Literature Review
The Digital Divide: Impacts on Inequality and Governmental Policy Recommendations

Introduction

As Information and Communication Technologies (ICT) continue to advance and become a more integrated part of our social, political, and governmental network, the potential for this technology to deepen and potentially worsen social inequalities grows. That is, in addition to the many benefits to public life advances in ICT bring, we must also consider the potential for new harms. The concern for this risk of harm is known as the digital divide. The digital divide is generally divided into levels each having the potential to impact different aspects of public life. This review will discuss the nature of the digital divide, why the digital divide matters to public policy, the potential benefits and harms associated with technology, governmental responsibilities associated with the digital divide, and what governmental policies and actions might be appropriate in the face of the digital divide.

Digital Divide

The digital divide concept stems from a comparative perspective of social inequality and relates to the idea that the internet has benefits, and the lack of its use has negative consequences. Original research on this topic focused on an individuals' access to the internet's infrastructure (Newhagen & Bucy, 2005). This access disparity is called the "first-level" digital divide. It represents the difference between those that do not have physical access to the internet and those that do have access. This first-level digital divide has been rapidly disappearing. The early weaknesses in internet access penetration of the late 1990s and 2000s, especially as it related to race and gender, have largely closed in countries such as the

United States (Hargittai & Hinnant, 2008). Currently around 90% of the population has access to the internet (Pew, 2020). As access increased, "second-level" divides relating to usage skills grew into focus (e.g., Dimaggio, Hargittai, Celeste, & Shafer, 2004; Helsper & Eynon, 2013; Van Deursen & Van Dijk, 2011, 2014; Zillien & Hargittai, 2009). The term "second-level" digital divide was coined by Hargittai (2001) to identify this type of disparity. Specifically, the second-level digital divide encompasses unequal technology interactions due to the lack of ICT skills required for meaningful internet usage (Swedes and the Internet 2019). Digital technology requires users to have operational, formal, informational, and strategic internet skills (van Deursen & van Dijk 2014): using the internet requires the ability to act, interact with other users and information, and make transactions. The absence of digital skills has become a problem with important social consequences (Wei & Hindman, 2011). This type of digital divide translates itself into a different internet experience as it relates to governmental action; individuals that fall behind because of low digital literacy are less likely to use the internet for political purposes, for example, to discuss political views, understand political or social realities, and/or seek further information about politics (Swedes and the Internet 2019). In addition to the second-level divide, a "third-level" divide has also been identified. Here the gap relates to an individuals' capacity to translate their internet access and use into favorable offline outcomes (Van Deursen & Helsper, 2015). Commonly, studies on the third-level digital divide investigate tangible offline outcomes from internet use in economic, social, political, and cultural terms (Van Deursen & Helsper, 2015). More recently, the literature has started to distinguish a third-level digital divide that is not focused as much on differences in skills but rather emphasizes the way in which technology worsens traditional forms of inequality (Ragnedda 2017). As the online and offline worlds have become indissociable, different sociological theories are being applied to understand the interconnectedness between offline and online inequality (Ragnedda 2017). According to this line of research, digital inequalities are determined by wider class dynamics; cultural aspects such as status and prestige, group affiliations, and digital capital (Ragnedda,

Ruiu & Addeo, 2020). These theories are suggesting that scholarship should depart from simplified and traditional perceptions of the digital divide (Stevenson, 2009; Hargittai, 2001; DiMaggio & Hargittai, 2001) and advance into a more multifaceted conceptualizations of technology (e.g., Lee, Park, & Hwang, 2015; Pearce & Rice, 2013; Van Deursen & Van Dijk, 2015). At a general level, the literature agrees that ICT growth has drastically reduced world inequalities (Ranchorda 2020), however, despite the expansion of the internet's infrastructure, the digital divide is unlikely to disappear (Ranchorda 2020) or be mitigated without appropriately directed policies and programs.

Digital Divide Impacts

While most scholars agree that ICT has provided many individual and social benefits, most also agree that the digital divide can create and worsen social inequality. Inequality is a relative concept (Birdsall, 2001) but it can impact lives in several ways. Inequality can impact an individual's life in areas such as: economic outcomes, social justice expectations, and political influence. Inequality often also undermines the governmental process leading to inadequate public policies. For example, inequality can undermine liberal political life (Birdsall, 2001) leading political disaffection. In addition, inequality can inhibit growth and slow poverty reduction as demonstrated in a study by Birdsall showing that, across countries, inequality in the distribution of wealth and education—a proxy for human capital—reduces overall economic growth (Birdsall, 2001). The optimist might say that, as ICT reduces inequality, the self-correcting nature of the democratic one-person one-vote political process, will ultimately correct for any lingering inequalities. However, this ignores the reality that political power is partly a function of economic power (Birdsall, 2001) and that, as such, the digital divide has the potential to accelerate and amplify social inequality with a resulting reduction in growth.

Technological Benefits

ICT can benefit citizenry in at least two ways. First, it can provide for a more direct and cost-effective access to government and, second, it can improve political discourse.

Digital government represents the migration from the brick-and-mortar government building to the online government portal. Specifically, digital government refers to the "introduction, application, and use of digital technologies and data in government and its external relationships, including citizens, businesses, and society" (Lips, 2019). Despite some initial setbacks, so called "e-government," has contributed to more openness, enhanced citizen participation, and reduced government expenditure (Noveck, 2015). For example, in the United Kingdom, Netherlands, and Denmark the automation of public services has allowed for a complete revamping of the way in which the welfare state operates (Dencik & Kaun, 2020). Additionally, ICT has improved how public authorities approach decision-making (Ranchorda, 2020).

In addition to the efficiency gained by digital government, the emergence of online media has fostered and reinvigorated political discourses (Dahlgren, 2005). As measured by activities such as writing emails to politicians, connecting with like-minded individuals in online communities, sharing political content on social networks or e-voting (Calenda & Meijer, 2009; Hoffman, 2012; Kahne, Lee, & Feezell, 2012; Livingstone, Bober, & Helsper, 2005) discourse has certainly been enhanced. Although mass media still holds significant sway over political narratives, more conversations now happen outside the purview of media gatekeepers (Bennett & Segerburg, 2012). Citizens comment on the conduct of politicians via Twitter, mobilize toward political action using social media platforms like Facebook, and narrate the stories of political events via Wikipedia (Schroeder, 2007).

While there is a lively debate on the role of online participation (Blank, 2013; Correa, 2010; Hoffmann, Lutz, & Meckel, 2015), the literature generally has a positive evaluation to this active online political activity. Generally, it considers participation as beneficial for both individuals and communities (Lutz, Hoffmann, Meckel, 2014) and considers the active political participation as beneficial to the quality and legitimacy of political decision-making (Pateman, 1970).

Technological Harms

Most assuredly there is justification for an optimistic view of ICT, however, the absence of explicit policies to deal with the increasing salience of new technology has the potential to lock in the forces of the digital divide resulting in increasing differentials in important social goods (e.g. wealth, education, influence, etc.) (Birdsall, 2001). The literature has found that digital inequalities tend to mirror existing social inequalities in terms of socio-economic status, education, gender, age, geographic location, employment status, and race (Robinson et al., 2015). For many people, it may no longer be possible to avoid the internet as it has become so closely integrated into modern life (Blank & Lutz, 2018). Governments do not have private service option providers (Ranchordas, 2020). This limits a citizen's choices. Although the distinction between the public and private realms is increasingly elusive, citizens are not merely consumers of governmental services such that they can easily switch when they find digital government too complex to use (Ranchordas, 2020). For those excluded from digital life the social impact can be compounding and sequential amplifying (Kraut, Kiesler, Boneva, Cummings, Heigeson & Crawford, 2002) on inequalities. That is, the internet can become a magnifier of existing offline inequalities. The greater an individual's existing offline resources, the more the internet delivers, but conversely, the fewer resources a person has, the less value the internet has within and across their domains. Consequently, excluded population groups do not reap the benefits from ICT to the same

extent as more privileged groups (Blank & Lutz, 2018; Van Deursen & Helsper, 2015). Therefore, optimistic claims that the internet would create widespread social mobility and could lead to less stratified societies are being challenged by many scholars (Norris, 2001).

Data-driven algorithmic systems could play a role in reversing the digital divide by expanding access to education, employment, and justice for marginalized populations. However, they might conversely contribute to a widening of that gap by providing a ready avenue to prey on the vulnerabilities of the socially disadvantaged, or to exclude them from opportunities due to biases entrenched in algorithmic decision-making tools (Madden, Gilman, Levy, & Marwick, 2017). Digital public services do not always have the necessary opaqueness and citizens can be left unsupported (Ranchorda, 2020). In the Black Box Society, Pasquale (2015) described extensively the asymmetries of information between the entities gathering data, the data being gathered, and the people it is being gathered about. He exposes the many limitations the average citizens have in interrogating these systems because of the lack of access, required resources, and the necessary specialized knowledge (Pasquale, 2015). When systems are implemented by public authorities in the context of such things as social welfare benefits (e.g. child welfare data systems throughout the United Kingdom or social security systems in the United States) (Redden, Dencik & Warne, 2020; Eubanks, 2018), citizens may become powerless in their ability to know how they are being 'ranked' and 'scored' (Eubanks, 2018). Thus, when individuals must submit applications exclusively online or when an offline alternative is made considerably more difficult, governments can treat marginalized citizens unfairly and/or citizens may be limited in their ability to resolve unfair and unequal treatments (Ranchorda, 2020).

Another potential harmful impact, especially to low-income citizens, is when data analytics are used in such services as law enforcement (Madden, Gilman, Levy, & Marwick, 2017). Poor people often have faced much greater surveillance than their wealthier counterparts, and anti-poverty advocates are

rightfully concerned that the digital world will reinforce, both covert and overt patterns of surveillance (Madden, Gilman, Levy, & Marwick, 2017).

Yet another harm that can result from the digitization of government and data-driven system requests is citizen humiliation. Consider Khiara M. Bridges' (2017) argument in The Poverty of Privacy Rights. In it, she provides the example of a pregnant woman, "Erica," seeking public assistance. In the process of obtaining benefits, Erica is interviewed by a social worker for input into the computerized system. The social worker is required to ask a series of questions about her romantic relationships, history with drugs and alcohol, and experiences with domestic violence and sexual assault. The supposed reason for such intrusive questioning is to protect Erica's child. However, the questions do not focus on Erica's preparedness for motherhood or her plans for feeding or clothing her child. Instead, Bridges argues, they presume that Erica is a particular kind of person, a morally suspect individual. Erica, knows that this information will be entered into a ICT system where it will be stored forever.

The digital divide can also disenfranchise the voice of certain members of the community. Social media has fewer gatekeepers leading to new ways of information filtering (Malinen, Kolvula, & Koiranen, 2020). Studies show that social media can help shape opinion leadership in various ways. With fewer traditional gatekeepers, such as the political institutions and journalists who formerly mediated and controlled information flow, new novel ways of information filtering and influencing are having potentially harmful political impact on those that cannot participate in the online communication stream (Matthew, 2009). Digital divide analysis has detected such disparities in online political discussion. For example, younger adults and highly educated individuals, who are generally more skilled, dominate the media with the intention to affect others' opinions. This indicates that those with access and skills can maintain a prominent position in shaping the digital public sphere (Malinen, Kolvula, & Koiranen, 2020) thus leaving out those with unequal access and skills.

Governmental Responsibilities

States have a responsibility to their citizenry when it comes to digital inclusion: first, as providers of public services they should guarantee access to those services and, second, as legislators and law enforcers that should ensure that all citizens are treated equally before the law (Ranchorda, 2020). Currently, most existing laws pre-date the proliferation of the internet and, therefore, it is imperative that policy discussions around digitization include the voices and perspectives of all the people (Madden, Gilman, Levy, & Marwick, 2017) including the less digitally savvy. Good administration requires that digital governmental policies be adequate to advance the public interest (e.g. government efficiency, broader participation, timely decisions, etc.) as well as proportionate to their objectives and not excessively restrictive (OECD, 2019). While states need to balance practical resources and fiscal constraints against the duty to provide access to public services, they should take all their citizens into account (Peacock, 2019). Therefore, digital government should consider all citizen needs including groups that are structurally behind the majority of the population due to their literacy skills, socioeconomic conditions, and digital capital (Park & Humphry, 2019).

Recommended Governmental Policies

It is often unclear how access, skills, and types of use result in different kinds of outcomes. While it seems reasonable to argue that insufficient skills might play a role in a person's failing to turn an online activity into a desired outcome, little is often understood as to how this process works in practice (Van Deursen, Helsper, Eynon, & Van Dijk, 2017). Therefore, it is incumbent on governmental bodies to

design digital processes that improve outcomes for their citizens. This requires that not only the online application be considered when implementing digital government but rather the larger overall social system. Most evaluations tend to focus on specific media tools or platforms in isolation rather than considering the larger social system (Dubois & Ford, 2015) and how that system might impact outcomes. Therefore, governments should create policies that evaluate ultimate outcomes when they implement ICT applications to assure that no citizen is left behind in the digital revolution (Ranchorda, 2020).

A focus on outcomes is critical but of specific concern is how digital gaps may limit the ability of marginalized citizens to navigate online (Gran, Booth & Bucher, 2020). As such governmental bodies seeking to streamline their public services and assist in political discourse through online platforms should consider carefully which parts of government to digitized (Ranchorda, 2020) or whether digitization is appropriate at all. Not all parts of government can or should be digitized. If a governmental body decides to implement ICT, it should evaluate whether there is a need to maintain offline alternatives for citizens that have difficulties (Yates, Kirby & Lockley, 2020). If these offline alternatives are necessary, they should not be regarded as a last resort but rather as options with equivalent value to those offered online (Ranchorda, 2020). For example, in many situations it is likely appropriate to maintain non-digital alternatives to tax payments and refund distribution systems (Asgarkhani, 2007). In all cases, governmental assistance programs are essential for citizens with physical and mental disabilities (Ranchorda, 2020) to help in navigating digital portals.

Another consideration is the impact of policies “surrounding” digital government. Governmental bodies might consider more lenient citizen-friendly policies as they move services into the ICT environment. For example, governments might excuse delay in citizen responses when administrative decision notification is made solely through governmental portals or when citizen’s online data entry errors are made (Ranchorda, 2020).

To be inclusive, user-friendly and simply designed governmental platforms are essential. Applications have the potential to be off-putting, challenging, and difficult in many contexts but when mandated by the government special concerns arise. For example, determining the right amount of citizen information to display (Noveck, 2015) online can be challenging. On the one hand, a user should be informed about why they are seeing the results/options being presented. Additionally, government platforms should not overload the user with information (Ranchorda, 2020). With these considerations, governments should seek to strike the right ICT balances for their citizenry.

One technique to help promote the right balance when designing software, is to perform a software walkthrough. Not only can walkthroughs identify the right balance of displayed information but can also assist in identifying any embedded cultural references and assumptions (Light, Burgess & Duguacy, 2018). Additionally, consideration should be given to interviewing users about the use of developed applications. One creative development strategy to analyze digital behavior is trace interviewing (Dubois & Ford, 2015). The trace interviewing technique uses digital mapping of user activity when conducting application user interviews. In this way qualitative user experiences can be captured allowing the designers to identify potential digital divide issues (Dubois & Ford, 2015).

During application development, governments also need to consider first-level divide issues especially as it relates to mobile computing. Many poor rely only on mobile phone internet access and do not have access to computers. Mobile phones may not allow the same access as provided by computers (Lutz, 2019). Mobile internet access can limit content availability. Therefore, governments should consider the development of mobile-friendly version of governmental websites and avoid designs that maybe cumbersome at best, impossible at worst (Napoli & Obar, 2014) for mobile users.

Of course, training and educating citizens on the use of digital government is an important function; especially during transitional phases. But merely training on how to use the ICT system may not be

sufficient. Citizens will likely be unaware of the underlying complexity of the system (Doteveryone, 2018). This requires that citizens trust blindly that the design does not mask anything that citizens would not want to use or that the system does not gather data they would not want the government to have. Such concerns may drive citizens away from utilizing the digital platform (Doteveryone, 2018). These concerns must be addressed through appropriate levels of communication. Additionally, privacy is often a concern of the citizenry and should be an important focus of the governmental body (Blank & Lutz, 2018). Some citizens may not feel comfortable with providing information online and appropriate assurances, protections, and alternatives should be considered. An additional area of privacy, one often overlooked by governments, is the policies of supporting technology companies (Gangadharan, 2017). The privacy policies and practices of such support companies should be examined carefully by governmental bodies before utilizing those companies. One going, reviews should also be conducted to ensure that the publics information is properly protected.

As digital government becomes a reality, governments should engage in the development of direct measurement indicators (Van Deursen, Helsper, Eynon, & Van Dijk, 2017). Evaluations should be directed toward a better understanding of how different aspects of inequality interact with the digital environment (Alvi, Bradbrook, Fisher, Lloyd, Moore & Thompson, 2007; Atkinson, Cantillon, Marlier, & Nolan, 2002). Such measurement tools might include post implementation surveys and evaluations to measure the disparate impact from digital government implementations. Developing and reviewing these measures can help guide governmental policy makers in future modifications to and implementations of ICT government applications.

Finally, government bodies should go beyond existing technology concerns about usability, disclosure, and privacy and engage in debates regarding fundamental issues connected with the shift in power dynamics from ICT (Redden, Dencik & Warne, 2020). By doing so, governments can open the

conversation to new reflections on the meaning of good administration in the digital age and on how to adapt its policies to these new challenges (Ranchorda, 2020).

Conclusion

In addition to the identification of the benefits to government which derive from the use of ICT, this review has shown that existing offline as well as digital inequalities can be accentuated by using digital technology. Such existing social inequalities must be specifically addressed through purposeful consideration and effort. This review has shown that it is important to understand the different levels of digital inequality experienced by citizens, identify how citizens are affected by these inequalities, and develop outcome driven design, education, and socioeconomic strategies to address them. Inclusive digital technology and inclusive digitalization as a strategy for governments entails an awareness of the benefits and risks of technology (Yu, 2002). Through the thoughtful application of policies, education, and software design discussed in this review, governments should be able to avail themselves of all the benefits of technology while assuring that those in social, economic, and technology disadvantaged groups are not left behind.

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