E-Government and the Digital Divide
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Abstract
The term "digital divide" became well known in the two decades ago, to describe the gap between those who have the information and communications technology and have the ability to use it and those who haven't the information and communications technology or can not use it. The existence of digital divide inside the communities is considered as a significant obstacle to e-government initiatives.

In this paper, the problem of digital divide is explored deeply. Also, its effect on e-government initiatives is discussed. A valuable recommendations and suggestions are stated for closing or overcoming the digital divide.

1) Introduction
The digital divide is the gap between those with regular, effective access to digital technologies and those without. The term digital divide refers to those who can benefit from it, and those who don't, as opposed to just talking about who has direct access to technology, and those who don't. The digital divide is not a clear single gap that divides a society into two groups. Researchers report that disadvantages can take such forms as lower-performance computers, lower-quality or high-priced connections (i.e. narrowband or dialup connections), difficulty in obtaining of the Internet and technological advances in developing economies.

It took digital divide researchers a whole decade to figure out that the real issue is not so much about access to digital technology but about the benefits derived from it. Examining the situation more closely, it turns out that upper-to-middle classes have high-quality access to digital technology because the profit motive pushes technologists to work hard at creating solutions designed specifically for them. In this equation, however, the poor are ignored because the assumption is that designing solutions for them will not be profitable. The result is that even where the poor are provided access to digital
technology, it is low-quality. Furthermore, the digital technology, they do have access to, is often of a design that ends up being harmful rather than beneficial. This, in turn, widens the digital divide.

The digital divide creates the risk of creating new forms of social exclusion. A society that does not offer equal access to the Internet to all of its citizens will create a digital divide between those that can access and use the on-line services and those that cannot. This divide can stem from multiple sources ranging from geography, to income, to years of schooling or any other dimension that could impact the equal access to on-line services required for an equal and wired society [1].

The current discussion on digital divide often focuses on technology. It argues that access to computers and to the Internet is becoming a key to the full membership in the future society. But, although Internet is important, it cannot be understood without a deeper analysis on its social impact. Future society is not about owning a specific piece of technology; it’s about how to use information and communications technology effectively.

In section 2 of this paper, the dimensions of digital divide are explained. The importance of closing digital divide is discussed in section 3. The role of e-government in closing the digital divide is discussed in section 4. Some suggestions and recommendations for closing the digital divide are stated in section 5.

2) Dimensions of Digital Divide

Digital divide has been identified along a number of dimensions. For some individuals and groups these may be interconnected and present multiple barriers to the effective use of information and communications technology. The researchers in the field of digital divide have stated many dimensions for the digital divide inside the communities; some are [2-14]:

a) Divide Based on ownership and access: Divides can be seen to exist in relation to ownership of new technologies and access to those technologies.

However, issues of ownership and access are not as straightforward as they are often presented. For example, ownership does not necessarily equate with use, and
ownership of household information and communications technology does not necessarily mean that all individuals within that household own or use the technology.

Even if a person or family has access to the internet, where are the computers which they can use? Are they at work, at home, at a friend's house, at a library, at an internet cafe, or someplace else? If the computers are only at work, then the parent may have the opportunity to develop technical literacy, but the children will not. If they have to go to a library to get access, then transportation issues become involved. How do they get to the library? How far away is the library? If they have to take a bus, how often do they have the time and money to take the trip to go to the library to access the computers? And how long will they actually be able to use the computers? Will they be able to do anything meaningful with that amount of time?

On the flip side of the coin, if the computers are at home:

- Do people have an internet connection at home, can they afford one?
- What speed is their connection?
- Is it reliable, or patchy?
- If it is dial-up, then can they download the files they need, or does it take too long/freeze up in the middle of the download?
- If they can download the files, do they have the programs they need to be able to read the files?
- If not, how much do those programs cost?
- Or if the programs are free, how large are they?
- Also, what mechanisms might they have to overcome these barriers?

When answering all these questions, we find that digital divide can not be avoided when we go into the details. Since the answer of each question with yes or no, at least, will increase the divide in that subject.

b) Divide Based on literacy: Physical access is not the whole story, however. For a person to use the access they have, they need to have the knowledge of how to use the technology effectively. A person who has never used a computer before has many skills they need to develop, including how to type, how to use the mouse, how to open and run programs, what a file is and how to access one, etc. Even a person who uses a computer
daily for their work, however, may not be skilled in general use of computers. Technological literacy is not a one-dimensional construct. People tend to be highly skilled users of programs and functions they need to use, and may be completely unaware of or lack the knowledge needed to use other programs and functions which a more general user might consider to be easy, straightforward, or obvious.

Certain levels may need to be achieved to use and benefit from a range of new technologies. Yet literacy levels are often left out of debates surrounding the digital divide. Moreover, it is argued that new technological tools may require a consideration of a range of literacies that enable individuals to utilize them effectively.

Similarly, reference [12] suggests that in terms of digital equity we should also consider issues beyond ‘basic literacy’ (can I read or write) to include:
- functional literacy (can I put my reading and writing skills to daily use?)
- occupational literacy (do I know the basics of working in a business environment?)
- technological literacy (can I use common information and communications technology tools effectively?)
- information literacy (can I discern the quality of content?)
- adaptive literacy (can I develop new skills along the way?).

c) Divide Based on Education Level: The education level has a significant impact on the ability of a person to use the information and communications technology. As education level raises the gap, related to information and communications technology usage, between those who are highly educated and those who are less educated increases.

d) Divide Based on Income: The available information and communications technology is still expensive for some people. And whatever are the efforts for reducing the cost of the personal computer and its accessories that are used for internet connection, the poor people still face the problem of gaining the information and communications technology. Since finding a home and food is their highest priority.
e) **Divide Based on gender**: Males use the Internet more often than females, worldwide. To some extent this was originally because "surfing the net" took more technical skill, and boys and men gravitated to these kinds of tasks more readily than girls or women.

Female use of information and communications technology is related to wider societal structural inequalities and barriers to power, and discrimination against women in traditional pathways such as education and employment can lead to resistance to learning with information and communications technology.

In some countries such as the UK, the US, Australia, Canada and the Scandinavian countries, this statistic is changing as women equal or exceed Internet usage of males. As Internet browsers have become more user-friendly, and as Internet use has become more widespread, the gender gap is closing.

f) **Divide Based on age**: Old people have less opportunity to use the information and communications technology than young people in all over the world. This in turn will increase the digital divide between younger and older.

g) **Divide Based on language**: Language is an important determinant of computer ownership and Internet use even after controlling for education, family income. It was found that most of the documents on the Internet are in English, yet a great number of individuals do not have English as their primary language, thereby leaving them in an inferior position in relation to advantages gained through uses of the Internet. Barriers exist to those whose first language is not English, as the majority of training, content and operating systems are in English.

Also, many people do not have sufficient literacy levels to use information and communications technology effectively. This poses a particular problem for groups whose first language is not English. Most keyboards are in English and do not include characters used in some other languages. Common computer programs tend to use English only instruction and the information on the Internet is in predominantly English.

h) **Divide Based on geography**: Another key dimension of the Digital Divide is the global digital divide, reflecting existing economic divisions in the world. This global
digital divide widens the gap in economic divisions around the world. Countries with a wide availability of internet access can advance the economics of that country on a local and global scale. In today's society, jobs and education are directly related to the internet. In countries where the internet and other technologies are not accessible, education is suffering, and uneducated people cannot compete in our global economy. This leads to poor countries suffering greater economic downfall and richer countries advancing their education and economy.

i) **Divide Based on disability**: Both computer use and internet access were found to be markedly lower amongst disabled people.

   Designers often fail to recognize the rights and access requirements necessary for people with disabilities. There is a wide range of disabling conditions that require specific approaches to information and communications technology design and provision.

   People with disabilities frequently face additional costs to obtain adaptive technologies (e.g. Braille keyboards and touch screens, speech interfaces) and the greater processing capacity required for specially designed software; as well as being less likely to have access to community information and communications technology facilities. They can also find it difficult to use website content that is not presented in an appropriate format.

j) **Divide Based on Race/Origin**: In some countries there is a clear digital divide between the communities according to their race or origin. For instance, in USA, Blacks and Latinos are much less likely to have access to home computers than are Whites, non-Latinos. They are also less likely to have Internet access at home. Many ethnic minorities have less access and ownership of information and communications technology due partly to economic factors.

3) **Why Closing the Digital Divide is Important?**

There are a variety of arguments about why closing the digital divide is important. The major arguments are as follows [7, 15]:
a) **Social mobility**: If computers and computer networks play an increasingly important role in continued learning and career advancement, then education should integrate technology in a meaningful way to better prepare students.

b) **Social equality**: As education integrates technology, societies such as in the developing world should also integrate technology to improve life. This will reduce the gender inequalities. Access to information through internet and other communication tools will improve her life chances and enable her to compete globally with her Contemporaries even in the comfort of her rural settings.

c) **Democracy**: Use of the Internet has implications for democracy. This varies from simple abilities to search and access government information to more ambitious visions of increased public participation in elections and decision making processes.

d) **Economic competitiveness and growth**: The development of information infrastructure and active use of it is inextricably linked to economic growth. Information technologies in general tend to be associated with productivity improvements even though this can be debatable in some circumstances. The exploitation of the latest technologies is widely believed to be a source of competitive advantage and the technology industries themselves provide economic benefits to the usually highly educated populations that support them. The broad goal of developing the information economy involves some form of policies addressing the digital divide in many countries with an increasingly greater portion of the domestic labor force working in information industries.

e) **Reducing poverty**: Many antipoverty experts believe that closing the digital divide is not a top priority, arguing instead that the poor need clean water and jobs before they need computers. However, what they do not realize is that access to digital technology greatly enhances the effectiveness and affordability of efforts to improve the water supply, improve rural health and education, generate jobs and address any of the other interrelated problems of poverty. Closing the digital divide may not necessarily be the
silver bullet for reducing poverty, but there is a much lower likelihood of large scale and sustainable poverty reduction without doing so.

4) E-Government

The term digital divide has been used in reference to the gap between those that do and do not have access to e-government. Normatively, it has been suggested that governments need to ensure universal access for their initiatives to succeed [16].

Government officials at all levels in Canada and many other developed countries such as the USA, the UK, Australia, New Zealand and the European Union countries, recognize that there is a digital divide within their population. This digital divide in the developed world has important results for the delivery of government services [4].

It is worthwhile to explore the key issues regarding the problems of this digital divide, and seek out solutions, especially for governments wishing to move towards a widespread delivery of e-services. An analysis of this problem may be framed by posing the following questions [4]:
- Is the digital divide in its current context, more than simply lack of access to the new technologies?
- What are the issues being debated?
- How much do the barriers such as: illiteracy, economic conditions of individuals, families and groups, disabilities, or lack of interest levels, prevent people from making use of the new technologies?
- Is there a significant gap between those benefiting from the new technologies and those in the population who do not use the technologies, for whatever reason?
- If there is a significant divide, how can this be overcome?
- How does the digital divide impact on the relationship between government and the citizenry?
- What kind of policies might or might not be needed by governments to ensure that large segments of the population are not overlooked when new and innovative ways of developing information for distribution are created?
- Is this one of the fundamental challenges facing governments, as information and communications technologies, the Internet, and other communication technologies (e.g.
mobile phones with text and video capabilities) increasingly become an intricate and essential part of our working and personal lives?

In order to minimize the gap and achieve universal services, governments have to improve equitable accessibility to the Information Technology applications.

For example, governments may provide many computer kiosks in public places and interlocking connection to wire/wireless telecommunications (e.g., automatic response system and mobile devices). Information Technology applications need to be more intuitive and user-friendly especially for computer illiterates, and support a high level of software compatibility for existing operating systems and web browsers [17].

On the other hand, equity and digital divides issues should be seriously taken into account in Information Technology application projects. Younger generation and those who are empowered by computers and the Internet tend to take more advantages from the Information Technology applications.

The issue of differential access to the Web is a major obstacle to the development of e-government. The cost of computers and high-speed access to the Web is far from trivial. One answer is to provide free Web access in public places. In the developed countries, libraries have moved quickly to step into this breach. Some community centers and, of course, public schools have worked hard to provide access to people who do not have access at home. The absence of Web access is more than the lack of a status symbol. Elementary school and high school students without web access will have a more difficult time completing their homework assignments. Workers in information and service businesses lose the ability to telecommute and may also lose their ability to keep up with information disseminated by their boss between working days.

Moreover, as government moves to place more resources on the web and deliver more services through the web, we could end up with a two-tier system of service delivery: One high-quality rapid service mode available to those with web access; and one lower-quality and slower mode of service requiring the public to give up valuable work or family time to interact with a government that is putting fewer and fewer resources to in-person service delivery [1].

Computer and communications companies can partner with governments and community groups to extend Internet connectivity to wider segments of the public, as has
been done in Canada. Companies in partnerships with governments will be looking for either acceptable returns, or good publicity, or both. Communities will be looking for additional and better service to their members. Governments will want recognition for playing a lead role in social improvement without increasing taxes or regulations in the process. As the cost of the technology continues to go down, and its power continues to increase, extending wider and wider service at reduced costs compared to the past will actually become more and more feasible. However, governments will need to take the responsibility of how to address and deal with these economic, social, literacy and interest divides. Governments are responsible for the overall good of society. Private sector and outside interest groups are concerned with their own particular agendas, which forward their activities [4].

The important point to remember, however, is that the digital divide is not a technical problem, but rather a political and economic one. Improving community access to and use of information and communications technology is a key element in achieving the government's vision for closing the digital divide.

That vision is consistent with the following government goals [14]:

**a) Growing an inclusive, innovative economy for the benefit of all:** by increasing people's awareness of the opportunities that information and communications technology offers, and by improving their access and skills, there will be increased opportunities for economic participation.

**b) Restoring trust in government and providing strong social services:** this will give greater access to government and government services, and will strengthen participation in democracy. Information and communications technology has the potential to facilitate building safe communities and promoting community development.

**c) Improving skills:** improving information and communications technology skills is an integral part of becoming a knowledge economy. There is also potential to use information and communications technology as an alternative way of teaching other skills, such as literacy.
d) Reducing inequalities in education and employment: Disadvantaged groups such as women, disabled persons, and those with low incomes are over-represented on the wrong side of the digital divide. Addressing inequalities or barriers for these groups has the potential to reduce other barriers, such as low levels of education and employment.

5) Recommendations for closing Digital Divide

There are a variety of methods for closing the digital divide, all of which require money to provide people possessing fewer resources with Internet-connected computers. Schools, libraries, and community centers have an important role to play in providing access to the Internet and the World Wide Web. Computer, software and Internet service providers also have a role to play. These public and private institutions can provide free Web access to communities without great wealth [1].

While access in public places is an essential resource that must be provided, children will also need Web access at home to do a thorough job on their home work and Internet access to communicate with friends and teachers about school work. In sum, the bridge across the digital divide must be built with money. The money should come from Internet users, access providers, and private computer and software companies.

Below are some more recommendations and suggestions that propose methods for closing the digital divide [6, 18-25]:

a) There are needs to be continued and active promotion that the digital divide has to be overcome because it undermines the basic rights of every individual.

b) Home outreach, childcare provision and women-only groups should be provided to encourage greater numbers of women to participate, especially where cultural backgrounds restrain women’s activities.

c) Develop the use of existing community resources and locations, including schools, in order to help offer further free or inexpensive access and training.

d) Encourage and develop special language facilities in areas where there are relatively high instances of individuals whose first language is not English. Offer appropriate software and courses for those with limited literacy, and develop initiatives that combine support for beginners in the use of information and communications technology alongside relevant language and literacy support, such as translation and interpretation.
e) Give recommendations to software producers to develop products with more non-textual representation in minority languages, and for teaching English as a second language. Create partnerships to identify areas for product development and incentives for companies to design products specifically for excluded groups.

f) Meeting the information needs of non-English speakers should be promoted and content should be readily available in languages other than English.

g) Involve the private sector in community initiatives to build the social capital necessary for community groups to effectively mobilize information and communications technology.

h) Audit disadvantaged communities to establish their needs and requirements in terms of content, and promote initiatives that involve them in directly creating materials.

i) Identify and work with recognized information leaders within the communities. Undertake social mapping to find key individuals, community needs and interests.

j) A drive toward universal access, meaning access to the whole Internet for everyone, and from the home. This might be worthy of recognition and consideration.

k) Encourage businesses to pass on their technical and general commercial expertise to community groups during the development of initiatives, including the negotiation of better deals on hardware and software, help with marketing plans, and hands-on help and support.

l) Create further competition to provide cheaper services amongst telecommunications, software and resource companies.

m) Internet service and content providers to develop alternative perspectives to attract non-users and give clearer messages about how they can benefit from on-line activities.

n) Develop a range of incentives to use the Internet, both financial and non-financial, and produce content and programs that are of relevance to people’s everyday life and encourage skills acquisition.

o) The rural areas must be given priorities in the e-government and information and communications technology initiatives in order to prevent the gap between them and urban areas from being increased. Reinforce investment in infrastructure and policy support of rural areas.
p) The governments of the developing countries must provide free kiosks for the public access to information.

q) A clear and coherent research strategy needs to be developed which focuses on various initiatives, models, aims, objectives, contexts and outcomes, and effectively disseminates the information gathered.

r) Raise awareness about the extent and dimensions of the divide to industry. This would help them to identify specific areas of product development and marketing as sales level out due to saturation.

6) Conclusions

The digital divide commonly understood as the gap between information and communications technology ‘haves’ and ‘have-nots’. Digital divide becomes more popular after the diffusion of internet.

As the range of information and communications technology and its capabilities increase, what constitutes a digital divide and how to measure it become unclear. It is possible to dispute the size, characteristics and reality of its existence, and hard to clearly measure any progress made in reducing disparities. Clearer definitions and measurement criteria are needed in order assess the effectiveness of policies and initiatives. The absence of such criteria can leave policy initiatives open to criticism and difficult to defend.

It is clear that the lack of connectivity is not the only cause of digital divide. Low incomes, illiteracy, lack of training, inability to buy the latest technological innovation or insufficient income to pay for access fees, prohibit people from participating in the new economic realities and also from using online government services. Despite the fact that online access fees have come down considerably, it does not necessarily mean that the low income family can afford to be connected. This is an area where governments might want to consider tax breaks for people below a certain financial threshold who want to be connected or have a computer in the home that is connected to the Internet. Such an incentive would be similar to many initiatives now offered by governments.

It is concluded that digital divide is one of the major challenges for the e-government. Hence, the governments are committed to closing the digital divide inside
their communities. They need to ensure that all their people have the opportunity to access and learn about new information and communications technology. Connecting communities is the first government strategy to support community access to information and communications technology.

Of course this will not happen overnight but rather it will take several years before the combined investment in information and communications technology, organization and skills delivers the full benefits. This is turn will allow some countries to reduce the digital divide.

References


