Research Report

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Leveraging emerging technologies to close the digital Divide to Promote Equal access and Reducing Global inequality

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Introduction

The rapid advancement of technology over the past few decades has transformed various countries, economies, and global communities. However, this progress has not been evenly distributed, which has resulted in a digital divide, a gap between people who have access to modern digital technologies, and those who do not. This divide has increased global inequalities, this hinders economic development, educational opportunities, and social mobility, particularly in low-income communities.

In modern society, digital skills play a critical role, this includes the needed skills for job requirements, school, and other social sectors which require citizens to own various forms of technology. However, not all households have the privilege of accessing reliable internet. According to various sources, only 66% of all citizens have access to the internet (Pelchen, 2024). This problem creates a digital divide as various technologies are starting to play a huge role in today's society.

Leveraging emerging technologies offers an opportunity to bridge this gap and promote equal access to digital resources. Tools such as artificial intelligence, blockchain, advanced telecommunications hold the potential to coordinate information, improve infrastructure, and foster growth regarding equality. By harnessing these technologies, global stakeholders, such as governments and international organisations, can work towards reducing global inequality and ensuring that the benefits of technological progress can reach all communities in need.

Addressing this issue requires approaches which include building digital infrastructures, implementing educational programs to enhance digital literacy, and creating policies that ensure digital access. These approaches are essential to achieving sustainable development goals, fostering economic resilience, and assisting individuals with fully participating in the digital age.

Definitions of Key Terms

Digital divide:

The gap between demographics and regions which have access to modern information and communications technology (ICT), and those that don't or have restricted access.

Emerging technologies:

New technology, and development of an existing technology; in various fields, with various definitions within the media, business, science, or education.

Digital literacy:

Digital literacy is an individual's ability to find, evaluate, and communicate information using digital media platforms.

ICT infrastructure:

Hardware, software, networks, data centres, facilities, and related equipment, which is used to develop, test, operate, monitor, manage, and support ICT services.

Socioeconomic inequality:

Disparities in income as well as in mortality, and standard of living.

Sustainable Development Goals (SDG's):

A set of 17 global development goals set by the United Nations which target reducing global inequality.

Less Economically Developed Country (LEDC):

Its people have low incomes, little access to good nutrition, health care, and education, and the country's economy is unstable.

Internet penetration:

The percentage of the total population of a given country or region that uses the internet.

General overview

What the issue is about:

The digital divide is the gap that has been created by unequal access to modern telecommunications technology and the lack of ICT infrastructure among different social groups and regions. This can include inequalities in access to computers, smartphones, the Internet, or digital literacy. This digital gap mainly occurs between developed and developing countries, and the difference in economic states on various societal groups. One of the main consequences of the digital divide is socioeconomic inequality, and could create isolation, on the workfloor, within schools, and in general social area's. This can ultimately affect the mental state of citizens and their ability to thrive in society.

The digital divide is an issue within many countries, citizens who are living within rural areas are much more likely to be cut off from digital technologies than most city residents are. The divide also exists among various countries and continents.

There are various ways in which a digital divide occurs, these are things such as: gaps which include the developed and developing countries, rural and populated areas, men and women. These divides mainly refer to the socioeconomic differences among people and its impact on people's ability to afford the devices necessary to participate in certain social settings. This commonly occurs in developing countries, many people have limited access to technology or the internet, and they do not have the skills necessary to use technology effectively. When the term "digital divide" was first used, it defined the gap between people with cell phone access and those without it. Though the term has since expanded to include the technical and financial ability to use technology and access the internet. This, however, does not fully define the term 'digital divide' as the definition of this complex term develops along with the development of technology.

Leveraging emerging technologies to close the digital gap is extremely important, this is because the digital gap has an impact on multiple aspects in society. The digital gap can cause differences in economic growth within different communities. The difference between economic growth is due to lack of access to digital tools and platforms in certain regions. Access to digital tools and platforms are also directly linked to economic opportunities, job creation, entrepreneurship, and improved productivity, which is why

any lack thereof could create inequality in economic growth. The digital divide has also had an effect on education, healthcare access, and social inclusion. Access to technology can improve educational outcomes, due to e-learning platforms and digital resources. The use of telemedicine, health apps, and online consultation services are used to improve healthcare quality. People who have the privilege of using technology, have the opportunity to participate in the digital economy, and people who do not have this privilege do not have the opportunity to access e-learning platforms, digital learning resources, telemedicine, health apps, and all digitised information. Because of the digital divide, there are groups of people who are not aware of recent information. The internet provides an abundance of resources that can educate and empower groups. For example, information on women's rights or educational scholarships is readily available online, anyone that cannot access online information is not able to inform themselves on lots of topics which creates a feeling of isolation.

However, there are some challenges which make leveraging emerging technologies to close the digital divide to promote equal access and reducing global inequality difficult. There are limitations such as infrastructure limitations, because many rural or economically disadvantaged areas lack the physical infrastructure, such as fibre-optic cables, or mobile networks, needed for reliable internet access. Another pressing issue is the cost and affordability of existing and emerging technologies. Devices and data plans can be expensive for low-income families and communities. Even if low-income families have the opportunity to own a device, simply providing access is not enough; individuals need to be trained in digital skills to effectively use technology. Training citizens that do not have the capability to use a device (smartphone, mobile data, computers, etc.) will be necessary in order to ensure that these citizens will be able to efficiently use their devices.

History of the issue:

In the 1970's the initial idea of a digital divide emerged with the development of personal computers and early networking technologies. Access to these technologies was largely limited to wealthier and urban areas in developed countries. Which led to the isolation of less wealthy and economically developed countries, citizens, and communities. The rise of telephony highlighted the differences in digital infrastructure between developed and developing nations, which laid the groundwork for discussions on digital inequality. As computers became much more common within schools and businesses, it became clear that only certain parts of the population could afford or had access to this technology. Particularly the use of computers in education began to reveal large differences between lower-income and rural schools versus wealthier urban ones.

The surface of the internet gave all people immediate access to information and communication, but this surface was mainly centred in developed countries. After recognising that not all citizens could afford such developing tools and devices, educated people began identifying the emerging gap in internet access and its potential consequences on global inequality. United Nations and International Agencies: Organisations like the International Telecommunication Union (ITU) started discussions on the need for universal access to telecommunications and digital technology.

During the 1990's, researchers and policy makers began discussing a so-called "digital divide," now defined as the difference between people who do and do not have access to information and communication technologies. In 2000, the United Nations Millennium Development Goals (MDGs), that, even though it did not explicitly focus on technology, included goals that implied its importance in reducing poverty and improving education. After that, the World Summit on the Information Society (WSIS), in 2003 and 2005, emphasised building an inclusive global information society. Major parties, including governments, tech companies, and NGOs, discussed ways to improve internet access globally.

The globalisation of smartphones and mobile internet drastically improved public access to digital resources, particularly in developing countries. Affordable brands which

produced mobile devices helped bridge the digital divide to some extent. Together with more affordable products, major names, like Facebook and Google launched programs to bring connectivity to underserved regions in order to attempt at closing the divide. Due to this recognition, there was a rise in e-learning, digital education and telehealth services began to expand access to quality education and medical care in remote or underserved areas.

In March of 2020, the pandemic largely impacted the need for proper emerging technologies. COVID-19 highlighted the reliability of devices as countries were forced to rely on remote work, online learning, and telehealth services. This period of time urged that action must be made immediately, in order to close the digital divide as soon as possible. Governments and international organisations invested in infrastructure to address these digital gaps, particularly in rural and low-income urban areas. However, these advances have not been enough to fully eliminate the pressing issue of the digital divide and the inequality that comes with it, devices are still difficult to afford, digital literacy is still a pressing concern, and infrastructure in Less Economically Developed Countries (LEDCs) is limited.

Initiatives are increasingly focusing not just on access but on equipping people with the skills to use digital technologies effectively. Governments and international bodies are working on policies to address the digital divide, aiming for more inclusive growth that leverages technological advancements without exacerbating existing inequalities. Leveraging emerging technologies to close the digital divide has evolved from the initial recognition to a global effort involving governments, tech companies, NGOs, and international organisations. However, significant work is still needed in order to overcome challenges related to infrastructure, affordability, and digital literacy, especially in underserved communities.

The current situation:

The current situation of leveraging emerging technologies to close the digital divide is divided by both significant progress and ongoing challenges. Technological advancements such as 5G networks, satellite-based internet, and public-private partnerships have expanded connectivity to previously underserved, low-income areas, providing more equitable digital access. However, the inequalities remain, particularly in rural and low-income regions where affordability, inadequate infrastructure, and limited digital literacy remain major barriers. While mobile devices and innovative tech solutions have allowed more people to engage in the digital economy and access education and healthcare services, these benefits will still often be lacking for those in the most vulnerable communities. Global initiatives by governments, international organisations, and tech companies continue to push for policies and affordable access to bridge the digital divide. Programs that promote digital skills and efforts aimed at reducing costs are steps toward reducing global inequality.

Major parties involved

International Telecommunication Union (ITU):
A UN agency responsible for issues related to information and communication technologies (ICT). The ITU sets global standards and facilitates international cooperation to expand connectivity and promote equitable access.

United Nations Broadband Commission for Sustainable Development:
This commission advocates for infrastructure as a fundamental part of (digital) global development. It sets targets and works with stakeholders to improve accessibility, affordability, and digital skills training.

World Economic Forum (WEF)
A platform for public-private cooperation that helps shape digital equity initiatives. The WEF works on developing frameworks and partnerships to work against the digital divide and integrate emerging technologies into development efforts.

World Bank:
Provides financial and technical aid to developing countries for infrastructure projects.

Tech Companies:
Companies such as Microsoft and Google contribute significantly through technologies and programs aimed at expanding internet access. Such as Microsoft (who works to deliver affordable broadband access to underserved communities), and Google (which used high-altitude balloons to provide internet in remote areas).

NGOs and Nonprofit Organizations:
Crucial in implementing on-the-ground projects, providing digital training, and advocating for policies that prioritise equal access. They often collaborate with governments and the private sector to amplify efforts.

Timeline of Key Events

1991 - The launch of the World Wide Web to the public.

1996 - The Telecommunications Act of 1996 aimed to expand services.

1999 - The Digital Opportunity Task Force (DOT) is established to provide policy advice to governments and international organisations for bridging the digital divide.

2003-2005 - The World Summit on the Information Society (WSIS) to address global challenges in digital access and set an agenda for inclusive digital growth.

2005 - The One Laptop per Child (OLPC) initiative is launched to provide laptops to children in developing countries to improve educational access.

2013 - Internet.org is launched by Facebook to bring affordable internet access to underserved regions.

2015 - The United Nations Sustainable Development Goals (SDGs) are adopted, with Goal 9 emphasising building resilient infrastructure, promoting inclusive and sustainable industrialization, and fostering innovation.

2016 - Google's Project Loon successfully launches to provide internet to remote areas through high-altitude balloons.

2020 - The COVID-19 pandemic urges the need for internet access as work, education, and social activities move online. Governments and organisations make efforts to expand digital infrastructure and access.

2022 - The ITU launches the Partner2Connect Digital Coalition to mobilise global efforts in connecting the unconnected by 2030.

2023-2024 - 5G technologies and further expansion of satellite-based internet services by private companies and partnerships, with a focus on rural and remote areas.

Previous attempts to solve the issue

1. The U.S. Lifeline Program, which was established to provide phone and internet services to low-income households with a discount, this has helped many people access digital services by making connectivity more affordable.

2. The World Bank, which has funded various projects aimed at improving digital infrastructure and supporting broadband expansion in developing countries. These projects often come with technical assistance to ensure sustainability and inclusive growth.

3. Google's Project Loon, which was an ambitious project that used high-altitude balloons to provide internet access to remote and rural areas. While the project was discontinued in 2021, it laid the groundwork for the potential of using different sorts of methods to expand connectivity.

Possible solutions

1. **Expanding infrastructure through public-private partnership.** Governments could collaborate with tech companies and telecommunications providers to expand infrastructure, particularly in rural and underserved areas. These partnerships could help with resources and expertise, which would allow for infrastructure projects that would otherwise be difficult to financially achieve. Public funding could also help with this issue. Initiatives similar to Google's Project Loon, or Internet.org by Facebook that provide satellite-based internet to remote areas are good models.

2. **Internet access and affordable devices.** Programs could be developed to provide internet access and affordable devices to low-income communities. By making both the internet and devices more affordable, more people can access educational resources, job opportunities, and digital services. Affordable devices can help on the route to bridge the digital divide. Programs or initiatives that would reduce the cost of devices could help in developing countries struggling with this issue.

3. **Enhanced digital literacy programs.** Investing in educational programs that focus on digital skills and literacy to teach individuals to use and benefit from technologies effectively. This would help with bridging the digital divide about device usage. Digital literacy programs help individuals understand how to use technology for education and job training. Organisations such as the Internet Society and local NGOs which run digital training programs aimed at teaching people how to use digital tools and services in their daily lives are a good start.

Further Readings

1. The International Telecommunication Union (ITU).

https://www.itu.int/en/Pages/default.aspx

The ITU serves as the United Nations specialised agency for ICTs, providing guidance, research, and initiatives aimed at expanding telecommunications infrastructure globally. It works with governments, private sector entities, and civil society.

2. The Broadband Commission (a joint initiative by ITU and UNESCO for broadband access).

https://www.broadbandcommission.org

The Broadband Commission for Sustainable Development advocates for the expansion of broadband access to make progress toward the United Nations Sustainable Development Goals (SDGs). The commission focuses on policy recommendations, partnerships, and research to bridge the digital divide.

3. Insights into how the World Bank is working to improve digital infrastructure.

https://www.worldbank.org/en/topic/digital

The World Bank focuses on leveraging digital technology as a tool for economic growth and poverty reduction by investing in digital infrastructure and supporting initiatives that ensure affordable and universal access to the internet.

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