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DECIPHERING DIGITAL DIVIDE: A MICRO-LEVEL ANALYSIS IN INDIA

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Abstract:
The digital divide, characterized by disparities in access, adoption, and utilization of information and communication technologies (ICTs), remains a critical global challenge. This paper provides a comprehensive overview of the digital divide, examining its historical context, evolving dimensions, and socio-economic implications. The analysis encompasses various factors contributing to the divide, including infrastructure, affordability, digital literacy, and socio-cultural aspects. Additionally, the paper explores the impact of the digital divide on education, healthcare, employment, and civic participation. Emerging technologies and innovative strategies for bridging the digital gap are also discussed. In addressing the digital divide, policymakers, educators, and technology stakeholders must collaborate to develop inclusive and sustainable solutions that empower all individuals and communities to harness the benefits of the digital era. the urgency of addressing the digital divide to ensure equitable access to opportunities and resources in an increasingly interconnected world.

Keywords: Digital divide, information and communication technologies (ICTs), access disparities, adoption gaps, utilization discrepancies, socio-economic implications,

1. Introduction

The advent of information technology (IT) has brought about a profound transformation in our way of life, impacting every facet of existence. The current generation can hardly conceive a time before computers, as IT has become an integral part of daily life. It has not only created numerous interconnected businesses and job opportunities but also paved the way for new avenues such as offshore corporate procedures and web-enabled services like customer support and healthcare transcription.

Recognizing the pivotal role of IT, corporate organizations now consider it indispensable for survival, given the rising demand for high-quality information technology. The global web, a significant component of IT, has witnessed substantial growth in popularity, enabling developing nations to actively participate in the global economy and address socio-economic disparities. Despite progress, India faces the challenge of catching up with the global community as the Internet rapidly expands.

Since the 1990s, the Internet has become accessible beyond researchers and experts, reaching anyone with a computer and networking capabilities. India, however, is striving not just to catch up but to prevent further lag as the Internet continues to connect the world. Rural areas, while holding great potential for marketers, present unique challenges that differ from metropolitan settings, including issues with physical distribution, channel management, promotion, weak infrastructure, small markets, and customer profiles.

Entrepreneurs aiming to tap into the rural market must devise innovative strategies to overcome these challenges. The issues of physical distribution and channel management negatively impact service quality and cost, with the success of a brand relying heavily on village merchants

due to limited direct communication with rural consumers. India recognizes the need to bridge the urban-rural divide, with efforts in both business and government sectors.

In this context, the organized retail model and ICT-driven value chains emerge as influential innovations for rural India. Entrepreneurs can enhance their reach and achieve desired outcomes by implementing cost-effective plans. Continuous innovation remains crucial for the advancement of India's villages in addressing these challenges.

2. Literature Review:

The 2013 India Mobile Landscape (IML) research conducted by Juxt revealed that India had 55.48 billion mobile phone owners and 14.32 billion internet users. The survey indicated that 2.38 crore individuals utilized data connections like GPRS or 3G for mobile internet access, with 93 individuals exclusively relying on mobile phones for internet, primarily in rural areas. According to TRAI, there were 87.33 crore mobile consumers in India. The telecom service providers earned Rs 54,284 crore in revenue in the January-March quarter.

The Internet and Mobile Association of India (IAMAI) and IMRB International reported that the internet user population in India grew from 33 million in March 2006 to 37 million. Satisfaction levels with Internet Service Providers (ISPs) were found to be low, with a focus on customer service being crucial for ISP selection.

Granger and Little's 2003 study emphasized the importance of educating individuals about ISP policies, covering areas such as intellectual property, cookies, data privacy, and legal aspects. Daman pour's 1991 article explored organizational variables affecting the adoption of internet technology.

The India Bulls Foundation's 2013 IT Project aimed to enhance internet literacy in rural areas, particularly among youth. Gulati and Williams (2013) highlighted the high internet usage among women aged 35 to 44, and the Indian blogging community's growth by 48%. Thomas (2013) discussed the shift in banking preferences towards online and mobile banking.

Bagchi and Mahmood (2013) predicted that online shopping would surpass traditional retail sales in India, driven by e-commerce growth. Schmidt (2013) discussed mDhil's efforts to improve healthcare information through mobile devices and the web.

The study by Altmann and Chu (2001) proposed a service plan combining usage-based and flat-rate pricing for ISPs. Pain (2011) emphasized the role of internet-based initiatives in addressing abuse issues, especially in rural areas with limited access to computers. Cecchini and Scott (2003) argued that ICT could alleviate poverty by improving access to essential services.

Sassia and Goaieda's 2013 study explored the correlation between economic growth and ICT penetration. Master (2012) discussed the need for banks to cater to the technologically proficient Generation Y clientele, while Chopra (n.d.) investigated the impact of government policies on ICT dissemination in rural areas.

Baliamoune-Lutz (2003) studied the correlation between ICT indicators and economic factors, finding a positive link with wealth. Nair and Mathiyalagan (2008) analyzed computer use patterns in Coimbatore, addressing concerns beyond the digital divide. Best and Kumar (2002) reported success in the Sustainable Access in Rural India (SARI) initiative.

Dijk and Hacker's 2011 research predicted increasing disparities in skill access and utilization. CBlattman, Jensen, and Roman (2002) evaluated networking viability in peri-urban Tamil

Nadu. Wong (2002) analyzed evidence suggesting that Asian countries lagged in ICT adoption, with notable disparities within the region.

- **Internet Progression:**

The Internet entered a significant phase in 2009, commemorating its 40th anniversary since the inception of the ARPANET. On September 2, 1969, a pivotal moment occurred at the University of California, Los Angeles (UCLA), where approximately 40 individuals gathered in Leonard Kleinrock's lab to witness the exchange of data between two computers, laying the foundation for the development of the Internet.

There are diverse narratives surrounding the Internet's origins, with a prevalent belief attributing its creation to the US military during the Cold War for security reasons (Hafner & Lyon, 1996). Another perspective credits Joseph C. R. Licklider, a psychologist from MIT influenced by Marshall McLuhan's communication technology theories, with conceptualizing a nationwide network of interconnected home computers as early as 1956, aligning with the eventual evolution of the Internet.

The US military's role in Internet development is well-established, particularly during the Cold War era prompted by the Soviet Union's launch of the Sputnik satellite in 1957. In response to this space exploration milestone, President Dwight David Eisenhower established the Advanced Research Projects Agency (ARPA) under the Department of Defense. ARPA was created amidst Cold War tensions and concerns over military superiority, exacerbated by the success of Sputnik. The Cuban Missile Crisis heightened fears of nuclear war, prompting the US military to seek a resilient product capable of withstanding a nuclear assault.

ARPA's Information Processing Techniques Office (IPTO) was established in 1964 to enhance computer utilization. In a groundbreaking proposal in 1964, the RAND Corporation introduced the concept of a decentralized computer network capable of functioning without a central authority, even if a significant portion was damaged. This concept laid the groundwork for the Internet as a network of interconnected computers (Laursen, 1997).

- **Rise of the Internet:**

Numerous research endeavors have been conducted to predict patterns in Internet usage, user demographics, popular online activities, and the behavior of online users. While findings may vary, they offer valuable insights into the evolving landscape of Internet use.

According to Internet World Stats (2009), approximately 23.8% of the global population is now connected to the Internet. Developed regions like North America exhibit high usage with 74.4% of the population being online. Emerging nations in Asia are experiencing a surge in internet use, notably in China, which boasts the highest number of users at 330 million, followed by the United States with 220 million. The global Internet user base has surpassed 1.7 billion, indicating its integral role in daily life.

India, initially projected to have 5.5 million Internet users in 2000, has witnessed remarkable growth, reaching an estimated 100 million users by 2010. Internet World Stats (2010) identifies India as one of the fastest-growing Internet markets. According to Forrester Research's "Global Online Population Forecast, 2008 to 2013" (2009), India is expected to rank third in Internet users by 2013, trailing the United States and China. Globally, the Internet user base is forecasted to reach 2.2 billion by 2013, marking a 45% growth, with Asia playing a pivotal role.

The India Online Landscape Report (Juxt, 2010) provides insights into Indian Internet usage. The country has 51 million active Internet users, with 40 million in urban areas and 11 million in rural areas, representing 4.4% of the population with Internet access. Noteworthy trends include increased daily users, a growing rural user base, and a rise in online purchases. South India shows pronounced growth, and there's a gradual increase in female users, particularly among housewives. Email remains the primary online activity for 94% of Internet users, while other popular activities include downloading music, chatting, job searching, and social networking.

- **Growth of Mobile Web:**

The proliferation of Internet access through both computers and mobile devices has led to a notable shift in user preferences, with mobile phones surpassing PCs as the preferred method of accessing the Internet for many. This trend is particularly evident in India, where the number of active mobile phone Internet users surged from 8 million to 25 million within a year, as reported by Ohri (2011). The affordability of mobile devices with Internet connectivity, coupled with the widespread availability of budget-friendly data plans from major mobile carriers like Aircel, Airtel, and Vodafone, has fueled the rapid expansion of the mobile web.

The accessibility and popularity of applications, or 'apps,' designed for specific mobile devices, have also played a pivotal role in driving mobile web usage. These apps, which offer simplified interfaces and quick information retrieval, cater to users accessing the Internet on devices with smaller displays and limited processing capabilities. Users can either access preinstalled apps on their devices or obtain them from app stores like Apple's iTunes, Blackberry's Apps store, and Nokia's Ovi shop. The past year alone witnessed the creation of around 40,000 different apps, spanning entertainment, social networking, and utility functions.

While tablets like the Apple iPad and Dell Streak have been introduced, their impact on the expansion of mobile Internet has been modest, primarily due to low penetration and high pricing. According to Morgan Stanley Research (2010), future trends indicate that mobile Internet will surpass desktop Internet connections, with more than 10 billion devices predicted to be linked to the Internet in the next decade.

The revolution in Information and Communication Technology (ICT) has significantly transformed societies, cultures, and economies. The diffusion of ICT, encompassing various modes of expression like teleconferencing and online education, has led to changes in productivity, competitiveness, economic growth, and human welfare. However, this progress has also given rise to the digital divide, signifying disparities in technology use, access, skills, and other related aspects. The "Digital Divide" refers to the unequal access to information between individuals with Internet access and those without, emerging as a significant socioeconomic issue.

The term "Digital Divide" gained prominence in the late 1990s, highlighting the disparities in Internet access between urban and rural areas. Bridging the digital divide in rural areas has become a focus, with strategies such as utilizing power lines and satellite communications to provide ubiquitous Internet access. Additionally, efforts are made to address limitations faced by potential Internet users, ensuring that individuals with disabilities do not lose access. Rural development, aimed at improving the quality of life in sparsely populated areas, is crucial for a country like India, where a significant portion of the population resides in villages. This essay

aims to address the digital disparity between rural and urban areas based on population, emphasizing the need for equal access to digital resources in rural regions.

3. Methodology

The current study aims to comprehend the use trends for Internet services in West Bengal's urban and rural areas (India). The exploratory character of the study offers understanding and insights into the ideas around the possibility of creative businesses based on Internet services in both urban and rural settings. The study also identified patterns of usage, information-related future possibility criteria, and information-related future necessity criteria for Internet services based on present usage, necessities, and opportunities in urban and rural locations. The majority of the study's data was gathered from primary and secondary sources. Control was used to choose the sample, and after that, the data was analyzed using the proper statistical methods.

- Samples:

Both urban and rural West Bengal were taken into consideration for the study. Ranaghat Town, which has a high population density, was designated an urban area in the research, whereas Ukilnara, which has a low population density, was classified a rural region.The sample was chosen from the population of Internet service customers in West Bengal's urban and rural areas. Data for the study were gathered from a total of 400 respondents.

- Identifying the Logistic Regression Model's Variables:

The logistic regression analysis in this model included the residence type as a dependent variable. This study has two categories of residents: urban areas like Ranaghat Town, where y = 1, and rural areas like Ukilnara Village, where y = 0.

Variables	Description
Dependent (Y)	1 = Ranghat Town; 0 = Ukilnara Village
Independent (X)	
X1	Quality of internet speed
X2	Rate of problem in having internet facilities
X3	Work from home
X4	Communication
X5	Online classes
X6	Online Marketing

The predominant method for modelling geographic data is logistic regression, as demonstrated by Augustin et al. (2001) and Cao et al. (2020). According to Berberoglu et al. (2016), this model explains the presence or absence of specific spatial occurrences. This model can forecast the relationship between categorical and continuous independent variables when the dependent variables are binary. This study examines the relationship between the growth of urban areas and the factors that affect it. It uses geographical data and employs an empirical statistical estimation method (Hamdy et al., 2017). Using specific parameters like elevation, slope, and roads as change agents, logistic regression generates the probability surface of land-use transition (Mustafa et al. 2018). LRM, which explains the relative relevance and influence of causes on changing phenomena, is this model's main strength. The main limitation of logistic regression models is their ability to estimate the probability of change in an urban

neighbourhood without accurately measuring the magnitude of the change. The ability to describe the extent to which change-related factors have an impact is, however, the main benefit (Liu et al. 2015; Yao et al. 2015; Mustafa et al. 2018).

The value of an internet connection has been studied using a binary logistic regression model (BLR), and the projected probability was verified using an online connection. Logistic regression is mainly used to evaluate the relationship between one or more continuous variables and a binary-dependent variable (Luo et al., 2019).

Independent variables in this model are not required to adhere to the concepts of normal distribution. The ROC curve has been used to assess the model's statistical significance. Binomial logistic regression is a statistical method that can only handle two possible values for the input-dependent variable. The variable must be in a Boolean format, meaning it can only take on true or false values (Liu and Feng, 2012). The two potential outcomes are 0 and 1.

The core idea of logistic regression is that the relationship between the predictors (Y) and the dependents (X) is not linear but rather follows a sigmoid function (logistic function). This function consistently produces a value between 0 (indicating an undesirable reaction) and 1 (indicating a good response). The subsequent explanation can be formulated utilising this equation:

$$P = (Y = 1|X) = \frac{\exp \sum_{k=0}^{k} b_k x_{i\kappa}}{1 + \exp \sum_{k=0}^{k} b_k x_{i\kappa}}$$

The estimated parameters, denoted as b = (b0, b1, b2... bk), indicate the variable coefficients. P is the probability that the dependent variable is equal to 1. X is considered the independent variable, where x is a vector consisting of elements x0, x1, x2... xk.

The logistic regression method $\varphi=e\alpha +\sum$ is used to calculate the probabilities of Y being 1. The odds ratio for the dichotomous variable X represents the association between each component and the usefulness of an internet connection (Y). In the study, Equation (2) was employed to calculate the odds ratios of the independent variables to predict the result.

$$P = \frac{\exp(\alpha + \beta, X_1 + \beta_2 X_2 + \ldots + \beta_n X_n)}{1 + \exp(\alpha + \beta_1 X_1 + \beta_2 X_2 + \ldots + \beta_n X_n)}$$

P represents the probability that a case belongs to a specific category for the response variable. The symbol "exp" denotes the base of natural logarithms, about 2.72. The symbol "is" referring to the constant term in the equation, particularly noticeable in step-wise models. It also represents the coefficient of the predictor variables.

4. Study Area:

Ranaghat, located to the northwest of the Greater Kolkata Area, is easily accessible from Kolkata, approximately 75 km away, through both road and rail connections. Positioned between latitudes 22˚53' and 23˚20' N and longitudes 88˚20' and 88˚45' E, the town spans a total area of 540 square miles in the southernmost sub-division of the district. The deltaic tract is bordered by Krishnanagar to the north, Bangaon in the 24-Parganas district to the east, Barasat to the south, and the Hooghly River to the west. The sub-division comprises four established towns—Ranaghat, Santipur, Chakdah, and Birnagar—along with newer ones like

Fulia, Kalyani, and Kanchrapara. Positioned at 23˚11'N and 88˚34'E on the Churni River, Ranaghat is approximately 40 km from the district headquarters of Krishnanagar.

The municipality is well-connected by rail and road to various West Bengal towns, including Kolkata, Berhampur, Krishnanagar, Gede, Bongaon, and others. Eastern Railway links Ranaghat to Sealdah in the north and Krishna Nagar in the south, with further connections to Bongaon, Gede, and Shantpur. The town is intersected by NH-34, and numerous bus routes connect it to distant North Bengali cities such as Siliguri, Cooch Behar, Raigunj, and Malda. Additionally, the Churni River facilitates boat travel to neighboring Gram Panchayet settlements. As a subdivisional town, Ranaghat is well-connected to motorable roads leading to its hinterlands.

In 1931, Ranaghat had a population of around 11,400, witnessing significant growth post the country's division. Between 1941 and 1951, the population surged from 16,488 to approximately 28,000, marking a growth rate of about 70%. Subsequent decades saw growth rates stabilizing at around 36%. In the 1991 census, the sex ratio was 952, and it increased to 961 in the 2001 census.

Ukilnara, located in Ranaghat I subdivision of the Nadia district in West Bengal, India, is approximately 35.6 km from the district headquarters in Krishnanagar and 13.2 km from the tehsildar office in the sub-district of Habibpur. As of 2009 statistics, Payradanga is the gram panchayat for the hamlet of Ukilnara. Spanning an area of 211.96 hectares, Ukilnara is home to a population of 6,572 individuals, with 3,402 men and 3,170 women. The literacy rate in Ukilnara is 77.37%, with 81.07% literacy among men and 73.41% among women. The settlement comprises around 1,551 homes.

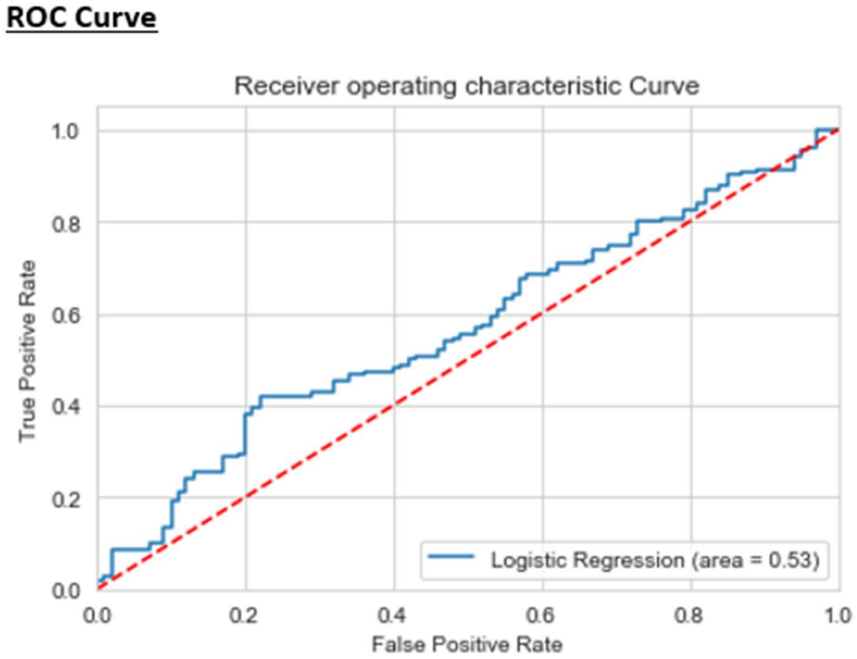

Figure 1: ROC Curve validating the Logistic Regression Equation establishing and validating the Digital Divide between Ranaghat (Urban area) Ukilnara (Village area).

	precision	recall	f1-score	support
0	0.43	0.49	0.46	200
1	0.62	0.57	0.59	200
accuracy			0.54	400
macro avg	0.53	0.53	0.53	400
weighted avg	0.55	0.54	0.54	400
Accuracy of logistic regression classifier on test set: 0.5360				

Table 1: Accuracy of logistic regression classifier on test set: 0.5360

The confusion matrix typically consists of four entries:

1. **True Positive (TP):** Instances correctly predicted as positive (actual positive and predicted positive).
2. **True Negative (TN):** Instances correctly predicted as negative (actual negative and predicted negative).
3. **False Positive (FP):** Instances incorrectly predicted as positive (actual negative but predicted positive).
4. **False Negative (FN):** Instances incorrectly predicted as negative (actual positive but predicted negative).

The confusion matrix is often represented in the following format:

	Predicted Positive	Predicted Negative
Actual Positive	True Positive (TP)	False Negative (FN)
Actual Negative	False Positive (FP)	True Negative (TN)

From this matrix, various performance metrics can be calculated, including:

- **Accuracy:** $\frac{TP+TN}{TP+TN+FP+FN}$
- **Precision (Positive Predictive Value):** $\frac{TP}{TP+FP}$
- **Recall (True Positive Rate or Sensitivity):** $\frac{TP}{TP+FN}$
- **Specificity (True Negative Rate):** $\frac{TN}{TN+FP}$
- **F1-Score:** $\frac{2 \cdot \text{Precision} \cdot \text{Recall}}{\text{Precision}+\text{Recall}}$

These metrics help evaluate the performance of a classification model by considering different aspects of its predictions.

The classification table provides a comprehensive view of how well the model is performing for each class and aids in identifying areas of improvement or potential issues, such as imbalances between classes.

- A sample size of 200 individuals were considered from both Ukilnara and Ranaghat area using Convenience Sampling for the Research to check the effect of the independent variables considered in order to classify the likelihood of whether coming from a much urban area of Ranaghat or in contrast to a rural area of Ukilnara.

The overall accuracy of the logistic regression classifier on the test set is reported as 0.5360 from the ROC curve which explains that the Logistic classifier can be deployed on a test data with a fairly good accuracy to perform the digital divide in order to identify the area whether urban i.e. Ranaghat (denoted by 1) or rural area i.e. Ukilnara (denoted by 0).
Evaluation metrics play a crucial role in assessing the performance of a classification model. In this context, a logistic regression classifier was applied to a sample of 200 individuals from Ukilnara and Ranaghat areas, selected using convenience sampling. The objective was to examine the impact of independent variables on classifying the likelihood of belonging to an urban area (Ranaghat) denoted by 1, or a rural area (Ukilnara) denoted by 0.
The overall accuracy of the logistic regression classifier on the test set is reported as 0.5360, derived from the ROC curve. ROC, or Receiver Operating Characteristic, is a graphical representation of a model's performance across different threshold values for classification.

Table 2: Logistic Regression Classification Results

Participant ID	**Location**	**Independent Variable 1**	**Independent Variable 2**	**...**	**Predicted Probability**	**Predicted Class (Urban/Rural)**	**Actual Class**
1	Ranaghat	Value	Value	...	Probability Value	Urban (1)	Urban (1)
2	Ukilnara	Value	Value	...	Probability Value	Rural (0)	Rural (0)
...	...	...	...	...	...	...	...
200	Ranaghat	Value	Value	...	Probability Value	Urban (1)	Urban (1)

Interpretation:

1. **Predicted Probability:** The logistic regression model assigns a probability value for each individual, indicating the likelihood of belonging to the urban class.
2. **Predicted Class:** Based on a chosen threshold value, the model predicts whether the individual is from an urban (1) or rural (0) area.
3. **Actual Class:** The true classification of the area, denoting whether it is urban (1) or rural (0).

The reported overall accuracy of 0.5360 suggests that the model performs slightly better than random chance but may not be highly accurate in classifying the areas. Further analysis and potential model adjustments can be explored to enhance the classifier's performance, considering factors such as imbalances between urban and rural classes, and identifying areas for improvement based on the classification table.

- **The Changing Nature of Work in the Platform Economy:**

The transformation brought about by the platform economy has significantly reshaped the conventional dynamics of employer-employee relationships, ushering in a new era of work characterized by gig employment. This shift is accompanied by a set of challenges and opportunities that directly impact workers operating within this framework. In the platform

economy, traditional notions of stable, long-term employment with a single employer are being replaced by short-term, task-oriented engagements facilitated by digital platforms. Workers in this environment often operate as independent contractors or freelancers, providing services on a project-by-project basis. While this offers a degree of flexibility, it also brings forth challenges such as job insecurity, lack of employment benefits, and income volatility. One prominent feature of the platform economy is the prevalence of gig work, where individuals take on short-term, often unpredictable tasks or projects facilitated through online platforms. Gig workers operate in various sectors, from transportation and accommodation to freelance creative services. The nature of gig work influences the way collective bargaining efforts are undertaken.

Collective bargaining in the platform economy encounters distinctive challenges due to the dispersed and often isolated nature of gig work. Unlike traditional workplaces, where a centralized workforce may negotiate with a single employer, gig workers are dispersed across various platforms, making it challenging to form cohesive collective bargaining units. Additionally, the fluid and temporary nature of gig employment poses hurdles in establishing lasting solidarity among workers. However, opportunities also arise in this evolving landscape. Workers in the platform economy have the potential to leverage technology to organize and advocate for their rights collectively. Digital platforms and communication tools enable gig workers to connect, share experiences, and collaborate on collective bargaining initiatives. Initiatives like online forums, virtual networks, and digital organizing efforts are becoming essential components of the modern labor landscape. In summary, the changing nature of work in the platform economy has redefined traditional employment structures, presenting both challenges and opportunities for workers. The prevalence of gig work, with its inherent characteristics, shapes the landscape for collective bargaining, necessitating innovative approaches to address the unique dynamics of this evolving labor market.

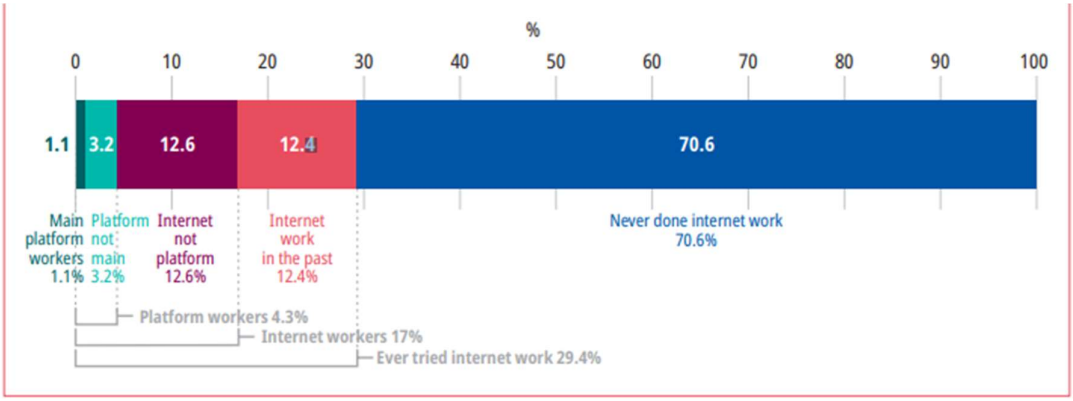

Figure 2: Internet Usages

remote services emerge as the most common type of internet work, with about one-third facilitated through labor platforms. On-location work, where online labor matching is done but the work is provided offline, constitutes approximately 3% of the working-age population, with only one in four internet workers organized by labor platforms. The transport sector, encompassing delivery and taxi services, is the most saturated by platforms, with around half of drivers relying on labor platforms for orders.

Despite this growth, the data also reveals untapped potential, particularly in services provided remotely, where only about one-third are currently organized through labor platforms.

Moreover, new entrants in the platform workforce, as highlighted in the right-hand panel of figure 2, indicate that between one-third and one-half of platform workers started this type of work within the 12 months preceding the survey, emphasizing the continuous influx of individuals into this sector.

Transitioning to Ranaghat's geographical context, the town situated northwest of the Greater Kolkata Area is easily accessible from Kolkata through both road and rail networks. Spanning a total area of 540 square miles, Ranaghat is positioned in the southernmost sub-division of the district, with established and newer towns contributing to its vibrant landscape. Well-connected by rail and road to various West Bengal towns, the town's strategic location facilitates transportation to and from Kolkata and neighboring areas.

The demographic data indicates substantial growth in Ranaghat's population over the years, influenced by historical events such as the country's division. The town's connectivity through rail, road, and river, along with its role as a subdivisional town, contributes to its significance in the region.

Moving to Ukilnara, located in the Nadia district of West Bengal, the hamlet is around 35.6 km from the district headquarters in Krishnanagar. Part of the Ranaghat I subdivision, Ukilnara is part of the Payradanga gram panchayat and spans an area of 211.96 hectares. The population of 6,572 individuals, with a relatively high literacy rate of 77.37%, is distributed across approximately 1,551 homes. Transitioning to the local context of Ranaghat and Ukilnara, their geographical and demographic features highlight their importance within the region, with connectivity playing a crucial role in shaping their dynamics

5.Data Analysis:

We utilised the ROC curve to determine how well the regression model worked. It shows the proportion of true positives against the balance of false positives at a preset threshold value. The area under the curve (AUC) is computed using the ROC. The threshold value for the AUC ranges from 0 to 1, with 1 being a perfect match and 0 a complete miss-match. According to Hu and Lo (2007) and Liu et al. (2018), the AUC is an essential metric for evaluating the correctness of the model.

The level of positive spatial autocorrelation is more significant in logistic regression when it comes to spatial data modelling. A pattern in data values that is probably similar to the relevance of nearby data points is called spatial autocorrelation. To correct spatial autocorrelation, we used two alternative spatial sampling techniques. Spatial dependency has been reduced through systematic random sampling. Systematic sampling has certain limitations, including the inability to accurately represent a sizable population and the potential probability of important isolated cells being missed in representative samples. However, random sampling only effectively eliminates spatial dependency to a small extent of the population (Puertas et al. 2014). Therefore, when the geographical distribution is substantially variable, stratified random sampling is acceptable. To get over geographical dependency, a sampling technique that uses both systematic and random sampling is used.

The significance and level of dependence of the dependent component on the six independent factors are satisfactorily explained by the logistic model. The Cox and Snell R square of 0.750 and the Nagelkerke R square of 1.000 show that the model is appropriate. The model has been fitted using loglikelihood. An excellent match for the model is also indicated by a log-likelihood of 0.000.

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	.000[a]	.750	1.000

Table 3: Model Summary

The simplest method for using logistic regression with the event/censoring indicator as the binary outcome, followed by the Hosmer-Lemeshow test, would be the naivest way to apply the Hosmer-Lemeshow goodness-of-fit test to survival data. Logistic regression was frequently used before the Cox proportional hazards model to analyze survival data (Efron, 1988).Since the Hosmer and Lemeshow goodness of fit test fails to reject the null hypothesis (there is no difference between the observed and model-predicted values), which implies that the model's estimates fit the data at an acceptable level, it is used to identify a good fitting model when its value is greater than 0.05.A great logistic regression model fit is indicated by a low Chi-squared value (0.000) and a high p-value (1.000).

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	.000	7	1.000

Table 4: Hosmer and Lemeshow Test

The model discusses the closeness of communication, internet speed, and online courses. Internet usage and internet speed quality are positively correlated. On the other hand, working from home, having internet access issues close by, and online marketing have a bad relationship with where you live.

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	Y	-15.166	18487.691	.000	1	.999	.000
	Y1	12.103	23009.323	.000	1	1.000	180375.561
	X1	13.004	7211.621	.000	1	.999	444394.416
	X2	-11.932	2316.287	.000	1	.996	.000
	X3	-4.205	9419.635	.000	1	1.000	.015
	X4	4.969	7954.901	.000	1	1.000	143.881
	X5	.409	6908.876	.000	1	1.000	1.505
	X6	-4.526	3157.693	.000	1	.999	.011
	Constant	69.333	65256.725	.000	1	.999	129088051356888 430000000000000 0.000

a. Variable(s) entered on step 1: Y, Y1, X1, X2, X3, X4, X5, X6.

Table 5: Variables in the Equation

Work from home has an extremely poor correlation with the location of residence for utilizingan internet connection, as indicated by the variables' negative coefficient of 4.205 and odds ratio of 0.015.With a negative coefficient of -11.932 and a probability of 0.000, the closeness of internet facilities suggests that areas farther from these centres have 11.9 times larger chance to reduce the digital disparity or divide among those locations. Proximity of internet speed quality to other census towns has a positive coefficient of 13.0004 and odds of 444394.416, which signifies a very high odds ratio, which shows that internet speed quality has a very significant relationship with the digital divide.

Correlation Matrix

		Constant	Y	Y1	X1	X2	X3	X4	X5	X6
Step 1	Constant	1.000	-.970	.953	.550	-.036	.446	-.716	-.466	.393
	Y	-.970	1.000	-.981	-.563	-.183	-.576	.748	.581	-.506
	Y1	.953	-.981	1.000	.586	.138	.550	-.777	-.558	.504
	X1	.550	-.563	.586	1.000	.136	.017	-.843	-.034	.008
	X2	-.036	-.183	.138	.136	1.000	.406	-.177	-.327	.383
	X3	.446	-.576	.550	.017	.406	1.000	-.455	-.973	.818
	X4	-.716	.748	-.777	-.843	-.177	-.455	1.000	.457	-.435
	X5	-.466	.581	-.558	-.034	-.327	-.973	.457	1.000	-.870
	X6	.393	-.506	.504	.008	.383	.818	-.435	-.870	1.000

Table 6: Correlation Matrix

Bridging The Digital Divide In Rural India: Initiatives

In 1991, the Technology Development for Indian Languages (TDIL) Programme was established by the Ministry of Electronics and Information Technology. Its principal objectives were to produce and access multilingual knowledge resources, integrate them to develop

innovative user goods and services, and enable human-machine interaction without language barriers.

Beginning in the Dhar district in January 2000, the Gyanadoot Project linked rural cyber cafés to the information demands of the general public, hence launching the mass-based IT revolution. The Gramme Panchayats use computer systems called Soochanalayas. Public organisations and Panchayats can meet the IT development needs of the Soochanalaya, which also offers user-pay services to the general public. The name of this intranet is Gyandoot. These types of initiatives show how connection benefits rural customers and how they can and will use it. This makes closing the digital gap easier.

The ***Bhoomi Project*** is regarded as the state government of Karnataka's showpiece initiative. The undertaking was launched in the year 2000. This initiative has won the support of many people and international financial organizations. All manual RTCs used for data entry were digitised as part of this operation and made available to the public through kiosk centres. It is believed that the Bhoomi initiative can sustain itself.

Project FRIENDS stands for a Fast, Reliable, Instant, and Efficient Network for the Distribution of Services. It is an integrated remittance centre with a single window and "no queue" where residents may pay all of their taxes and other obligations to the government for no additional fee. FRIENDS, a continuing initiative of KSITM, is currently functioning across Kerala's 14 districts.

The Indian agricultural sector has several difficulties. On January 21, 2004***, Kisan Call Centres*** were opened nationwide by the Department of Agriculture & Cooperation (DAC), Ministry of Agriculture, Government of India to provide extension services to the agricultural community. An innovative project combining ICT (Information Communication Technology) with agriculture technology is called ***Kisan Call Centre (KCC)***. This service utilizes the Management Information System's integrated backend data support system. KCC enables the farmers to communicate directly with subject matter specialists who can analyze the issue thoroughly and offer a direct solution. If the contact centre representative cannot respond satisfactorily to the farmer's inquiry, the customer will promptly transfer the call to a group of agricultural specialists. This initiative by the Indian government aims to bridge the information gap between users and the relevant sources of information effectively.

In November 2006, they launched Life Lines India in reaction to a forward-thinking proposal. Its principal goal is to increase the availability of information and technology resources for people living in rural India, thus reducing the digital divide. We developed an innovative ICT-driven support line called Life Lines India due to a collaboration between One World, British Telecom, and Cisco Systems. The fundamental strategic goals of the programme were to improve rural residents' access to critical information to raise their standard of living and economic opportunities. Build a suitable knowledge repository and integrate it with the information exchange during service provision to establish a sustainable delivery paradigm.

Through one-on-one conversations in the local language and within one day, Lifelines India hopes to bring vital and personalised information, counsel, and direction to rural and outlying areas of India. It does this by combining the power of the internet with that of the telephone. We have taken care of the service thoroughly today.

6.Discussion:

Internet development in India:

Millions of people use the Internet, a global network of independent but connected networks, every day to get information, share information, or interact with others. Almost every sort of computer platform and transmission medium may transfer messages and information using the Internet as a standard method. Although the term "Internet" just became widely known in the last ten years, it has been in some form for much longer. Early on, the government, academic institutions, and scientists were the main users of the Internet. Because it needed a computer and was challenging to use, the Internet remained largely unknown to the general public and the business sector for more than 20 years, while being widely used in academia and among government researchers. However, as technology advanced, new uses appeared swiftly. Hardware for communications was enhanced first, and subsequently, computers were faster and had better graphics.

Universities and research institutions in India were the first to use the Internet. The Department of Electronics (DOE) launched Internet services in 1991 through the Educational and Research Network (ERNET) for use by government agencies, colleges, non-profit organizations, and public and private research entities. The United Nations Development Programme provided funding for ERNET. In August 1995, Videsh Sanchar Nigam Limited (VSNL) commenced offering Internet connectivity to commercial enterprises and individuals. Furthermore, it was inaugurated in 1999. The first dial-up email network was built in 1996 by the National Centre for Software Technology (NCST) and the Indian Institute of Technology, Mumbai. This was followed by links to the US and Europe.

On August 15, 1995, VSNL launched the commercial Internet in India using leased lines and dial-up connections. However, access was difficult in the early going. For a dial-up connection that was unstable and sluggish, customers had to spend outrageous sums for Internet time in addition to additional phone rates. The Internet gospel did not spread as quickly as it should have due to issues with broadband connectivity, spectrum allocation disputes, and bureaucratic opposition to cutting-edge technologies like Wi-Fi and Wi-Max.This revolution, however, was one that could not be put an end to. It was propelled forward by the 1999 pronouncements of a liberal telecom policy, the establishment of ISPs across the nation, and the eventual availability of the Internet through methods other than dial-up. Broadband, net telephony, and wireless access also become commonplace (Thomas, 2005).

The private sector's entry into the market, which reduced prices, sparked India's Internet boom. In India, a number of commercial service providers, including Satyam Infoway, Dishnet, and Asianet, started to offer Internet services, breaking the VSNL Internet gateway's monopoly. Internet usage has expanded as well. The Indian government-built Internet cafés around the nation to increase access and bridge the digital gap (Chaudhary, 2004). The cybercafés have been a major force behind the growth of the Internet in India. Low broadband costs have also contributed to a rise in Internet usage.

The 'Digital India' plan is a comprehensive project aimed at transforming the Indian information society into a knowledge-based society and increasing the domestic penetration of IT services. Prime Minister Narendra Modi declared its commencement on July 1st, 2015. Consequently, local manufacturers will boost the production of IT equipment and software, improve the availability of high-speed internet in rural areas, have easier access to services

through technology-driven platforms, and greater transparency in government processes. Finance Minister Arun Jaitley introduced a national effort called "Digital India" in the budget to address the disparity between those with access to digital technology and those without access. To address the disparity between rural and urban areas, he proposed the establishment of the National Rural Internet and Technology Mission (NRITM), which would offer services to local communities. Jaitley proposed the utilisation of "e-Kranti" to enhance the delivery of services and governance across several tiers of the government. The 'Digital India' campaign comprises nine pillars and serves as a governance initiative to enhance transparency and optimise service delivery of various government programmes by utilising information and communication technology (ICT). The Indian government has characterised the "Pillars of Digital India" as follows: The mentioned initiatives are Broadband Highway, which aims to provide widespread access to high-speed internet; Universal Access to Mobile Connectivity, which seeks to ensure that everyone has access to mobile communication services; Public Internet Access Programme, which aims to make internet access available to the general public; Information for All, which focuses on providing information to all individuals; Electronics Manufacturing, which promotes the manufacturing of electronic devices; IT for Jobs, which aims to create employment opportunities in the IT sector; Early Harvest Programme, which focuses on implementing technology solutions quickly; E-Governance, which aims to reform government processes via the use of technology; and E-Kranti, which focuses on delivering government services electronically.

The government can describe the e-governance projects introduced as part of this programme using three primary classifications: infrastructure, services, and empowerment. The following initiatives are now ongoing:

Infrastructure initiatives (consisting of 30 projects)

Services initiatives (composed of 69 projects)

Empowerment initiatives (composed of 16 projects)

- **Impact of the Internet in India*:***

The Internet and other new media have been seen as solutions to many of the social, cultural, and political issues that currently beset society. In developing nations like India, there are certain restrictions on the use of modern technology like the Internet, but they must be weighed against the advantages. In reality, if a country wants to exist in the twenty-first century, it cannot ignore the need to integrate computers and the internet into its growth strategy.

The internet presents alluring chances for developing nations like India to overcome the technology gap created by the industrial era and catch up to the industrialized world. 'Flatism', which holds that everything in the universe is a level playing field with simple entrances and exits, is a later variation of the same idea that is now popular (Kumar and Kaur, 2005).

India is implementing an information revolution in its numerous villages, which constitute the majority of its population of over one billion people, by effectively using information and communication technologies. These facilities assist to mobilize local communities by giving access to much-needed information, technological services, and business. People's living situations are being improved by learning more about their professions as farmers, fishermen, artisans, and craftspeople. A noteworthy example is the Kerala Government's Akshaya initiative, which aims to close the digital gap by introducing computers to at least one member

of every family. A maximum of 2 kilomerters (miles) should separate every family from a quality ICT distribution and service delivery facility (Akshaya Centre) in order to achieve this goal. With the growth of practical e-literacy, Akshaya is now a tool for rural empowerment and economic development. The Akshaya Project catalyses economic growth and employment creation, focusing on e-learning, e-transaction, and e-governance.

Except for a few instances like Akshaya, Internet use in India is primarily centred in urban regions, however, rural areas are increasingly using it as a means of promoting rural development. Reaching out to the rural market makes sense for several reasons. The priority is to make rural residents' lives better. Technologies that are affordable and simple to implement, suitable apps and services, and a regulatory environment that fits itself to rural India's needs are the solutions. In order to communicate with the large population of multilingual people in India, language technologies are essential. Another area of issue is the cost and accessibility of personal computers. Initiatives in rural regions cannot succeed, as Jhunjhunwala and Ramachandran (2008) note, unless the issues related to the unpredictable power supply are resolved. In order to reach the large majority of the rural people in these locations, government support is essential for Internet expansion. It has the capacity to swiftly alter itself if allowed. Numerous examples show how the Internet may improve the lives of those who live in rural areas. Thus, the rural population can be empowered by the Internet and other communication technologies to write their own futures, which is completely different from anything that could have ever been envisioned or written about (Jhunjhunwala & Ramachandran, 2008).

The Internet can significantly enhance democracy by facilitating informed political engagement, online advocacy, and promoting e-governance and e-commerce while also serving as a valuable source of knowledge and education. Several internet campaigns have recently emerged as influential channels for worldwide mobilisation and discourse. After Anna Hazare's recent anti-corruption campaign and the Mumbai terror attack in November 2008, there was a surge in internet activism. The 2008 murder of Aarushi Talwar in Noida also sparked a lot of online curiosity.

The enormous potential made possible by the digital revolution must be taken advantage of in order to advance sustainable development for all people (Parthasarathy, 2005). To achieve their development objectives, governments in many poor nations have made significant investments in Internet-related infrastructures (Mansell, 2004).

- **Internet's characteristics:**

New media's three most important characteristics are synchronization, demassification, and interaction. In other words, because both sender and receiver do not need to be in contact at the exact same moment in order to communicate, new media technologies enable more individualized communication where engagement may be on a one-to-one basis. The current tendency is away from mass production and towards customization. Industrial society was a mass society with mass media, mass industry, and other aspects of mass culture. As new media are demulsified, the information society is becoming more individualized. In contrast to broadcasting, some refer to it as narrowcasting (Rogers, 1986).

The Internet's technology is also asynchronous, allowing users to send or receive messages whenever it's most convenient for them (Papacharissi& Rubin, 2000). In a communication system, we essentially witness a transfer of control from source to receiver here. The audience

also has greater accessibility and options. No one person or group has exclusive authority over it. Although a few of governments, including those in China, Iran, and the United States, attempt surveillance and limited content restriction.

According to Barry Wellman (2004), the emergence of individualized networks is being facilitated by the Internet's increasing capacity for personalization, portability, ubiquity, and wireless mobility. Each person may now serve as a communication and information switchboard between other people, networks, and organizations thanks to the Internet. Groups have unquestionably evolved into individualized networks, both online and offline. The individual has evolved into the gateway (Wellman, 2001, 2002).

A unique medium is the Internet. Each kind of communication was a distinct entity in the past. The differences are vanishing now. The trendy word is convergence. Today, a single piece of equipment can house a mobile phone, a video recorder, a television, a printer, and a computer (Clarke, 2004, p. 79).

The variety of activities that people of all ages engage in on the Internet provides a clear understanding of its nature. A 2010 Pew Research Centre survey titled "Generations Online" showed that a significant portion of users (between 80 and 100 percent) across all age groups predominantly utilized the Internet for three purposes: e-mail, search, and health information. Social networking was popular when people were younger, but as people became older, that popularity gradually waned.

Additionally, a lot of people utilized the internet to access government websites, make purchases, book vacations, and acquire news. Up until the age of 64, internet banking's popularity grew with a person's age; after that, it began to fall. Few individuals utilized the internet to start and manage blogs, podcasts, online auctions, and charitable donations. Less than 9% of those over the age of seventy-four utilized the Internet for instant messaging, compared to between sixty and sixty-nine percent of young people (Pew Internet & American life project, 2010).

- **Internet: Potentials and Issues:**

Each person's experience with the internet can only represent a small portion of its vastness and rapid growth. everyone Internet user engages in a separate Internet niche, and as a result, everyone has opinions that are noticeably different. James Costigan (1999, p. XVII) said, "I am not sure that I know what the Internet is; I am not sure that anyone does." It is challenging to characterize the Internet in precise terms because of its chameleonic nature. Because of its mutability, it constantly changes and means different things to different individuals at different times, like a bowl of jelly.

Let's examine the divergent perspectives of two of the most well-known communication specialists of all time, Marshall Mcluhan and William Gibson. Gibson is known as the "godfather of cyberspace," while Mcluhan is responsible for many of the phrases we use every day, like "the medium is the message" and "global village." The advancement of technology has given fresh life to McLuhan's ideas, which include the possibility that "the human tribe can become truly one family and man's consciousness can be freed from the shackles of mechanized and enabled to roam the cosmos" (1964, p.158). The world described by Mcluhan as a global village is an exciting place where individuals can interact and engage with one another more thanks to technology. Gibson also makes note of how we become

indistinguishable non-individuals who unite behind objects as a result of electronic technology. We identify with those who have some common products rather than with those who share our shared culture because we are joined by things that we can purchase. The topic of internet commercialization is still up for debate. He continues by saying that the internet is a waste of time, yet he really does think that this is the case. He believes that the internet gives us the chance to squander time, roam aimlessly, and daydream about the innumerable other lives, the other people, in far-off locations in its awkward, larval, wonderfully innocent way. He thinks that online browsing is the ideal way to put off tasks. People who witness you doing it, however, could even mistake it for work (Gibson, 1996). When put into perspective, the opportunities seem to exceed the risks.

- **Potentials:**

On the bright side, the internet may empower people. It offers millions of silent people a voice. It may be a potent force for democratization, allowing underrepresented people to participate more fully in social, economic, and political life (Bhatia, 2005). The activists of the Arab movement in 2011 who demanded democracy in Tunisia, Egypt, Libya, Syria, and Yemen made extensive use of the internet's possibilities. Previous governments were overthrown in Tunisia and Egypt.

Online activism and campaigns have a lot of potential in modern society. The Mumbai attacks of 2008 in India served as a catalyst for many, significantly influencing urban India and inspiring the creation of internet forums to encourage political awareness and voting. Both the recent 2011 Kerala Assembly elections and the 2009 Lok Sabha elections saw a lot of activity online. Politicians made an effort to connect with voters via their blogs and websites. The election monitoring websites mocked the country's thieving leaders. Not just among the competing political parties but also among voters and business organizations, there was online involvement. Many websites, especially those that focus on politics, offer a broad range of content during election seasons, including hit songs, magic shows, online games, the chance to create your own cabinet, political cartoons, e-books, candidate blogs, surveys, and opinion polls. Games, music, and magic acts might be found on the website indiavoting.com. Numerous non-resident Indians (NRIs) appear to have been interested in the election websites as they are becoming active, participating, and even supporting these websites. Corporate organizations also publish "edutainment" websites that primarily appeal to young people. The Jaago re-advertising campaign for Tata Tea, which had begun in 2007, was one of the elections' ads in 2009.It was a campaign to advertise four different tea brands because tea transcends all barriers, serves as a wake-up call, and is reviving. The Jaago re campaign's catchphrase, "don't just wake up, awaken," was largely seen as an attempt to raise social consciousness and motivate multiplex-going, well-off young to cast ballots.

The internet opens up new avenues for learning and education. No of their class or country of origin, anybody may access this vast repository of knowledge at any time. Beyond time and distance limitations, e-learning technologies, digital libraries, and smart classrooms provide storage capabilities never before possible.

The internet offers opportunities for telemedicine, e-governance, and rural development. The gulf between the powerful and the common people has been closed. The Internet is being used by governments for development, publicity, tourism, disaster management, and other purposes.

In India, e-commerce is developing rapidly. When discussing e-commerce in the Indian context, websites like startupduniya.com, Makemytrip.com, Rediff.com, naukri.com, indiatimes.com, and eBay India are some of the names that instantly spring to mind. E-commerce transactions will increase in the next years due to shifting lifestyles, purchasing patterns, the availability of numerous Internet connection points, and increased Internet knowledge. Innovative business owners have demonstrated that there is money to be made online. Examples are the websites naukri.com of Sanjeev Bikhchandani and shaadi.com of Anupam Mittal. The Indian Railways website is another 'chug away' achievement. Online transactions are also carried out by banks and airlines (Bhatia, 2005).

In the present day, entertainment is still among the most crucial uses of internet. Internet continues to be an extremely popular place in social networking, online gaming, and downloading music, video, and pictures.

- **Issues:**

Some early internet pioneers, like Clifford Stoll, don't find much value in the online world. It is "an unreal universe, a soluble tissue of nothingness," as he puts it. The Internet seductively tempts us to give up our time on earth with its brilliantly glowing emblem of information as power. This virtual environment, where dissatisfaction is rampant and where fundamental facets of human connections are persistently undervalued in the name of education and development, is a terrible alternative. Stoll (1995), p. 4.

The ease with which objectionable content like hate speech, misinformation, and violence is available has been described as the moral peril inherent in the Internet. This worry has unavoidably sparked calls for restrictions around the globe, notably to safeguard youngsters from cyberspace brothels. As of now, pornography has been the internet's main source of revenue (Lee & Tamborini, 2005). The digital gap, which separates individuals and nations into "information haves and have-nots," has been introduced as a new dimension to the existing inequalities in the globe by the internet. Technology dissemination that is uneven can exacerbate disadvantages and deny people of equal opportunity. Combating cybercrime is also necessary. Credit card fraud, computer infections, software piracy, and hacking are all on the rise. Due to the multifaceted nature of cyberspace, which offers anonymity as well as an ever-rising level of attack tool sophistication, the problem of cyber security is multifaceted.

Terrorist and extremist organizations utilize it for propaganda and anti-social behaviour campaigns. Recently, terrorists sent emails through unprotected Wi-Fi connections. The Indian government is preparing to put up a centralized system to monitor conversations on mobile phones, landlines, and the Internet in response to terrorist threats. The IT Act was amended by the government in 2011, giving it the authority to track, eavesdrop on, or restrict any online information. The 26/11 terrorist attacks in Mumbai in 2008, when Internet and mobile technologies were utilized to organize and carry out the operation, prompted the demand for Internet control. India’s approach is not unique and is consistent with those of nations like the US and China, which are using the Internet to combat terrorism. Governments defend their activity by stating that it is intended to preserve national security and internet strategic assets from the State's opponents, despite many people perceiving this as an invasion of privacy.

The privacy and confidentiality of information are not guaranteed over the Internet. The cyber era has brought forth new privacy issues, and although the regulations are still being developed,

websites are often breached, databases are traded, and personal information is dispersed. Even if efforts are made to safeguard them, passwords, bank account information, biometric data, and medical records are susceptible to the insecure edge of technology. Another issue is online plagiarism, particularly in the student population.

- **Internet Services' Innovative Projects:**

ICTs have a crucial role in facilitating communication and access to information, which are vital for developing agriculture and rural areas. Agriculture is a potentially advantageous sector for applying ICTs for economic transformation because it is the national priority sector. The growth of networks and the application of inexpensive ICTs provide rapid access to accurate and trustworthy information. The Agricultural Informatics and Communications Network (AGRISNET), Agriwatch Portal, ASHA, e-Krishi/Agri-Business centres, ICT Intervention for Farmers through Query Redress Services, and Information Village Centres of MSSRF target several communities (Qaisar, Khan, and Alam 2011). These can be categorized as initiatives funded by the federal government, state governments, the private sector, and non-profit organizations.

e-Agriculture is a recent concept in agricultural informatics due to the rapid advancement of the Internet and ICTs. E-agriculture is an emerging discipline that integrates agricultural growth, entrepreneurship, and improvements in informatics to enhance agrarian services, technology distribution, and information dissemination through the Internet and ICT progress (Qaisar, Khan, and Alam, 2011).

e-Governance: The inception of e-government in India dates back to the 1970s, primarily focusing on developing internal government applications in planning, economic monitoring, and defence. Additionally, it involved utilising information technology to effectively handle intricate tasks like election management, conducting censuses, and administering taxes. The National e-Governance Plan (NeGP), a significant government endeavour for bringing e-Government to a national level, was authorized on May 16, 2006. NeGP comprises 27 Mission Mode Projects (MMPs), 9 of which are central, 11 of which are state-level, and 7 of which are integrated and cover a variety of backend Ministries/Departments.Additionally, it has eight program support elements designed to provide the essential institutional and governance frameworks, core infrastructure, standards, and laws for the implementation of e-Government in the nation.

E-commerce: Electronic commerce refers to any transactions made over computer networks. Computer networks have become an essential element of the economic infrastructure due to advancements in telecommunications and computer technology in recent years. More and more businesses are enabling purchases online. There has been fierce rivalry to reach every computer owner who has a Web connection. While business-to-business transactions hold importance in the e-commerce industry, business-to-consumer transactions contribute to a percentage of e-commerce revenues in developed countries. E-commerce provides customers several benefits, such as lower pricing, increased choices, and time efficiency. With a mouse click, anyone may purchase items without leaving their home or place of business. Like banking, tickets (including for flights, buses, and trains), bill-paying, and hotel booking, among other services, clients have benefited greatly from online services. Most analysts predict a significant surge in the growth of e-commerce in the upcoming years. The primary source of sales will be business-

to-business transactions, while online purchasing will also witness a considerable swell. Internet enterprises that offer financial services, travel, entertainment, and cuisine are expected to experience growth.

Regarding the RBI Internet Banking report, Internet banking continues conventional banking activities. Traditional and Internet banking transactions are not differentiated in Section 6 of the Banking Regulation Act 1949. Banks are not obligated to obtain additional clearance or previous approval from the regulator to offer Internet banking services, as they already engage in similar banking activities using various methods and channels. Banks are increasingly using the Internet as a platform to receive instructions and offer their products and services to clients. Personal computers are widely available, and accessing the Internet and the World Wide Web is accessible. Internet banking is commonly used to describe the range of goods and services offered by different banks, which differ significantly in their nature and intricacy. The provided online banking services can be categorised into three broad categories:

(i) The Fundamental Category Offering includes the banks' websites, which provide extensive information on the wide range of products and services available to clients and the public. The system can receive and rapidly respond to emails from users seeking information.

(ii) Simple Transactional Websites fall under the next level, allowing users to make requests for services, applications, account balance inquiries, etc. but not fund-based transactions on their accounts.

(iii) Fully transactional websites provide the third level of Internet banking services. These websites allow users to do various operations on their accounts, such as cash transfers, bill payments, subscriptions to other bank products, and the buying and selling securities.

Traditional banks offer the described forms of Internet banking services as an additional means to help consumers. In contrast, new banks provide banking services as added value services through the Internet or other electronic delivery channels. Virtual or Internet-only banks, albeit delivering various financial services, need a physical presence in a particular country.

Internet service use:

Based on a 2021 IMRJB study, the primary Internet services utilised by active Internet users in India were communication (77 %), information search (70 %), online shopping (34 %), entertainment (85 %), and e-commerce (52 %).

Internet Service	Active Internet User (%)
Entertainment	85
Communication	77
Social Media	70
Net Commerce	52
Online Shopping	34

Table 7: The primary Internet services utilised by active Internet users in India

Urban and Rural Areas:

Classification of metropolitan areas is based on the "town" unit, whilst the "village" unit categorises rural regions. To characterise a city, the 2001 Indian Census used the following definition: (a) any specified part with a governing body such as a town area committee, cantonment board, corporation, or more. (b) A location that meets all three of these requirements simultaneously: i) A population density of at least 400 people per km² (or 1,000 people per sq mi); ii) A minimum of 75% of the male labour force employed in occupations other than agriculture.

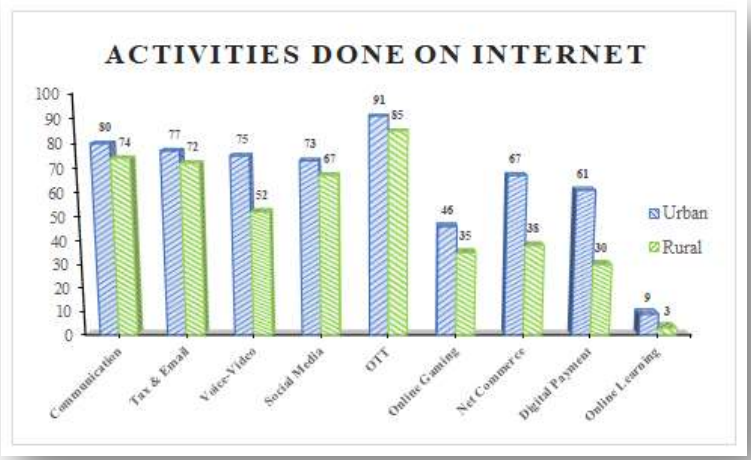

Figure 3: Activities done on Internet

The 1991 Census determined that a village could only be classified as "urban" if it had a population of four thousand or more, a population density of four hundred people per square kilometre, and at least seventy-five per cent of the male labour force participating in non-agricultural occupations. According to b) (ii), the government used core employee data to calculate the male worker proportion. Any group of towns, including their immediate surrounding areas, known as "urban outgrowths" (OGs), or even more than one town linked by physical means, and any OGs in the immediate vicinity, can be considered an urban agglomeration. Areas that appear to be adjacent to a city or statutory town but outside their formal bounds are known as OGs or Outgrowth areas. These include railway colonies, university campuses, port regions, and other locations. However, they fall under the taxing authorities of nearby villages or towns. While each of these individual regions may not meet the demographic requirements to be classified as independent urban units, the government can logically integrate them with the town to create a continuous metropolitan area.

The Census of India 2001's Urban Agglomeration Delineation requires the following conditions to be fulfilled as prerequisites: (a) For an urban agglomeration to be considered as such, its main town or at least one of its towns must have legal status; (b) Concerning the 1991 Census, the combined population of all the towns and outgrowths that comprise an urban agglomeration must be at least 20,000. If these two conditions are satisfied, then urban agglomerations could form in the scenarios described below: A continuous spread can be seen in three situations: (i) a single town or city with multiple adjacent expansions; (ii) multiple

surrounding towns with their expansions; and (iii) a single city with one or more neighbouring towns' expansions.

The "Urban Agglomeration" concept was introduced in 1971 to enhance understanding of urban processes, trends, and contingents. An urban agglomeration refers to a city or town that experiences continuous expansion beyond its legal boundaries but remains within the borders of nearby villages or two or more adjacent towns. This expansion may include the growth of a city alongside one or more adjacent towns, with or without having all these areas, resulting in a continuous spread.

Demographic Profile of Respondents:

- ***Gender of Respondents:***

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	156	39.0	39.0	39.0
	Male	244	61.0	61.0	100.0
	Total	400	100.0	100.0	

Table 8: Number of respondents classified by Gender

According to the above table, 39 percent of the respondents were female and 61 percent of the respondents were male, using internet connections.

- ***Age Group of Respondents:***

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Below 20	73	18.3	18.3	18.3
	20 - 30	89	22.3	22.3	40.6
	30 - 40	106	26.5	26.5	67.1
	40 - 50	73	18.3	18.3	85.4
	Above 50	59	14.8	14.8	100.0
	Total	400	100.0	100.0	

Table 9: Age Group of Respondents

The majority of respondents (26%) were between the ages of 30 and 40; 22% were between the ages of 20 and 30; 18% were between the ages of 40 and 50 and below the age of 20; and 14% were above the age of 50. These findings suggest that the population in the study region with internet connection is primarily between the ages of 30 and 40.

- ***Medium Use for the Internet:***

The majority of the rural (53 percent) and urban (55 percent) population use mobile internet connection, 30 percent of the rural population uses broadband internet service whereas 17.5 percent of the urban population uses wireless Fiber connection, and only 3.5 percent and 6 percent of the rural and urban population use modem internet service.

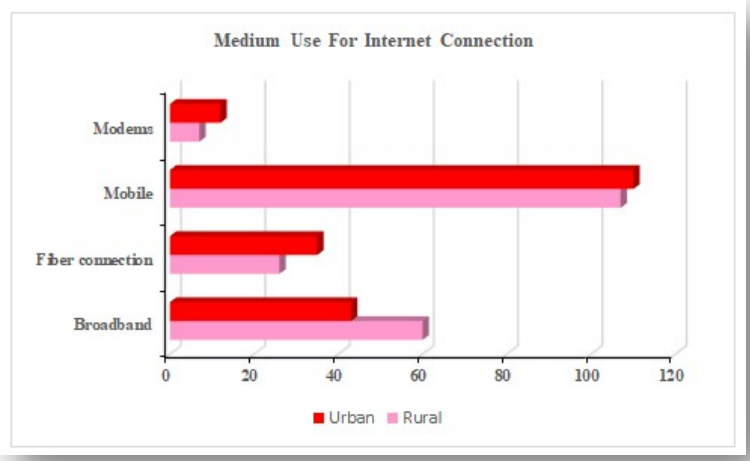

Figure 4: Medium Use for Internet Connection

- ***Benefit Gets from Internet Connection:***

		Benefits get from internet connection			
		Education	Entertainment	Office Work	Total
5. Place of residence:	Rural	73	86	41	200
	Urban	67	83	50	200
Total		140	169	91	400

Table 10: Benefits that the residents get from Internet Connection

The three categories of education, entertainment, and business activities were used to group the major justifications for utilizing the Internet. According to the data, the majority of respondents (42%) use the Internet for pleasure, followed by 35% who use it for learning, and 22.75% who use it for commercial purposes.

- ***Statistics for Research Variables:***

The mean number represents the responses that respondents to the researchers' queries provided most frequently. The mean scores of the composite variables in this study ranged between 5.10 and 6.60, which, in accordance with the description above, indicates that respondents gave average values for the majority of the composite factors. The respondents' attitudes regarding service quality, pricing, brand image, promotion, and satisfaction were moderate, according to the survey results. The composite variables' standard deviations ranged from 3.071 to 3.301.

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
X1 = Quality of Internet Speed	400	1	10	6.60	3.102
X2 = Rate of Problem in having Interret Facilities	400	1	10	5.10	3.301
X3 = Work From Home	400	1	10	6.54	3.137
X4 = Communication	400	1	10	6.50	3.071
X5 = Online Classes	400	1	10	6.38	3.247
X6 = Online Marketing	400	1	10	6.41	3.149
Valid N (listwise)	400				

Table 11: Descriptive Statistics

- ***Hypothesis Testing:***

By using a method that accounts for the two sets of data, the correlation coefficient can be computed, which reflects the relationship's strength and direction (Sekaran, 2013).

Hypothesis Testing				
Sl. No	**Hypothesis**	**Correlation (Pearson)**	**Sig.**	**Hypothesis Status**
1	There is a significant relationship between Internet Speed and the Digital Divide of Places of Resident.	.942**	0.000	Accepted
2	There is a significant relationship between Problem having Internet and the Digital Divide of Places of Resident	-.817**	0.000	Accepted
3	There is a significant relationship between Work From Home and the Digital Divide of Places of Resident	.943**	0.000	Accepted
4	There is a significant relationship between Communication and the Digital Divide of Places of Resident	.937**	0.000	Accepted
5	There is a significant relationship between Online Classes and the Digital Divide of Places of Resident	.940**	0.000	Accepted
6	There is a significant relationship between Online Marketing and the Digital Divide of Places of Resident	.947**	0.000	Accepted

Table 12: Hypothesis Testing

In accordance with the aforementioned table, the Pearson Correlation Coefficient between the independent variables X1, X2, X3, X4, X5, and X6 and the dependent variable, place of residence, was marked as.942, -.817,.943,.937,.940, and.947, respectively. Due to the fact that each hypothesis' sig value was 0.000 (less than 0.05), the relationship was statistically significant. As a result, it may be statistically inferred that the independent factors and dependent variable have a meaningfully positive association.

- ***Linear Regression:***

Researchers have chosen the multiple regression model to examine the linear relationship between the independent factors and the dependent variable based on the conceptual model created in this chapter.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.956[a]	.914	.913	.148

a. Predictors: (Constant), X1, X2, X3, X4, X5, X6

Table 13: Model Summary of Linear Regression

The model summary provides vital information on the degree to which the regression model fit or did not match the observed data. R square presupposed that the model's independent variable explained the dependent variable's fluctuation. As shown in the model summary table, the predictor variables (X1, X2, X3, X4, X5, X6) for the test can account for 91.4% of the variance in the dependent variable, with an R square value of 0.914.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	91.444	6	15.241	700.064	.000[b]
	Residual	8.556	393	.022		
	Total	100.000	399			

a. Dependent Variable: Place of residence:

b. Predictors: (Constant), X1, X2, X3, X4, X5, X6

Table 14: Table showing ANOVA for the analysis

The model's significant value, which is less than 0.05, according to the ANOVA table, was 0.000. The selection of a service provider by customers was considerably impacted by the mean of independent factors.

The table shows that the regression coefficient for Internet Speed quality was 0.048 and the sig value was 0.000. It was under 0.05. It then showed a statistically significant leaner correlation between the place of residence and the digital divide.

The problem with having internet has a regression coefficient of -.014 and a sig value of 0.001. It was under 0.05. The correlation between the difficulty accessing the internet and where to live was then shown to be statistically significant.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.351	.049		-7.136	.000
	X1 = Quality of Internet Speed	.048	.010	.298	4.744	.000
	X2 = Rate of Problem in having Internet Facilities	-.014	.004	-.090	-3.330	.001
	X3 = Work from Home	.018	.015	.110	1.187	.236
	X4 = Communication	-.001	.014	-.007	-.086	.931
	X5 = Online Classes	.014	.014	.092	1.028	.304
	X6 = Online Marketing	.063	.013	.398	4.879	.000

a. Dependent Variable: Place of residence:

Table 15: Coefficients of the Model

Work from home had a regression coefficient of 0.018 and a sig value of 0.236. The value exceeded 0.05. There is no statistically significant link between residents' places of residence and internet users in the research region and work from home.

Communications has a regression coefficient of -.001 and a sig value of 0.931. The value exceeded 0.05. In the research region, there is no statistically significant association between communication utility and the location of residents who use the Internet.

The online classes regression coefficient was.014 and the sig value was 0.304. The value exceeded 0.05. There is no statistically significant link between online classes and the percentage of inhabitants in the Ranaghat-Ukhilnara region who use the Internet.

The internet marketing facility's regression coefficient was 0.063 and its sig value was 0.000, as shown in the table. It was below 0.05. Following that, it showed a statistically significant leaner correlation between online marketing resources and the place of residence of regular users of the internet in the Ranghat-Ukhilnara region.

The researchers concluded that all factors are favourably impacted by the digital divide in the location of internet users based on correlation analysis. Regression findings showed a significant correlation between the area of inhabitants and internet speed quality. Additionally, the difficulty accessing the internet has a significant bearing on the location of the respondents. And other factors (online learning, working from home) have no discernible connection to where internet users reside. Results showed that internet marketing significantly impacted users' places of residence.

Concept of Digital Divide:

Information and communications technology (ICT) was shown to be a significant contributor to productivity and economic performance in the OECD's economic Study. The Working Party on the Information Economy undertook a series of peer reviews on the spread of information

and communication technology (ICT) to enterprises. It developed in reaction to a call from the OECD Council Ministerial to track better how member countries are putting the Growth Study's suggestions into practice.

The phrase "digital divide" encompasses the disparity of individuals, households, businesses, and geographic regions of varying socioeconomic statuses regarding their access to and utilisation of information and communication technology (ICT) and the Internet (OECD, 2001).

1) The presence of a tangible network to transmit data;
2) The capability to establish a connection using devices such as a PC, modem, and access line;
3) Computer and Internet literacy training;
4) Users' cognitive abilities and societal inclusion (influenced by their intellectual and educational attainment, profession, and social connections) determine their proficiency in information utilisation and adaptability to online communication demands.
5) We are making and using targeted material to appeal to specific demographics. In contrast to the last three requirements, which outline possible active appropriation places, the first two apply to passive Internet access features.

India's Digital Divide:

In the 1990s, governments and organisations worldwide expressed concerns regarding the unequal distribution of new technologies among individuals and inside institutions. The phrase "digital divide" was coined to highlight this discrepancy in access. Given several digital divides, it is necessary to tackle each in diverse ways (Warschauer, M. 2010). Public libraries are making a difference, despite the digital divide being ongoing and still present. The overwhelming support for public access computers and libraries from both users and librarians, together with the obvious need for technological literacy in today's environment, warrants sustained investment and support in these infrastructures. There are many chances to serve in the digital information revolution if we are truly motivated to do so. If we don't wish to serve well, the service won't end. Models of cooperation between researchers, social scientists, library technologists, etc., have to be developed. So that a technological breakthrough satisfies regional needs. Rural libraries in India can help bridge the digital divide and promote literacy and knowledge because that is where most of the population resides: in rural areas.

- Internet Divide:

Internet access originally appeared in India in the early 1990s. In 1995, Videsh Sanchar Nigam Limited (VSNL) launched the country's first dial-up connection in six cities. The National Telecom Policy of 1999 provided several small and major Internet service providers with numerous options, which led to an improvement in services and a decrease in cost.

- Tele Dependencies Divide:

The main cause of the ongoing divide between rural and urban parts of a nation is the lack of adequate telecommunications infrastructure, which contributes to the knowledge gap between rural and urban areas. The disparity between urban and rural tele-densities continues to remain despite an increase in rural tele-density.

Net Users in the Rural:

In India, 83.3 million people live in rural regions, compared to 37.7 million who reside in urban areas, according to the 2011 census data. The majority of people in the nation nearly 70% live in rural regions.

The Internet user landscape in India has been undergoing significant changes because more than two-thirds of the Indian population resides in rural areas and is more reliant in the Internet. Contrarily, urban areas are home to just a third of the nation's Internet users. There has been a 93% year-over-year growth on the number of rural mobile Internet customers or users, according to research conducted by IAMAI and IMRB. Despite the recent expansion, the data market in rural regions is still largely unexplored, with just 13% of residents having access to the Internet, against 58% of residents in metropolitan areas. Rural data users will be the primary drivers of the upcoming development phase as Internet access develops in rural India. Their initial exposure to data services will likely be through smartphones. Within two years, this specific group will account for approximately 70% of newly acquired customer situations.

7. Conclusion

the Internet has become an integral part of contemporary life, influencing consumer behavior in both urban and rural areas of India. Recent research indicates a shift in the shopping preferences of urban residents towards online platforms, citing convenience and efficient delivery services. However, in rural areas, traditional brick-and-mortar stores remain more popular, driven by concerns about shipping costs and a desire for hands-on inspection of products.

Winning the trust of rural consumers and educating them about the safety and benefits of online shopping pose significant challenges for the e-commerce sector. Understanding the evolving demographics of the new India, marked by continuous cultural changes, is crucial for marketers seeking success in this dynamic market. Consumer spending is expected to play a pivotal role in the success of emerging businesses.

The transformative impact of Information and Communication Technology (ICT) is reshaping how people interact, learn, and work. Despite government initiatives like Digital India and various projects aimed at reducing the digital divide, a knowledge gap persists between the tech-savvy and tech-unsavvy segments of the population. The widening inequality, particularly in rural areas, underscores the need for enhanced skills and infrastructure to effectively utilize ICT.

While India's technological infrastructure is widespread, there is a necessity for additional skills, especially in rural regions. To address issues of rural poverty, illiteracy, and limited infrastructure, it is imperative for the Indian government to provide maximum support. Establishing rural libraries and conducting extensive awareness campaigns could be instrumental in narrowing the digital gap, promoting literacy, and ensuring broader access to information for the population.

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