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The Digital Divide: A 1st-Mile Perspective

The Digital Divide is a complex socially evolving matter, and there is much ‘devil’ in the details. The term Digital Divide has been used for over 25 years to represent those sectors of society who are not able or interested in participating in the digital computing and communications revolution due to geography, age, affordability, accessibility, education, access or other factors. In the U.S., annual updated assessments of the Digital Divide are reported on by the Pew Research Center, NTIA and others. Though well-surveyed, these have largely been top-down views and analyses.

Looking from the bottom-up, the view is somewhat different. From here, those on the wrong side of the Digital Divide are many of the leaders and decision-makers in government, along with vested-interest, anti-competitive corporate services providers, who by their (lack of) actions are widening the divides in our society. There have been few official studies or reports on this view.

A more holistic analysis and understanding of the Digital Divide ought not simply focus on the ‘victims’ of this socio-economic malady, but would court controversy by taking a hard look at current mitigation programs, policies, regulatory interventions, funding initiatives, business strategies, and gaps, in order to make needed systemic action-agenda changes.

It is clearly important to note that the Digital Divide cannot be considered or properly addressed separately from the dominant, widening economic divides that are concerningly at play in our society and which are greatly impacting rural and tribal communities and people. Systemic approaches are needed, that go beyond the dominant broadband-as-consumer-product model. We must change our point of view. We have too much to lose to not get on a ‘smart’ path.

The Digital Divide is evolving, as technological progress, business strategies and eco-social agendas evolve. Under these circumstances, access and adoption will be less a factor, than how the majority of people use and benefit from internetworking. Infotainment (movies, sports, games, porn, etc.) is driving the economy of Gig networks, not healthcare, education, civic participation or other socially benefiting applications and services.

While many important, exemplary and effective steps are being taken nationwide, the nature of the divide is evolving. It is changing, driven by technological development and the economic surges wrought by the rapidly proliferating flow of information networking and the troublingly widening economic divides in this country. Many, even if they are connected to broadband networks and paying for ‘pay-per’ services, cannot easily keep up with the rate of change, the daunting increase in ‘noise to signal’ and increasing intrusions on personal privacy and security.

Our “Grand Challenge” would be to consider and act on ways to get out ahead of the evolving but widening divide, rather than playing a never ending game of catch-up .

Consumers Prosumers

All of us, the public, are commonly referred to and often refer to ourselves as ‘consumers’. This is a psycho-linguistic encapsulation of our current unsustainable political-economic world-view. The words and concepts, ‘consumer’ and ‘consumerism’ are antithetical to the nature of networked societies, where we can all be producers as well as consumers: prosumers. The terms ‘consumer’ and ‘consumerism’ are also antithetical to an ecologically informed world-view and understanding of the public as ‘stewards’. An ecological world-view and practice requires that we at least renew or replenish at the same rate as we consume. In the Information Society this ecological balancing act becomes qualitative rather than quantitative.

Referring to network services subscribers as consumers is a top-down view, resulting in distorted pricing plans and technical access, such as asymmetric bandwidth allocation (12 Mb down / 1.5 Mb up). As we all increasingly send and receive images and video files, and connect multiple devices amid the “Internet of Things”, we must be recognized as prosumers.

Network Futures

“Looking Beyond the Internet”, an NSF funded study + report, just released on March 28, 2016, describes and makes recommendations for Internetworking research and development for the next 5-10 years. Though social and economic factors are not discussed, the reality of the report raises questions and concerns about the implications for a new Digital Divide.

The world is now in the early stages of simultaneous revolutionary deep changes in the foundations of computer and communications technology. These changes range from innovations in large-scale storage, software defined networks and infrastructure, to next-generation wireless access technologies and the emergence of ubiquitous sensors, on our bodies, and in our homes and automobiles, which are rapidly becoming sensor-packed “clouds on wheels.”

Realizing seamless programmability across tomorrow’s city-scale, multi-domain systems is a major research challenge. Heterogeneous hardware, owned and operated by many organizations, will need to support abstractions necessary to support large-scale software systems such as a “programmable city.”

Today’s gigabit networks will be superseded by terabit and petabit networks, all components of which will be software defined. Virtualization, network slicing, software defined infrastructure (SDI) and software defined exchanges (SDX) will enable the dynamic allocation of network and computer resources leading to potentially dramatic changes in today’s Internet paradigms.

The global Internet will be almost unrecognizable ten years from now – driven by a deluge of low-latency sensing and actuation data, increasingly diverse “edge cloudlets” (comprising Internet of Things, Cyber-Physical Systems, etc.), within a planetary-scale network largely built from Software Defined Infrastructure (SDI) and a decentralized, diverse cloud.

Rural Networking Futures

Rural America is diverse, it is spacious, it is home, it is poorly understood and it is under threat.

As the majority of the world's people now live in cities, urbanization and increasingly urbanized markets are getting a great deal of attention, especially with the advent of broadband networking.

Less is currently understood about new rural-urban-global relationships, networked rural economics, smart rural community planning, or of exemplary, sustaining and vitalizing rural paths forward.

Addressing these complexly difficult issues urgently requires dedicated multi-sector initiatives, which would take a bottom-up meets top-down, ecological-economic view of our changing rural landscapes, conditions, and local-global networked futures, offering fresh insights on technologies, policies, sustaining financial strategies, eco-social opportunities and the need to better integrate evolving telecommunication networks with transportation, renewable energy, regional planning, lifelong learning, cultural enrichment and steps toward more sustainable rural quality of lives and livelihoods.

Tribal Issues

The U.S. GAO published the Jan. 2016 report, **“Broadband on Tribal Lands”**, which primarily focused on program inefficiencies and missed opportunities resulting from lack of coordination between the FCC and the USDA.

The Federal Communications Commission's Universal Service Fund subsidy programs and the Department of Agriculture's (USDA) Rural Utilities Service grant programs are interrelated in that they seek to increase high-speed Internet access in underserved areas, including tribal lands. However, FCC and USDA do not coordinate to develop joint outreach and training.

FCC has not developed performance goals and measures for improving high-speed Internet availability to households on tribal lands. Without these goals and measures FCC cannot assess the impact of its efforts.

FCC's E-rate program provides funds to ensure that schools and libraries have affordable access to modern broadband technologies, but FCC has not set any performance goals for the program's impact on tribal institutions. Nor has FCC defined “tribal” on the E-rate application.

GAO recommends that FCC (1) develop joint training and outreach with USDA; (2) develop performance goals and measures for tribal areas for improving broadband availability to households; (3) develop performance goals and measures for improving broadband availability to tribal schools and libraries; and (4) improve the reliability of FCC data related to institutions that receive E-rate funding by defining “tribal” on the program application. FCC has agreed.

The Tribal Digital Inclusion Working Group was established in early 2015. Initially comprised of the Association of Tribal Libraries and Museums, Native Public Media, Southern California Tribal Digital Village, Santa Fe Indian School, the Arizona State University American Indian Policy Institute, and Nez Perce Tribe, the Group is actively at work and growing.

The TDI is extremely concerned about the lack of data regarding digital connectivity in Indian Country. Data and what works, in terms of delivering digital inclusion to Native Americans, and the evidence of the needs and desires of Tribes must be consistently delivered to policymakers at the local, State and Federal levels.

Rural and Tribal Broadband Statistics

(Jan. 2015 FCC fact-sheet)

- Using the current standard of 4/1, only 1 percent of rural Americans have gained access to broadband fixed networks since 2011.
- 53 percent of rural Americans (22 million) lack access to 25Mbps/3Mbps.
- Rural Americans demand the service at the same rate as their urban counterparts—where 25Mbps/3Mbps is available in rural areas, 28 percent have adopted it (urban = 30%).
- Rural America continues to be underserved at all speeds: 20 percent lack access even to service at 4Mbps/1Mbps, down only 1 percent from 2011, and 31 percent lack access to 10/1, down only 4 percent from 2011.
- Approximately 50 percent of residents living on rural Tribal lands do not have access to basic 4/1 broadband service.
- 63 percent of Americans living on Tribal Lands lack access to 25/3 broadband.
- Overall, the broadband availability gap closed by only 3 percent in 2014.

Recommendations

1. That we all have a more serious and deep set of conversations and commitments, leading to next phase, cross-sector action agendas addressing the rapidly evolving Digital Divide and the impacts and implications for tribal, rural and urban underserved people and communities.
2. That the RTC (Rural Telecommunications Congress) act to aggregate, facilitate and champion greater cross-sector and cross-organizational cooperation and support to address our Rural Networked Future, with a stronger, more inclusive and more cohesive voice.
3. That the Broadband Communities Summit and publications, play an evermore dedicated and overt role in presenting and addressing next-phase, eco-socially integrated, difficult issues that are shaping the our Internetnetworked local-global future.