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A Critical Discourse Analysis of three US municipal wireless network initiatives for enhancing social inclusion

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ABSTRACT

The US has a long history of telecommunications policy aimed at providing equitable access to information and communication services. In this paper we examine the most recent of these efforts, municipal wireless broadband Internet networks. Using three cases (Philadelphia, PA; San Francisco, CA; and Chicago, IL) we examine how social inclusion is expressed in the digital inclusion policy articulated in each municipality's broadband network public rhetoric. Using Critical Discourse Analysis, our findings confirms that the growing use of digital inclusion rhetoric around broadband deployments has brought the social inclusion issue to the forefront, and effectively links discourse and technology with discursive practices and types.

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1. Introduction

Broadband access to the Internet is commonly believed to be essential for all, yet is not available to all. The skills necessary to use information and communications technologies (ICT) are not universally prevalent, yet are seen as becoming centrally necessary to navigate everyday tasks and to fully engage in civic life.

Simultaneously, broadband in the United States has become one of the most talked about telecommunications issues; the country's suffers from poor broadband penetration when compared to other less industrialized nations (Bleha, 2005). Although broadband availability has grown in the past few years, it is still a problem (USDA Economic Research Service, 2009). Statistics show the US remains far behind many other countries in broadband deployment The Organisation for Economic Co-operation and Development ranked the US 15th among its 30 member nations in broadband adoption per capita (OECD, 2009). This is often blamed on unreliable and slow service, high prices, and a low-density, distributed population. While the US has made recent significant gains in broadband adoption, it still lags far behind other countries in terms of the average speeds available over broadband connections (Little, 2005).

To address these deficiencies, municipalities in the United States are stepping in to offer wireless broadband Internet access. As of December 2007, nearly 400 cities in the US have initiated, developed or deployed wireless network initiatives with the intent of providing Internet access to their populace. These initiatives have taken diverse forms, adopted different business plans, and are at various stages of development. Despite these differences, they are similar in their commitment to three stated justifications for developing these networks: (1) provide low-cost alternatives for public safety and other institutional

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demands for wireless Internet, (2) promote economic development, and (3) narrow the digital divide (see Ortiz and Tapia (2008a), Ortiz and Tapia (2008b), and Tapia and Ortiz (2006) for a full analysis of these policy justifications).

Considering motivations for developing these networks, municipalities have fundamentally different goals in providing broadband Internet access than private industry. Municipalities are interested in promoting civic engagement, social inclusion, and economic development across all neighborhoods and communities through the deployment of their wireless network initiatives. Private industry is concerned with providing service with a mind towards profits rather than social welfare. Traditionally, the US has relied on private industry and competition to achieve greater quality and efficiency in the provision of Internet services. However, this approach is not working well. The US is falling behind the rest of the world in terms of its broadband rollout and its average speed and quality of service. In addition, significant portions of inner cities and rural areas remain without service and the price of the service, although more stable, remains high.

The study aims to address the following research questions:

- What are the trends in municipal broadband discourse in relation to digital inclusion?
- Does a Critical Discourse Analysis approach provide any insights in understanding the public discourse on social inclusion of municipal broadband initiatives?

In this paper, we focus on social inclusion by examining the language used to justify the construction of municipal broadband networks and associated digital inclusion policies. Social inclusion is understood as a process for dealing with social exclusion and integrating communities into society (Gurstein, 2000). Social inclusion enables individuals to participate effectively in economic, social, political and cultural life in mainstream society. Thus, social inclusion has considerable potential to improve understanding of social issues and policies.

The public discussion and documentation of municipal wireless networks provide particular insights in understanding the public discourse on social inclusion, its complexities, its importance, its severity, and its solutions. One way to include disenfranchised communities in the wider society is by working together to build interlocking networks that can help address problems that transcend boundaries (Warschauer, 2003). In broader terms, "digital inclusion" is used to describe the goal of expanding the capabilities of ICT to better serve society. Specifically, digital inclusion is the term used here to frame the argument that basic ICT skills such as the ability to access the internet, check email, participate in social network sites, and so on are key communication tools, and attainment of them should be considered key to broader economic and social inclusion under-served communities (Norris, 2001; Warschauer, 2003). Digital inclusion, the use of ICT to promote social inclusion, is key to the sustainability of municipal broadband networks.

Studying language, public debate and discussion is essential to understanding public technology efforts like municipal-sponsored networks. As its root suggests, public rhetoric is important because it is the most immediate source of the flow of social meanings. A mismatch between promised and actual project outcomes has the potential to damage community efforts and community–city relations. If community groups are to partner with municipalities they need accurate information about the intentions and purposes of their partners and the network. If the goals of the city and the goals of the community groups are not similar, e.g., the municipality promises but fails to solve the digital divide problem, the community groups may back away from supporting the effort. Even worst, municipal technological rhetoric may permanently sour relations with local community groups and/or community groups may abandon informatics projects altogether.

This study is important for several reasons. First, this study will expand current understanding of a phenomenon that has far-reaching social, business, economic, and political implications. Second, little, if any, research to date examines the role municipal broadband plays in promoting digital and social inclusion. Third, the project will make an important contribution to the ongoing debates about how to (or not) improve quality of life for marginalized communities via government telecom interventions. Lastly, informed by critical theories, this research will allow governments, telecom incumbents, businesses, and community organizations to develop and tailor services and programs to more accurately and effectively help their local citizens leapfrog into the information society.

We describe the municipal wireless phenomena in the US, and then profile three cases – Philadelphia, PA; San Francisco, CA; and Chicago, IL. We approach this topic in four parts. First, we offer a brief review of the literature. Second, we describe Critical Discourse Analysis (CDA) as a methodology for analyzing language, and how we apply CDA to the analysis of policy documents related to the broadband wireless projects in three US municipalities. Third, we present the municipal broadband projects in our three profiled cities. Lastly, we offer our analysis and directions for further research.

2. Social exclusion and the digital divide

Information and communication technologies (ICT) such as the Internet and computers have become an integral part of America's entertainment, information, and communication culture. Corporations and government agencies are increasingly offering products, services, and information online. Educational institutions are integrating ICT in their curriculum and are offering courses from a distance. Indeed, over the past decade, ICT has become indispensable for many middle- and upper-class American households (Hoffman et al., 2004). However, as the American economic and social life becomes increasingly networked through the Internet, historically under-served populations such as low-income households, racial and ethnic minorities, and older and disabled Americans may continue to be distinctly disadvantaged if they lack access to ICT.

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The 'digital divide' is the term used to describe disparities in ICT access. Gaps in access are generally formed along the longstanding and systemic fault lines of race, gender, age, income, education, physical and mental ability, and spatial location (Hoffman and Novak, 2000; Norris, 2001; Servon, 2002). While early researchers suggest that a digital divide exists in solely in terms of access, later researchers have identified digital divides in terms of access, broadband connectivity, intensity of Internet use, and the nature of Internet use (Barzilai-Nahon, 2006; DiMaggio et al., 2004). However, both camps agree with Van Dijk and Hacker's (2003) position, that these gaps do exist, that they are social ills, and that innovations and markets alone will not fix them.

Castells (1998) uses the concept of 'technological apartheid' to refer to this process of disconnecting entire countries and poor neighborhoods from the world's economic and social systems. According to Norris (2001), these disconnections occur not only as a global divide between the developed and undeveloped worlds, but also as a social divide between the information rich and the information poor, and as a democratic divide between those who do and those who do not use the new technologies to further political participation. As Internet access and use increasingly become the basis for participation in knowledge societies, a persistent digital divide raises concerns that information "have-nots" will be disadvantaged in their pursuit of life chances (Hoffman and Novak, 2000; Norris, 2001; Selwyn et al., 2001). Those who have access to and the skills to use the Internet are (1) more successful economically, with respect to education, jobs, earnings, (2) more likely to participate in political and civic engagement, and (3) receive more government services and other public goods than those who do not (DiMaggio and Hargittai, 2002; Katz and Rice, 2002; Kennard, 2001; Oden, 2004; Tufekcioglu, 2003). The Internet expands access to education, jobs, and healthcare. It also provides new deliberative spaces for political discussion and direct access to government (DiMaggio et al., 2004; Mossberger et al., 2003; Oden, 2004). Thus, ICT skills and access behave like public goods such as education and libraries by providing positive externalities associated with economic growth and democratic governance (Mossberger et al., 2003).

The positive benefits of Internet access and use such as those presented in these prior studies provide a strong case for government intervention to provide access to all citizens, not just those who are already advantaged. Governments are establishing and implementing ICT policies to advance the social and economic situation of marginalized groups, including women, racial and ethnic minorities, newcomers and people of low socio-economic status (Atkinson et al., 2002).

However, to fully realize the promise of ICT, policymakers should reframe the digital divide from a narrow mechanism for alleviating economic inequality to a more comprehensive notion of social inclusion. Whereas a digital divide perspective privileges increased access to ICT, social inclusion is concerned with the use of ICT to enhance participation in a complex network of valued relationships within a community (Gurstein, 2000). Individuals and entire geographic communities are marginalized from full participation within valued 'equal status' in the economic, cultural, political, social and interpersonal domains of society (Cushing, 2003). Lenoir (1974) posits that an individual is socially excluded if (a) he or she is geographically living in a society and (b) he or she does not participate in the normal activities of the citizenry in that society. In defining 'normal' activities, the author establishes five spheres of involvement in society that can be regarded as comprising 'inclusion'. These are clustered as: *consumption activity* (the ability to consume a minimum level of the goods and services which are regarded as normal for the society); *savings activity* (accumulation of assets); *production activity* (engaging in a socially or economically valued activity, such as education); *political activity* (engaging in some joint effort to better the environment, such as running for office); and *social activity* (engaging in significant social interaction with family for instance). Those socially excluded suffer from the negative effects of unemployment, poor skills, low income, poor housing, crime, bad health, family problems, and limited access to services.

Research has shown a high degree of correlation between social inclusion/exclusion and digital inclusion/exclusion (Warschauer, 2003; DiMaggio et al., 2004; Selwyn, 2007; Notley, 2009; Al-Jaghoub and Westrup, 2009). Becoming digitally enabled can be a catalyst for social inclusion. Digital inclusion projects foster social inclusion by enabling people, organizations and businesses to apply ICT in ways that foster greater participation in our growing knowledge-based society. Thus, digital inclusion programs are critical to bridging the digital divide in local communities.

3. Methodology and research approach

To examine the stated objectives and goals that inform the development of municipal wireless broadband initiatives, we are engaging in Critical Discourse Analysis (CDA). CDA is defined as "deliberately probing the (often opaque) relationships of causality and determination between (a) discursive practices, events, texts, and (b) wider social and cultural structures, relations and processes" (Fairclough, 1995). The name of this research approach belies our epistemological stance as critical and our data as discourse. The three principal goals of CDA are to (1) elucidate how events, practices and texts arise out of and are ideologically shaped by power relations and power struggles; (2) to explore how the opacity of relations between discourse and society is itself a factor in securing power and hegemony; (3) to examine how our social practice is bound up with causes and effects that may be not at all clear to us (Fairclough, 1995; van Dijk, 2008).

CDA is employed for several reasons. First, CDA acts as theoretical and methodological frames of reference for practioners. Second, this analysis is useful for examining the meaning of issues in popular culture and media coverage that inform the development of ICT belief constructs. Third, as noted by van Dijk (2008), CDA can be useful for examining how power is enacted, reproduced or legitimized by the text and talk of dominant groups or institutions; power is often subtly exercised by way of cognitive manipulation via text and speech.

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This data used in this paper represents a small part of a dataset from a much larger project. Since June 2005, a database of all municipal wireless initiatives in the United States has been created and updated over time (see Ortiz and Tapia, 2008b; Tapia, 2006; Tapia et al., 2006a,b; Tapia and Ortiz, 2006). There are a total of 357 entries, each represented a municipality engaged in the delivery of telecommunications services in some form. While not important to the findings of this paper, as of June 2006, 166 municipalities (approximately 46%) textually addressed either universal service, social inclusion or the digital divide in some way.

In the larger database, the data stored spans multiple categories including information on the shape, form, uses, and technologies of the municipal network itself; the business plan and or service delivery plan; the status of the development/deployment of the network; the social impacts of the network; and the marketing language used by the owners and users of the network. The database has been populated through a variety of methodologies. In most cases, information was obtained through the use of the Internet, using web crawling techniques. In addition, when information proved scarce or dubious, municipalities were called, and information was supplemented and verified via phone.

For the purposes of this paper a smaller, subset of data was selected from the larger database to focus more on the quality, rather than quantity of textual documentation. The researchers collected this data from January 2007 to June 2007. The data was gathered from both formal and informal text discussing the planned municipal wireless broadband network of three American. The three US cities examined were Philadelphia, PA; Chicago, IL; and San Francisco, CA. The textual pieces that formed the basis of this analysis can be seen in Table 1.

While the documents analyzed do not form a complete picture of the intents of the city or its' representatives, as they are specific in time in the experiences of that city, they were read literally in terms of discursive event.

Our coding framework was established a priori based on our review of the literature on the digital divide. Twelve key codes were developed, including (see Table 2).

All textual documents gathered mentioned keywords such as digital or social inclusion programs and the digital divide (or related terms) as they related to the planned municipal broadband project in each city.

Second, a separate spreadsheet was used to organize and summarize the data collected. In the first column was the name of the city, in the next column was the text unearthed. This allowed information to become readily visible without extraneous information. Because a goal of case studies is to establish believability and reliability (Yin, 2003), the researchers have

Table 1
Sources of textual data.

	Total number of pages/sources	Number per city
Main/general municipal website	3	Philadelphia 1 San Francisco 1 Chicago 1
Official municipal press releases	26	Philadelphia 14 San Francisco 9 Chicago 3
Local institutional website (telecommunications, education, religion)	10	Philadelphia 4 San Francisco 2 Chicago 4
Municipal project-specific website	3	Philadelphia 2 San Francisco 1 Chicago 0
Local independent newspaper website	20	Philadelphia 8 San Francisco 9 Chicago 3
National/regional independent newspaper website	39	Philadelphia 22 San Francisco 14 Chicago 3
Local community group website	7	Philadelphia 2 San Francisco 5 Chicago 0
Online community group website	4	Philadelphia 1 San Francisco 2 Chicago 1
Issue-focused group blog	6	Philadelphia 4 San Francisco1 Chicago 1
Individual blogger	3	Philadelphia 1 San Francisco 2 Chicago 0
Total	121	

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Table 2
Initial codes for textual data analysis.

1. Digital divide	7. Information rich and poor
2. Digital inequality	8. Low-income
3. Digital gap	9. Disenfranchised
4. Social inclusion	10. Underrepresented
5. Social exclusion	11. Disadvantaged
6. Information haves and have-nots	12. Underprivileged

Table 3
Discursive types (adapted from Thompson (2004)).

Discursive type	Description
Legitimacy	"appeal to a 'higher order' need for intervention" [e.g., unquestionable, fundamental aims like 'world peace' and 'development']
Corporatism	"the deployment, hence 'ownership' of elements of dominant corporate discourse, such as 'leveraging', 'empowering', 'objectives', and 'knowledge'"
Tech(nological) optimism	"the unproblematic linking of ICT to 'opportunity'; bordering on determinism"
Pragmatism	"show of ICT pragmatic use on the ground, thus ensuring 'results'"

completely documented all procedures and processes for this study. Although much care was taken to ensure the accuracy of the data, the results of this study are limited due to the subjectivity and interpretation of the researchers (Creswell, 1998).

For the purposes of the analysis of these data we have adapted Fairclough's multi-level framework for CDA. This framework postulates that macro-level social structures (e.g., power relations) are linked in a dialectical relationship to micro-level social practices, such as speaking or writing. Though connections between language use and the exercise of power are generally invisible (by design), Fairclough (1995) argues that close examination can bring to light concealed mechanisms of domination. Throughout this framework we find something called an "order of discourse" which encompasses the sum of "discursive practices" associated with an institutionalized set of ideas and the relations between them. This is made up of "discursive types", or thematic constructs that are "vertically" identifiable with a particular order of discourse (Fairclough, 1995).

Our intent is to examine use CDA to examine public rhetoric employed by city offices in their efforts to promote digital inclusion. While the documents analyzed do not form a complete picture of the intents of the cities or their representatives, they represent the publicly articulated plans and objectives. Most importantly, these textual data can be thought of as the archeological remains of a city's public discussion around technology and social inclusion.

In our efforts to link discourse and technology with discursive practices and types, we look to Thompson (2004) in his work with the technological discourse of the World Bank. He identified six recurring discursive types: *technocracy*, *legitimacy*, *neutrality*, *corporatism*, *pragmatism* and *technological optimism*. We have adopted four of Thompson's themes to frame our analysis of the textual discourse produced by each of three cities developing a digital inclusion program through a municipal broadband program (see Table 3).

Using Thompson's discursive types is important for explaining how municipal broadband knowledge remains defined, contextualized and framed by government, and thus revealing how digital and social inclusion programs are negatively impacted. Public officials believe that by simply introducing technological solutions the social fabric of their communities is dramatically influenced. To municipal broadband leaders, the creation of a citywide, digitally wireless cloud will enable social opportunities, namely, create jobs, reduce crime, promote a sense of community and help the information deprived. Yet, government-led wireless initiatives are not a natural process, although they have been touted as such by the mass media and popular press. By accepting it as a natural process, we accept it without question and legitimize the technological artifact. Such belief is mythic and highly deterministic, and has been intrinsically woven into the fabric of Mu-Fi culture. Thompson's framework allows us to show the fallacy of this approach.

In the following section, we present three short profiles of each city and their municipal digital inclusion aspects of their overall municipal wireless broadband initiatives. We then present some of our textual data from which we draw our conclusions. This data is organized around Thompson's discursive technological types.

4. Three exemplar cities

4.1. Philadelphia

We selected Philadelphia, PA because it is the first large municipality in the US to initiate a municipal wireless network, the first to inspire limiting legislation, and the first to address digital inclusion as associated with its network. At the time of this writing, the city's network was also the furthest developed (e.g., an external board of advisors had been established, a

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public–private partnership with the provider was created, a preliminary project plan was published, and so on). Philadelphia's digital inclusion program is the oldest of the three analyzed; the most clearly specified as to how and what it will do, and the best funded. The digital inclusions efforts for Philadelphia are unique because they are managed by a non-profit associated with the city and were not specified in Philadelphia's formal request for proposals (RFP) process.

The municipal wireless broadband project in Philadelphia began in 2004 with a public–private partnership to provide wireless Internet access throughout the city.[3] The key goals of the wireless initiative were to enhance economic development, help overcome the digital divide and to improve quality of life for every citizen. In July of the same year, the mayor announced the Wireless Philadelphia Project, the largest municipal wireless initiative in the US at the time. The City of Philadelphia created a business model in which a non-profit corporation manages the municipal wireless broadband network. The non-profit receives start-up funding from external sources and outsources the design, deployment, management and maintenance of the network to private industry. These private industry partners resell the service to the public at a very low cost and provide some forms of free access to certain locations. The benefits of this model are that it promotes public–private cooperation, creates increased competition between providers thus lowering the broadband costs in the market, and diverts funds to economic development and digital inclusion programs. For instance, Earthlink's (i.e., the provider) multi-million initial commitment alone will pay for approximately 10,000 computers and training in many low-income neighborhoods, while its subsequent annual contributions (equal to 5% of its revenue) as well as grants and low or no-cost computer loans will extend this to even more households.

4.2. San Francisco

We have chosen San Francisco, CA as our second city to showcase a municipality that is midway through the development process. San Francisco also was chosen because its original RFP to build a wireless network did not have any digital inclusion language. The digital inclusion piece was added after the RFP was submitted and Earthlink and Google were accepted as partners.

The goal of the San Francisco wireless project was to provide wireless access throughout the City, in schools, homes, and businesses and on the street.[4] In addition to a range of low cost, high bandwidth services, the San Francisco program was intended offer a free basic service designed to read e-mail and surf the Internet. The San Francisco program was also promised to expand personal computer ownership to all residents of San Francisco and teach users basic skills like email and web browsing to use their new tools. The city planned to increase awareness about current programs that collect, refurbish and distribute used computers to under-served communities. In addition, a low or no-interest computer purchase program would have relieved qualifying low-income residents of some of the financial stress of purchasing a new computer. Furthermore, technology fairs in the under-served neighborhoods would have promoted these services. In order to better serve San Francisco's diverse and multicultural communities, the city hoped to increase multi-lingual and multi-cultural content geared towards under-served communities. A 'digital inclusion' portal would have provided info about the purchasing programs and services. Resources for digital safety and responsibility were intended to be offered to help residents understand privacy and safety while online. This content was to be provided in English, Spanish and Chinese. In addition, digital inclusion content and services will also accommodate the unique needs of seniors, and people with disabilities. Community based websites and local content and news would have been encouraged and promoted through Google and Earthlink. Finally, digital literacy training programs was intended to be available for communities to develop their own content.

4.3. Chicago

Lastly, we chose to profile the Chicago model because it is at the beginning stages of its development and has chosen to integrate its digital inclusion efforts into its wider municipal wireless efforts, making it a seamless single project. The city of Chicago released its RFP for the entire wireless project, which included aspects of providing affordable and universal broadband Internet service, to make computers more widely available to low-income residents.

The City of Chicago included a number of innovative plans in its digital inclusion program. To enhance the financial sustainability of the project, 'Digital Excellence' was promoted as an institutionally funded priority for Chicago.[5] A Digital Excellence Trust, guided by local constituents and practitioners in the field of digital literacy would have advocated on behalf of the digitally under-served, offered programmatic support to establish local capacity and promoted the vision of digital excellence. Universal broadband access was heavily promoted in that all residents have access, regardless of where they live, work or learn. Chicago was also unique in its commitment to community-driven content development. Civic, educational, and government websites may have been available for free to residents at all times through a Civic Garden accessible on the wireless splash page. Affordable hardware and free public use access were intended to be made available through libraries, community based organizations and parks. Chicago was also the only municipality to address environmental and health concerns. The City and

[3] At the time of this writing, the Philadelphia Wireless Project was still operational although it had slowed down and scaled back its activities.

[4] The San Francisco Wireless Project has been put on hold due to the pull-out of Earthlink and Google as providers and vendors. As a result, materials concerning the San Francisco Project are written in the past tense.

[5] The Chicago Wireless Project has been put on hold due to the pull-out of Earthlink as provider. As a result, materials concerning the Chicago project are written in the past tense.

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technology vendors would have supported economically and environmentally sustainable processes for disposal and recycling of outdated electronic materials. In terms of economic development, the network would have provided mechanisms to expand existing small businesses and cultivate new opportunities in under-served communities.

5. Critical Discourse Analysis: municipal wireless broadband as solution and savior

5.1. Legitimacy "appeal to a 'higher order' need for intervention" [e.g., unquestionable, fundamental aims like 'world peace' and 'development']

Legitimacy could be defined in terms of constituency, regulatory recognition, experience, or expert knowledge of the issues at hand. Our working definition of legitimacy implies that an organization is authentic and is justified in its actions. It is the right to be and do something in society (Brown, 2001). This right is justified through appeals to higher order, incontestable causes such as development and economic imperatives. In the case of municipal broadband networks, legitimacy is evidenced by the claim that municipalities are lawful, acceptable, and justified in their chosen course of action to deploy Wi-Fi access to their communities.

5.1.1. Philadelphia

The primary call for legitimacy in the Wireless Philadelphia initiative is digital inclusion. "Beyond the many commercial and retail benefits the new network will bring to our City and its residents, it is EarthLink's extraordinary commitment to digital inclusion that is enabling us to build toward our vision of 'The Entire City Connected.'... It is nearly impossible to even apply for entry-level employment without having basic digital skills and Internet access... All people deserve... and really need... broadband access to the Internet at home. In Philadelphia, we feel that to limit the vision of a Digital Inclusion strategy to connecting public spaces—while useful in the short term—will, in the long run, widen the Digital Divide." Greg Goldman, CEO, Wireless Philadelphia.

As seen by the comments above, legitimacy can be grounded on regulatory (i.e., promoting a more equitable society) or normative (i.e., the right thing to do) bases. Computer and information literacy are positioned as requisite skills for participation in the labor force, even at the most basic level. Digital inclusion is used to represent the ideal that computing technology is ideal in connecting everyone to valued resources.

5.1.2. San Francisco

For San Francisco, legitimacy of their broadband system is situated in language that appeals to progress (i.e., removing roadblocks to innovation and economic growth) and shared values and moral perspectives (i.e., social justice). "The City's Digital Inclusion programs will address the many different barriers that under-served communities face in accessing and using technology. This is important for the future of the city. For San Franciscans without technological knowledge and skills, the digital divide is just one more roadblock to getting a good education, achieving a better paying job, and a higher standard of living. Investing in these residents will promote innovation, economic growth and social justice within the City."

Specifically, San Francisco's Digital Inclusion Strategy documents lay out a comprehensive framework that guides the development of Digital Inclusion programs in order to reach the following objectives: "(1) Support all San Franciscans in acquiring the technology and skills needed to use the Internet to access jobs, education, healthcare, government services and other information services. (2) Create a more vibrant San Francisco by leveraging the Internet to enhance communication, empower new voices, enhance civic engagement and increase the connectedness in physical and cultural communities. (3) Further enhance San Francisco's role in the local, regional and global economy by expanding opportunities for innovation and participation. (4) Encourage collaboration throughout San Francisco by partnering with existing organizations serving the community, strengthening technology adoption and digital empowerment (City of San Francisco, Digital Inclusion Strategy, 2006).

5.1.3. Chicago

Chicago demonstrates their legitimacy through high order appeals to alleviating persistent urban social problems such as education and poverty. In September 2006, Chicago Mayor Daley stated "When we make modern computer and Internet technology available across Chicago, we are giving every person in Chicago the same chance for a good life... We're improving our children's education. We're working to end poverty. We're creating a more modern, sophisticated workforce. And, most important, we're creating hope and opportunity." "Digital inclusion is key to helping our students graduate from high school prepared to receive a college education, accept a good job, and compete in the global economy," said Arne Duncan, chief executive officer, Chicago Public Schools.

Uplifting and connecting historically under-served citizens (i.e., the disconnected) is also a salient theme. "...It should not just be looked at as just an effort to ensure that there is connectivity in all neighborhoods, and to reach back to bring along the disconnected. Instead, we believe that bridging the Digital Divide should be a by-product of a citywide, multi-sector campaign to actually achieve a state of Digital Excellence that establishes universal and meaningful participation." Julia Stasch, Chair of the City of Chicago Mayor's Advisory Council on Closing the Digital Divide.

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5.2. Corporatism "the deployment, hence 'ownership' of elements of dominant corporate discourse, such as 'leveraging', 'empowering', 'objectives', and 'knowledge'"

Corporatism is a. top-down relationship in which organizations dominate associations. Corporatism means that we participate in society as members of groups, which not only represent us but also control us. Municipalities' incorporate corporate language into their structures, and engage in business practices such as setting project goals, establishing business plans, and measuring granting neighborhoods certain benefits.

5.2.1. Philadelphia

Wireless Philadelphia's Digital Inclusion Program will connect to the community through partnerships with community-based entities capable of delivering computers, training and Internet access to people who qualify for Wireless Philadelphia's Digital Inclusion Program. These Wireless Internet Partners (WIPs) are critical to the digital inclusion mission because they are the organizations that identify, qualify, and sign up digital inclusion customers onsite. Additionally, WIPs will offer computer training, provide technical support, and assist with PC Purchase Program info from a Qualified Vendor list. Each WIP will be responsible for a minimum of 200 customers.

According to Greg Goldman, CEO of Wireless Philadelphia, the city believes "...that it is extremely advantageous to utilize existing programs, organizations, and structures that already engage low-income and other under-served groups. In fact, these agencies' institutions provide a foundation upon which to develop the strategy of 'presumptive eligibility' so that we can rapidly identify and address the needs of those on the other side of the Digital Divide. If you are a person who receives food assistance or Social Security benefits, or are a child in a foster care family, you should automatically qualify to participate in the Digital Inclusion program." Hence, the Wireless Philadelphia project adopts corporate notions of partnerships as a means of outsourcing the direct customer facing activities to more experienced and more knowledgeable organizations.

5.2.2. San Francisco

Like Philadelphia, San Francisco seeks to leverage partnerships and bargained exchanges among disparate organizations. "The City will enlist the participation of the public, private, educational, philanthropic and non-profit sectors to create and sustain innovative programs that advance digital inclusion and empowerment across all of San Francisco's neighborhoods. Advancing digital inclusion will be a collaborative effort among residents, community based organizations, city departments, the Unified School District, social services agencies, higher education, businesses and community volunteers... We envision a citywide effort involving the public, private, educational and non-profit sectors to create and sustain innovative programs that advance digital inclusion and empowerment across all of San Francisco's neighborhoods."

Corporate language such as engagement, leveraging, and measurable outcomes align is also evidenced in the three principles that guide the initiative. According to the principles underlying the execution of San Francisco's digital divide initiative, the program aims to, "(1) engage the community in a community driven planning and implementation process; (2) leverage existing community, governmental and business resources whenever possible; and (3) include measurable outcomes and indicators of success."

5.2.3. Chicago

The RFP from Chicago stated that "...a critical component of the Project is to ensure that high-speed access is available to those who cannot currently afford it. Therefore, Proposals must demonstrate a business model, which stresses affordability for under-served Chicagoans." Corporatism finds expression in the stated need for business models that can generate profits sufficient for subsidizing low-income residents.

Like Philadelphia and Chicago, San Francisco adopted elements of dominant corporate discourse, such as 'empowering', 'leveraging', and 'objectives.' This suggests that the knowledge produced by public elites remains defined, contextualized and framed by concepts, language and practices of business. This approach is based on a topology of knowledge that is produced by and for business, and seeks to apply these knowledge frames to the domain of digital inclusion in municipalities.

5.3. Tech(nological) optimism "the unproblematic linking of ICT to 'opportunity'; bordering on determinism"

Technological optimism is the tendency of public elites, in their quest for digital inclusion, to idealize their technological ventures, suppress dissent and pursue the unalloyed good of technological progress. Technological optimism is driven by deterministic beliefs and depicts technology as an exogenous developmental idea that coerces and determines social relationships Technological determinism has been largely discredited within academia. Paradoxically, it remains the dominant view within most news media and popular culture. In a municipal broadband context, politicians, telecommunication executives, researchers and mass media have enthusiastically promoted the Internet despite the low rates of success. The optimism with which stakeholders have rushed into Mu-Fi programs and linked ICT to opportunity often overshadow the question of precisely how municipal Wi-Fi efforts promote social inclusion.

5.3.1. Philadelphia

In Philadelphia, "...digital inclusion is the effort to enable people who lack access to the Internet to get connected and receive the tools they need to use that connection to improve their lives. So the deliverable is computers, software, local

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technical support, relevant Internet education, and a high-speed Internet account for the household – pretty straightforward. And we're going to deliver that through existing organizations in the community that people already know, that they are already related to, that already have related services around a technology education and other forms of economic programs oriented toward helping people become economically independent" (Greg Goldman, CEO of Wireless Philadelphia, December 2006).

"The municipal wireless movement is not about technology, it's about equal opportunity—its about leveling the playing field and bridging an enormous divide that exists right here in Philadelphia: the digital divide... In sum, in today's world, lack of access means less connection, weaker communities, limited employment opportunities, poorer health, and fewer educational opportunities." Greg Goldman, CEO, Wireless Philadelphia.

From a technological optimism standpoint, Philadelphia seemed to have been "blinded" by the novelty of Wi-Fi. Technology becomes an autonomous agent that has a direct effect on other societal processes. Digital inclusion, if done thoughtfully, is thought to be fairly straightforward.

5.3.2. San Francisco

Mayor Gavin Newsom announced that San Francisco: "is poised to become the first major city in the country to offer free universal wireless Internet access...free wireless as the first step in a larger initiative to create a comprehensive digital inclusion strategy that includes computer hardware, technology training, and Internet access targeted at helping bridge the digital divide for low-income communities. This agreement ... is a critical step in bridging the digital divide that separates too many communities from the enormous benefits of technology. Ubiquitous Wi-Fi will change how residents access education, social services, and economic opportunities."

Furthermore, Mayor Newsom said "I made a commitment to bringing the social, economic and cultural benefits of Internet technology to all San Franciscans. Access both to hardware and content is critical – that's why it's vitally important that we move forward to make free universal wireless a reality as soon as possible." (March 2006).

From a technological optimism perspective, it appears that San Francisco has latched onto wireless broadband as a "good thing" rather than critically exploring the many interwoven factors that contribute to social exclusion that predate the digital divide. These factors, such as poverty and underperforming schools cannot be remedied solely by ICT. These "utopian visions" have overwhelmingly positive effects on digital divide reduction and appear to be driven by deterministic beliefs.

5.3.3. Chicago

For Chicago, "Digital inclusion is a key tenet in the booming growth of the municipal Wi-Fi marketplace. Cities, non-profits and companies are coming together to build wireless networks for citywide Internet service and to help people who have not had access to broadband – either due to availability or affordability – get access to the hardware, software, training, support and service necessary to take advantage of high-speed Internet access."

The expectation that these networks will afford myriad benefits all while improving digital inclusion have propelled public elites to launch their projects aggressively. In doing so, they hope to leapfrog into the new information economy and join other communities in the digital realm. It can be argued that this is done out of fear of being left behind or outperformed by other cities. This phenomenon has been promulgated by the perceived benefits that Wi-Fi seems to afford citizenry, at lease in principle. It may well be an illusion to believe that cities can catch up to other cities that are subject to different dynamicity and complexity (different rates of technological adoption and resource allocation, for instance).

These quotes demonstrate how these cities view their networks as powerful agents-of change. It is particularly instructive to note how they understood the potential benefits of a wireless cloud in their city. To them, their complex network was viewed (a) positively, (b) with strong expectations of creating a very bright future for their citizens, and (c) with open-ended outcomes. As technological optimism shows, technologies like Wi-Fi have been framed as a force that can fix the social fabric of life by eliminating scarcity, like unemployment, poverty, poor quality of life, and so forth.

5.4. Pragmatism "show of ICT pragmatic use on the ground, thus ensuring 'results'"

Pragmatism is the value that emphasizes practical purposes and adoption of systems to ensure achievement of the organization's objectives. It refers to behavior that temporarily sets aside one ideal to pursue a lesser, more achievable ideal. Pragmatism tends to cull confidence by citing sensible ICT deployment "on the ground, thus ensuring 'results'". For municipal wireless broadband systems, pragmatism refers to the setting aside of complex social ills, for more achievable short term goals like low-cost broadband access. It carries the stamp of matter-of-factness and justification that the Wi-Fi project is achievable and will be successful.

5.4.1. Philadelphia

The mission of Wireless Philadelphia's Digital Inclusion Program states, "Wireless Philadelphia was created to transform Philadelphia's neighborhoods by making high-speed Internet access more available and affordable through Digital Inclusion – the initiative that helps people who are not online gain access with hardware, software, tech support and information, and broadband Internet service, so they can begin to use this technology to improve their lives." In this framework, basic computing needs are the considerations that inform the mission of Wireless Philadelphia.

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The projects undertaken are also shaped by solutions that consider concrete needs in terms that residents themselves can start to address. "...the cool thing about the Internet is, it's cool. And so what we want to do is deliver these services to qualified people in a way that's as cool as the Internet itself. So that people want to participate in it and aren't going to say, "Uh, you know I'd love to, but I'm not going to go wait in that line or stand for two hours to show my crumpled stuff to somebody, and then have to wait in another line to pay for it." Greg Goldman, CEO of Wireless Philadelphia, December 2006. Here we see practical concerns like standing in line and waiting being addressed.

5.4.2. San Francisco

Like Philadelphia, San Francisco addressed the practical need to get basic computing resources to disadvantaged individuals and communities. "The San Francisco Digital Inclusion initiative focuses on six major programmatic areas... To promote Digital Inclusion, the initiative will offer free and affordable Internet access, computer ownership programs, assessable hardware and software solutions and basic skills training, including resources that promote digital safety and responsibility."

San Francisco, however, goes further to address additional practical issues such as language diversity and digital literacy. "To further expand the value of information technology for San Franciscans – to promote Digital Empowerment – the City will partner with others to enhance digital literacy programs and to expand the availability of relevant, multi-lingual content that speaks directly to our citizens and communities."

5.4.3. Chicago

The City of Chicago has included a uniquely pragmatic orientation in its digital inclusion program. To enhance the financial sustainability of the project, "digital excellence" has been promoted as an institutionally funded priority for Chicago. A Digital Excellence Trust, guided by local constituents and practitioners in the field of Digital Literacy, should advocate on behalf of the digitally under-served, offer programmatic support to establish local capacity and promote ongoing community participation.

It also requires access to basic computing infrastructure. The RFP from Chicago stated "Reducing the digital divide takes more than providing access to broadband infrastructure. Access to affordable hardware, software applications, and training are also critical to addressing the growing disparity between those who can use technology and those who cannot. Proposals must include clearly articulated plans for reducing the digital divide. Opportunities include but are not limited to: training programs, hardware programs, and grant programs to supplement existing community, government and philanthropic programs. Creativity in this area is strongly encouraged."

6. Discussion and conclusions

As changing technologies have made broadband affordable, cities have jumped into the broadband market, seeing it as an alternative to the poor and spotty service and high prices now offered by private carriers. If we can only connect disadvantaged groups to ICT, the discourse goes, then we will have extended to them the means to succeed in the new economy. Thus, digital inclusion discourse claims legitimacy by calling attention to urgent need to address pressing social and economic issues. ICT is presented as the key to wiping out the inequities that have long hounded historically marginalized groups.

In profiling these three cases, we unveiled economic, political and social values that inform the digital inclusion provisions of each city's Wi-Fi implementation (see Table 4).

In Philadelphia, the municipal wireless broadband campaign has been framed largely as an access issue. Local officials view their role as a catalyst whereby they offer the Wi-Fi service but do not enter into the how-to debate themselves. Instead, they utilize their infrastructure (street light poles), and resell the Internet service provided by Earthlink. Because much of the public rhetoric surrounding these networks is commercialized and marketized, public officials seldom discuss how they intend to build long-term relationships with local business, non-governmental organizations, grassroots groups, non-profit agencies and computer technology centers. They do, however, engage WIPs to take on this role. The financial sustainability of the service is addressed through a sliding fee that makes broadband affordable for low-income residents.

In San Francisco, there have been several concerns voiced about the Digital Inclusion plan. The topography of San Francisco is extremely hilly, which raises concerns that the signal will not reach interior rooms, or above the second floor. Individuals in these situations would need to purchase a repeater box which can cost as much as $150. A second area of concern is funding. The City must secure robust funding for a Digital Inclusion Fund as a "community benefit" in its contract negotiations with Google and Earthlink. Without such committed funding, implementation will be difficult. Finally, the tiered service may contribute to another digital divide. Typically, the people who need Internet access the least are the ones who use municipal Wi-Fi the most. Municipal Wi-Fi may save money for the people who can already afford it and provide them with fast Internet connections. Low-income households will receive free service but at much slower speeds.

Chicago proposes the most comprehensive Digital Inclusion Program. The city seeks to provide hardware, software, training and literacy programs, and opportunities for content development that meet the needs of culturally diverse residents. Moreover, Chicago has articulated a plan that targets small businesses. Although the actual implementation has not occurred, the economics of the project are addressed through the "digital excellence" concept, and public–private partnerships are being put in place to work through the political dimensions.

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Table 4

	Economics	Politics	Social values
Philadelphia	• Start-up funding from private firms • Outsourcing management & maintenance of network (EarthLink) • Reselling service to public based on sliding fee	• Public–private partnership (Wireless Philadelphia) • "Grandfathered" agreement with incumbent (Verizon) • Community partnerships (WIPS)	• Digital inclusion (training, hardware, loans, grants) • Quality of life for businesses and residents • Economic development
San Francisco[a]	• Three levels of service (free, 300 Kbps; $12.95, 3200 Kbps; $21.95, 1 Mbps)	• Public–private partnership (Google, Earthlink)	• Digital literacy • Digital safety and responsibility • PC ownership • Multi-lingual content and online services
Chicago	• Digital excellence (affordable and, sustainable funding)	• Public–private partnership	• PC ownership • Software/meaningful applications • Training • Universal service to all areas of city • Quality of service/high speed available • Digital literacy • Open access to all (businesses, residents, visitors)

[a] In the case of San Francisco, digital inclusion provisions were added after the request for proposals was published.

While many municipalities pursuing Wi-Fi envisioned access for every citizen as a means of fostering social inclusion, the focus has shifted from social justice to profit sharing. This shift is the result of an inherent tension that exists between the municipality, which is motivated to provide the service at a low cost so that disadvantaged citizens can benefit, and the service provider which is motivated to price the service as high as possible so as to maximize their profit (Young, 2006). While smaller municipalities have developed their own Wi-Fi initiatives with seed funding through community development grants obtained from state and federal government and have been able to focus on social inclusion, larger municipalities have generally opted to outsource development to telecoms and ISPs who operate from a profit making business model (Mandviwalla et al., 2008). The United States has taken a deregulatory approach under the assumption that the market will build enough capacity to meet the demand for broadband Internet. However, the market may do a good job of providing reliable infrastructure with reasonable quality of service, but it has no incentive to provide universal, ubiquitous coverage if it cannot generate sufficient profit doing so (Middleton, 2007; Clement and Potter, 2007). The business pressures of providing connectivity do not ensure that networks will be built with the standards deemed important by communities.

More importantly, we are concerned about this tension between the digital inclusion programs that motivated the city officials and the profit motive that motivated the private companies that developed the network. This disconnect may lead to a host of other problems in which public policy, local government, and wireless broadband technologies are seen by under-served communities as untrustworthy. In these three municipalities the experience of the digital divide was pervasive, the language used to promote the network as a solution was strong, and taxpayer dollars were committed to fund the project. The digital inclusion programs represented a tangible opportunity to provide useful services to under-served communities. However, as these digital inclusion projects fail to deliver on this promise, a further mistrust of authority and an exacerbation of the cultural problems at the root of social exclusion and the digital divide may persist.

However, a positive result of our case studies demonstrates that municipal Wi-Fi efforts were able to convincingly reflect a rhetorical strategy needed to sway vendors and community-based partners toward a more favorable stance. Social inclusion rhetoric may be increasingly important, especially in the light of continued state and federal legislation that threatens continued deployment. We concede that the growing use of such language has brought the social inclusion issue to the forefront of many large municipalities, demanding much needed political attention. At the same time, corporatism and pragmatism are needed to speak to the business and community constituents. Thus, these municipal Wi-Fi projects serve as sites that bring together the realities of business and the need for social inclusion, and as a new frontier for research that addresses social–political–technological concerns. The questions are immense, the current research is meager, and the implications are far-ranging.

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