Explaining Connectedness: An Exploration of the Factors Affecting Internet Access in India

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Abstract:
Access to the internet can promote education, upskilling, human capital, and national and international economic outcomes. However, the household internet access rate in India in 2011 was 10.1% (Roser et al., 2015). Using data from the 2011 Indian Census, this study analyses the impact of computer access, area, literacy, and working rates alongside a gender perspective to explain district-wise household internet access. The analysis demonstrates that access to computers, area, male activity, and literacy significantly explain the internet access rates observed in Indian districts. The study concludes that socio-demographic factors influence the internet uptake and digital divide in India. The conclusion of this paper contributes to theoretical discussions of the digital divide in the modern history of India and provides implications for policy and market expansion in India.

INTRODUCTION

The internet access rate is a valuable statistic to understand the digital divide, particularly in developing economies. The digital divide refers to the unequal access to digital resources in a local, national, or international context (Van Dijk, 2013). Research has shown that this divide can be described and impacted by the type of internet usage, age, gender, working status, and more (Van Dijk, 2017; Van Deursen & Van Dijk, 2014). In this context, the internet access rate refers to the percentage of households with access to resources derived from internet use. It is vital to distinguish the internet from other forms of media consumption due to its nature; the internet access rate refers to the availability of internet connection through computers, phones, and other smart devices and does not include television or radio technologies. The internet is at the forefront of the digital access divide; hence the concepts of access are relevant for greater theoretical understanding as well as implications for policy and the private sector.

It is essential to understand the drivers of this inequality. From an international perspective, there is strong evidence that richer countries have greater access to the internet than the Global South (Bartikowski et al., 2018; Cruz-Jesus et al., 2016). This observation is not surprising, particularly as these countries have greater access to resources due to financial status and hence tend to pioneer new technologies (Bhardwaj et al., 2011; Batra et al., 2000). From a within-country context, some of the factors impacting internet access include the level of digital skills, working status, education, and

community impact (Estacio et al., 2019; Tsetsi & Rains, 2017). For example, research has conclusively demonstrated that a high level of digital literacy is associated with increased internet adoption and accompanying technical services (Estacio et al., 2019). Such factors, particularly in developing and remote societies, provide an intuitive explanation for the rate of adoption of the internet.

In 2011, India's overall internet access rate was 10.7% (Roser et al., 2015). While recent statistical reports have estimated the 2020 value to be approximately 50% (Ang, 2020), it is relevant to understand the determinants of such a low internet access rate to appreciate the demographic and socio-economic factors affecting the digital divide from a recent historical perspective. Utilising data from the official 2011 Indian Census, I aim to understand the role of district demographics to explain the household internet access rate in India. Using this approach, I will examine the importance of household computer access, area, literacy, and economic activity with a gender lens where applicable. Therefore, the research question is:

RQ: What is the impact of computer access, area, literacy, and activity on the internet access rate of districts in India?

This question is valuable for research as access to the internet facilitates connectivity nationally and internationally. The internet can be a valuable source of knowledge and influence and serves as an essential development factor for human capital and the economy (Anand et al., 2018). Additionally, internet and media use can potentially increase political participation and promote social capital, which refers to a set of positive outcomes such as finding jobs and increasing promotion rates (Neves, 2013; Bakker & De Vreese, 2011). By understanding the factors affecting household internet access, this study seeks to understand the underlying causes of the digital divide in India and uses the results to discuss various policy and market recommendations to promote equal access to internet resources throughout the country.

LITERATURE REVIEW

Theory

Understood through internet studies, the theory and literature surrounding the digital divide and Indian economic development have shown that the possibility and rate of internet adoption are reliant upon education, area, working status, and the culture of technological access in the community. Such conclusions have also been supported in studies of Sub-Saharan Africa (Silver & Johnson, 2018), Thailand (Lopez-Sintas et al., 2020), and Ecuador (Tirado-Morueta et al., 2017).

In international development, income is widely regarded to be at the root of inequalities. The basic needs model provides an international aid framework to eradicate poverty by providing"basic needs" to communities in hardship (Watson & Derrill, 2014). In particular, these basic needs include food, shelter, and clothing. However, the literature has noted that supplying these resources does not encourage the receiving society to become self-reliant; instead, it promotes dependency on more prosperous nations (Sundar, 2020; Qayyum & Anjum, 2019). Increasingly, academics and government officials view internet access as a fundamental right due to the potential benefits and potential for self-

sufficiency (Hidayat et al., 2021; Ferreira et al., 2020). Understood through this approach, the internet is considered a vessel for development, education, job-seeking, and economic growth.

Digital literacy is becoming ever-more important, especially with the rise of jobs that require digital skills. The theory of human capital postulates that factors such as education, training, and intelligence add to the economic value of an individual in the labour force (Parika & Singh, 2020). In an Indian context, increasing human capital through digital education promotes access to higher pay and greater company performance (Arora & Jalilian, 2020; Parika & Singh, 2020). With such evidence, the low internet access rate presents a potential roadblock to self-improvement and development, particularly for households in rural India (Bhukuth et al., 2018). Overall, this theory highlights the importance of digital literacy in the new age of work and the untapped potential of the Indian workforce.

The final theory relevant to the digital divide is the unified theory of acceptance and use of technology by Venkatesh et al. (2003). Originally developed to explain the organisational value of skill-building and sharing, the theory was quickly extended to add the consumer and include the intrinsic motivations necessary to adopt technology (Bartikowski et al., 2018). This theory has implications for internet adoption as it focuses on the agent and whether they believe using the internet would benefit them. The impact of the community influence remains highly relevant, as the hedonic value of internet adoption is shaped by the necessity to adapt and learn to develop competitive skills and nurture modernisation.

Key Factors Influencing Internet Adoption

The first factor implicated in the literature affecting internet adoption and the digital divide is the influence of the area. It is well documented that rural areas in India have lower internet access rates (Vij, 2018; Haenssgen, 2018), with one district in India having a 0.15% internet penetration rate in 2011 (Census of India, 2011). In contrast, urban areas tend to have higher internet adoption rates, likely owing to the greater degree of modernisation as well as the influence of and pressure from Global North countries to keep India economically competitive (West, 2015). Hence, the literature on area dynamics in internet access tends to focus on the adoption trends and limitations in rural India. Academics have found that perceived outcomes, perceived effort, social influence, and facilitating factors such as availability of resources explain some of the reasons why the internet uptake rates in rural areas tend to be low (Vij, 2018; Gollakota et al., 2012). Therefore, the existing literature has emphasised the necessity of improved internet service adoption in rural areas.

In a longer-term digital education for rural areas context, fieldwork studies have emphasised the community aspect of internet adoption. In particular, the need for applying the local language in a technology context limits the impact that technology would have, particularly as English and Hindi are mainly spoken in urban areas (Parshad et al., 2016; Ale & Chib, 2011). Additionally, the teachers need to be digitally literate and have a positive attitude towards technology adoption to influence their students to do the same (Pegu, 2014; Ale & Chib, 2011). To do so, they need to promote the value of the internet, which is potentially difficult as these teachers are likely new to the internet themselves and hence may not fully appreciate the broad contexts of its use (Ale & Chib, 2011). Therefore, the

first step to introduce a longer-term plan to promote internet access would be to address the attitudes and limitations in rural India.

The education level, particularly the literacy rate, has been a relevant factor in explaining the digital divide. The literacy rate is computed as the percentage of individuals over 15 years of age who can read and write (Census of India, 2011). Individuals with higher literacy are more likely to be digitally literate and use the internet (Khokhar, 2015; Wulundari, 2013). Explanations for this phenomenon from the literature include the principles of education promoting continued upskilling and the interrelationship between education and digital technologies (Nedungadi, 2018; Roy, 2012). For example, Sinha and Kumar (2015) found that accessing research and further resources at a university level required the internet to search and source academic research; internet access was a necessity for students. Additionally, there is a gender dissociation between male and female literacy, with males having a higher literacy rate (Census of India, 2011). This duality has been attributed to historical bias, opportunity costs, and available education quality (Malekar & Malekar, 2021; Batra & Reio, 2016). Therefore, there is a potential impact on the tendency to adopt digital services with literacy as the education and literacy of an individual corresponds with their tendency to have access to the internet.

The working status of an individual is also associated with internet access. The activity rate refers to the percentage of individuals engaging in commercial, paid work (Census of India, 2011). Areas with higher activity rates tend to have greater internet access, likely due to the nature of employment and economic incentives (Terzi, 2017; Gnanasambandam et al., 2012). Additionally, like the literacy rates, there is a gender dissociation in the activity rate, with men having higher activity rates than women (Gray & Suri, 2019; Census of India, 2011). Some academics attribute this duality to the nature of work, with women undertaking more unpaid labour not considered in official census statistics (Menon & Rodgers, 2017; Mazumdar, 2011). Therefore, the literature has demonstrated that working status is relevant for consideration when considering the digital divide in India.

Access to a computer in the household is the final predictor considered. However, there is a distinction between the computer access rate and the internet access rate as the computer refers to the physical machine present. In contrast, the internet is a network that can be provided through a computer or other device (Awadhiya et al., 2014). Therefore, it is relevant to consider computer access as a factor as it provides insight into the district's cultural values regarding technology adoption, and hence is a valuable metric to understand the digital divide (Aneez et al., 2019). Additionally, the computer can sometimes be carried to cybercafes or other public spaces with internet access, so there is a dissociation between computer ownership and internet access (Illayarasan et al., 2012; Smyth et al., 2010;). Therefore, the analysis of internet access requires further understanding of the computational facilities and culture in a district.

METHODS

Data

The data analysed is selected from the most recent Indian Census in 2011, which provides comprehensive information about the demographics and conditions of individuals and households in India. While the data is relatively older, it provides an insightful snapshot into the factors affecting internet access at the time. This census requires participation from almost all Indian residents, serving as a valuable data source for analysis due to representability, particularly for individuals living in rural or remote areas. Due to ethical limitations, the data obtained provides an aggregate summary of factors by district and state rather than individual data, therefore providing a total of 15,390 observations. The analysis includes all Indian states and territories for which data was available, yielding a total of 35 states and territories as well as 640 districts.

Based on the literature review, six variables were chosen for analysis: computer access rate, percentage of rural and urban households, percentage of literate males and females, and percentage of economically active males and females. The data provided were in numbers of people and households; to enable relative district and state-wise comparisons, all factors measured were converted into percentage points using the overall household, population, and literacy data for the corresponding district. Internet and computer access rates were computed as the proportion of households having internet and computer access, respectively, out of all households in the district. Similarly, the urban and rural rates were calculated by obtaining the proportion of households classified as urban or rural. The male and female literacy and activity rates were calculated as the proportion of literate and active individuals out of all males and females in the district. By converting the data into percentages, the districts could be compared robustly.

Multiple Linear Regression

This paper employs a multiple linear regression model to understand the relationship between internet access and population demographic factors. The rationale behind this approach is that this regression model is a helpful technique to model the impact of multiple independent variables on one dependent variable. In this study, the independent variable is the internet access rate. As displayed in the equation, the internet access rate is examined with various socio-demographical characteristics. These characteristics included the percentage of rural and urban households, the male and female activity rate, and the male and female literacy rate. Due to high multicollinearity, the urban household rate has been removed from this analysis.

Therefore, the equation for the multiple linear regression model used takes the following form:

$$Internet_{ij} = \beta_0 + \beta_1 Internet_{ij}\, \beta_3 Rural_{ij} + \beta_4 MaleLiterate_{ij} + \beta_5 FemaleLiterate_{ij} + \beta_6 MaleActive_{ij} + \beta_7 FemaleActive_{ij}$$

Robustness

The descriptive and inferential statistics computed are robust to the specifications and assumptions made by the linear regression model. After removing the urban household rate from the regression analysis with respect to Simpson's paradox (Alin, 2010), the multicollinearity assumption was met, and the model was able to provide a reliable result. Additionally, the sample size of over 640 observations provides statistical power of the probabilities and model measured. Furthermore, the

computation of the predictors into population percentages ensured robustness and fairness in the measurements. Such a computation also allowed the observations to be compared and hence present any differences or similarities, benefiting the robust analysis provided. Lastly, the regression was run five times with all variables included. Therefore, the socio-demographic characteristics analysed and the model employed constitute robust, strong predictors of the internet access rate of districts in India.

RESULTS

Descriptive Statistics

Table 1 reports summary statistics for the measured variables, with t-test results reported for the different sub-categories within the factors where appropriate. The percentage of rural households was significantly higher than the urban households ($p < 0.001$). In the activity rate measurement, the male activity rate was significantly higher than the female activity rate ($p < 0.001$). Similarly, the male literacy rate was significantly higher than the female counterpart ($p < 0.001$). These comparisons are helpful to convey the economic condition of India in 2011.

Statistic	Subcategory	Subcategory	P-Value
Internet Access Rate (%)			
Mean (SD)	10.1 (3.43)		
Median [Min, Max]	1.66 [0.15,17.31]		
Area (%)	Urban	Rural	
Mean (SD)	27.17 (21.17)	72.62 (21.17)	0.000
Median [Min, Max]	20.99 [0.00,100.00]	79.01 [0.00,100.00]	
Activity Rate (%)	Male	Female	
Mean (SD)	67.76 (9.48)	32.24 (9.47)	0.000

Median [Min, Max]	66.63 [46.31,89.86]	33.37 [10.14,53.70]	
Literacy Rate (%)	Male	Female	
Mean (SD)	57.44 (3.52)	42.56 (3.52)	0.000
Median [Min, Max]	57.23 [45.54,69.38]	42.77 [30.62,54.46]	

TABLE 1: *Descriptive Statistics for Internet Rate, Area, Activity, and Literacy*

Table 2 displays the aggregate state-wise descriptive statistics. Chandigarh, New Delhi, and Goa have the highest internet access rate. By the same token, Tripura, Chhattisgarh, and Meghalaya have the lowest internet access rate.

	Districts (N)	Internet Rate (%)	Computer Access (%)	Rural Households (%)	Male Activity (%)	Female Activity (%)	Male Literacy (%)	Female Literacy (%)
		Mean	Mean	Mean	Mean	Mean	Mean	Mean
Andaman And Nicobar Islands	3	1.53	4.11	79.36	59.36	20.15	78.71	69.27
Andhra Pradesh	23	1.96	6.59	68.53	56.88	36.96	66.17	52.09
Arunachal Pradesh	16	1.05	4.92	75.01	49.83	37.11	60.60	47.40
Assam	27	1.03	6.36	84.25	53.43	23.48	66.67	56.48
Bihar	38	0.61	5.52	88.9	46.41	19.50	58.25	41.85
Chandigarh	1	14.84	26.18	2.99	56.51	16.00	80.14	71.63
Chhattisgarh	18	0.70	3.16	79.58	56.21	42.43	64.79	47.89
Dadra & Nagar Haveli	1	1.85	5.53	44.33	61.57	25.25	73.56	53.82
Daman & Diu	2	1.90	5.99	33.01	63.12	13.61	81.48	68.14
Goa	2	7.11	17.46	35.44	56.67	21.90	83.16	76.25
Gujarat	26	1.48	4.87	63.96	56.94	26.76	73.32	59.26
Haryana	21	3.27	8.52	64.58	50.38	17.72	72.54	57.37
Himachal Pradesh	12	1.24	4.07	90.59	60.70	47.84	78.71	66.08
Jammu & Kashmir	22	1.14	3.80	79.68	48.90	21.23	63.56	45.30
Jharkhand	24	0.81	4.57	79.8	50.19	31.37	62.67	44.94
Karnataka	30	1.71	6.59	69.01	58.98	33.29	71.65	58.63

Kerala	14	3.97	10.10	58.62	53.29	19.86	85.52	82.84
Lakshadweep	1	1.54	7.07	24.9	46.25	10.96	84.60	78.25
Madhya Pradesh	50	0.86	4.18	76.05	53.66	33.63	65.63	48.90
Maharashtra	35	2.26	6.49	66.18	55.68	34.07	77.00	65.53
Manipur	9	1.31	6.67	74.26	51.77	41.73	71.79	60.74
Meghalaya	7	0.78	4.70	83.01	46.58	33.01	60.12	57.43
Mizoram	8	1.33	9.05	55.31	51.75	36.03	77.22	72.74
Nagaland	11	0.87	5.56	74.24	54.19	48.15	69.43	63.41
New Delhi	9	12.38	20.53	1.82	54.27	11.50	80.48	72.10
Orissa	30	0.89	3.52	84.47	56.27	29.90	69.57	54.22
Pondicherry	4	3.52	8.70	20.34	52.02	13.83	80.69	75.22
Punjab	20	3.33	8.27	63.69	55.17	14.03	70.43	62.01
Rajasthan	33	0.91	4.15	76.9	51.88	36.65	65.57	42.63
Sikkim	4	1.80	7.13	76.99	60.64	40.39	76.67	65.76
Tamil Nadu	32	2.53	7.13	56.7	59.22	33.33	77.26	65.19
Tripura	4	0.60	5.33	76.17	55.13	23.89	79.18	71.01
Uttar Pradesh	71	1.15	5.59	78.99	47.87	17.44	65.31	48.05
Uttarakhand	13	1.31	5.17	81.11	48.53	34.77	77.17	60.94
West Bengal	19	1.55	6.20	70.49	56.70	19.38	71.31	60.77

TABLE 2: *State-Wise Descriptive Statistics*

Multiple Linear Regression

Table 3 displays the impact of the variables measured on the internet access rate. Computer access rate, the percentage of rural households in an area, male activity rate, and male and female literacy have significant contributions to the internet access rate. The female activity rate is the only variable measured that does not significantly contribute to internet access.

VARIABLE	Internet Access Rate
Computer Access	**< 0.001**
Rural Households	**< 0.001**
Male Activity Rate	**< 0.001**
Female Activity Rate	< 0.512
Male Literacy	**< 0.001**

Female Literacy	**< 0.001**
Observations	640
R-squared	0.909
Adjusted R-squared	0.909
F-statistic	1058

Note: Statistically significant values are denoted in bold.

TABLE 3*: Results of Multiple Linear Regression*

As displayed in Table 3, the adjusted R-squared value is 0.909. This value indicates that approximately 91% of the variance observed in the internet access rates can be explained by the multiple linear regression model used for analysis. This value corresponds to the strength of the model and indicates that the model explains a high degree of variance in the dependent variable.

DISCUSSION

The descriptive and inferential statistics display a significant impact of household computer access, rural household rate, male activity, and male and female literacy on explaining the household internet access rate in Indian districts, therefore addressing the research question proposed. This result indicates a high degree of impact for these demographics on the likelihood of experiencing the digital divide.

The corresponding areas can explain the internet access in the districts. For example, the more rural an area is, the less likely they are to have a high degree of household internet access. By the same token, urban areas tend to have a higher degree of internet adoption, likely owing to economic necessity and greater modernisation. This finding is similar to the conclusion from West (2015), who found that affordable services, local language translation, reliable infrastructure, and diverse content were necessary to promote internet uptake in rural parts of India. Additionally, this conclusion builds on the work of Ale and Chib (2009), who used qualitative interviews to find that proper training, a positive attitude, and community support were missing in rural areas and hence presented as a challenge to the implementation and usage of the internet. Furthermore, there may be a layer of social capital and pressure as households are more likely to obtain internet access if their community supports such behaviour (Vij, 2018). Therefore, when this evidence from the literature and results from this study are considered, there is strong evidence that the area dynamics heavily impact the internet adoption behaviour of individuals and households.

The access to a computer in households was significantly impactful on the internet access rate. Households that own a computer are more likely to have access to the internet due to the interrelationship between computers and internet access. These households are more likely to foster an environment conducive to high digital literacy due to the easier access to the computer resource. Additionally, using a computer would indicate that from a cultural standpoint, the household may welcome modernisation and change to their way of life. It is also likely that they understand the benefits of accessing the internet as a resource for education, economic development, and leisure.

Literacy rates for both men and women in a given district significantly impacted internet adoption in that area. In particular, areas with high male and female literacy rates tended to have higher household internet access rates. This finding is in line with previous literature that indicated a vital role of education and continued learning on the propensity to be digitally literate and interact with the changes promoted by upskilling programs and private internet providers. Nedungadi (2018) explained that the theoretical principles of education include fostering a passion for continued self-development; the inclusion of digital literacy falls along the same lines due to the high impact on employment prospects and leisure activities. Additionally, it is relevant to note that no statistically significant gender dissociation was observed in the impact of literacy rates, indicating that the impact of education may be gender-neutral and the prominent interrelationship between technological literacy and formal education may override the gender inequalities observed within the literacy rates.

Male activity rate was a significant predictor of internet access. Therefore, the internet adoption rate tends to be greater in areas where the male activity rate is also high. This observation may occur as men may use the internet as part of their work. With the rapid growth of the e-commerce sector in India at the time, it is likely that an increasing number of jobs demanded employees to be skilled in internet usage, which would promote learning and adoption of internet services (Terzi, 2017). For example, the HarVa program sets up employment and skill-building programs in rural areas throughout India to promote digital inclusion and upskilling to adapt to the changing world of work. In addition, as the societal structure in some parts of India promotes male activity and employment over their female counterparts (Malekar & Malekar, 2021), more men may engage in these programs. Therefore the male activity rate would relate to internet adoption in a district.

The only predictor that was found not to significantly impact the internet access rate was the female activity rate. This finding may be because the measured female activity rate is generally lower than the male activity rate. However, it is vital to consider that the work that women undertake may not be in formal employment (Gray & Suri. 2019). Instead, they may engage in more household and agricultural work, which does not require a high degree of internet usage. This discrepancy between male and female activity is indicative of broader socio-cultural structuresand hence reflects that the culture in their district may value the women more as homemakers and family-oriented individuals rather than career-driven (Gray & Suri, 2019). As a result, the female activity patterns would not relate to internet access divides throughout the country.

Public Policy and Marketing Implications

The findings from this study have implications for public policy due to the demographics and characteristics responsible for a lower internet adoption rate in households across Indian districts. By

providing a district-wise analysis, this study can identify the states that need further support as well as states that serve as examples of the importance of utilising the internet as a positive resource. Furthermore, the conclusions from this study can be used to develop targeted upskilling or development programs. Based on the results from the activity rate predictors, there is a need to provide women with digital literacy skills and attitudes to promote female development. While these concepts serve as tangible projects, it is also essential to consider the challenges discussed in this analysis. For example, the societal structure of certain areas may not promote women engaging in formal work. In such cases, a more culturally-sensitive and nuanced approach is necessary. Overall, the results suggest that the involvement of the Indian government and non-governmental organisations is required to further the potential of these currently unconnected areas and to grow the country culturally and economically.

There are also implications for the private sector. In particular, the low internet access rate has indicated the market available in 2011. As of 2020, the internet adoption rate is approximately 50%, a considerable improvement from the 10.1% in 2011. However, there is still a long way to fully reach the country's potential and support human capital. With approximately half a billion people in India still not having access to the internet, internet companies such as Jio or Airtel can target these demographics and serve as a bridge to connect them to the resources available through internet usage. From a marketing standpoint, the prospects of further education and engaging in rewarding employment are relevant to consider and providing these incentives would nurture an individual's intrinsic motivation. Additionally, financial and e-commerce services online could benefit from their increased usage and, therefore, grow their market. Such a diffusion would also impact the culture and structural values of the country, which would subsequently help India develop into a competitive international economy.

Limitations and Future Research Directions

While this paper provides insight into the digital divide in India, there are limitations that serve as future research suggestions for the field. Firstly, the study used 2011 data to capture and explain the state of internet access at the time. However, analysing data from the next census, which is due to be published in 2023 rather than 2021 due to the COVID-19 pandemic, can allow a comparison of internet access over time and further understanding of the factors that may have led to increased internet adoption. Secondly, a multi-level model approach would be helpful to determine the impact of the state on the internet access rate. However, a multi-level model approach is not suitable for this study as individual-level data is unavailable due to ethical limitations, and the number of level 1 units per level 2 unit is variable. However, if the data published in 2023 provides granular individual-level data, a multi-level model approach can provide deeper, valuable insight into the country's state- and the district-wise digital divide. Thirdly, the data focused on household internet access did not account for cybercafes or other shared facilities (e.g., libraries) that may provide internet access to the public. Future research can build on this limitation by examining the impact of these shared facilities on internet adoption and social and human capital. Lastly, this study used traditional census data to explore internet access in India. While this has provided interesting results and conclusions, building on this study with non-traditional data collection measures, such as smartphone and satellite data, can

allow researchers to understand the online behaviour and distribution of people using the internet in India and other developing nations.

CONCLUSION

This study has used a multiple linear regression model to understand the influence of computer access, area, literacy, and economic activity on internet access rates across Indian districts in 2011. The robust model explained internet access in terms of its factors well and found a significant impact in explaining the digital divide. Therefore, these socio-demographic factors are essential to understand the historical factors behind such a low internet adoption rate in Indian households.

These findings provide corresponding contributions to the national and international academic literature on international development and the digital divide. Additionally, the conclusions also serve as policy implications and private sector market expansion suggestions to further the country's economic development. By building on the aforementioned limitations of the study, future research could focus on individual-level data, non-traditional data sources, measure policy impact, and more. These relevant implications and ideas proposed have the potential to be powerful constructs in future research.

CONFLICT OF INTEREST STATEMENT

No conflict listed.

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