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Digital Transformation: Its Impact on Employment Generation in India

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Abstract

Digital technology has greatly transformed business activities, e-commerce, e-government, and the global labor market. To keep up with these changes, employees need access to quality training and essential skills. The shift to online job platforms impacts both national and international markets. This research aims to explore the long-term relationship between digital transformation and employment in the country. The study employed the OLS method to analyse how digital technology affects employment growth. Additionally, the Johansen co-integration test was used to identify the long-term causal relationship among the variables.

Keywords: Digitalisation, Employment, OLS estimations, Granger-Causality, Johansen Test of Co-integration.

Introduction

“The internet is becoming the town square for the global village of tomorrow” (Bill Gates). The world is experiencing a significant change due to the rapid spread of digital technologies, which are influencing various aspects of life, including the economy, labour markets, and employment. The digitalization of business activities and the growth of e-commerce have led to the development of e-government structures and a digitized international labor market (Pedchenko N., et al, 2021). In this environment, it is essential to have well-trained employees equipped with the necessary skills and competencies for the digital age (Izmailova, 2018).

The labour market is undergoing transformation due to the growing use of online job platforms and digital technologies (Chinoracky et al., 2019; Aly, 2020). The relationship between digital transformation, economic development, labour productivity, and employment is complex and not yet fully understood, highlighting the need for further investigation. Some self-claimed pioneers of change have provided an inaccurate view of flexible innovation, often defined by cost-cutting, risk-shifting, and exploiting legal loopholes, which can disrupt labour law (Aloisi et al., 2020). The digital revolution's impact on the national economy, especially in terms of technological advancement and innovation dissemination, is very significant, offering both advantages and challenges (Pizhuk et al., 2020).

The concept of digitalization and digital technologies, along with their impact on the labor market, individual and collective labor relations, and the wider labor sector, remains an active area of research (Tomashevski, 2020). Developing digital infrastructure is a strategic process that can influence employment levels across various regions, including Russia, where there are both opportunities and risks associated with its implementation (Dmitrieva et al., 2020). The influence of economic digitalization on

employment is being studied and assessed, with the extensive use of digital tools for processing, storing, and sharing information playing a significant role in the digital transformation of business operations and the growth of a global digital labor market (Stefanenko et al., 2021).

Countries with strict employment laws often see lower activity in technology-focused sectors, as these regulations can block the entry of new startups. The spread of digital technologies and job growth in the service sector progress more slowly in upper middle-income countries compared to high-income nations. Meanwhile, low-income countries often lack the necessary ICT infrastructure and digital tools to participate fully in the global digital labor market (Pedchenko N., et al, 2021; Delin et al., 2021). The long-term link between the digital revolution and employment levels is a key research area, offering guidance for policymakers on directing investments and regulating the economy to boost employment while safeguarding public interests. For instance, attracting foreign investment through effective policies can create more jobs and enhance workers' skills via digital learning. Additionally, gains in digital efficiency and productivity can foster a business-friendly environment across regions, helping to reduce inequalities and drive economic growth.

Figure 1

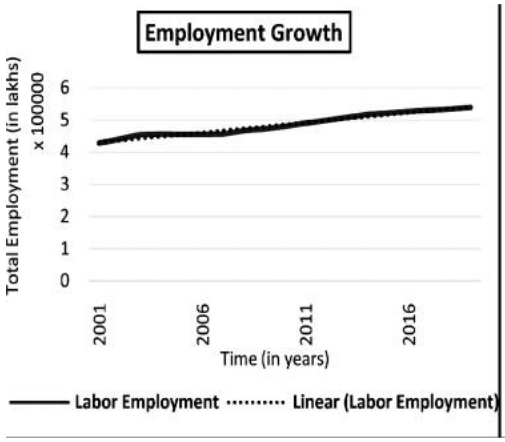
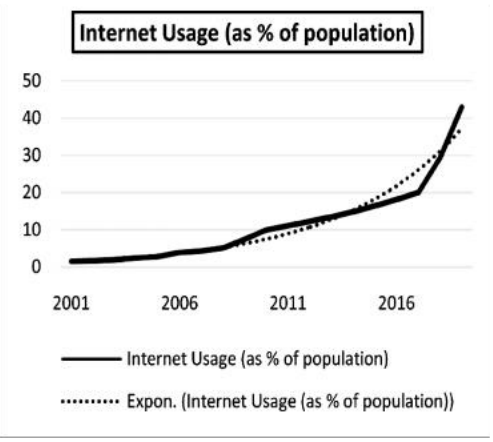


Figure 2



Source: KLEMS Database, RBI and WDI, World Bank

Figure 3

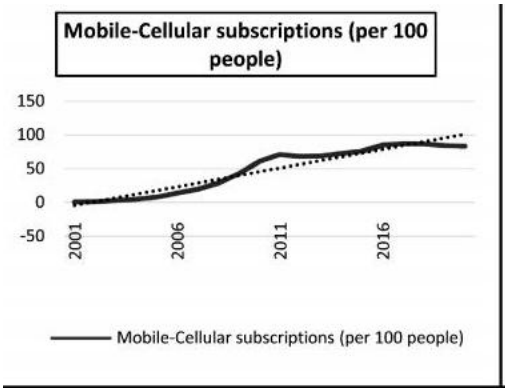


Figure 4

Source: WDI, World Bank

Figure 1 illustrates the growth of total employment across all organized sectors of the economy, based on the RBI KLEMS database. The unorganized sectors are still not included in the assessment of digital influence on employment levels. The figure also shows an average compound growth rate of 1.36% over the study period. While multiple factors may contribute to this growth, our focus is on measuring the impact of digital activities over time. Figure 2 presents data on internet usage and access, which increased at a compound rate of 24.58% during the same period. Additionally, the figure highlights a sharp rise in internet users since 2017, coinciding with improvements in telecommunication infrastructure and the expansion of 4G technology.

Figure 3 shows that mobile device usage increased significantly after 2010, driven primarily by the rising demand for smartphones. Mobile cellular subscriptions grew at an annual rate of 29.58% during the study period. This growth can be attributed to the entry of numerous electronics manufacturers like Apple, Samsung, Motorola, Xiaomi, and Google into India, facilitated by flexible FDI policies. Additionally, Figure 4 illustrates that exports of ICT goods are still very modest, with a compound annual growth rate of just 0.26%. India remains heavily reliant on foreign technology despite producing a large number of ICT graduates and engineers. However, many of these graduates lack the essential skills needed by the foreign sector, limiting their employability. Furthermore, investments in Indian companies capable of serving the domestic market, such as Micromax and Maxx Mobile, often face restrictions on expansion, hindering their competitiveness against overseas counterparts. Consequently, the relationship between digital transformation and employment is complex and requires ongoing analysis. Key research areas include expanding digital infrastructure, the impact of digital technologies on the labour market, and the effects of economic digitalization on employment. Findings from these studies can guide policy-making and contribute to a more equitable and prosperous society.

Review of Literature

Digitalization is a complex and relatively underexplored aspect of global economic transformation, involving the use of digital technologies for processing, storing, and transmitting information. This process fuels the digitization of business operations, expands e-commerce, advances e-government systems, and creates a globally digitalized labour market. (Izmailova, 2018) highlighted the importance of quality training for skilled workers to meet the demands of the labour market and the real economy. Online job platforms are also reshaping local and global labour markets. (Chinoracky et al., 2019) analyzed technology's impact on the labour market, especially in transportation. (Aly, 2020) explored the links between digital transformation, AI trends, development, employment, and productivity. Aloisi et al. (2020) argued that some advocates of change tend to distort flexible innovation, often causing disruptions in labour law. Pizhuk et al. (2020) examined both positive and negative effects of digital transformation on the national economy. Tomashevski (2020) discussed the concepts of' digitalization" and' digital technologies" and their influence on the labour market, including individual and collective labour relations, and the labour sector.

Dmitrieva et al. (2020) and Alàbinà (2021) outlined strategic directions for developing digital infrastructure in SMEs within the Russian Federation, including the opportunities and challenges of implementation. Stefanenko et al. (2021) aimed to analyse the effects of economic digitalization on employment, employing methods such as descriptive analysis, variance analysis, synthesis, individual and group comparisons, and econometric techniques like OLS. Pedchenko et al. (2021) emphasised how

digitalization impacts the global economy and transforms the labour market, noting that countries need to assess their digitalization levels across groups. They observed that nations with stringent employment regulations tend to have reduced activity in technology-intensive sectors. Additionally, they pointed out that the rapid growth of technology and employment in the service sector is slower in upper middle-income countries compared to high-income countries. Conversely, low-income nations face challenges due to limited ICT adoption, hindering their populations from participating fully in the digitalized global labour market. Similarly, Delin et al. (2021) discussed utilising digital setups- such as technology, goods, and platforms- as initial steps toward transformation. Rakhmawan (2022) studied how digitalization, social security, productive age, and COVID-19 risks influence the wellbeing of casual workers in East Java.

The study found that digitalization can enhance microeconomic activities and societal well-being, identifying different levels of readiness for digital transformation through cluster analysis. Kokånova et al. (2020) examine digitization in agriculture and its potential to address climate change challenges by reducing risks, boosting yields, and increasing the competitiveness of agro-products. The study emphasises the importance of digitalisation for Kazakhstan's agriculture sector to support global food security. Choy (2020) shows that digital transformation positively affects productivity, prices, and economic growth in Russia, recommending innovation policies to enhance productivity and stabilize prices. Goel (2021) investigates how digitization impacts faculty employability in India's education sector during the COVID-19 pandemic, using secondary data. The findings highlight how online teaching can influence employment prospects and suggest strategies to create jobs and prevent salary reductions during digitalization.

Narang (2018) emphasises the benefits of India's "Digital India" initiative, which aims to foster a knowledgeable economy and a digitally empowered society with equal access to technology. The program intends to enhance citizens' quality of life through improved governance and the delivery of government services. De Groen et al. (2017) observe that digitalization is transforming the business landscape and impacting employment and industrial relations. Their work underscores the importance of addressing labor conditions, taxation, and social security in government strategies for digitalization. Shewale (2018) investigates how digitization affects economic growth in India and its potential to generate employment. The study highlights rising internet penetration and technology use, which boost the digital market, lead to more firms, increased prices, and higher productivity. The paper concludes that expanding SMEs is essential for digital progress and job creation.

Similarly, the study by Beauty (2019) explores Nigeria's challenges in digital transformation and its economic impact. It emphasises the need for improved digital infrastructure, such as reliable and affordable broadband, and provides extensive literature on digital transformation through the Leaser-Fiche Model. Varlamova and Larionova (2020) analyzed how ICT influences labor productivity in Russia, discovering that organisational digitalization and internet usage boost productivity. Managers are encouraged to focus on internetization, digitalization, and e-commerce to enhance efficiency. Sumathi and Savitha (2019) noted that India's "Digital India" initiative aims to elevate living standards and foster a digital economy by promoting digital transactions and enhancing service sectors for more transparency and responsiveness. Meena and Parimalarani (2020) observed that digitalization is transforming India's banking industry, affecting employees in both public and private banks. Their study, based on secondary data, examines how the digital revolution influences employment prospects in the sector.

Furthermore, Sun and Guo (2022) showed that digital transformation significantly advances sustainable modernization through three mechanisms and offers policy suggestions to speed up digital revolution, cut

costs, and enhance green innovation and corporate social responsibility. Mohsen and Magdi (2022) found that digital transformation in government helps boost efficiency, improve services, and reduce unemployment, driven by the widespread use of smartphones, cloud computing, and the COVID-19 pandemic, with Egypt's new capital city also contributing. Kaka et al. (2019) concluded that India could become a connected nation by 2025, generating economic value and jobs with its rapidly expanding digital market, though challenges like worker redeployment will need management. All stakeholders must prepare to handle the opportunities and challenges of digital transformation.

Anshu and Kumari (2021) discovered that the Digital India programme aims to empower the nation by giving access to technology and a unified platform for government services. It primarily relies on mobile phones for service delivery and includes initiatives like digital document storage, online government services, and fiber optic infrastructure. Bertani et al. (2019) analysed the economic impact of technology using an agent-based computational approach and concluded that although digital sector growth can generate employment, it might also cause job losses in traditional mass-production industries.

Careful assessment of how digital transformation might affect employment is essential. Tan et al. (2022) employed Bayesian linear regression with g-prior candidates to identify a positive link between digital transformation and development across 155 countries. Latta and Singh (2021) highlighted that India's growth prospects and large market position it as a key global player, with the government leveraging technology and digitization to foster growth and streamline processes. Bertani, Raberto, and Teglio (2020) observed that the economy has experienced digital transformation over the past 30 years, resulting in increased intangible digital assets driven by advances in information and communication technologies. Their findings reveal a strong correlation between growth in intangible digital investments and productivity, while also cautioning about the long-term risk of industrial job losses due to high levels of digital investments with subtle impacts. Singh and Bansal (2019) examined the impact of the digital revolution on Indian businesses, including established firms and startups, and how government initiatives are utilising technology to enhance public services. The research offers a comprehensive view of the industry, highlighting potential disruptions for various stakeholders.

Similarly, Fossen and Sorgner (2018) examined how AI influences labor market shifts in the US, discovering that digitalization significantly affects the likelihood of changing professions or becoming unemployed. Their study also highlighted gender differences in how digitalization impacts entrepreneurial transitions. Hazarika (2020) analysed digitalisation's effect on employment in India's banking sector, noting that extensive technology use has reduced the number of clerks and supporting staff. Yoo and Yi (2022) reviewed research on innovation, finding that various factors accelerate digital economic growth, causing changes in business structures, increased productivity, and lower production costs. Popelo et al. (2021) investigated digitalization's impact on jobs and related markets, showing both positive and negative effects on the economy and proposing a management model for digitalization in Ukraine. Aydin et al. (2023) studied the digital revolution's influence on human life, emphasising its both positive and negative impacts. Ivanitskaia (2022) assessed digitalization's effect on unemployment in Nordic countries, revealing that increased digitalization by 1% correlates with a 0.025% decrease in unemployment, indicating a significant negative impact.

Similarly, Brintseva (2021) highlighted that evolving job market deviations and technological proliferation demand new digital skills for workers. The 2019 pandemic accelerated digital transformation and remote working, underscoring the need for effective change to maintain competitiveness in banking. Managing remote teams well is vital for keeping employees engaged and productive. Promoting foreign investment

through open policies can generate jobs and enhance employee skills via digital learning. Boosting digital efficiency and productivity fosters a positive business climate in areas with growth potential.

Objectives and Methodology

This study aims to explore the long-term relationship between digital transformation and employment levels in a country. It examines the rise in internet usage, mobile subscription rates, and ICT exports, as well as how technology influences employment in India. The study also suggests policy ideas to enhance employment growth through digital technologies. To achieve these goals, the research is based on the following hypothesis:

H0: Digital technologies cannot significantly alter the country's employment structure.

H1: Digital technologies can significantly alter the country's employment structure.

Data and Method

This study analyses a time series dataset from 2001 to 2020 to examine the impact of the digital revolution on national employment levels. We used Ordinary Least Squares (OLS) estimation to explore the relationship between digital transformation indicators and employment. The proxies for digitalization include: i) the percentage of internet users in the population, ii) mobile cellular subscriptions per 100 people, and iii) ICT goods exports as a percentage of total exports. Employment level (TE) is measured by total employment across various sectors, sourced from the RBI's KLEMS database. Details about data sources, abbreviations, measurement units, and variable names are provided in Table 1.

Table 1: Data Sources, Acronyms and Measurement Units

Variable Name	Acronym	Description	Measurement	Data Source
Total Employment	TE	Total Labor Employment across all economic activities	No. of persons (in count)	RBI-KLEMS Database
Internet Usage	IU	Internet usage by people (as percentage of total population)	In percentage	World Development Indicators (WDI)
Mobile-Cellular Subscriptions	MCS	Mobile-Cellular subscriptions by the people	Per 100 people	World Development Indicators (WDI)
Export of ICT goods	ICTGE	Export of ICT goods as percentage of total goods exported	In percentage	World Development Indicators (WDI)

Source: Authors' construction

Model specification

Where, TE represents Total Employment, IU stands for Internet Usage, MCS indicates Mobile-Cellular Subscriptions, and ICTGE denotes the Export of ICT goods. $\beta 0$ is the intercept, while $\beta 1$, $\beta 2$, and $\beta 3$ are the elasticity coefficients of labor employment (LE) with respect to IU, MCS, and ICTGE, respectively. The white noise error term is represented by "μ". Given the time series nature of the data, an Ordinary Least Squares (OLS) method was employed for analysis. The Augmented Dickey-Fuller (adf) test checked

the stationarity of the series. The Jarque-Bera test was used to verify the normality of the data. The Durbin-Watson (D-W) statistic helped assess autocorrelation among variables. The breusch-Godfrey (LM) test and Breusch-Pagan-Godfrey heteroskedasticity test evaluated serial correlation and heteroskedasticity levels. Additionally, the Johansen co-integration test was performed to identify long-term relationships among the dependent and independent variables. Finally, the Granger Causality test was used to examine potential cause-and-effect relationships between variable combinations. The model's results are used for analysis and to develop policy recommendations aimed at enhancing environmental sustainability.

Results and Discussions

Descriptive Statistics and Test of Multicollinearity of the Variables

Descriptive statistics are employed to analyse and summarize data related to factors impacting employment in India from 2001 to 2020. Table 2 presents key descriptive metrics such as mean, standard deviation, minimum, maximum, and Jarque-Bera statistics. The results indicate that the average employment level was 13.08336, ranging from a low of 12.93983 to a high of 13.19696. Internet usage had an average of 2.969719, mobile-cellular subscriptions averaged 6.253304, and ICT goods exports averaged 1.221442. The Jarque-Bera tests revealed p-values above 5 per cent for all variables, suggesting they follow a normal distribution.

Table 2: Descriptive Statistics

Statistics	TE	IU	MCS	ICTGE
Mean	13.08336	2.969719	6.253304	1.221442
Median	13.07384	2.95597	8.035905	1.221457
Maximum	13.19696	6.557439	9.344396	1.857465
Minimum	12.93983	0.812494	0.779982	0.929583
Std. Dev.	0.077874	1.53333	3.143337	0.240961
Skewness	-0.075722	0.57488	-0.578541	0.78999
Kurtosis	1.850305	2.659886	1.718275	3.303336
Jarque-Bera	1.120611	1.19802	2.484715	2.156959
Probability	0.571034	0.549355	0.288703	0.340112
Observations	20	20	20	20

Source: Authors' calculations by using E-views 10 Statistical Software.

Table 3: Multicollinearity Test

Variable	Coefficient Variance	VIF value
C	0.000	NA
IU	0.000	4.346
MCS	0.000	4.347
ICTGE	0.000	1.001

Source: Authors' calculations by using E-views 10 Statistical Software.

Table 3 displays the multicollinearity test results for the variables used in the regression analysis. The Variance Inflation Factor (VIF) scores assess the level of multicollinearity among the explanatory variables. The VIF for Number of Internet Users (IU) and Mobile-Cellular Subscriptions (MCS) are 4.346 and 4.347, respectively, indicating moderate multicollinearity but still within acceptable limits since both are below 10. Meanwhile, the Export of ICT Goods (ICTGE) has a VIF of 1.001, suggesting no multicollinearity. Overall, the findings indicate that multicollinearity is not severe and is unlikely to significantly impact the regression results.

Diagnostic Checking:

Unit Root Test Results: To assess stationarity, the ADF test was employed because research by Dickey and Fuller (1979) and Phillips and Perron (1988) shows it to be a dependable method for detecting unit roots, with an accuracy of over 80% to 90%. Table 4 displays the outcomes at levels I(0), indicating non-stationarity. When testing the first difference I(1), it was found that two variables, TE and ICTGE, are integrated, showing stationarity, while two others, IU and MCS, are integrated at second order I(2). Using the second difference is a common approach in time series analysis to determine stationarity.

Table 4: Stationarity Test Results

Variables	Statistic	Level I (0)			First Order Difference I (1)			Second Order Difference I (2)		
		Intercept	Intercept and Trend	No Intercept and Trend	Intercept	Intercept and Trend	No Intercept and Trend	Intercept	Intercept and Trend	No Intercept and Trend
TE	*t-Statistic*	0.0764	-3.4475	2.9286	-3.0878	-2.8928	-1.6513	-4.19668	-4.36621	-4.26554
	Prob.	0.9521	0.0782*	0.9976	0.0494**	0.1913	0.092*	0.0054***	0.02**	0.0003***
IU	*t-Statistic*	2.1214	-0.8503	1.9799	-0.5211	-1.3187	0.2258	-3.97024	-4.17476	-3.82656
	Prob.	0.9997	0.9403	0.9842	0.8654	0.8492	0.7402	0.0085***	0.0221**	0.0007***
MCS	*t-Statistic*	-2.3706	-1.0595	-0.1434	-1.4719	-2.4577	-1.1789	-3.85483	-3.7031	-3.92744
	Prob.	0.163	0.9081	0.6203	0.5243	0.3413	0.2085	0.0107**	0.0506*	0.0006***
ICTGE	*t-Statistic*	-3.2908	-3.1461	-0.4085	-5.3736	-5.2919	-5.5336	-5.3116	-5.13527	-5.46592
	Prob.	0.0343**	0.1318	0.5226	0.0005***	0.0026***	0***	0.0007***	0.0045***	0***

Source: Authors' calculations by using E-Views 12 Statistical Software.

This technique, known as second-order difference, is used to eliminate the drift component and achieve stationarity in series through differencing. Many studies have employed this approach in unit root tests to assess the stationarity of a variety of economic and financial time series, including inflation rates, real GDP, stock prices, exchange rates, and interest rates (Phillips and Perron, 1988; Kwiatkowski et al., 1992). Additionally, Zhang et al. (2021) found that the S&P 500 stock index became stationary after applying second-order differencing. Overall, the second difference method is a widely supported and valuable tool in unit root testing.

Heteroskedasticity and Serial Correlation Tests

Table 5: Breusch-Pagan-Godfrey Test of Heteroskedasticity

Statistic	Value	Probability	Value
F-stat.	0.894334	*F (3,16)*	0.4654
Obs. R^2	2.872132	*Chi² (3)*	0.4118
Scaled explained SS	1.109821	*Chi² (3)*	0.7747

Source: Authors' computations using E-Views 12 Statistical Software.

Table 6: Breusch-Godfrey (LM) Test of Serial Correlation

Statistic	Value	Probability	Value
F-statistic	0.600286	*F (3,13)*	0.6262
Obs. R^2	2.433449	*Chi² (3)*	0.4874

Source: Authors' computations using E-Views 12 Statistical Software**.**

The p-value from the Breusch-Godfrey (LM) Test for serial correlation and the Breusch-Pagan-Godfrey test for heteroscedasticity Exceeds 5 per cent, suggesting the model is free of serial correlation and heteroscedasticity (Tables 5 and 6).

Co-Integration Tests: The Johansen cointegration test is regarded as superior to other tests, with various empirical studies showing it correctly detects cointegration in over 80% to 90% of cases across diverse macroeconomic and financial datasets (Johansen and Juselius, 1990 and 1992). Table 7 presents the results of the Johansen cointegration test. At a 5% significance level, the trace statistic value (98.17421) exceeds the critical value (47.85613). Similarly, the maximum eigenvalue (66.30889) is higher than its critical value (27.58434). As a result, the null hypothesis (H0) of no cointegration (R=0) is rejected, and the alternative hypothesis (H1) is accepted.

Table 7: Test Results of Co-integration

Trace Test				
Hypothesized CE(s)	Eigenvalue	Statistic	c.v. at 5%	p-value
R=0	0.974873	98.17421	47.85613	0
R=1	0.715997	31.86533	29.79707	0.0285
R=2	0.264498	9.207446	15.49471	0.3466
R=3	0.184801	3.677805	3.841466	0.0551
Maximum Eigenvalue Test				
Hypothesized CE(s)	Eigenvalue	Statistic	c.v. at 5%	p-value
R=0	0.974873	66.30889	27.58434	0
R=1	0.715997	22.65788	21.13162	0.0303

R=2	0.264498	5.529642	14.2646	0.674
R=3	0.184801	3.677805	3.841466	0.0551

Source: Authors' computations using E-Views 12 Statistical Software.

At a 5 per cent significance level, the trace data show two co-integrating vectors, and the maximum Eigen also shows two co-integrating vectors, and the findings revealed a long-run association between TE, IU, MCS and ICTGE.

Regression Estimations

The empirical findings from the regression model shown in Table 8 indicate that the variables studied have a consistently positive and significant impact on employment levels in the country at a 5 per cent significance level. Additionally, an increase in mobile or cellular subscribers had a direct and notable positive effect on employment, while a rise in ICT exports had a negative yet significant impact. This is because the industry is still in its early development stage, hindered by limited funding, inadequate policy frameworks, and a high demand for highly skilled labour. Moreover, the overall regression model is strong, with R-squared values of 96.3 and 95.6, respectively. The F-statistic was 138.214 with a p-value of 0.000 at the 5 per cent significance level, confirming the model's reliability.

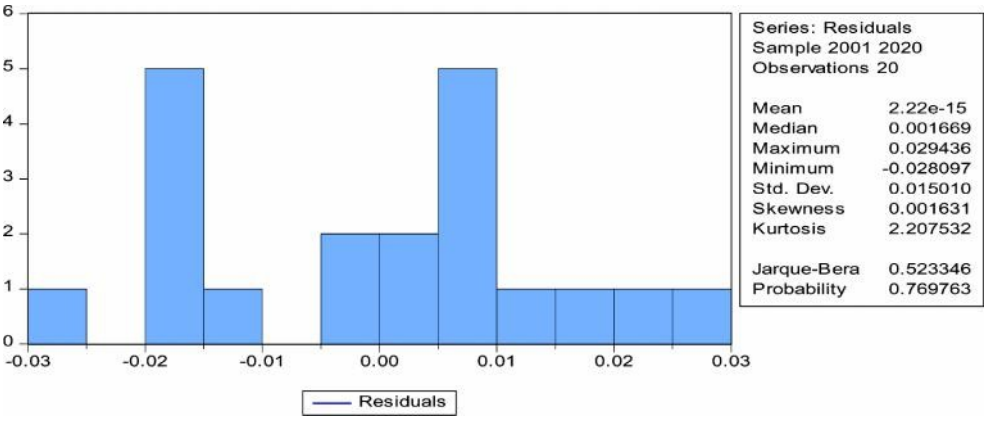
Table 8: Regression and Residual Figures

Explanatory Variables	Coeff.	s.e.	t-stat.	p-value
Intercept	12.991	0.021	621.559	0.000
IU	0.032	0.005	6.189	0.000
MCS	0.009	0.002	3.743	0.002
ICTGE	-0.049	0.016	-3.117	0.007
Regression Statistics				
R^2	0.963			
Adjusted R^2	0.956			
S.E.	0.016			
Obs.	20			
F-stats.	138.214			
Sig. F	0.000			

Source: Authors' computations using E-Views 12 Statistical Software.

The residual statistics in Figure 5 suggest that the mean of the residuals is nearly zero, with a very small value of 2.22e-15, and a standard deviation close to 0.015010. The skewness and kurtosis values, 0.001631 and 2.207532, respectively, indicate that the residuals are evenly distributed. Additionally, the Jarque-Bera test yields a probability of 0.769763, which exceeds the 5 per cent significance level, confirming that the residuals follow a normal distribution.

Figure 5: Residual Statistics



Granger-Causality Estimations

The ability to recognise non-linear relationships and estimate causality strength makes the Granger causality test a valuable tool for analyzing time series data and understanding causality in complex systems (Luetkepohl, 1991; Toda and Yamamoto, 1995). From Table 6, it is evident that there is a unidirectional link between internet use (IU) and total employment (TE) in the country. This confirms that IU influences changes in employment levels (TE). According to the regression results, a one-unit increase in internet usage results in a positive and significant increase of 0.032 units. Although this change appears small now, as technological knowledge and digital literacy grow among the population, and demand for skilled, educated workers rises across various institutions, the impact coefficient is likely to increase in the future. Another key relationship shown in Table 9 is between mobile communication systems (MCS) and TE, which is also unidirectional. This indicates that as mobile communication use expands, more people will gain access to the interconnected world known as the internet. Smartphones, in particular, have the potential to dramatically change how people view the future.

Null Hypothesis (H_o):	Obs.	F-stat.	Prob.
IU does not Granger Cause TE	17	11.9308	0.0012***
TE does not Granger Cause IU		0.21747	0.8821
MCS does not Granger Cause TE	17	2.94432	0.0851*
TE does not Granger Cause MCS		0.559	0.654
ICTGE does not Granger Cause TE	17	1.19364	0.3612
TE does not Granger Cause ICTGE		0.7539	0.5448
MCS does not Granger Cause IU	17	0.85846	0.4937
IU does not Granger Cause MCS		1.27426	0.3355
ICTGE does not Granger Cause IU	17	1.91156	0.1917
IU does not Granger Cause ICTGE		2.14022	0.1586
ICTGE does not Granger Cause MCS	17	0.63778	0.6077
MCS does not Granger Cause ICTGE		0.28943	0.8321

Concluding Observations

The study underscores the complex and multifaceted impact of digitalization on employment in India. It indicates that digitalization is driving automation in many jobs, especially in manufacturing and the service

sector, which can displace many workers, mainly those with less education and fewer skills. However, it also highlights that digitalization creates new employment opportunities, especially within the digital economy. Consequently, it is essential for government policies and programs to support workers affected by automation and digitalization and to ensure that the transition to a digital economy remains inclusive and equitable. all.

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