HANDBOOK

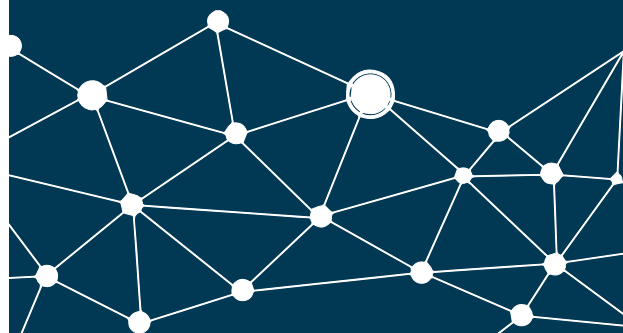## HOW TO DESIGN AND IMPLEMENT DIGITAL LITERACY STRATEGY AND COMPETENCES FOR MUNICIPAL TEAMS AND CITIZENS.

CONTENTS

How to Design and implement Digital Literacy Strategy and competences for Municipal teams and Citizens.

DIGITAL DIVIDE AND LITERACY CONCEPT.

1.1 What is digital divide?

In spite of the overwhelming acceptance of the fact that ICT can help transform the economies, as well as the social inequalities and political problems, of developing countries, a major concern remains: what are generally referred to as information inequalities, or the digital divide among individuals and groups in a given society.

Definitions of the digital divide

Type	Definition
General	A division between people who access to and use of digital media and those who do not. • WHO (individuals vs. organizations/communities vs. societies/countries/regions), • with WHICH characteristics (*individuals*: income, education, age, gender; *organizations*: public or private ownership, size, sector; *countries*: developed or developing, urban or rural.) connects • HOW (access, skills, usage) • to WHAT type of technology (computer, Internet, phone, digital TV)? (Hilbert, 2011)
Process	Divisions in the access to and use of four phases in the adoption of digital media: motivation, physical access, digital skills and usage.

(Source: van Dijk, 2019)

The researcher Jan A.G.M. describes that the focus of digital divide research is, first, on individuals and, second, on divisions between countries or within countries (urban and rural). He also mentioned that there has also been attention paid to the individual demographics and characteristics of countries (rich and poor or developed or developing).

The short history of the discourse shows that the emphasis on 'how' runs from access to skills and usage. Finally, he says that the technology in question has moved from PCs and dial-up or narrowcast Internet to hand-held computers, mobile devices and broadband Internet. (Source: van Dijk, 2019)

1.2 The Concept of Literacy

Literacy is a person's ability to process and understand information while doing reading and writing activities. Reading is the process of translating language symbols to be processed into an understanding. Writing means expressing thoughts by carving language symbols. So, literacy generally is defined as the ability to read and write.Along with the development of Information, Communication, and Technology (ICT), the definition of literacy is increasingly expanded. So, it is not only based on mere reading and writing skills. Today, we often hear about digital literacy, computer literacy, visual literacy, technology literacy, media literacy, etcetera. (Source: Rintaningrum, 2019)

Digital literacy is the ability to understand, analyze, and use information in various forms from varied sources that we can access through computer devices. Digital literacy is more associated with technical access, compiling, understanding, and disseminating information skills. (Dinata, 2021). Digital literacy requires the ability to make critical information and evaluation, the accuracy of the application used, and a deep understanding of the information content contained in the digital content. (Source: Rintaningrum, 2019)

1.3 The Importance of Literacy

Literacy is a movement that is useful to increase our insight and knowledge. There is a saying that "books are windows to the world". So, with reading literacy, we can explore the world indirectly. So, it can be interpreted that literacy is the ability to read and write to someone who will later get and process the information he gets. Literacy can also be interpreted as a person's ability to use all his potential and skills. With the individual's ability to use all the potential and skills he has in his life. With that understanding, literacy means the ability to read words and read the world. (Source: Rintaningrum, 2019)

1.4 Citizens as Information and Communication Technology users

Technological advances enable a "ubiquitous computing" infrastructure, a term that is closely related to the concepts of sensors and Internet of things. It refers to the embeddedness of wireless, intercommunicating microprocessors, etc., in objects of everyday life such that these objects can record and modify the environment. The critical factor is to put these technological developments at the service of the citizens. These developments still remain too abstract for most citizens who are most interested in applicable solutions. New citizen-oriented applications can be mapped to the infrastructure. These innovative applications range from Augmented Reality systems, through Citizen Science platforms and Public Displays to any innovative application that makes the citizens feel surrounded and supported by technology and motivated to engage in other applications. (Source: Lytras & Visvizi, 2019)

DIGITAL LITERACY PROGRAMS AND STRATEGIES: CITIZENS ACCESS TO TECHNOLOGY.

The incredible advances in technology have changed the way people communicate, interact and work, but that's not all. Technology has also altered the way people learn. Digital literacy involves learning through various technology platforms, such as computers, the internet, remotely, or a combination of all three. Becoming digitally literate means that people develop technological skills, learn authorship rules, such as copyright and plagiarism, understand how to access online information, or learn social responsibility while interacting on social networks.

Giving digital literacy programs is essential. The introduction to digital media prepares people for the skills they need to engage in technology both safely and responsibly. What's more, digital technology education empowers and educates by providing people with the tools they need to thrive in an ever-changing digital world.

Through programs and strategies centralized in this, a correct and effective result and teaching can be achieved.

It is essential to analyze, study and understand examples related to strategies and programs.

2.1 Citizens as democratic participants

Seeing citizens as direct democratic participants in a smart city has several advantages. By being involved in the decision process, the citizens can learn about difficult technical problems and become experts in matters of public relevancy. Moreover, the public servants are also learning from the citizens about the reasons why a policy might be unpopular and how to avoid this.

Democratic participation of citizens is also cost effective as it reduces the chance for litigation or, in a smart city, useless investments that will not be helpful or used by the public.

To reduce the time and money consuming nature of the decision making process, this support can reward the citizens through financial but also other kinds of social benefits ("Citizen of the week" awards, free training courses, etc.).

As citizens may not be used to participate in this kind of meetings, facilitators should also ensure each voice is heard through the use of facilitating techniques. (Source: Lytras & Visvizi, 2019)

2.2 Citizens as Cocreators

The traditional approach to innovation in cities consisted in urban planners making centralized decisions based on their own ideas, but in recent years, and in the smart city context, a new model that takes advantage of the citizens' input and ideas has emerged. Hence, citizens should not be considered as passive consumers but as crucial stakeholders that can generate valuable ideas that can meet social needs.

There exist some direct interaction techniques to collect citizens' ideas such as conducting focus groups or interviews with experts and users, town hall meetings, testing usability, functionality, and accessibility, encouraging real-time comments and suggestions, and developing and adhering to measures and standards of service quality. (Source: Lytras & Visvizi, 2019)

DIGITAL LITERACY, MUNICIPAL EMPLOYEES AND PUBLIC SERVANTS.

The aim of smart governance is to support and improve democratic processes, transparency in governance, citizen-centric development, and political strategies through the use of technology to facilitate the involvement of citizens. It is also encouraged to benefit from the available advanced technology for coordination with other municipalities and other stakeholders to fulfill citizens' needs to improve both public services and confidence in the public institutions. (Source: Mergel, 2019)

Local administrations and municipalities, as well as communities at large, especially of cities in developing countries that are known to be vulnerable, are urged to follow the smart city paradigm to guarantee their resilience and sustainability.
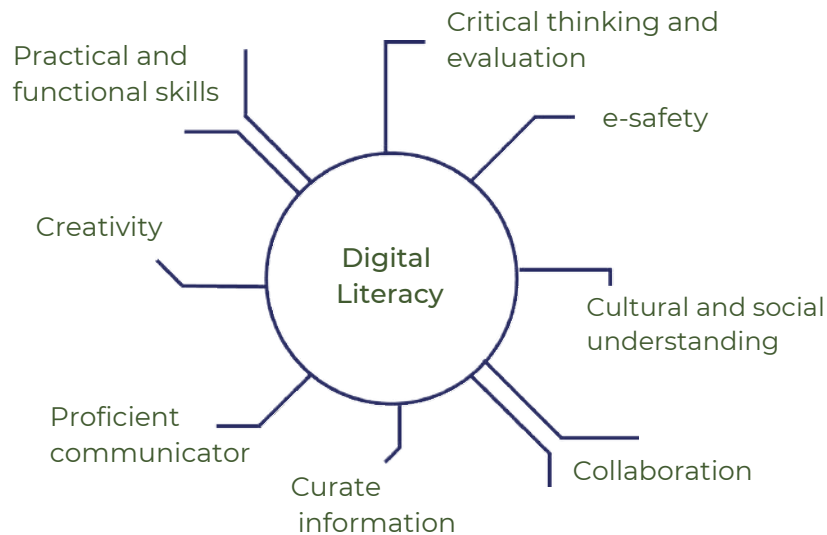
These administrations need to consider investing in both infrastructures for adequate flow of information, besides, human resources through education and health-care services.
(Source: Mergel, 2019)

One good example about Smart cities is Makkah, a city and administrative center of the Province of Saudi Arabia, which has covered four out of six dimensions; smart living, mobility, environment, and economy, and two dimensions are missing, smart governance and smart people.

In this point, the smart governance practice is illustrated through an e-government program, the use of technology by the city governance, and the use of e-services in several sectors. The implementation of smart people is through training provided by the city government for employees and students. (Source: Mergel, 2019)

HOW TO DESIGN AND IMPLEMENT DIGITAL LITERACY STRATEGY AND COMPETENCES FOR MUNICIPAL TEAMS AND CITIZENS.

Practical and functional skills

Critical thinking and evaluation

e-safety

Creativity

Digital Literacy

Cultural and social understanding

Proficient communicator

Collaboration

Curate information

Digital technologies confront users with the need to master a wide range of technological, cognitive and social competences.

Digital literacy refers to a particular set of competencies that allow one to function and participate fully in a digital world: there are 8 competencies that help one to improve those skills needed to live, learn and work in a society where communication and access to information is increasingly through digital technologies.

ANALYSIS RATING

Critical thinking and evaluation

Critical thinking is the intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication, as a guide to belief and action.

In order to apply the principles of critical thinking, it is recommended to identify the problem, gather data, analyze and evaluate, identify assumptions, establish significance, make a decision, and communicate.

(Source: Edvarsson, 1998)
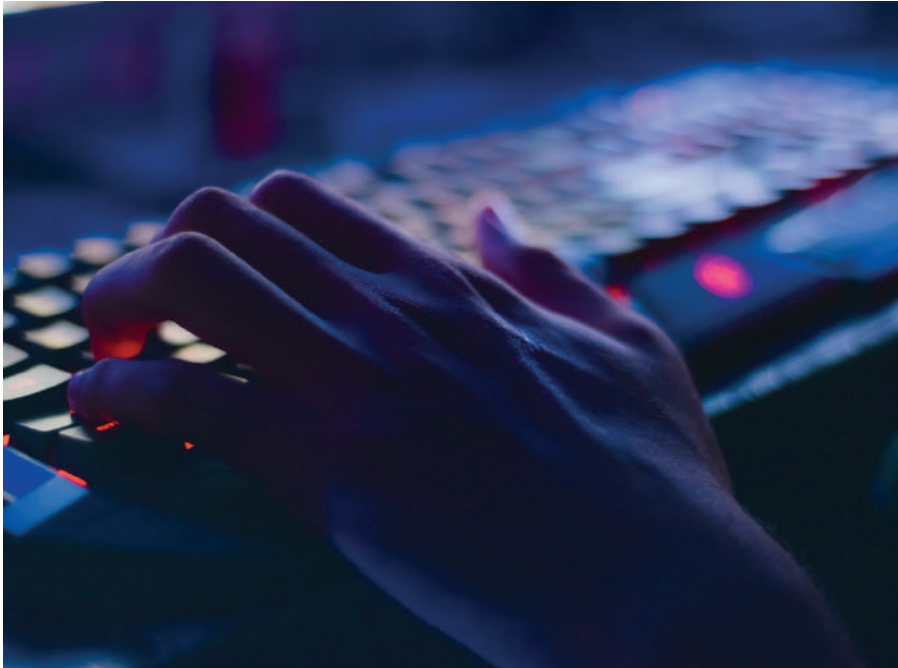
DIGITAL IMMUNITY

e-safety
E-safety is the concept of protecting users as they navigate the internet, especially those most vulnerable. It tries to protect users from potentially harmful content that can be found on apps or websites, or the effects of such content.

(Source: Times, 2002)

WORLD-PREHENSION

Cultural and social understanding
The internet enables people to connect with any part of the world and to create shared experiences, online content and a sense of belonging.
People are able to have contact with a culturally diverse set of people.
 To understand that, it is important to have an awareness, understanding, and appreciation of the interconnectedness of the social and cultural dimensions within and across local, regional, state, national, and global communities. (Source: Dawesar, 2013)

WORKING TOGETHER

Collaboration

Every member of a team has different skills, expertise, and talent. When all the members collaborate together they are able to utilize the experience, knowledge, and skills of everyone involved to achieve the shared goal.

Collaboration is the glue that binds the various processes in an organization together. It is the foundation of all work processes, and while technology has made it much easier, much of the basics of work collaboration remain unchanged. (Source: Tylor, Francis, 2017)

GOOD SELECTION

Curate information

"Curation is using your expertise in a field to gather great content around a specific theme and present that content in a way that will educate others." (Hatch Leishman, S. 2013)

Curation provides context to any information item, value and a specific perspective and story to look and appreciate it, any information resource gains greater value and usefulness when curated and contextualized.

Curation requires vetting, verification, resource-finding, providing a viewpoint and an ability to synthesize and illustrate what is of value in what is presented, while crediting systematically your sources. (Source: Newberry, 2020)

LEAD SPEAKER

Proficient communicator
Great communicators are highly respected and trusted. To them, it is very important to first build relationships-- both personal and professional--as a way to create successful communication. Great communicators appreciate all their relationships and all the interactions they have.

As well, they are competent and have vast knowledge about their areas of expertise. They are prepared to show people that their communication is valuable.

They listen more than they speak. They won't dominate a discussion or a presentation. Great communicators frequently ask questions to give people an opportunity to share their knowledge and express their opinions.

(Source: Patel, 2017)

COOL BRAIN

Creativity
Creativity represents the ability to develop new or imaginative ideas and turn them into a reality

Some benefits of creativity: Identify new opportunities, embrace challenges or risks, promote innovation, stimulate the mind and improve collaboration.

People involved are very important because It's the brilliant individuals that generate ideas and drive them to become tangible results. (Source: Al-Ababneh, 2020)

LIFESAVER IN ACTION

Practical and functional skills

Functional Skills are those skills which enable an individual to communicate, interact with others and to perform tasks which have practical utility and meaning at home, in the community or on the job; language, mathematics and information, communication technology (ICT), etc.

Practical skills are self-help and life-saving skills and lessons that you can learn (often easily), teach to others, and practice every day to prepare and protect your and others' health. Most practical skills do not require special certification or formal training to perform, but you do need education.

Practical and Functional skills are paramount when it comes to being digitally literate. It could be argued that people have an inherent knowledge when it comes to using technology. Many students feel comfortable using technology but they also need to learn the basics and can use technology independently. (Source: Partington, 2016)

4.1 Desirability, Feasibility and Viability: A technique for innovation

Successful innovation evolves at the right balance of three aspects; Desirability, Feasibility and Viability. It is a proven model followed by all disrupting companies, government and education systems across the globe. This model is the basis of a design thinking framework as well, where the team tries to answer the below question under each of these aspects.

Desirable

Is the product/service/solution desirable?

Is it rightly fitting into the customer's needs and their lives?

Is this what they were waiting for badly?

Is this solving their right problem, or is it solving a problem which they didn't know they had?

Feasible
Are we able to implement this solution?
Is this technically feasible?
Do we have the capability to implement this solution?
Is it feasible to build the solution within the given time and budget constraints?

Viable
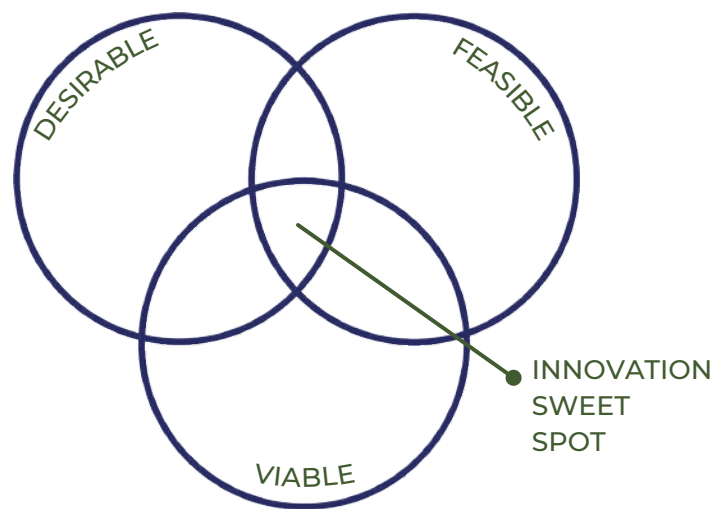Is this solution profitable?
What is the Customer Value You Provide?
What are Your Revenue Sources?
What Incentives Does Each Stakeholder Possess?
Does the Solution Contribute to Long-Term Growth?
What are the costs to develop and operate the solution?

This technique helps and runs all their divergent ideas through these questions and arrive at a successful innovative solution. (Source: D, 2021)

OVERCOME DIGITAL DIVIDE: CHALLENGES, INFRASTRUCTURE, MUNICIPAL HARDWARE, MUNICIPAL SOFTWARE AND POST-DIGITAL LITERACY.

5.1 Challenges to Internet Access

Tools necessary for crossing the digital divide and accessing the Internet include hardware and software as well as the cost of connecting to the Internet; an often significant on-going cost which is dependent on Internet service providers (ISPs) and their charges. Free ISP access is a growing trend, with projects like Telecom Egypt's plan for free dial-up Internet access in Egypt being instituted in other developing countries, especially those in Latin America. However, connectivity continues to be a considerable roadblock to many trying to enter the information superhighway.
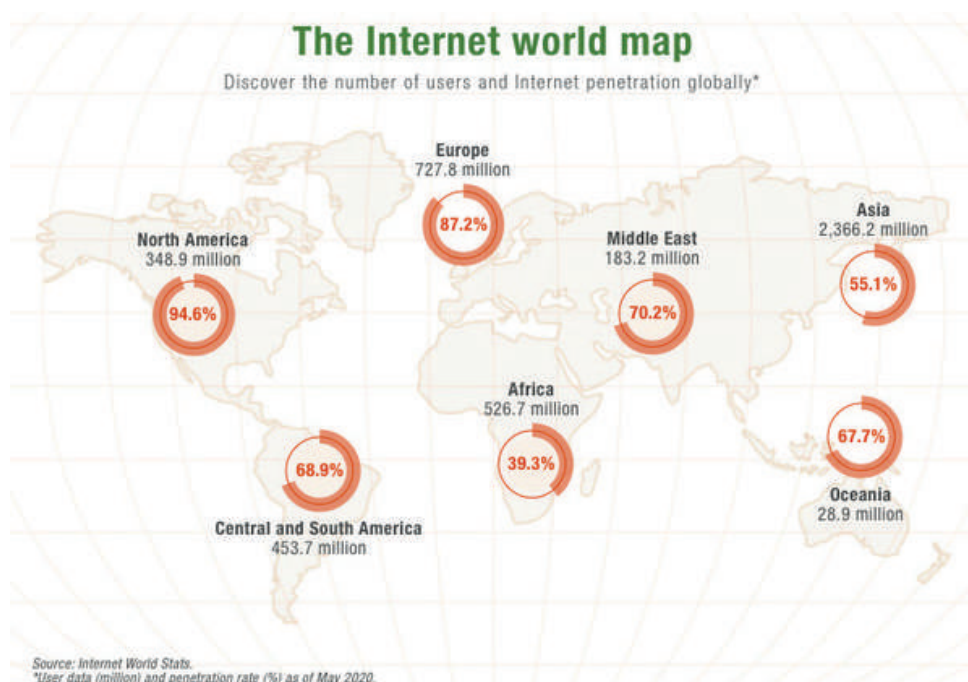
The invisibility of the developing world is principally due to the lack of connectivity as the telecommunication infrastructure is uniformly poor or lacking in these areas. An ILO report has found that, "The level of national income is strongly related to ICT diffusion and is clearly the distinguishing feature of the divide between industrial and developing countries." (ILO 2001) The availability of telecommunications therefore is not a consequence of development, but an empowering force behind it. (source: Speirs, 2010)
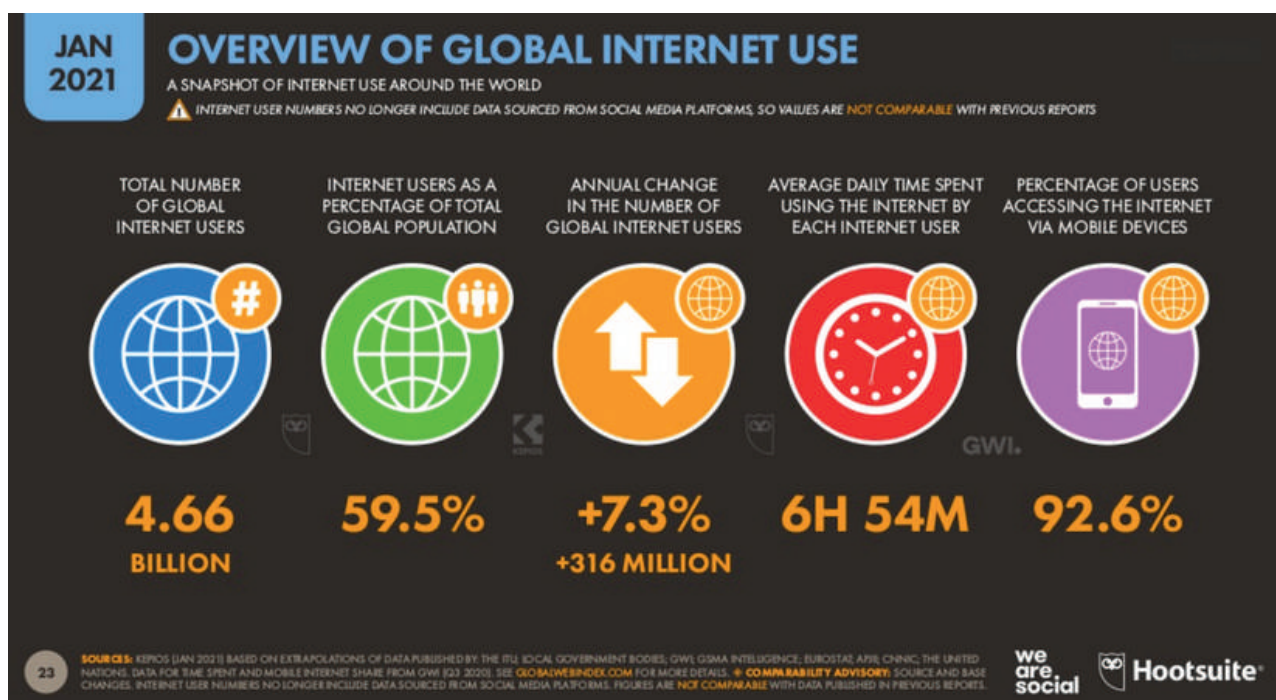
5.2 The Impact of the Digital Divide

As the Internet helps to create new ways of doing business and communicating it also creates a disparity between the haves and have-nots, perhaps faster and more significantly than any other movement in history. However, there are valid questions about its social relevance in the greater scheme of things and the priority that it should be given development concerns. There are those who ask what good information and communication technology does for this disenfranchised population.

There are those who feel that "you can't drink a computer" and that water is a much more important issue for those suffering from this sort of inequality or disenfranchisement. (Roach 2001a) The answer to these concerns is that it is not a trade-off of either/or but that ICT offers solutions; solutions that aid by supplying information to support health, education, and enterprise efforts. It can boost efforts to address the complex and more profound problems of famine, AIDS, infant mortality, and war related relocation problems. It can also supply information which can help to encourage gender equality, education and self-sufficiency. Rodrigo Baggio, the founder of Committee to Democratize Information Technology based in believes that "the computer is more than a machine. It's a tool that can turn poor and underprivileged people into active citizens" (Koss 80). Technology alone is not a panacea and ICT is not a magic bullet, but it can be part of the solution. (source: Speirs, 2010)

The Internet world map
Discover the number of users and Internet penetration globally*

Europe
727.8 million — 87.2%

North America
348.9 million — 94.6%

Middle East
183.2 million — 70.2%

Asia
2,366.2 million — 55.1%

Africa
526.7 million — 39.3%

Central and South America
453.7 million — 68.9%

Oceania
28.9 million — 67.7%

Source: Internet World Stats.
*User data (million) and penetration rate (%) as of May 2020.

Digital Gender Divide
In orange countries males have more access, while in blue countries females have more access   Gender Divide (percentage points)
Grey = No Data   -100.0 ▬▬▬ 100.0

© 2021 Mapbox © OpenStreetMap
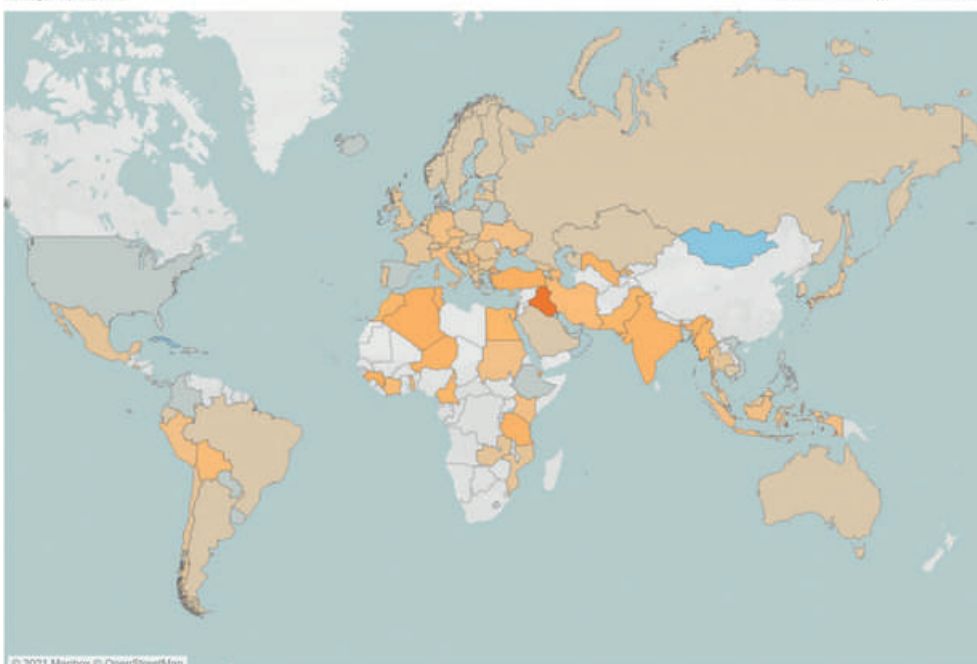
Source: ITU Internet Stastitics | Visual: Orion Wilcox

Another social impact of the consequences of the digital divide is the effect that the lack of access to reliable communication and information technologies (ICT) and the resulting feelings of disenfranchisement have had on global security risks. The inequality of access can be dangerous as it can encourage frustration and feelings of powerlessness. (source: Speirs, 2010)

5.3 Tools which Empower
Hardware, software and connectivity are essential tools for entry onto the information highway. Software as an important factor in enablement, like free software sites that are becoming more common. Connectivity can be increased by using mobile networks and satellites. Mobile networks can reach quickly into regions where fixed networks are slow to emerge and they can bypass the often highly regulated state-run telecommunications monopolies. (source: Speirs, 2010)

5.4 Leapfrogging
Technology leapfrogging is defined as "The implementation of a new and up-to-date technology in an application area where at least the previous version of that technology has not been deployed." (Davison 2) This leapfrogging is inevitable and something that happens automatically; for instance, no one being introduced to a computer today needs to understand punch cards or mainframes and latecomers to technological development are actually sometimes better placed than those using older technologies as they are not hindered by investments in obsolete technology that they are reluctant to abandon.

The environment surrounding the development of new technologies must be coordinated internationally while being geared to local and regional differences in the implementation of educational, financial, and social philosophies and policies. For instance, telecenters, where access is shared, are not only more economically feasible but the concept of sharing oral literature, information, and telephones, where they exist, is part of many developing countries' cultures. (source: Speirs, 2010)

Sustainability
It's important to add a new aspect to the sweet spot of innovation, or rather it's high time to redefine the true meaning of successful innovation for mankind. So what all new questions to be answered while adding this new aspect — "Sustainability". We are in a time, we should no longer call it "sustainable innovation". This is how Innovation should be. Sustainability should be in the basic fabric to consider something as innovative. (Source: D, 2021)

DESIRABLE
FEASIBLE
VIABLE
SUSTAINABLE
INNOVATION SWEET SPOT 2.0
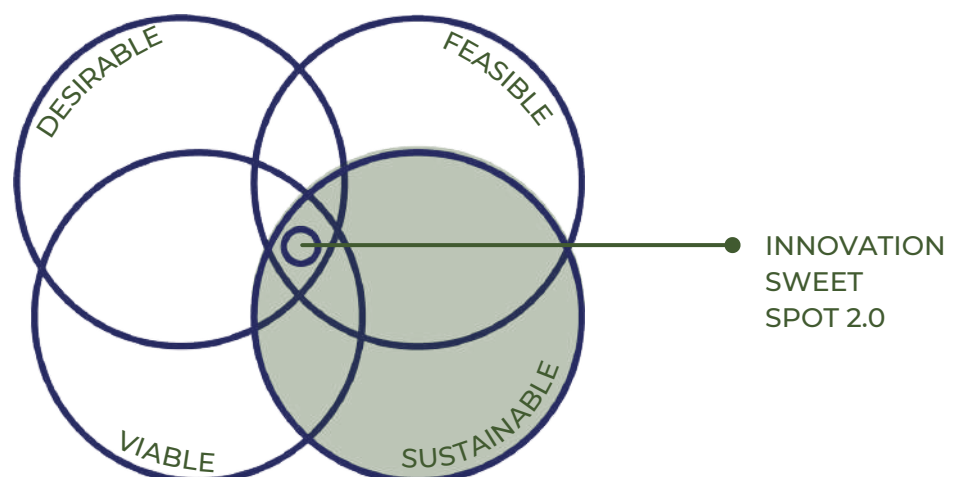
A good example of that is the sustainable impact of paperless.

For many companies, environmental, social and governance (ESG) issues have become a growing, board-level concern — not only for ethical and regulatory compliance reasons but because of increasing demands from customers and potential customers.

Digital transformation can be an important tool in addressing critical ESG issues. Data analytics, artificial intelligence and related technologies dramatically improve the identification of illegal and unethical activities in financial and retail markets; digital technologies aid enormously in providing equal access to information that increases corporate and product transparency and health awareness. More fundamentally, digital transformation reduces negative environmental impacts like natural resource consumption, pollution and waste.

Perhaps one of the most tangible examples of digitalization that has a positive impact on the environment while also providing major business performance benefits is the paperless office (i.e., reducing the use of paper in business processes). Paperless business is a sound and important environmental practice, but it also contributes to better, more efficient business operations. (Source: Xiong, 2021)

5.5 Post-digital Literacy

Efforts towards delivering the hardware and software and connecting populations to the Internet may be increasing but the factor that is even more important in this enabilization effort is that of how ICT will be integrated into the lives of those who had not been a part of the earlier technological revolutions; this effort is crucially important.

The inequality in IT resources can be dealt with by various methods of supplying the hardware, software and communication needs but these measures in themselves do not solve other adaptation concerns. It is inevitable that ICT will spread to all regions of the globe, much as television and the telephone have, but the imposition of this new and potentially interactive technology opens up the question of post-digital literacy and that of the necessity for evaluation of the information provided via the Internet.

Leapfrogging in literacy and the philosophical problems related to education are necessary in the same way it is necessary for the developing populations to leapfrog over DOS and 5 1/4 in. diskettes. They will also have to use the newer currently unfolding methodologies of engaging with the new technologies.

An integrated approach is needed. You can put computers in all the schools, but you must also train the teachers in post-digital literacy. The social context for the introduction of ICT will have to be developed and a synergy between the new context and the technology. (source: Speirs, 2010)

Literacy and education cannot be bypassed, as both are vital for reaping the greatest advantages from the emerging digital era. We need to leapfrog over some of the old educational philosophies since many of these only deal with ways to interact with older technologies using older methodologies, however, we do want to retain whatever traditional methods will still be applicable in the new digital world. The promotion of education, literacy in general, and digital literacy in particular, is a challenge facing all countries. (ILO 2001) New methods of education and literacy must go along with the technological leapfrogging that is taking place as educational reform is inseparable from social reform. (source: Speirs, 2010)

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