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E-Governance in Punjab: Digital Literacy and the Challenge of the Digital Divide

Randeep Dhoot

Research Scholar, Department of Political Science, Desh Bhagat University, Mandi Gobindgarh

Abstract

The rapid expansion of e-governance in India has transformed public service delivery by enhancing efficiency, transparency, and citizen engagement. In Punjab, several e-governance initiatives have been introduced to provide online access to government services across sectors such as municipal administration, welfare delivery, revenue, and public grievances. However, the effectiveness of these initiatives is significantly influenced by the level of digital literacy and the persistence of the digital divide. This research paper examines the status of e-governance in Punjab with a specific focus on digital literacy as a key determinant of digital inclusion. The study analyses demographic and literacy data, patterns of internet and mobile usage, and rural–urban and gender-based disparities to understand how unequal digital capabilities affect citizens' access to e-governance services. The findings reveal that despite high mobile penetration and growing internet connectivity, a substantial section of Punjab's population—particularly rural residents, women, elderly citizens, and economically weaker groups—remains digitally excluded due to limited digital skills, language barriers, and lack of confidence in using digital platforms. This exclusion often leads to dependence on intermediaries, undermining the core objectives of e-governance.

The paper argues that bridging the digital divide in Punjab requires a holistic approach that combines infrastructure development with targeted digital literacy programmes, regional language support, and strengthened assisted service mechanisms. The study concludes that improving digital literacy is essential for ensuring inclusive, accessible, and effective e-governance, and for enabling equitable participation of all citizens in Punjab's digital governance framework.

Keywords: E-Governance, Digital Divide, Digital Literacy, Urban-Rural Disparities, Inclusive Digital Development

Introduction

E-Governance stands for electronic government. The objective behind this initiative is to explore the use of Information and Communication technology as a part of e-Governance at the different levels for better governance, participation and development. The development in the field of e-governance has helped a lot to the government and people. E-governance in India steadily involved from computerization of government departments to fragmented initiatives aimed at speeding up e-Governance implementation across the various arms of the government at the national, state, and local levels. The government has been able to administer the services meant for the people efficiently after implementing e-governance. All the developed countries of the world are progressing well in e-

governance implementation. The UN E-Government Survey 2018 has ranked India at 96th position for its performance in development and execution of information technologies.

E-Governance is defined by Word Bank as "E-Government refers to the use by government agencies of information technologies (such as Wide Area Networks, the Internet, and mobile computing) that have the ability to transform relations with citizens, businesses, and other arms of government. These technologies can serve a variety of different ends: better delivery of government services to citizens, improved interactions with business and industry, citizen empowerment through access to information, or more efficient government management. The resulting benefits can be less corruption, increased transparency, greater convenience, revenue growth, and/ or cost reductions. "

The development of e-Governance includes publishing, interaction and transaction. The activities aim at broadening access to government information such as laws, regulations and data, increasing public participation in decision making, publishing through e-mail addresses of government officials and online forums, making government services more readily available to the public through e-filing of government documents, online permits.

In India, the main thrust for e-Governance was provided by the launching of *National Informatics Centre Network* (NICNET) in 1987 – the national satellite-based computer network. It has been instrumental in steering e-Governance applications in Government Ministries/ Departments at the Centre, States, Districts and Block level, facilitating improvement in Government services, wider transparency, promoting decentralized planning and management, resulting in better efficiency and accountability to the people of India.

Review of Literature

The main focus of the study is on the measurement of the digital divide and the role of different factors that contribute to the challenge. The literature review focuses on such works. Some researchers and international organizations used statistical methods to evaluate the digital divide and identify the roles of contributing factors. The focus of the literature review is on the research work that has already been conducted. Research papers, articles, books, and case studies have been reviewed.

Amit Kumar (2018). According to his study**,** the government's efforts to implement e-governance may not reach every person. This situation has given rise to a challenging phenomenon known as the Digital Divide. He discussed the factors responsible for the digital divide and concluded that there is a need for uniform distribution of infrastructure and for services to be accessible to the people of the country. He has taken a macro-level study.

Prof. Amiya Kumar Sahoo, Dr. Dasarathi Sahu, and Dr. Kshitish Kumar (2015) - This paper focuses on how a government can work to raise the level of the citizens' IT skills so that citizens can become an active part of the information society and hence grab the services provided by the government to citizens. The digital divide is a major impediment to e-governance, and illiteracy is the primary contributor. The paper shows that there is a difference between what the government is doing and what experts say about the digital divide. The study's outcome is that the main cause is digital illiteracy. It should be overcome through the government's efforts. The method used in this study was observation and content analysis of different government web portals.

Santanu Das (2019) - In this paper, the major reasons for the digital divide in India are discussed. The researcher discussed the journey of India's e-governance strategies, undertaken by the Central Government, to bridge the digital divide over a 20-year period (1998-2018). Various governments are

trying to establish e-governance in India. The crux of the study states that the requirement is strong determination among people, good policy makers, and political support to bridge the digital divide.

Dr. Thawar T. Arif (2008) - The researcher identifies a gap between those who have access to and can use information and communication technology and those who do not have access or cannot use it. He finds that the existence of a digital divide within communities is considered a significant obstacle to the implementation of e-governance. The study concluded that the digital divide is a major challenge for e-government. All that is needed is to ensure that people have the opportunity to access and learn about new information and communications technology.

F. Belanger and L. Carter (2006) report that e-services make the public sector more responsive, efficient, and transparent. However, not everyone benefits equally. There is a digital divide in society, both in access and skills. Their study examined how this divide affects e-government by surveying a wide range of people to identify which factors influence the use of e-government services. The results show that income, education, age, and how often someone uses the Internet all play a big role in whether people use e-government services.

Arief Rahman, Mohammed Quaddus, and **Jeremy Galbreath (2012) -** This research presents a comprehensive picture of the digital divide and analyzes its impact on e-government use, particularly in Indonesia and other Asian countries. The digital divide is a significant problem that should be addressed to improve the use of e-government. The research is significant for scholars to provide empirical evidence of the digital divide and its impact on e-government systems. For local governments, this research may contribute to policy-making aimed at improving e-government implementation. It further suggests that future research should test the findings using a quantitative method with a larger number of users. Regarding the informants, it will be important to include non-users and to explore differences in behavior toward e-government between users and non-users. To better understand the digital divide, future research should examine how its various factors are interconnected.

Kriti Priya Gupta (2020) - In this study, the researcher has analyzed the impact of various aspects of the digital divide on e-government. The findings indicate that the three main digital divides, namely the access divide, skill divide, and innovativeness divide, have a significant effect on e-government use intention. The access divide has the greatest impact on e-government use, followed by the skills and innovativeness divides. Besides these three, other factors such as gender, age, education, and where people live also influence how much the digital divide affects people's willingness to use e-government services.

Rowshon Ara Romke (2013) - This study explains that governments in developing countries are using ICT tools to support and transform governance. The unequal access to computers and digital technologies in developing countries creates a digital divide. To bridge the gap, the need is to eradicate poverty by providing business startups. This paper presents an outline of E-Governance and the digital divide in Bangladesh. The paper concludes that, although e-governance is a blessing and inevitable, it creates a gap between developed and underdeveloped countries and between urban and rural areas. E-governance is a system-based approach, and the digital divide is creating unequal access to and use of ICT.

E-governance is the movement initiated by governments worldwide to deliver their services and programs online and to provide government information promptly. It further interacts with citizens electronically. This results in greater use of information technology for communicating information, registering complaints, etc. The e-governance policy is a good initiative that makes the government more

accessible, efficient, and accountable through technology. Digital technology has proved to be a key enabler during the pandemic, with digital initiatives providing the much-needed connection to keep the momentum going. E-governance services have helped India respond to the COVID-19 pandemic expeditiously and have served as a strategic asset in the fight against it.

The use of technology in governance also brings many new challenges. One such challenge is the digital divide. It can affect citizens' ability to access government services and online information. In societies with a more pronounced digital divide, people may lack the ability to participate in e-governance initiatives. Therefore, such studies are much more required in the present scenario. This type of research will help address challenges in implementing e-governance. This is the need of the hour to address the challenges and bring them to the notice of the present governments. By eradicating such disparities, the dream of making India a digitally empowered nation can become true.

Research Objectives

The objective of the study is to provide an understanding of how a major part of the citizenry is deprived of access to ICT and the Internet, which creates a clear-cut digital divide in society, and, hence, the effectiveness of e-governance is not achieved as expected. To analyze critically how, in India, and especially in the urban local bodies of Punjab, the government is engaged in e-governance to improve operations and service delivery for its citizens. E-governance can help by using technology to provide better information and services to people, involve citizens more in making decisions, and ensure the government is open, responsible, and efficient. The study will be further done by evaluating & analyzing different government web portals of the union and state government departments. In this paper, the digital divide is explored in depth. Also, its effect on e-government initiatives is discussed. Valuable recommendations and suggestions are provided to close or overcome the digital divide.

Implementation of e-governance in India

The Government of India has taken various steps to promote e-governance. A National Task Force on Information Technology and Software Development was set up in 1998. In the year 1999, the Ministry of Information Technology was created at the Centre. Thereafter, the National e-Governance Plan (NeGP) was launched, comprising 31 Mission Mode Projects (MMPs) and 8 support components. The National Policy on Information Technology (NPIT) was adopted in 2012. E-Kranti, which stands for Electronic Delivery of Services, is a key part of the Digital India program. 23rd National Conference on e-Governance was based on the theme 'India 2020: Digital Transformation.'

In its battle against COVID-19, India has leveraged e-Governance for various information dissemination, tracing and monitoring activities as well as to ensure the smooth functioning of government processes. While the benefits of e-Governance are well established, its ability to deliver effective, rapid results in matters like COVID-19 has further enhanced its significance. Digital technology proved to be a key enabler during the pandemic, with digital initiatives providing the much-needed connection to sustain momentum.

There are many potential barriers to the implementation of e-Governance. Some hindrances to implementation include security concerns, unequal access to computer technology by citizens, high initial costs of setting up e-government solutions, and resistance to change. For e-government to work well, trust is needed at two levels. First, users must feel safe and comfortable using the online systems or technology involved. Second, they must also trust the government providing these services. Cost is one

of the most important barriers to e-governance implementation, particularly in developing countries like India, where most people live below the poverty line.

The Challenge of Digital Divide and e-governance

The digital divide means that some people, groups, or businesses can use technology and the internet, while others cannot. This gap is shaped by factors like income, education, infrastructure, and language. People with lower incomes often have less access to digital tools. The phrase "digital divide" became widely used about twenty years ago to highlight how uneven access to technology can be. This divide is a major challenge for e-government because it prevents everyone from benefiting equally from online public services.

Someone living below the poverty line often cannot buy a computer, so they miss out on e-government and other online services. When more people gain access to technology, e-government can reach a wider audience. However, poverty isn't the only reason for the digital divide-lack of awareness is also a factor. Even people with enough money may not know about the advantages of e-governance. Even some of the economically stable people don't know about the scope of e-governance.

Awareness may encourage people to try e-government services for the first time, but they will only keep using them if the services are easy to use and meet their needs. Processes should be straightforward and offer real benefits. Clear instructions should be given so that people can use the services themselves, without having to rely on middlemen.

Dimensions of Digital Divide in India

The digital divide in India refers to the gap between different sections of society in terms of access to digital technologies, internet connectivity, and the ability to use digital tools effectively. With the rapid expansion of digital platforms in governance, education, healthcare, and financial services, digital access has become essential for socio-economic participation. However, unequal access and varying levels of digital literacy have created a significant developmental challenge in India.

Access Divide

One of the most visible dimensions of the digital divide in India is the unequal access to digital infrastructure. Urban areas enjoy better internet connectivity, wider broadband coverage, and higher device ownership, whereas rural and remote regions often suffer from poor network quality and limited access to smartphones and computers. This disparity restricts the effective use of digital services among large sections of the population.

Affordability Divide

Affordability plays a crucial role in shaping digital inclusion. For economically weaker sections, the cost of smartphones, computers, and internet data packages remains a major obstacle. Even when basic connectivity is available, recurring expenses related to data usage and device maintenance discourage continuous access, thereby limiting meaningful digital participation.

Digital Literacy and Skills Divide

Lack of digital literacy is another major contributor to the digital divide in India. Many citizens lack basic skills such as filling out online forms, uploading documents, using digital payment systems, or navigating government portals. Elderly people, informal workers, and less educated groups face greater difficulties in adapting to digital platforms, thereby affecting the success of digital governance initiatives.

Gender Divide

Gender inequality significantly influences digital access in India. Women, especially in rural areas, have comparatively lower access to mobile phones and internet services. Social norms, limited education, and economic dependence often restrict women's use of digital technologies, reducing their access to information, education, and online public services.

Regional Divide

Regional disparities also contribute to the digital divide. States and regions with better infrastructure and higher levels of economic development show greater digital penetration, while backward regions lag behind. This uneven digital development reinforces existing regional inequalities and hampers balanced national progress.

Language and Accessibility Barriers

Language remains a major barrier to digital inclusion. Most digital platforms operate primarily in English, which limits accessibility for users who are more comfortable with regional languages. In addition, inadequate accessibility features for persons with disabilities further restrict inclusive digital participation.

The digital divide poses serious challenges to effective governance in India. While e-governance initiatives aim to improve efficiency, transparency, and service delivery, unequal digital access can exclude vulnerable groups from essential public services. Citizens without digital skills or access often depend on intermediaries, which may increase costs and reduce transparency.

Digital competence and ways to narrow the gap

Bridging the digital divide requires a wide approach that includes expanding affordable digital infrastructure, promoting digital literacy, strengthening regional language interfaces, and providing assisted access through service centers. Inclusive policy design focusing on marginalized groups is essential to ensure equitable digital participation.

The digital divide in India is not merely a technological issue but a broader socio-economic and governance challenge. Although digitalization has the potential to transform public service delivery and promote inclusive development, its benefits can only be realized if all sections of society are included. Closing the digital divide is essential for making sure everyone can benefit from progress and for successful digital governance in India.

Recent data clearly highlight the persistence of the digital divide in India despite rapid digital expansion. According to recent national estimates (2023–24), India has over 800 million internet users, yet this represents only about 55 percent of the population, indicating that nearly half of Indians remain digitally excluded. The access divide is particularly evident at the household level, as only around 25 percent of Indian households have internet access, while ownership of computers or laptops remains below 12 percent. The urban–rural divide continues to be sharp: more than 65 percent of urban households report internet access compared to barely 25 percent of rural households. Gender disparity further deepens digital inequality, with survey data showing that approximately 57 percent of men use the internet, while female usage remains significantly lower at around 33 percent, reflecting social and economic barriers faced by women. Digital literacy also remains uneven, as fewer than 40 percent of households possess basic digital skills, limiting effective use of online platforms. Socio-economic inequality compounds the problem, with richer households being several times more likely to own digital devices and access online services than poorer households. Although over 95 percent of villages are now covered by mobile

networks, gaps in affordability, skills, language accessibility, and quality of connectivity prevent meaningful digital inclusion. These figures demonstrate that India's digital divide is no longer only about infrastructure availability but increasingly about unequal capacity to access, use, and benefit from digital technologies, posing serious challenges to inclusive digital governance and development.

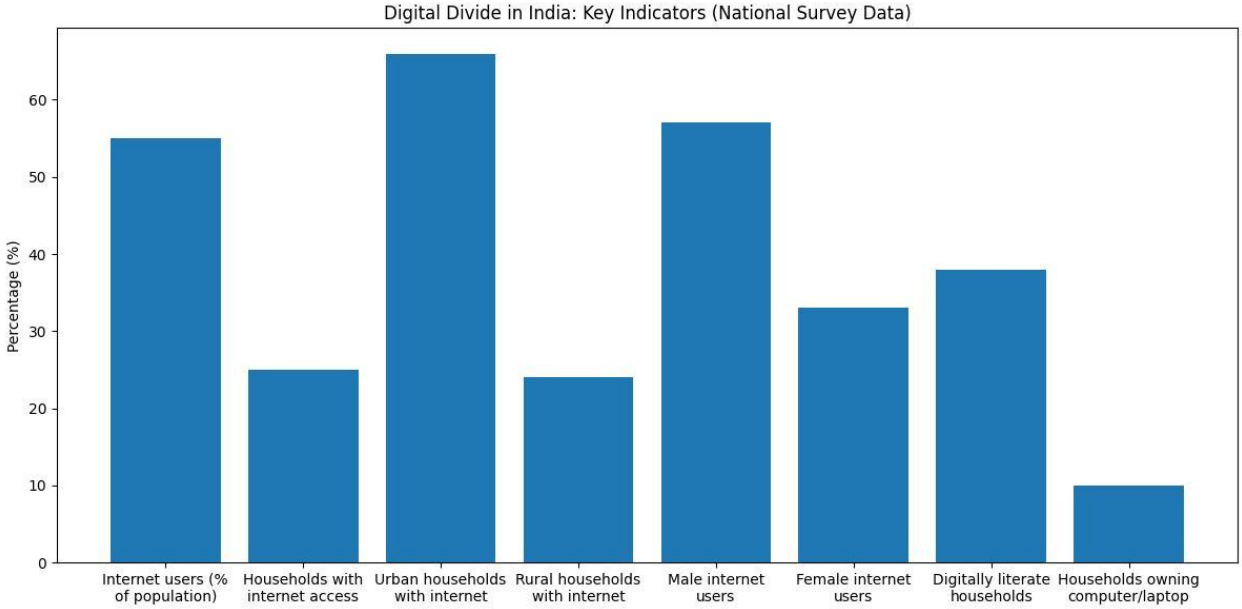

Figure-1 Digital Divide in India

Figure-1 represents the key indicators of the digital divide in India based on national survey data. While over half of the population uses the internet, only one-fourth of households have internet access. The contrast between urban (66%) and rural households (24%) highlights a pronounced access divide. Gender disparity is also evident, with male internet usage (57%) significantly exceeding female usage (33%). Additionally, low levels of digital literacy (38%) and minimal computer ownership (10%) further constrain meaningful digital inclusion. These figures demonstrate that India's digital divide extends beyond connectivity to include skills, affordability, and socio-economic inequalities.

Roots of the Digital Divide in India

The digital divide in India results from multiple interrelated socio-economic, infrastructural, and institutional factors. Economic inequality and widespread poverty remain the most significant causes, as a large section of the population cannot afford smart phones, computers, or regular internet data services, making digital access irregular or impossible. Inadequate digital infrastructure further deepens this divide, particularly in rural, remote, and border regions where poor network connectivity, unreliable electricity, and limited broadband coverage restrict digital participation. The urban–rural divide remains prominent, with urban areas enjoying better access to digital devices, high-speed internet, and online services, while rural areas lag behind due to lower incomes and limited awareness. Low levels of digital literacy and skills also contribute substantially, as many citizens lack the ability to operate digital devices, navigate online platforms, fill out e-forms, or use digital payment systems, even when access is available. Gender inequality intensifies digital exclusion, as women—especially in rural and conservative social settings—have lower access to digital devices due to social norms, educational

disparities, and economic dependence. Language barriers further restrict inclusion, since many digital platforms and government portals operate primarily in English, limiting usability for non-English speakers. Social and educational inequalities based on caste, occupation, and level of education also shape digital access, with marginalised communities being disproportionately excluded. Additionally, the rapid digitisation of governance and public services without adequate offline alternatives or assisted access has excluded digitally illiterate citizens. Finally, lack of trust in digital systems due to concerns about online fraud, data privacy, and cyber security discourages many people from adopting digital technologies. Together, these factors collectively explain the persistence of the digital divide in India despite significant technological advancement.

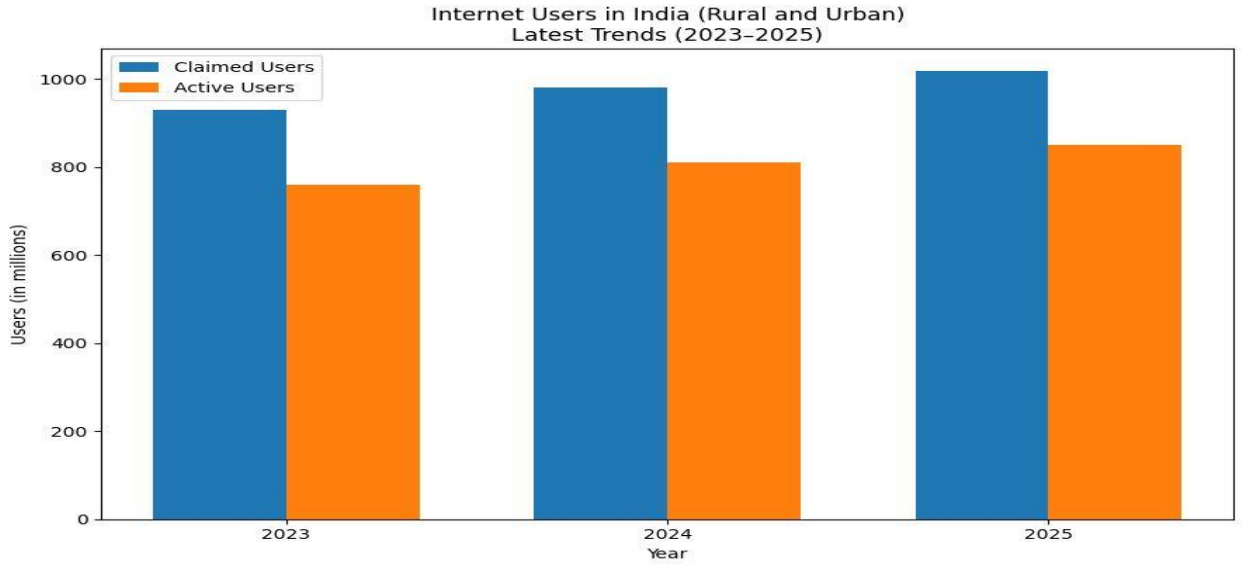

Figure-2-Source: Internet and Mobile Association of India (IAMAI)

Figure-2 depicts the trend of internet users in India (rural and urban combined) for the period 2023–2025, distinguishing between claimed and active users. Although the total number of internet subscribers has crossed one billion by 2025, the gap between claimed and active users remains substantial. This difference highlights issues of effective usage, digital literacy, and accessibility, which continue to pose challenges for the success of e-governance initiatives in India.

E-Governance in Punjab: Challenges of Digital Divide

Punjab, a state in northern India, has embraced e-governance to improve public service delivery, increase transparency, and make government interaction more citizen-friendly. Over the last decade, the state government has implemented several digital platforms and initiatives, including e-Sewa (one-stop citizen services), online portals for certificates and licenses, municipal services, and integrated financial management systems. These efforts aim to bring administrative processes online, reduce paperwork, and facilitate easier access to services like birth/death certificates, tax payments, licenses, agricultural extensions, health records, and welfare scheme registrations.

Despite progress, the digital divide remains significant in Punjab's e-governance landscape. The digital divide shows the gap between those who can access and use e-technologies effectively and those who cannot. In Punjab, this divide is visible between rural and urban areas, across socio-economic groups,

and among people with differing levels of digital literacy. Many rural citizens, older adults, and individuals with limited education struggle with internet access, smart phone or computer ownership, and the digital skills needed to navigate government portals. Lack of reliable connectivity in some rural pockets and language barriers further restrict access, often forcing citizens to rely on intermediaries or offline alternatives, diluting the benefits of digital services. Studies also highlight those areas with lower IT literacy face greater exclusion from e-governance services, underlining the need for targeted digital inclusion policies. Demographically, Punjab's population still skews toward rural areas, a factor closely linked to the digital divide. According to census data, Punjab has a total population of approximately 2.77 crore (27.7 million). Of these, about 1.73 crore (62.5%) live in rural areas, while roughly 1.04 crore (37.5%) reside in urban areas. This rural majority underlines why bridging the digital divide is crucial for inclusive digital governance: large rural populations must be digitally empowered to benefit from online public services.

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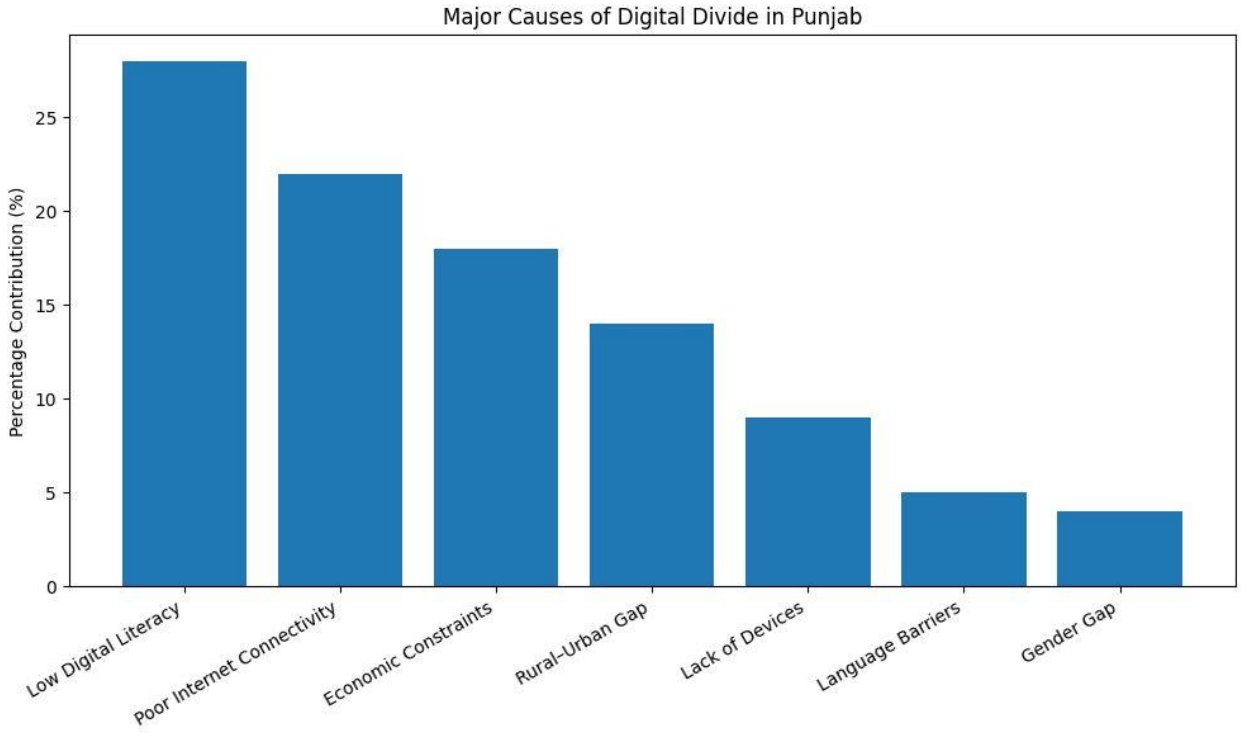

Figure-3 Major causes of the digital divide in Punjab showing the relative contribution of factors such as digital literacy, connectivity, economic constraints, rural–urban disparities, device availability, language barriers, and gender gap.

Major Causes of Digital Divide in Punjab

The main causes Included in the Graph (with % contribution):

- Low Digital Literacy – 28%
- Poor Internet Connectivity – 22%
- Economic Constraints – 18%
- Rural–Urban Gap – 14%
- Lack of Digital Devices – 9%
- Language Barriers – 5%

- Gender Gap – 4%

The graph clearly indicates that low digital literacy and poor internet connectivity are the most significant contributors to the digital divide in Punjab. Economic constraints and rural–urban disparities further limit access and effective usage of digital technologies. Although issues such as lack of devices, language barriers, and gender gap contribute relatively less in percentage terms, they play a critical role in excluding vulnerable sections of society. These factors collectively hinder inclusive access to e-governance services and highlight the need for targeted digital capacity-building and infrastructure development in Punjab. The graph clearly indicates that low digital literacy and poor internet connectivity are the most significant contributors to the digital divide in Punjab. Economic constraints and rural–urban disparities further limit access and effective usage of digital technologies. Although issues such as lack of devices, language barriers, and gender gap contribute relatively less in percentage terms, they play a critical role in excluding vulnerable sections of society. These factors collectively hinder inclusive access to e-governance services and highlight the need for targeted digital capacity-building and infrastructure development in Punjab.

Rural and Urban Internet & Mobile Users in Punjab (2025)

Data Used (Punjab-specific, 2025 estimates):

- Rural Internet & Mobile Users: 9.6 million (62.7%)
- Urban Internet & Mobile Users: 5.7 million (37.3%)

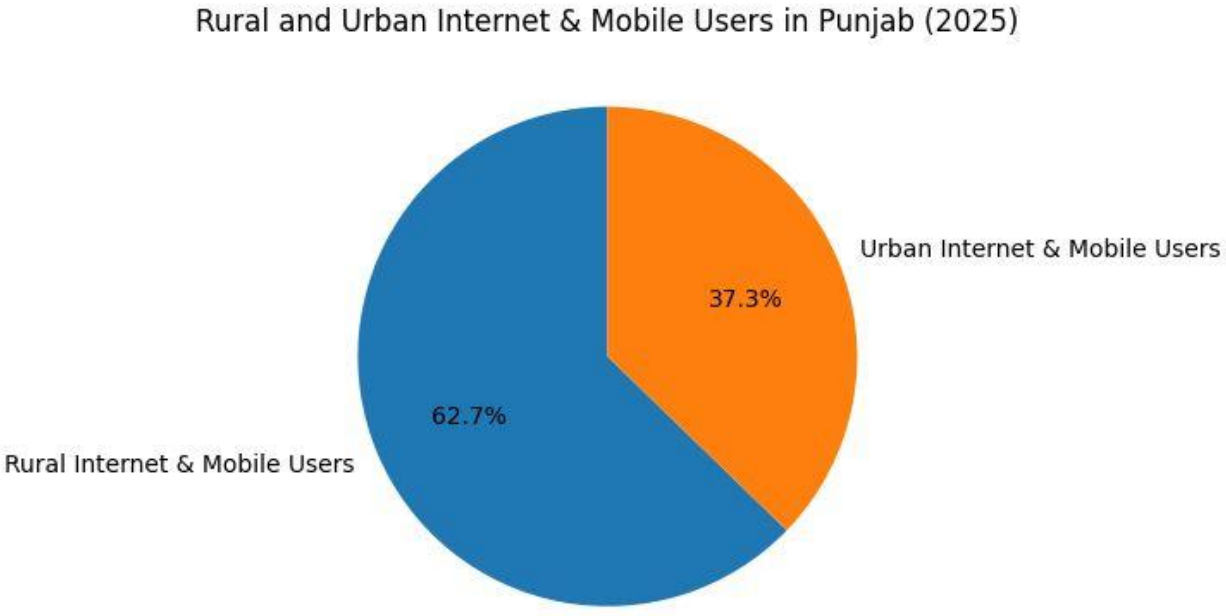

Figure 4 Distribution of rural and urban users of internet and mobile services in Punjab (2025). The chart shows that a majority of users are from rural areas due to the larger rural population base, though urban users generally experience higher quality access and more effective usage.

The figure shows that nearly two-thirds of internet and mobile users in Punjab live in rural areas, reflecting the state's predominantly rural population. However, despite higher numerical representation, rural users often face challenges such as poor connectivity, low digital literacy, and limited access to

advanced digital services. In contrast, urban users, though fewer in number, typically enjoy better infrastructure and more effective utilization of digital platforms. This imbalance highlights the rural–urban digital divide in Punjab and poses significant challenges for inclusive e-governance implementation.

Although rural internet users may numerically exceed urban users due to a larger rural population, this does not imply digital equality. Urban users continue to enjoy higher-quality access, better digital literacy, and more effective utilisation of online services. The rural–urban digital divide, therefore, persists in terms of intensity, capability, and outcomes rather than mere access.

Punjab has recorded a relatively high literacy rate compared to many other Indian states, reflecting steady progress in educational development over the decades. According to the Census of India 2011, the overall literacy rate of Punjab stands at 75.84 percent, showing a significant improvement from 69.65 percent in 2001. Male literacy in the state is 80.44 percent, while female literacy is 70.73 percent, indicating a noticeable gender gap. Urban areas of Punjab exhibit higher literacy levels, with urban male literacy at 87.80 percent and urban female literacy at 77.10 percent, whereas rural literacy remains comparatively lower, particularly among women, where rural female literacy is 68.36 percent. These disparities highlight persistent rural–urban and gender-based inequalities in educational attainment. Although Punjab's literacy achievements contribute positively to human development, the uneven distribution of literacy continues to affect digital inclusion and access to e-governance services, particularly among rural and marginalised communities.

Population and Literacy Demographic Data of Punjab
(Source: Census of India, 2011 & 2001)

Description	2011	2001
Male Population	14,639,465	13,069,768
Female Population	13,103,873	11,713,415
Total Population	27,743,338	24,358,509
Proportion to India Population	2.29%	2.36%
Urban Population	37.49%	33.95%
Rural Population	62.51%	66.05%
Sex Ratio (per 1000 males)	895	874
Male Literacy Rate	80.44%	69.95%
Female Literacy Rate	70.73%	63.55%
Average Literacy Rate	75.84%	69.65%
Urban Male Literacy	87.80%	Not Available
Rural Male Literacy	77.41%	Not Available
Urban Female Literacy	77.10%	Not Available
Rural Female Literacy	68.36%	Not Available

The main cause of the digital divide in Punjab is low digital literacy, which significantly limits people's ability to access and use digital technologies effectively. Although Punjab has relatively high general literacy levels compared to many Indian states, digital literacy—defined as the ability to operate digital devices, use the internet, and navigate online platforms—remains unevenly distributed. A large proportion of the population, particularly in rural areas, lacks basic skills such as using smart phones beyond calling, filling out online forms, accessing government portals, or making digital payments.

This problem is more pronounced among women, elderly citizens, and economically weaker sections, who often have limited exposure to digital tools and inadequate training opportunities. Many rural

residents depend on intermediaries or Common Service Centres for accessing e-governance services, which reduces independence and may increase costs. Low digital literacy also discourages regular and meaningful internet use, even where mobile connectivity is available.

Furthermore, rapid digitization of government services in Punjab such as online certificates, municipal services, and applications for welfare schemes has not always been accompanied by adequate digital capacity-building programmes. As a result, citizens who are unable to understand or trust digital platforms are effectively excluded. Therefore, despite improvements in internet access and mobile penetration, low digital literacy remains the most critical factor sustaining the digital divide in Punjab and limiting the inclusive reach of e-governance initiatives.

Measures to Bridge the Digital Literacy Gap in Punjab

Bridging the digital literacy gap in Punjab requires a comprehensive, people-centric approach that goes beyond mere internet access. One of the most important measures is expanding digital training programmes at the grassroots level. Digital literacy camps should be organised regularly in villages, wards, and community centers to teach basic skills such as using smart phones, accessing the internet, filling online forms, using e-governance portals, and making digital payments. These programmes should focus on practical, hands-on learning rather than theoretical instruction.

Another crucial measure is the strengthening of Common Service Centers (CSCs) and similar assisted digital service points. CSCs act as a bridge between digitally illiterate citizens and online government services. By equipping these centers with trained staff, updated infrastructure, and adequate support for awareness, citizens can gradually learn to access digital services independently while receiving assistance when required.

The promotion of regional language-based digital platforms is equally important. Many people in Punjab face difficulty using digital services due to limited proficiency in English. Government portals, mobile applications, and instructional content should be made available in Punjabi, with simple, user-friendly interfaces. This will significantly enhance confidence and participation among first-time users.

Special attention must be given to women, elderly citizens, and marginalised groups. Targeted training programmes, self-help group initiatives, and digital awareness campaigns can help overcome social and cultural barriers. In addition, integrating digital literacy into school and adult education curricula can ensure long-term improvement.

Addressing these challenges requires comprehensive strategies such as improving rural broadband connectivity, subsidizing devices and data plans, offering digital literacy and skills training in regional languages, expanding assisted digital access centers, and localizing e-governance platforms in Punjabi and other local languages. Only through such inclusive policies can e-governance effectively serve all sections of Punjab's population and reduce the digital divide in the state. Punjab has become the first state in the country to roll out the e-Office facility for seamless electronic movement of government files and to make decision-making efficacious and transparent. The e-Office facility comprises a hi-tech inter and intradepartmental service, and officers are expected to use it to the fullest for the greater good of the public. The new initiative aims to shift from manual handling of files to online transactions, thereby reducing the burden on employees and potentially serving as a milestone in transforming work culture and ethics in the public administration.

As part of the "Digital Punjab" Mission, the Punjab Government has created a state-level IT cadre to ensure the proper and effective implementation of e-Governance initiatives.

Finally, building trust in digital systems requires awareness of cyber security, online safety, and fraud prevention. When citizens feel secure and confident, they are more likely to adopt and use digital technologies effectively, thereby narrowing the digital literacy gap in Punjab.

Conclusion

This study has examined digital literacy in Punjab and its critical role in shaping the extent and nature of the digital divide, particularly in the context of expanding e-governance and digital service delivery. The findings clearly indicate that while Punjab has made noticeable progress in terms of internet penetration, mobile connectivity, and the digitisation of public services, low and uneven digital literacy remains the most significant barrier to inclusive digital participation. The digital divide in the state is not merely about access to technology, but about the ability to use digital tools effectively, confidently, and independently.

The analysis highlights that rural–urban disparities, gender inequality, age-related challenges, and socio-economic differences continue to influence digital literacy levels across Punjab. Large sections of the population, particularly rural residents, women, elderly citizens, and economically weaker groups, remain dependent on intermediaries or assisted service centres for accessing online government services. This dependence undermines the objectives of e-governance, such as transparency, efficiency, and citizen empowerment, and often results in additional costs and exclusion.

The study also underscores the need to view digital literacy as a core component of human development and governance reform, rather than as a supplementary skill. Bridging the digital literacy gap requires sustained efforts in capacity building, grassroots-level training, regional language support, and institutional strengthening of assisted digital access systems. Equally important is the creation of a secure and user-friendly digital environment that builds trust among citizens.

In conclusion, achieving inclusive and effective e-governance in Punjab is not possible without addressing the digital literacy gap. A holistic and inclusive digital strategy—combining infrastructure development with education, awareness, and social inclusion—is essential to ensure that the benefits of digital transformation reach all sections of society and contribute meaningfully to equitable and sustainable development in the state.

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