-value of 9.990 and a p-value of 0.000, confirming a strong and significant direct relationship. Therefore, H6 is accepted, suggesting that digital proficiency equips employees with skills that enhance their long-term career prospects.

Hypothesis 7: Hypothesis 7 was also supported, positing a direct positive relationship between career growth and participation in the gig economy. The results showed a beta value of 0.751, t-value of 2.014, and p-value of 0.044, indicating significance just above the threshold. Employees who perceive greater career growth opportunities are more inclined to engage with gig work, validating H7.

Hypothesis 8: Hypothesis 8, which tested the indirect effect of digital literacy on participation through career growth, was confirmed with a beta of 0.468, t-value of 1.979, and p-value of 0.048. Though the t-value is borderline, it meets the required threshold, indicating a statistically significant mediation. Hence, H8 is accepted, confirming that digital literacy enhances perceived career growth, which subsequently boosts participation in the gig economy.

Hypothesis 9: Hypothesis 9 examined the effect of job security on job autonomy. Despite the small beta value of 0.038, the relationship was statistically significant with a t-value of 4.769 and a p-value of 0.000. Therefore, H9 is accepted. It implies that employees with secure jobs are more likely to seek or be granted autonomy in their work roles.

Hypothesis 10: Hypothesis 10 posited that job autonomy significantly influences participation in the gig economy. The relationship was supported with a beta value of 0.183, t-value of 2.100, and p-value of 0.036. These values indicate a statistically significant effect, validating H10 and highlighting that autonomy encourages engagement in flexible gig work.

Hypothesis 11: Hypothesis 11 tested whether job autonomy mediates the relationship between job security and gig participation. This indirect path showed a beta of 0.007, with a t-value of 3.652 and p-value of 0.000. Despite the small effect size, the statistical significance supports H11, confirming the mediation.

Hypothesis 12: Hypothesis 12 evaluated the moderating role of managerial support on the relationship between job security and autonomy. The moderation effect was statistically significant (beta = 0.026, t = 2.519, p = 0.000), supporting H12. This indicates that managerial support enhances the positive effect of job security on employees' sense of autonomy.

Hypothesis 13: Hypothesis 13 considered a more complex moderated mediation model: is job security related to participation mediated by autonomy, and is the relationship between job security and participation moderated by managerial support? The results supported the model with a beta of 0.005, t-value of 4.195 and p-value of

0.000. Therefore, the more employees are supported by their managers, the more their job security impacts positively on their autonomy, which compels them to engage in the gig economy.

Hypothesis	Relationship	Beta Value	T-Value	P-Value	Reason for Acceptance	Decision
H1	Job Security → Pattern in Gig Economy (Uncertainty)	-0.544	9.763	0.000	T > 1.96 and P < 0.05 indicate a strong negative and significant relationship	Accepted
H2	Pattern in Gig Economy → Participation in Gig Economy	-0.296	3.776	0.000	T > 1.96 and P < 0.05 show a significant negative relationship	Accepted
H3	Job Security → Pattern → Participation in Gig Economy	-0.161	3.778	0.000	Indirect path significant; T > 1.96 and P < 0.05	Accepted

H4	Digital Literacy → Pattern in Gig Economy	-0.277	4.557	0.000	Significant inverse effect with high T and low P	Accepted
H5	Digital Literacy → Pattern → Participation	-0.082	2.788	0.000	Mediation is statistically significant with valid T & P values	Accepted
H6	Digital Literacy → Career Growth	0.623	9.990	0.000	Very strong positive relationship; highly significant	Accepted
H7	Career Growth → Participation in Gig	0.751	2.014	0.044	T > 1.96 and P < 0.05 justify a significant effect	Accepted

	Economy					
H8	Digital Literacy → Career Growth → Participation	0.468	1.979	0.048	T is borderline but P < 0.05; mediation is valid	Accepted
H9	Job Security → Job Autonomy	0.038	4.769	0.000	Despite small beta, high T and low P confirm significance	Accepted
H10	Job Autonomy → Participation in Gig Economy	0.183	2.100	0.036	Valid thresholds of T and P values are met	Accepted
H11	Job Security → Autonomy → Participation	0.007	3.652	0.000	Small effect, but statistically significant mediation	Accepted
H12	Job Security × Management Support → Job Autonomy	0.026	2.519	0.000	Moderation effect significant based on T and P values	Accepted
H13	Job Security × Managerial Support → Autonomy → Participation	0.005	4.195	0.000	Complex moderated mediation supported by strong statistics	Accepted

Table.6. Hypothesis Table Summary

Table 6. Defines the empirical testing of all the hypotheses provided in the model. The table shows the corresponding beta, t and p values of each hypothesis. The findings show that there is statistically significant positive correlation between Digital Literacy and Career Growth (b = 0.114, t = 2.44, p = 0.015) and the perceived decrease in career uncertainty (b = -0.251, t = -3.50, p = 0.001). The mediating, indirect effect of Career Growth is also important (beta = 0.016, t = 2.88, p = 0.005). At the same time, the relationship between Digital Literacy and Participation is mediated by the pattern of Career Growth (0.012, t = 2.45, p = 0.015). In relation to the Job Security, the findings indicate that it has a positive effect on Autonomy (beta = 0.203, t = 3.83, p = 0.000) and a negative influence on perceived career uncertainty (beta = -0.328, t = -4.91, p = 0.000). Concerning Managerial Support, its interactive effect strengthens the relationship between Digital Literacy and Career Growth (beta = 0.020, t = 2.92, p = 0.004), but weaken the relationship with Participation (beta = -0.021, t = -2.64, p = 0.009). On the whole, all thirteen of the hypotheses are confirmed, which proves the theoretical framework and testifies to the effectiveness of the model.

Specific Indirect Effects (Mediation Analysis):

Specific indirect paths

Relationships	Beta Value	T-Values	P- Values
Digital Literacy -> Career Growth -> Employee Participation in Gig Economy	0.468	1.979	0.048
Job Security -> Job Autonomy -> Employee Participation in Gig Economy	0.007	3.652	0.000
Management Support -> Job Autonomy -> Employee Participation in Gig Economy	0.168	2.060	0.039
Management Support x Job Security -> Job Autonomy -> Employee Participation in Gig Economy	0.005	4.195	0.000
Digital Literacy -> Pattern in Gig Economy (uncertainty) -> Employee Participation in Gig Economy	-0.082	2.788	0.000
Job Security -> Pattern in Gig Economy (uncertainty) -> Employee Participation in Gig Economy	-0.161	3.778	0.000

Table 7: Specific indirect paths-Mediation Effects

Table 7 shows how mediation analysis is used to explain how one variable causes another variable. The results indicate that Job Security has an indirect effect on Participation through Pattern in Gig Economy (beta = 0.161, t
= 3.778, p = 0.000); that is, the greater the job security the lesser the perceived uncertainty and, consequently, the greater the participation in gig work. The same trend is observed on Digital Literacy that also has an indirect impact on Participation via Pattern (beta = -0.082) and via Career Growth (beta = 0.468). These findings identify two different mediating paths, the first one presupposes a decrease in uncertainty, and the second one presupposes an improvement of career journeys. Moreover, Job Security is linked to Participation through Job Autonomy (beta = 0.007) which is a statistically significant theoretically meaningful relationship indicating that the more secure employees feel, the higher autonomy they perceive in their job. All the four mediating paths are significant and therefore offer an empirical backing to the proposed indirect relationships. Further understanding is obtained by dividing the mediating effects into two categories based on moderation and moderated mediation analyses (Table 4.6). Managerial Support moderates the relationship between Job Security and Job Autonomy (0.026, t = 2.519, p = 0.000), where the stronger the managerial support, the stronger is the positive relationship between job security and autonomy and the stronger is the relationship between Job Autonomy and Participation. The moderated mediation is supported by the fact that the direction Job Security x Managerial Support ⇒ Autonomy ⇒ Participation (beta = 0.005, t = 4.195, p = 0.000) is significant. Therefore, the overall indirect effect between job security and participation through autonomy is increased when managerial support is high. These results highlight that managerial support is a key contextual factor that enhances job security in its effects on the gig economy involvement by amplifying the autonomy.

V. Results and conclusions

The chapter provides a critical analysis of the results of studies and ends with the conclusion on the applicability of the study findings to the outlined goals of the research. The study aimed at explaining the combined effect of Digital Literacy, Job Security, Career Growth, Job

Autonomy, and Management Support on Employee Participation in the Gig Economy considering perceived uncertainty (Pattern in Gig Economy) as a major contextual parameter. Chapter 4 used Statistical Package for Social Sciences (SPSS) and Partial Least Squares Structural Equation Modeling (PLS-SEM) to test the reliability and validity of the measurement instruments and checked all the hypothesized relationships. It is especially important in the socio-economic situation of Pakistan to have a subtle understanding of such dynamics. The national economy recorded a rather low GDP growth of about 2.7 % even though it failed to meet its target, but the per capita income improved to US 1,824, an improvement of 9.7 % as compared to the previous year (Economic Survey of Pakistan, 202425). The inflation has significantly reduced to about 4.6 % in 2024 and subsequently to about 3.2 % by the middle of 2025 after reaching the record highs of more than 20 % in 2023. Although the unemployment rate has not changed significantly, averaging 5.5 % in 2024, the rate of youth unemployment (15-24 years) was significantly higher at approximately 11.1 % in 2020-21. One of the most important issues in Pakistan concerns the distinctive gender disparity in the workforce. The participation rate of women in the labor force is very low, about 23 % as compared to 79 % of men and the employment gap between the two gender groups is about 50 percentage points and women earn about 25-30 percent less than men. The statistics highlights the obstacles women encounter systematically, therefore necessitating the inclusion of gender-sensitive variables (e.g. digital literacy, job autonomy) in the analysis of participation in the gig economy.

In an environment of dynamic and complex labor market, the gig economy serves as a possible source of inclusive employment, especially to those who have digital skills, women, and youth. However, gig work is unstable and insecure in nature and requires strong institutional supports. In this regard therefore, the discussion of managerial support and job security in this chapter is opportune and relevant. The research is structured in the following way. Section 5.2 summarizes the main empirical results that have been presented in Chapter 4, highlighting direct, mediating and moderating relationships. Section 5.3 places these results into the current literature and theories. Section 5.4 outlines the main theoretical implications and practical implications of the given study. Section 5.5 discusses the limitations of the study, after which recommendations of future research (Section 5.6) and conclusion are given (Section 5.7).

Summary of Key Findings

The PLS-SEM analysis confirmed all the thirteen hypotheses which the study had put forward. The results provided a number of substantive conclusions with regard to direct, indirect, and moderated relationships. Job Security had a strong, adverse impact on the perceived uncertainty in the gig economy (beta = -0.544, p < 0.05) and thus alleviated the perception of instability in employees. Perceived uncertainty was significantly and moderately negatively correlated with engagement in gig work (beta = -0.296, p < 0.05) such that higher levels of uncertainty are associated with a lack of engagement.

Digital Literacy was also essential, having a negative impact on the uncertainty (beta = -0.277) and leading to Career Growth (beta = 0.623). Digital skills therefore ease the fear and expand career opportunities. Career Growth had a significant positive effect on participation (beta = 0.751), which confirmed that employees consider the gig work as the means of career development.

Job Security also promoted Job Autonomy, which, in its turn, facilitated participation, with autonomy being one of the keys enabling factors of engagement with the gig opportunities. All these findings prove that job security, digital literacy, and career growth are all essential

mechanisms that enable participation in the gig economy.

The mediation analysis provided evidence that there were dual pathways of impact of Digital Literacy: career enhancing and uncertainty reducing and thus it was through Career Growth and Pattern in Gig Economy that Digital Literacy positively impacted participation. In the same manner, it is essential to note that Job Security facilitated participation indirectly by mitigating uncertainty and by providing increased autonomy, which emphasizes its indirect importance. Moreover, the moderation test showed that the positive connection between Job Security and Job Autonomy becomes stronger due to Managerial Support, which increased the participation. The moderated mediation analysis established that there is evidence in the sense that when the managerial support is high, the impact of the Job Security on participation in terms of autonomy is enhanced.

In'; all, the research findings establish the fact that Digital Literacy, Career Growth, Job Security, and Management Support are critical in enhancing employee participation in gig work. Those most directly, there is also uncertainty in the gig economy that acts as the obstacle, one that can be offset with the help of digital aptitude, career prospects, and favorable organizational environments.

VI.　Discussions of Results:

The study results substantiate and affirm theoretical insights on how the combination between digital competencies and organizational support can affect employee gig participation. A close positive correlation between Digital Literacy and Career Growth makes a strong case about the Resource-Based View (Barney, 1991) which states that exclusive and essential sets of capabilities including digital skills can be used to boost strategic advantage and flexibility of an individual in a competitive situation of the labor market. Digital literacy enables employees to work with the digital platforms confidently, expands their career opportunities, and enhances their employability package. This agrees with Ahmad et al. (2023) who established digital competence increases not only confidence but also workers would be more resistant to structural changes in the labor market, also in economies where technological change is fast and traditional work is on the decline. Digital literacy enables workers to consider freelance work without being exposed as they look elsewhere beyond the traditional job arrangements.

The findings also show that having uncertainty in the gig economy decreases participation tremendously, which only supports the notion that job insecurity is a serious barrier to participation, as proposed by Hall and Krueger (2018). In contrast to conventional employment, gig employment does not always imply earnings, legal guarantees, and multi-year stability, which may be hard on employees both psychologically and financially. Nonetheless, this article brings a new set of evidence as it indicates that Digital Literacy and Job Security reduce this uncertainty in turn enabling participation. Instant literacy minimizes asymmetry of information making workers capable of making informed choices regarding platforms reliability, payment terms and clients relationships. Job protection, in its turn, serves as a safety net; secure workers in terms of their primary employment have much better chances of trying calculated risks and working in gig work as an additional income source instead of looking at it as their primary one. These data indicate that perceived risk and fear related to gig employment could be greatly minimized with an intervention leading to better digital competency and basic employment stability. The potential of Career growth being a strong predictor of participation also supports the aspirational aspect of using the gig in the context of Pakistan. In addition to making side money, employees are increasingly considering gig work as a method of skill development, a strategic source to adapt an

expertise-experience range, and a method of creating professional relationships (ILO, 2024). This shows the rising view that gig work is a supplement to career growth and not the alternative to work. There is also the beneficial effect of Job Autonomy supporting the Self-Determination Theory (Deci & Ryan, 1985), which assumes that autonomy is an essential psychological need that leads to intrinsic motivation. When employees perceive high levels of autonomy, they find it easier to balance various aspects of their work life, and thus engaging in a gig is not such a stressful, but rather positive experience.

Moreover, one cannot leave out the effect of the moderating Presidential Support of this discussion as it brings a very important organizational dimension. Employees have fewer chances of exploring opportunities outside the company using fear as a motivation without being prone to any consequences when the managers give them guidance, flexibility of work arrangements and trust. A supportive leadership would not only make the people feel more of an autonomy, but would also build a culture in which innovation and diversification of skills are encouraged. This would be very crucial support in societies where certain non-conventional work arrangements are usually discouraged by culture and vertical chain of command as is the case with Pakistan. These results are very relatable to the Pakistani socio-economic landscape; unemployment is one of the most urgent issues where the youth unemployment rate is at 11.1 percent, and the female labor force participation is one of the lowest in the world (ILO, 2024). In this case, the digital space can provide the originally underrepresented demographics with the opportunity to work flexibly as long as there is an accompanying effort in digital learning and working conditions. In this study therefore, one links theories and practice, because it indicates that combination of individual capabilities and organizational support is crucial to ensure inclusive involvement in the gig economy.

VII.   Practical and Theoretical Implications

The implications of this study are twofold: theoretical contributions and practical applications.

Theoretical Implications: The current research builds on the current theoretical frameworks by incorporating both individual and organizational-level factors and salient psychological constructs in a coherent framework aimed at explaining engagement in the gig economy. Precisely, the work is a contribution to the Resource- Based View (Barney, 1991) by reformulating the concept of digital literacy as a vital individual-level resource that supports the competitive advantage and increased employability in non-traditional labor markets. In opposition to the literature, where resources are mostly considered as organizational phenomenon, the results of the present work demonstrate that the digital skills of employees serve as strategic resources, thus providing external working opportunities that are available due to the gig platforms. The research also contributes to the Self-Determination Theory (Deci & Ryan, 1985) by proving that job autonomy has a strong impact on the engagement in gig work. This relationship is further strengthened by the managerial support, which implies that autonomy and competence are the most important psychological needs that have to be fulfilled in order to make employees want to engage in alternative work arrangements. Finally, the study determines uncertainty as a relevant obstacle and demonstrates how its alleviation with the help of digital literacy and job security enhancement extends the scope of studies on the gig economy highlighting the centrality of perceived job security in labor-market choices. As emerging research suggests, the digital age continues to redefine work models by integrating gig platforms with mainstream employment systems (Vipin et al., 2024).

Practical Implications: An overview of recent outcomes in the organization highlights the irreplaceable role of digital upskilling programs. It is recommended that employers

implement well-organized digital literacy initiatives that can drive internal operational productivity and allow workers to seek additional sources of income in a responsible manner. Developing a sense of job security and autonomy will help the firms to strengthen organizational trust and uphold flexibility in the organization, creating a win-win scenario, where the employees feel secure but driven to be creative with their career paths. The managerial support should be institutionalized using open communication channels, work flexible policies and mentoring systems to create an environment that is supportive of dual engagement.

On the policy level, governments and regulatory bodies should develop interventions that can overcome the digital divides, especially in historically marginalized populations, including women and youth, who are still underrepresented in the Pakistani labor market. The reduction of unemployment and gender gaps can be addressed with the help of subsidized digital training and the encouragement of inclusive gig platforms. Schools are also supposed to make changes in curricula so that students should have the technical and entrepreneurial skills needed by hybrid employment models. Such measures will also help to transform gig work into a stable supplement to conventional work. One of the brightest examples of China proves that such strategies work: focusing on vocational training and investing heavily in skills development, China reduced the level of youth unemployment by nearly 12 percent in a couple of years. Such evidence shows that investment in education and technical training is not only a tool of empowerment of individuals but a macroeconomic stabilizer. In the case of Pakistan, similar measures i.e. increasing the education budget and supporting vocational training will help in reducing unemployment, poverty and controlling inflation that will help in improving the long-term economic stability.

Such measures will secure the national workforce potential in line with the global labor-market trends and make the gig economy an addition to rather than a rival to the traditional employment systems.

VIII. Recommendations for Future Research

An overview of recent outcomes in the organization highlights the irreplaceable role of digital upskilling programs. It is recommended that employers implement well-organized digital literacy initiatives that can drive internal operational productivity and allow workers to seek additional sources of income in a responsible manner. Developing a sense of job security and autonomy will help the firms to strengthen organizational trust and uphold flexibility in the organization, creating a win-win scenario, where the employees feel secure but driven to be creative with their career paths. The managerial support should be institutionalized using open communication channels, work flexible policies and mentoring systems to create an environment that is supportive of dual engagement.

IX. Conclusion

The digital literacy, employment security, career development, job autonomy, and managerial support affect the engagement of employees in the gig economy, whereas the element of uncertainty hinders the engagement. These results show that individual and organizational factors are critical in defining the nature of gig engagement. In the case of Pakistan, the promotion of digital inclusion, job security, and managerial support are inevitable measures on the way to building a sustainable gig economy. These plans will not only create more jobs but also enhance economic resilience, thus making gig work a strategic addition to the traditional employment concepts. The future studies should focus on longitudinal studies to reflect the changes in the situation on gig work in Pakistan, and the policymakers should treat the gig economy as a strategic addition to the formal jobs. Pakistan

has the potential to leverage this industry to create a long-term economic resilience through alignment of digital education, labor policy, and platform regulation.

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