CAPTURING THE CONTEXT OF DIGITAL LITERACY: A CASE STUDY OF ILLINOIS PUBLIC LIBRARIES IN UNDERSERVED COMMUNITIES

BY

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DISSERTATION

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ABSTRACT

This dissertation study examines the role of the public library in fostering digital literacies in underserved Illinois communities. Over the course of two years I collected data on the library as an institution, and as a context, by investigating people, policies, activities and infrastructure related to how individuals learn, comprehend and apply digital technologies in collaboration with and in relation to the library. The data was collected during visits to libraries in sixteen locations around the state with significant levels of poverty, including a selection of rural localities and predominantly African American and Latino communities. Research methods included several kinds of site observation as well as interviews with librarians. As a collective whole, these case studies yield a series of interesting and surprising stories that reflect some of the connections between social roles and service roles, as well as the particular innovations and challenges present in underserved communities.

These findings support a number of related theories and initiatives, including the need to reconstruct digital literacy as digital *literacies*, in the plural, and the impetus to see them primarily as a function of community engagement, especially in underserved community settings. The data suggests that library roles related to digital literacy are changing in several substantial ways. First, libraries are moving beyond merely providing internet to proactively promoting assisted public computing. Second, they are shifting their view of themselves as a community space to include leadership in community networking. Finally, they are working to cultivate information experiences that progress beyond consumption to involve a dimension of generative learning.

When considered in conversation with existing scholarship, these findings have important implications: they show new avenues for research into diversity and social inclusion, critical discourse analysis and dynamic models for learning. They also suggest new directions for the field of Library and Information Science (LIS) and offer a compelling reason for libraries to both participate in and help guide movements and initiatives to promote digital literacies.

ACKNOWLEDGEMENTS

When I first started writing this dissertation I had written a small acknowledgement snippet featuring praise of Mountain Dew, videogames and rollerblading. It's amusing how much we can transform in just a few years. I clearly owe my committee substantial thanks for their insightful feedback and guidance throughout the project, especially Linda Smith, who must have had the will of a titan to put up with all of my informality and rampant side projects. More importantly, I owe a lion's share of gratitude to a whole network of people who kept me going along the way. To say they supported me would be too vague; I think I'd rather express my enrapturement in their outstanding belief that my strange hacking of scholarship, technology and activism actually had some merit to it.

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INTRODUCTION

A few years ago, I conducted what became the seed for this dissertation. As part of the study, I spent time calling and talking to librarians about the kinds of internet access their public libraries offered, and, naturally, one of the questions was about wireless. At the time (2008), many libraries were only just beginning to implement wireless networks, and they were often still determining policies and expectations. When I asked one librarian in a small town about the strength of their library's wireless, she replied that it extended well beyond the walls of their building and proceeded to tell me how, after hours, youth would often gather in cars just outside with a laptop to watch YouTube videos together. They probably could not do this sort of thing in the same way at home, maybe as a result of the prying eyes of parents, a single contested family computer, or the speed of their internet. The scene was almost like a stereotypical 1950's diner or ice cream parlor where youth would go to hang out when it was late, only in this case it was a kind of renegade public computing. They could make as much noise as they wanted, playing music and talking loudly, limited only by the battery life of their laptops.

In this story, we can see the rather deviant use of library resources for a kind of community gathering—but also the possibility for informal learning with information communication technologies taking place between peers. These youth exposed a gap between actual and intended service provision, and, among other things, showed that the library *meant* something different to them. The library, in turn, recognized the behavior and did not see anything wrong with it, so they permitted it to continue. They were not concerned about viruses or torrenting any more than they would be if a patron did these things inside of the library with a laptop during the day.

This dissertation project, however, is not primarily about investigating youth behaviors in evolving third spaces, as interesting as that might be. Nor is it a call to argue the learning opportunities present in engaging in participatory culture communities like those found on YouTube, at least not explicitly. It is instead about uncovering the unconventional, unexpected, and innovative ways public libraries are evolving as places that enable learning with technologies. It is also about shedding light on the full context in which the process of participation and socialization occurs by investigating several dimensions of the public library's social and service roles as an institution. In the case of the library in the above example, a combination of library infrastructure (the wireless broadband and parking lot), policy (all-hours wireless and parking open to public use), and people

(youth patrons teaching and sharing with one another) made it possible for the library to facilitate a kind of informal social program (YouTube sharing in cars), one that presented an opportunity for these youth to develop digital literacies.

I never managed to get enough information about this activity to determine what kinds of outcomes were happening for the youth, or if it continued for very long or was popular, but that's not the point. The point is that no form of official research survey about libraries is ever going to capture these sorts of occurrences. Libraries, even ones in rural locations or those with limited assets, are innovating and responding to evolving patron needs all of the time, and they often do so in ways that don't fit the norm or that are not well-documented. Conversely, they also face challenges that arise with these innovations that require context-sensitive solutions. So what can we learn from this that is generalizable? How does it relate to what we already know?

SPOTTING THE GAP

Public libraries, for the most part, have always been tied to the social development of technologies. As card catalogs and large physical collections have shrunk or disappeared and databases and online services have grown over the past two decades, libraries across the US have necessarily evolved to become the mainstay of free public computing and public internet access in most communities (Gant et al. 2010, Manjarrez and Schoembs 2011). In many libraries, you can walk in to the computer lab at most times of the day and see every workstation in use, by people of all kinds. Just as librarians in the past helped patrons to find the right book or resource, now they help them to find the right website or learn how to use the right software. Understanding everything related to processes like these, and how they relate to library service roles overall, is a substantial part of what library and information science does.

As implied earlier, the inspiration for this project began many years ago, in the spring and summer of 2008. By examining twenty-two public libraries spread throughout five counties with significant African American populations in Illinois,[1] using a research framework based on an access-based conception of the digital divide, I was able to gain some insight into the data, methods, and issues that eventually turned into this dissertation study. I began the project by surveying library staff

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[1] As part of the eBlack Illinois project, http://eblackillinois.net.

over the phone about their IT infrastructure, personnel, policies and technology education activities, with the objective of assembling a database of information on these variables. I soon found myself inadvertently collecting a series of stories like the one told earlier in this introduction, many of which were quite interesting, if not downright inspiring or surprising, and which didn't fit in the database. It wasn't just a library here or there with an odd story, it was over half of them, which meant there had to be some pretty big issues that numbers-based narratives were missing. Since I couldn't summarize much of what I was discovering suitably with spreadsheets and typologies, I began to go out and visit library sites. The case study format proved to be an effective method of data collection, and eventually became the impetus behind this dissertation. Respectively, this work was designed directly in response to two gaps in the data:

1. While there are substantial publications available that measure the technology-related resources that libraries provide, most studies fail to capture an adequate array of factors. Furthermore, existing governmental, academic, and NGO reports and case studies do not integrate a holistic perspective of digital literacy, one of the main goals behind providing these assets. Only in recent years have such studies moved beyond wide surveys and isolated, case-based data collection techniques. This dissertation takes a kind of hybrid approach by working with several case study sites comparatively while considering them in relation to larger issues, to better ensure generalizability.

2. Few existing published studies are explicitly focused on underserved, low-income or ethnically diverse communities in small town and rural Illinois. The few identifiable focused case studies in the body of literature feature stories and research on libraries with considerably more assets, those located in Chicago and the outlying suburbs. We stand to learn a great deal from the other, often-overlooked, communities in Illinois. There is as much value in their knowledge and experience as there might be anywhere else. As public libraries increasingly find themselves in a position of inheriting a widening burden for providing social services, it becomes more pressing to understand what innovations and challenges exist in settings where resources are not plentiful.

The purpose of this dissertation, however, is not just to collect different data in a quest to plug holes in the literature; it is to ask *why*. Developing measures to explain what technologies libraries possess, which digital literacy related programs they run, and how they go about conducting their

services is all to aid in understanding why they're doing what they're doing and why it works (or doesn't), why it *matters*. In doing this we construct important and specific examples of the social forces and structures as well as individual agencies that shape, characterize and otherwise determine outcomes and impacts. The mission, consequently, is to contribute to the scholarship and theory in several fields of study and help to inform implementation and practice. Specifically, in many ways the parts of Illinois outside of Chicago—small-town, struggling post-industrial and rural—are similar to parts of other states with limited resources, underserved demographics and hidden innovations. Furthermore, I believe my work will encourage scholars to rethink the application and interpretation of digital literacy as a conceptualization and challenge library professionals to reconsider the ways they believe public library service roles carry out social roles.

A SNAPSHOT OF THE STUDY DESIGN

In order to establish a basis through which to understand the essential "why" questions I started with one with sufficient room to explore:

What is the role of the Illinois public library in fostering digital literacy?

My first objective was to achieve a general understanding of the character and conditions of digital literacy in Illinois public libraries. I did this by operationalizing pertinent dimensions of the context that represent service roles—infrastructure, people, policies and activities—to achieve a more holistic base of data from a specific set of public libraries all around the state. The meticulously-assembled sample included only libraries that serve socially excluded populations arguably most in need of services and empowerment, particularly those in the most rural areas, impoverished areas, and areas with significant African American and Latino populations.

I then traveled all around the state over the course of several months, visiting libraries for observations and conducting interviews. In total I explored 16 libraries, interviewed 34 librarians, took a wealth of field notes, accumulated over 45 hours of audio, and then stepped back to consider the amalgamation. I wrote up and critically interpreted the sum of the data to supply the stories, comparisons and implications presented in this text. The work naturally led to several library-related digital literacy projects and an extended case study not included in this dissertation.

CHAPTER OVERVIEW

The next section is a literature review that details the path of inquiry I took to assemble my research question. This includes some of the theory and social forces at play beneath the social roles of the public library, how they relate to public education and the definition and purpose of digital literacy. I then move on to review several related studies that this work was originally positioned in response to and make the case for the gaps in data indicated earlier. Following is a detailed breakdown of my research design, which includes a clarification of disciplinary affiliations as well as an explanation of the multi-stage study. Readers will then reach two sets of findings: the first is a series of stories illuminating some of the interesting and surprising ways library roles relate to fostering digital literacies and the second is a series of comparisons between libraries in the form of tables and explanations demonstrating the breadth of institutional attributes. The dissertation concludes with a discussion of the "why" questions in the form of implications for theory as well as related research and practice.

LITERATURE REVIEW - PATH OF INQUIRY

This section helps to guide readers through the relevant literature that comprises the foundation beneath my research question.

UNDERSTANDING THE ROLES OF THE PUBLIC LIBRARY

In 1947 the American Library Association (ALA) asked the Social Science Research Council, led at the time by Robert D. Leigh, to conduct a study of the value of the public library in the United States. The study (Leigh 1950) was built upon the assumption of several American democratic values that find deep integration with the conception of the library's social role at the time. In his text he walks us through a series of assumptions:

1. All individuals deserve equal opportunity, which relies on their opportunity to learn and grow.
2. Freedom of personal expression and communication are individual rights, but in the aggregate they are a kind of social good.
3. Institutions of public good must be subject to popular control as well as direction by experts (an electorate), which implies a blend of top-down and bottom-up governance.
4. We ought to cultivate institutions which serve the whole community by investing in resources for and by persons of diverse types and backgrounds.
5. Such public goods necessitate both centralization and local participation.
6. We must strike a balance between technological progress and cultural traditions.

Leigh noted that the public library is a symbol as well as a servant of culture and that it relies primarily in a kind of faith, "belief in virtue of the printed word" as a fundamental force of social change. He found that the social functions of the library were very much in alignment with those of democracy: the promotion of tolerance, free speech and participatory governance (pg. 12). His research, though rather limited in its selection of inputs, identified that many representatives of the field of library science at the time were rather forward thinking. They saw that the library's service roles included provision of information in all forms, such as "films, recordings, and radio; also by lectures, forums and discussion groups" and that not only should information materials be made available free to the public but that "library service should be established where it is not now available" (pg. 18). In its entirety Leigh even posited that "the library, however, may also be

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thought of as a constituent part of public (or mass) communication" (pg. 25). And perhaps bolder, an outstanding social role of the library was identified in stating: "Librarians should change the intensity, the duration and even the nature of their services so that they will contribute directly to the solution of the crucial problems of our time" (pg. 19).[2]

Ultimately, what Leigh builds up to is a rather noble and magnificent vision of the public library. It is remarkable in that it captures so many dimensions of American values and then finds those values to be woven into the very structure of the operations as well as the recurrent effects the public library has on our communities. But to what extent was this really the case? Was the library really as splendid as its ideal form was described?

Leigh worked within the context of his time, which was an atmosphere of great post-war governmental approval characterized by assumptions of American exceptionalism. Libraries were often still of the Carnegie sort, giant stone buildings with towering stacks of books available primarily for the privileged. Without a doubt, the insistence of the importance of public libraries as an underpinning in our democracy has persisted over the years, but they haven't served as quite the tremendous apparatus of public communications or social problem solving centers that Leigh's report may have envisioned them to be. How does one measure the public library's contribution to democracy? Should we assume an operational definition, on the basis of historical analysis of policy? What about measures based on the character of library activities and patrons as well as the content of information made available? A comprehensive understanding of outcomes and impacts would certainly require analysis from many perspectives. More recent critiques, like the one given by John Buschman[3] in *Dismantling the Public Sphere* (2003) have suggested that the connection between libraries and democracy may be more of a matter of rhetoric or faith than substance, and

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[2] Leigh even noted challenges that are still relevant today – the amount of information people consume from (presumably questionable) commercial sources (as compared to academic or government curated) as well as a key question of agency: "Are librarians teachers, or are they rather the keepers and organizers of the instruments of education and stimulators of their use?"

[3] Challenging the assumption that libraries are democracy incarnate is based, in part, on works by Leah Lievrouw, Brenda Dervin and Neil Postman written in the 80's and 90's. Buschman's conceptualization of the new public philosophy is grounded heavily in the critiques written by Michael Apple, Henry Giroux and Sheldon Wolin.

that in the age of a new public philosophy, an age driven in large part by the descendants of Reagan-era marketization, libraries are on the defensive. We see this reactive state through language and policy: libraries are frequently forced to render their social value in terms of economics, such as monetary value per individual user, as opposed to aggregate value to the entire community or variance in value to different sorts of patrons. Buschman claims that scholars in library science are all too willing to assume a kind of "information equals democracy" narrative, and yet they remain unsettled about the relationship between libraries and the emergent capitalistic forces of the information society. In effect, our field has entered a perpetual state of panic because this perception of crisis has become woven into our very identity over the past thirty years. Buschman levels this criticism not without hope, and instead calls for a solution in the form of a sustained return to the *democratic public sphere*, an elaboration on the vision of Jürgen Habermas (pg. 42):

> *As an ideal type, the public sphere is the space in between the state (and its formal systems of [civic participation like] voting or legislation) and private life. It is where unfettered and equally available information is gathered and argumentation and critique (i.e. discourse) takes place among people as the basis of rational public will formation: the genesis of legitimacy in laws, decisions, and ethical norms in a democracy.*

Buschman finds several key duties the library performs in the domain referred to as the public sphere:

- Collecting and organizing information resources, from a diverse array of sources and perspectives, for access and use, which in effect extends the parameters of rational discourse (debate) and affects resulting normative conclusions.
- Active demonstration of information transparency in the implementation of these collections (and services), and, in parallel, provision of verification (or refutation) through the ability to backtrack the development of ideas in literature.

Buschman contends, on the basis of considerable literature, that "libraries contain within their collections the potential for rational critique and individual/community self-realization" (pg. 47) and that, for better or worse, they have supported the *right* of access to information to people

outside of the dominant culture. This position bears some similarity to Leigh's rhetoric, but is better immersed in recent and critical scholarship.

So what do these understandings of the public library say together? It appears to be here to support social (or public) goods, like free speech and education, which ideally lead to outcomes such as self-realization and informed civic participation. In this view the library is positioned as a supporter, providing knowledge and information tools to bolster other endeavors, a common theme in library and information science when we talk about the social roles of the library. In my opinion, these authors present views that do not do enough to adequately address to what degree the library should be a pro-active enabler, however. Is its domain just one of conscientiously and equitably sorting, circulating and promoting a diversity of materials, in hopes that someone will use them? Is the contemporary library here to support providers of education by simply making information available or is it actually a provider of education itself by helping patrons to make sense of, understand, apply and create information? The field has continued to grapple with these questions over recent years.[4]

Every civic institution develops service roles that are situated in response to desired social roles. Social roles, implicitly desirable facets of democracy, are usually framed in terms of the impacts, benefits or values they provide (or affect), related to information, education, recreation or culture and economic regeneration (Williamson 2000, Debono 2002, Kerslake and Kinnell 1998). Numerous disputes exist over the best ways to measure these engagements, of course, be they about effectively and appropriately demonstrating the contributions of public libraries in hypothesis-structured performance measurement (Matthews 2004, 2007), discerning the degree to which libraries influence social capital in communities (Bourke 2005, Hillenbrand 2005, Alkalimat 2003, Alkalimat and Williams 2001), or reconciling the position of the library in providing new social-cyber infrastructure (McClure and Jaeger 2009). In 1987 the American Library Association (ALA) and Public Library Association (PLA) commissioned a study that, over its evolution, gives a comprehensive and progressive typology of library *service* roles: what libraries do, concretely, in their fulfillment of *social* roles. They posited that the public library fills key functions as a center

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[4] The debate is often framed in terms of neutrality, and though scholars have generally recognized that the library is far from apolitical the discourse still persists amongst practitioners.

for community activities, local information, formal education support, independent learning, research, and as an access location for popular materials, learning for preschoolers, and reference provision (McClure et al. 1987). An update to the report over a decade later (Nelson 2001) added several library service responses and also maintained some overlap. It indicated that the library should help address literacy needs, act as a business and career information center, be a kind of commons environment for community discourse and social inclusion, promote cultural awareness, foster lifelong learning, facilitate local history and genealogy efforts, and offer government information. Yet another installment was developed in 2007 (Nelson 2008) and added a few new service responses, including public internet access, a commitment to services for immigrants and supporting patrons in: informed citizenship in the context of world affairs, creation and sharing of creative expression, critical evaluation and use of information, participation in physical and online spaces. With each update common themes were carried over and the organization of the information presented changed to better match evolving implementations of public library service roles.[5]

In total, this list of possible roles is as dizzying as it is inspiring. Clearly the range of service roles the library assumes is both changing and expanding and assumes active engagement with information. The latest version of the ALA Policy Manual (ALA Council 2013) cites, in total, eleven service responsibilities, including literacy, instruction and services to the poor, all of which were prominent areas of focus throughout my study. The two service roles that drove the development of my initial inquiry and successive research, however, were a little more restrictive: (1) enabling the acquisition, critical evaluation and need-relevant use of information, and (2) encouraging the expression of creativity through the creation and sharing of multimedia content.[6] Other goals addressed by libraries, like lifelong learning, clearly overlap with these two missions in substantial ways, but for the sake of creating a manageable and defined analytic frame, I narrowed my focus, at least initially, to just those two. These two service roles seemed to most directly support a call for libraries to be engaged in fostering digital literacy through services and thus merited investigation.

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[5] For an elaborate and better narrated presentation of this particular document's history see McClure and Jaeger (2009).

[6] Initially framed as an emphasis on 'critical and creative' components of digital literacy.

SHIFTS IN EDUCATION

By many assessments, the US public education system is in trouble (Singer et al. 2006). As the forces of digital capitalism have swept across the globe over the past few decades, the expectations and needs of education and preparation for participation in the current workforce have changed quite rapidly. The logic of labor markets has sunk deeply into the values and culture that impact policy and education reform, and as a result we've seen an increase in standardization. Our nation has been preoccupied with replicable, portable and competitive assessment ever since the introduction of No Child Left Behind in 2001,[7] amidst a generalized fear of failure to retain leadership in our global economy. The social sciences, arts, and humanities have become a kind of collateral damage in the midst of an ever increasing focus on mathematics, science and regimented testing.[8] If anything, teachers are more pressured, stressed and overwhelmed than ever before[9] and schools sacrifice important context-specific education (situated learning) for desperate access to better funding. Interestingly, even more students go to and graduate from college than ever before and yet they still face a very intimidating job market, a challenge only exacerbated by ever-increasing levels of student loans. On the other end of the spectrum, large numbers of students in disadvantaged communities drop out before making it through high school, and, in most of these places, they face considerably more difficult chances for employment.

Ken Robinson (2011), who is certainly not the first to speak of this occurrence as a kind of crisis, suggests that the rise of industrialism in eras past permanently disfigured education both structurally and culturally. Today, students systematically move through their days cued by bells, segregated by a date of manufacture (their age) instead of their needs or interests. Almost as if on an assembly line, students are shuffled from one location to another, taught by teachers categorized by the distribution of labor embedded in disciplines, moved forward by year on the basis of a progressive accumulation of knowledge. This year's algebra feeds into next year's geometry and

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[7] And has been arguably continued by additional legislation, such as the America COMPETES Act of 2007 and Race to the Top.

[8] Emphasis on STEM (Science, Technology, Engineering and Math) has compounded the existing agendas like report cards for the nation. In the end it appears like the humanities and arts lose out the most, given that the NSF's definition actually includes social science (Gonzalez and Kuenzi 2012).

[9] Dropout rates are incredibly high, compared to other fields. See Fairbank (2013) for a convincing overview.

so on, until one day they might reach calculus, if they work hard enough, or so they are told. Robinson describes this vision of education as a sort of gas-tank model, where students start out as empty tanks ready to be filled up to make their journey through life. The problem is that their tanks were never completely empty to begin with, and there is a whole lot more than gas going into them, substances that may or may not help them to make it effectively through their journeys in life. Save for the occasional bout of graduate school, many of these students never engage in formal education again in their lives, despite the very real fact that they will all indisputably be rolled into life-long learning of all kinds.

Robinson is not alone in his concern for the trajectory of public education. Buschman (2003) makes the argument that the education system faces the very same 'crisis' (or crisis culture) of information society that libraries do, in terms of being consistently disrupted by reduced flows of funding, fragmented identity, and the challenge of putting their great potential for impact as an element in the public democratic sphere into action. By extension public education must also oblige what Buschman identifies as the new public philosophy: technocratic conservative attack that occurs mostly in the form of social exclusion and decontextualized standardization. Buschman (pg. 20) cites Giroux (1983, 1988) and Apple (1982, 1986, 1993, 1996) who identify a variety of issues in schools brought on by the economic-driven public philosophy: failure and dropout rates, the differential performance of minorities, absenteeism and also accountability programs, testing, accreditation processes, and emphasis on credentials over instead, say, learning and meaning. Capitalistic dimensions include privatization, increasing corporate information in classrooms and the continuing conservative nature of reforms as 'market-based' and 'competitive individualism,' effectively privileging those already in power.

What Robinson describes is well-known in the field of sociology of education, and could also be referred to simply as what Lisa Delpit (1988) designates the *culture of power*:[10] codes and rules that reflect those who have power, that are enacted in classrooms. Delpit insightfully points out that participants in this system are seldom directly told the *real* rules of power acquisition, and as

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[10] Many other scholars have referred to this concept in other ways. The preservation of power is a way of talking about social reproduction, or, as Warschauer (2003) says, "education institutions are structured in ways that reflect and contribute to broader social, economic, political and cultural relationships (Bowles and Gintis 1976, Willis 1977)."

Robinson emphasizes, they're often blatantly misled.[11] Those who do successfully navigate the system often do so without any acknowledgement or comprehensive awareness of their own privilege. Beyond these cultural norms manifested in daily life, public education is impacted by many other issues of structural inequality: racism in criminal justice, white flight, the cycle of poverty and more. Kids are brought up being socialized into the American ideal of a meritocracy only to find that individual agency will only get them so far without structural support.

Digital literacy does not fit neatly into the four to six servings[12] of academic discipline students receive each year. Often, computer-based activities happen in isolated labs, where students follow ritualistic patterns inextricably tied to certain software programs that may or may not be phased out in a year or two. In contrast to subjects like mathematics, where we have consistent and widely accepted systems for dependencies and regularized measurement, computer, information and media literacy skills have no universally accepted metrics, outside of perhaps the prerequisite of keyboarding and the effective use of a mouse.[13] Even these assumptions are changing as we depart from a world where computers are our sole point of digital information access and authorship. In low-funding public school settings teachers may at best have a couple of computers in their classroom to share amongst dozens of students. Access to the latest technologies is really just one facet of this problem, however; the social construction of education lies at the heart of the issue (Warschauer 2003). On-going debates in the US have well-problematized our framing of educational methods, be they understood as a process of transmission (Hirsch 1987), constructivism (Piaget 1970, Papert 1980), learning within communities of practice (Lave and Wenger 1991, Brown, Collins and Duguid 1989), apprenticeship (Vygotsky 1978, Collins, Brown and Newman 1989), critical pedagogy (Freire 1994) or in relation to tools and knowledge and outside of schools entirely (Illich 1971, 1973). How we think about education—where it happens,

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[11] And Ivan Illich, as explained by David Gauntlett, who I will introduce later, would claim that students are misled such that they believe they are unable to do things for themselves at all.

[12] The subjects we see emphasized in standardized testing, give or take a few: math, science, English, history and language.

[13] Or, perhaps, to demonstrate my point more poignantly, recent potential requirements may be use of touch screens and other interface manipulations, like orienting attention and directing actions in a 3D environment.

with whom it happens, why it happens, and for what purpose it happens—absolutely determines our answer to the question of the social roles of civic institutions like the public library.

The ALA's Office for Information Technology Policy (OITP) recently published the findings from what began in 2011 as a task force, entitled Digital Literacy, Libraries and Public Policy (2013a, 2013b). The report seeks to be an overview of the involvements of libraries in fostering digital literacies as well as a general guide for action. It identifies three primary discourses that take place around digital literacy: inclusion, education and the workforce. I will revisit and distinguish the first of these in greater detail in an upcoming section on contextualizing access to technologies but it is worth examining the other two here to understand what they imply about the library's potential and realized contemporary social roles.

The public library continues to be known for providing lifelong opportunities for instruction and extracurricular learning but is increasingly being recognized for cultivating advanced digital literacy skills, through project creation and creative expression in K-12 settings. Much of the focus happens in school libraries, where concern over standards[14] and teacher competencies remains dominant but efforts like the Digital Media and Learning initiative of the MacArthur Foundation strive to enable learning in after-school settings and alternative environments like museums.

Unfortunately in Illinois much of the focus in education and workforce development remains on the barebones essentials. The federally-mandated tests[15] do not include substantive dimensions of digital literacy, instead focusing on a minimal set of basic subjects like reading, writing, math and science. Additionally, the format of these exams emphasizes rote memorization and ritualistic operations, which raises questions about what they can truly measure about a given student's ability to write and read in a variety of media contexts, apply math in interdisciplinary settings and

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[14] 21st Century Learning frameworks, the National Educational Technology Standards (from ISTE), Common Core Standards and the recent Technology and Engineering Learning assessment of the National Assessment of Educational Programs (NAEP) are all examples of attempts to codify and measure dimensions of digital literacies.

[15] Find details on The Illinois Standards Achievement Test (ISAT) at http://www.isbe.state.il.us/assessment/isat.htm and on the Prairie State Achievement Exam at http://www.isbe.net/assessment/psae.htm. The Illinois State Board of Education does not include any standards or easily locatable information about digital literacy or technology learning assessments.

participate in the processes of science, such as hypothesis formation and experimentation. While a student's capability to navigate through a given exam on a computer might matter in a minimal way, the actual content tested on leaves a lot of room open. Optimistically this could allow for teachers to cover the minimal set of standards material and then move on to teaching digital literacies in ways appropriate to their preferences and student needs but realistically this possibility often falls prey to pressure to keep schools in the black by ensuring students pass tests. Similarly institutions like the National Center for Education Statistics focus primarily on basic literacies (the three "r's") amongst youth and adult learners alike, making it difficult to even know where to begin when it comes to getting a sense for where we stand in terms of digital literacies.

Libraries also continue to provide base-line training for job-seekers, offering internet and limited computer software training for unemployed, under-skilled and elderly populations. Some offer resume workshops and career centers or helpful services like activities for children while adults work. The Illinois Department of Commerce and Economic Opportunity (DCEO) supports programs for these activities, including some libraries (and programs attached to them) and operations like WorkNet, a place the library may refer patrons, make an attempt to at least assess and enable computer literacy.[16] Nearly all of these programs are social services and safety net contributions to economic development, not programs for advanced digital literacies and associated businesses or innovative fields of practice.

The US public library can (and currently does) serve as a component of our public education system, and when decoupled from more formal or explicit institutions, can break free from some of the imposed limitations outlined above. There are no restrictions on age, no subjects enforced in timetables, and tremendous potential for collaborative and contextualized learning with varying degrees of formality, directionality and scope. Public libraries grapple with the very fundamentals behind education: aiding in the cultivation of talents and sensibilities in individuals, deepening understandings of the world by sharing and challenging knowledge, and providing skills and resources required to earn a living and be economically, morally and politically productive. If anything, there is an opportunity for the public library to aggressively step up its role, through

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[16] Characterized by a person's ability to type, use a mouse effectively to control interfaces, and extends to basic navigation of the web, as well as file organization.

actions like collaborating with nearby community colleges, serving as a public lab for multimedia production, leveraging resources dedicated to multicultural community history and more.

DIGITAL LITERACY

Digital literacy provides a uniquely appropriate perspective to studying the relationship between education, learning and service roles in public libraries. It is not without a layer of abstraction, and consequently I have developed my conceptualization of it as an engaged scholar since my early pilot study back in 2008. At the time I found the discourse on the digital divide wanting, and sought to explain the socio-cultural and cognitive dimensions of technology adoption and application as a kind of "digital consciousness" (Ginger 2008) that built upon Adam Banks' notion of experiential access (Banks 2006). In some ways this idea reflected the digital natives (Prensky 2001, Palfrey and Gasser 2008) debate, which had reached a peak around this time, and still lingers in discourse on the topic even today. As I struggled with reconciling the various views I traced a path through the surrounding body of literature that led me to ultimately characterize the term with two imperative qualifiers: critical and creative. This composite definition informed the formulation of research questions and acted as an analytic lens for data collection and successive scrutiny. Over the course of several stages of my dissertation research I grew to adopt an even broader approach to the issue, eventually choosing the model pioneered by Douglas Belshaw (2012), which will be addressed specifically in relation to my data and discoveries in the discussion chapter. For now, I will cover the seed of the dissertation: the definition of digital literacy and the consequential questions that can be raised about it in the context of public libraries.

DEFINING LITERACY

Literacy finds many different definitions in varying contexts, but one of the most globally conscious, as well as universally adopted, is that put forth by the United Nations Educational, Scientific and Cultural Organization (UNESCO 2004):

> *Literacy is the ability to identify, understand, interpret, create, communicate and compute,[17] using printed and written materials associated with varying contexts. Literacy*

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[17] Compute as in basic mathematics, not modern computing or computer operations.

involves a continuum of learning in enabling individuals to achieve their goals, to develop

their knowledge and potential and to participate fully in their community and wider society.

In presenting this definition UNESCO (2004, 2005) thoughtfully positions literacy as a set of social practices rather than a singular skill, and elevates it to the level of a human right (the right to education, UNESCO 2005). It suggests that meaningful acquisition and application of literacy provides the basis for positive social transformation, justice, and personal and collective freedom. Although this characterization establishes desired outcomes that include a dimension of relevancy and everyday practice, the UN report purposely restricts their focus to text and written materials. It is at this juncture where digital literacy comes into play.

In the vernacular, literacy often is taken to be equivalent to competency, proficiency or functionality, and is frequently affixed to other words to create compound meanings, such as information literacy, (new) media literacy, and stranger and perhaps contested pairings, such as emotional literacy.[18] Digital literacy is another one of these duos, and like the others it has a surrounding body of literature and discourse. However, I think it stands apart because it is well-positioned to appropriately frame research on libraries, information technology and empowerment, as will be explained.

Many studies of digital literacy have turned up over the course of the past two decades, but they can generally be sorted into two major categories: (1) conceptual (abstract) definitions, often advocacy-laden, and (2) "standardized sets of operations intended to provide national and international normalizations" (Lankshear and Knobel 2006:21), or, more simply, comparable (and usually measurable) described skills. In a sense this is just theory and application, but the examples are so numerous and vague that they become difficult to track, especially when someone is seeking to determine which theory leads to which application. Even still, digital literacy research is largely international[19] and this makes direct comparison and universal classification difficult, and a

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[18] For a brief history and example of emotional literacy analysis in action see Liau, Liau, Teoh, Liau 2003. As Burman (2009) points out, however, the term is still somewhat contested in its use and needs to be considered and employed with caution.

[19] An ever-increasing amount of research on digital literacy education and associated practices is taking place in countries outside of the US, including Ireland (Digital Literacy in Primary Schools 2009), Greece (Koutsogiannis

dominant portion of it seems to be focused on youth enrolled in K-12 education,[20] which delivers an incomplete view of the issue. Included here is *not* a comprehensive literature review[21] of all 'digitally' associated literacies but instead a simpler outcome-oriented alignment of commonalities found in several models of digital literacy that I think are important.

IN THE ABSTRACT

Conceptual definitions of digital literacy include a call for an alteration of the media and mode limitation seen in the aforementioned UN articulation: reading and writing with physical text. Some interpret this as broadly as the ability to comprehend information however it is presented physically, no matter how complex[22] (adapted from Lanham 1995), while others provide a new concentration as a stipulation: the ability to understand, evaluate and organize information represented through ICTs (among the first to propose this was Gilster[23] 1998; there have been many others since). The field of New Literacy Studies is so bold as to suggest that digital literacy[24] is a facet of entirely 'new literacies' and that though these literacies include practices mediated by

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2007, Mitsikopoulou 2007), Israel (Eshet-Alkalai & Amichai-Hamburger 2004, Eshet-Alkalai & Chajut 2009), Spain (Meneses and Mominó 2010), Australia (Walsh 2010, Bulfin and North 2007), Brazil (Braga 2007), South Africa (Jacobs 2004, Walton 2007), Botswana (Mutula and Mutula 2007), Rwanda (Mukama & Andersson 2008), Hong Kong (Lee 2002) and more. Together these comprise a rich array of ideas and perspectives.

[20] It is widely acknowledged that digital technologies significantly impact literacy developments in K-12 education (Walsh 2010, Carrington and Robinson 2009, Jones 2007, and more), and this has been given some special attention with young children (Hisrich and Blanchard 2009, Burnett et al. 2006, Russo et al. 2009, Marsh 2005). The popularized 'digital natives' concept (Prensky 2001, Palfrey and Gasser 2008) may be responsible for this heightened interest and concern, but could also be a reflection of the current iteration of moral-panic that is reoccurring in education (Bennett, Maton and Kervin 2008).

[21] Readers seeking a more thorough review of material on digital literacy would do well to consult Lankshear and Knobel (2008) and Belshaw (2012).

[22] This might be stated more specifically as any "ways of making meaning with diverse semiotic resources" (Warschauer 2010:124) that could enable the discovery of 'invisible literacies' (Baynham 1995, Warschauer 2010), which is too broad of an approach to be useful here.

[23] A budding typology that included several aspects: assembling knowledge, evaluating information, searching and navigating in non-linear routes.

[24] And in fact, Lankshear and Knobel (2008) advocate that an expansive frame of 'digital literacies' (plural) more honestly accounts for the diversity of research on the topic, and ties well into previous research on literacies.

post-typographic forms of text they also inherently involve social behaviors and patterns, such as being 'participatory,' 'collaborative,' or more 'distributed' (Lankshear and Knobel 2008, Jenkins et al. 2006, Mills 2010, Hague and Payton 2010). Such practices may dramatically transform the production of knowledge (Warschauer 2010, Tapscott and Williams 2008) and this also implies that new sets of cultural or social relations may be necessarily represented through information sharing and expression with ICTs. Stated differently, it could be said that these new social practices are value-laden, and these values become intertwined with the experience process and overall medium of various ICTs. Many discussions on related issues seem to indicate this is the case, such as the discourse on digital natives (Bennett et al. 2008), privacy and impression management in social networking sites (Utz and Kramer 2009), and media ideologies (Gershon 2010), to name just a few.

The potential of digital literacy, to some extent, actually lies in its flexibility and lack of strong structure. In the 1980's scholars grappled with the idea of computer literacy, and later, in the 1990's they incorporated a broader view of information literacy (Bruce 1994, 1997). Bawden (2008) explains that the roots of digital literacy are interrelated to a host of other terms: library literacy (Bawden 2001), network literacy (McClure 1994), informacy (Neelameghan 1995), mediacy (Inoue, Naito, and Koshizuka 1997), and e-literacy (Martin 2003, 2005). Though the objective is not to create one master form of digital literacy, Lankshear and Knobel (2008) and Belshaw (2012) suggest that a view of digital *literacies* (plural) is appropriate, and can account for the underpinnings of traditional text literacy, computer literacy, background knowledge, central competencies like knowledge assembly, and attitudes or perspectives, like independent learning that relies on patience and persistence. I will return to this issue later on in the text, as it is quite important.

Digital literacy is notably situated in related sociocultural debates (Koutsogiannis 2007, Williams 2003), topics like textual design and multimodality (Kress 2003, Kress & Van Leeuwen 2001), the trajectory of education in the global information age (Cope & Kalantzis 2000, Luke & Carrington 2003), what forms or adoption processes the social practices of literacy take (Lankshear and

Knobel 2008),[25] and in envisioning new media as potential sites or environments of learning (Gee 2004). This discourse may be, in many cases, a reproduction of previously-encountered literacy debates (Collins & Blot 2003), and a great deal of the extant reports on digital literacy could stand to benefit from integrating a broader range of disciplinary perspectives.[26] Conversations too far removed from practice and experience may give insufficient attention to cultural tradition, the role of identities and local economic factors, to the point where we may fall into the trap of reinforcing digital capitalism, in a variation on a broader theme of the digital divide (Pieterse 2005, Koutsogiannis 2007). Despite all of this, the rhetoric does illustrate the sheer assemblage of ideologies on the topic, as well as the powerful interdisciplinary constituency of scholarship.

AS MEASURED

The fragmented theory from the numerous academic disciplines connected to digital literacy is passed on to its application in research; many measures of digital literacy exist in recent publications. Similar to education or intersections of humanities topics and social science, digital literacy seems to be most often measured in two ways: (1) in terms of flexible (qualitatively described and socially situated) examples and typologies of best practices or processes as well as (2) specifically measured aptitudes and behaviors, usually seen in the performance of tasks.

A complete review of studies employing these types of measures is beyond the scope of this work. Instead, reviewed here are exemplars that give an idea of the ways definitions of digital literacy might be expressed in measurement.

First is the model for participatory culture discussed by Jenkins et al. (2006). In their report the authors argue for the existence of an emerging culture tied to digital literacy, described as having "relatively low barriers to artistic expression and civic engagement, strong support for creating

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[25] Though they make reference to this in the introduction, examples can be found throughout their whole book by a range of authors: David Bawden, Genevieve Marie Johnson, Maggie Fieldhouse, David Nicholas, David Buckingham, and Ola Erstad.

[26] One such example can be seen in Williams' 2003 assessment of the National Research Council's 1999 report *Being fluent with information technology*. While the report effectively captured fluency with IT in terms of technical skills, concepts and history, it failed to articulate many of the ways literacy connects to social structures related to power, democracy, and cultural hegemony.

and sharing one's creations, and some type of informal mentorship whereby what is known by the most experienced is passed along to novices" (Jenkins et al. 2006:3) The authors suggest that the recipe for participatory culture includes many social practices connected to engagement with ICTs, such as affiliations in online communities, digital expressions and circulations, and distributed problem-solving. They see this social action as related fundamentally to other challenges, such as digital inclusion and participation, transparency of information, and the question of ethics in the proliferation of new media. Out of this they draw a set of skills and cultural competencies and give examples that include teaching scenarios and encouragement for best practices. For instance, they describe transmedia navigation, "the ability to deal with the flow of stories and information across multiple modalities" (Jenkins et al. 2006:46) by presenting the case of Pokémon, a fictitious set of creatures for which there is no single core source of information. Children learn about Pokémon by following stories of their experiences and characteristics in a variety of mediums with different affordances and systems of representation, including card games, television, videogames and websites. Though Pokémon appear in many contexts, children still have a grasp of who and what they are. The application of digital literacy seen here is helpful in that it constructs useful and flexible categories and instances of social practice, but without chaining them to specific information technologies.

Second, Eshet-Alkalai (2012) together with other colleagues (with Amichai-Hamburger 2004 and Chajut 2009) introduce a compelling model in their operationalization of digital literacy as testable skills: photovisual literacy, reproduction literacy, branching literacy, information literacy, socioemotional literacy, and real-time thinking skills. Their series of studies (2004, 2009, 2012) featured a sample comprised of a diverse group of participants controlled for age, education and socioeconomic variables. They demonstrated the examination of digital literacy skills through verifiable and reliable tests over time, but with sufficiently complicated tasks. For instance, participants were challenged to use a word processor to modify the meaning of text by rearranging its parts. The work involved included an understanding of connotation, grammar, and composition as well as knowledge of the interface and comfort with hardware manipulation. In comparison to other simpler measures of digital literacy, such as knowing how to send an e-mail,[27] the authors

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[27] As seen in Meneses and Mominó 2010, for instance.

more effectively capture digital literacy in its context: while they might pay more attention to technical aptitudes and cognitive abilities with regards to certain variables, they acknowledge the complexity and embeddedness of technology use. Knowing how to send an e-mail has as much to do with knowing what or how to write and grasping the cultural norms of the people using your domain of the internet as it does using a mouse, typing or navigating Gmail.

What makes these examples powerful is their emphasis on surrounding context and application-oriented research. They are also in need of one another. Jenkins et al. don't present metrics that work well with portable, operationalized (hypothesis testing) research and evaluation and Eshet-Alkalai et al. rely on cognitive models that may not draw upon enough of the wisdom found in cultural literacy studies, such as the plight of literacy as relative or contextualized. Research on digital literacy more generally falls in to the same trap: how to balance giving sufficient attention to informing theory and at the same time establishing and testing comparable, valid and applicable models or measures.

DIFFERENTIATING AND DECIPHERING THE DIGITAL DIVIDE

Before addressing my chosen arrangement for inquiry into digital literacy I want to take a moment to explain how I see it as related to the digital divide. In community informatics a lot of work on the subject of information society examines people's ability to participate in it meaningfully, be it as part of global conversations, local democracy, or broad social change movements. The perspective this often instinctually assumes is that participation boils down to a matter (or requirement) of access, known commonly as the digital divide, or, stated perhaps more appropriately, the power differences between people or communities tied to varying levels of computer and internet opportunity.

Establishing the digital divide as our enemy necessarily embarks us on a quest for digital solutions, but the lack of possession of material access to technology and the absence of skills, community support and perceptions to make effective use of it is often a symptom of deeper, prolonged issues. In some sense the digital divide is a moving target, because the make-up of ICTs shifts as we look back over time. We've been in something of an information revolution (or crisis) for over thirty years. First it was the onset of significant availability of computers in business and homes (the computer and information revolutions, Beniger 1986 and Jones 1982, cited in Williams 2001),

then it was the internet (DiMaggio et al. 2001, Warschauer 2003) and more recently mobility (Johnson, Levine and Smith 2009, Horrigan 2009b), broadband (Horrigan 2008, 2009a, Smith 2010) and Web 2.0 (Scholz 2008). It is worth taking a step back, disentangling oneself from the ever-changing constitution of ICTs, and interrogating the underlying assumptions and agendas of the digital divide and the credence for the proliferation of ICTs.

A fitting example might be Jan Pieterse (2005), who questions the agenda behind the discourse of the digital divide in his critique of information communication technologies for development, or ICT4D. His argument takes place in the context of digital capitalism, where networks of corporations drive and dominate cyberspace and subject the world to restrictive types of media and deepen forces like consumerism (Schiller 2000), which is not unlike the network society described by Castells (2010). ICT4D implies the imposition of flawed (or loaded) developmental models, such as technological determinism or neo-liberalism (market forces are assumed to be equivalent to development) that serve to mask the true intentions of insidious political and economic agendas: to make money off of poor people through selling more material goods and exploiting labor, to control markets with ideologies like copyright and to force developing countries to choose between dependence on NGO's or corporate networks. Pieterse's stance is accurate, if resoundingly pessimistic, and reminds us of the baggage we drag with us when we deploy ICTs to 'bridge the divide' between peoples, especially in the international context. Looking at just the possession, use and access to information technologies does not preclude attention to outcomes and impacts. Furthermore we often forget that these tools reflect the values and intentions of their creators, which may do more to sustain privilege than dismantle it.

Another more recent and localized example can be found in the work of Virginia Eubanks (2007), who worked with low-income women living in transitional circumstances participating in popular technology programs in her local YWCA. She argues that emphasis on a "distributive paradigm," one that seeks to equally distribute technologies, is an inappropriate model to describe the social relations that may or may not enable a person to be empowered or participate meaningfully in shaping information society. Perhaps the most interesting part of her analysis was a series of diagrams drawn by participants illustrating their visual annotations of the traditional 'divide' diagram of information 'haves' and 'have-nots.' While they did not all have the same features in common, they demonstrated a remarkable familiarity with a variety of conceptions of social

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exclusion that really just demonstrated that the digital divide is a reductive and faulty theory. People deal with a lot more than if they've got a computer or internet, and the context in which they're using these contraptions matters a lot – it's one thing to own your own laptop to watch cat videos on the web, it's another to do data entry for ten hours straight on an old and failing workstation. While filling out a resume on a cell phone is much harder than it is on a desktop, they're both a big problem if you don't know how to present yourself in terms that make sense to employers. Giving people computers and telling them what buttons do is simply not enough, and it may in fact be a deterrent. The digital divide may also be a pessimistic view, explained in adept form by Eubanks, "A bridge over the digital divide underestimates the skills and resources of the people on the 'deficit' side of the divide. It also distorts the very qualities of networked communication that can make a powerful tool for social change: its flexibility, its openness and its ability to connect people to people" (Eubanks 2007:10).

Its failings aside, many researchers have gone about the task of revealing the digital divide and have found helpful ways to describe dimensions related to unequal distribution and use of ICTs: from material access and a simplified set of skills (DiMaggio et al. 2001, Banks 2006, Van Dijk and Hacker 2003) to mental access (interest in ICT) and usage opportunities (Van Dijk and Hacker 2003, Banks 2006) to perceptions of these variables (Porter and Donthu 2006) to the accumulative ability to openly critique technology tools (Banks 2006). Van Dijk and Hacker express the situation rather appropriately when they criticize the passing way most articles situate their findings:

> *…based on a rather static and superficial sociological analysis of the present situation. Constructing rather arbitrary background variables of individual resources at a single point in time does not make a theory that is able to relate to social and technological development, that is to say, the level of society and technology.* (Van Dijk and Hacker 2003).

They instead link ICT policy to long-lasting and concrete positive outcomes, specifically social inclusion and equal distribution of resources for life chances, and suggest researchers place emphasis on variations of classic factors that strongly determine socioeconomic status, like education. In other words, I would argue that a positive outcome of the digital divide is that it has led us back to the discourse, theory and tools that are rolled up into literacy. While my dissertation

research deals primarily with digital literacies, I would never wish to assume that these are the extent or limit of the factors that empower people. In a sense this is just another reflection of my view of community informatics (as established by Stoecker in 2005), that really we can see ourselves as a subset of community development and work with many other models or methods in an interdisciplinary or collaborative fashion.

The shift in focus from divide to literacy might also be desirable because the emphasis can be more easily placed on working with individuals, who then in turn effect social change in the aggregate. The learner ought to play a strong role in orienting their own education agenda, not just external authorities like government, corporations or NGO's. In this way access instead becomes a down payment for literacy, empowerment and inclusion, not an end goal.

AND WHAT ABOUT OTHER LITERACIES?

So why examine digital literacy, as opposed to the many other compound affixations? What may ultimately set digital literacy apart from classic media, visual, and information literacy is that it is fundamentally about being an active player with use of digital tools and expression mediums. The study of the influence of a hundred channels of information all produced by external authorities might be an act of raising awareness, but viewers in the contemporary[28] have little or no ability to shape what's on the airwaves of radio or TV. They have limited access to the print-based publishing world and little say in the formalized rules of visual design in print media. By contrast, the discourse, ideas and content that perpetuate throughout the internet and via ICTs is in large part authored by individuals and organizations of varying type and scope. Digital literacy is represented by involved and directed activity or processes that are about interacting and producing; it must go beyond watching, reading and even interpreting and understanding as much as it might go beyond experience and comfort with computers and input devices.[29] Exposure to ICTs does not

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[28] When radio and TV first debuted they had considerable entrepreneur uptake and were not dominated by a limited set of corporate powers (Zittrain 2008). This fell away over the years to reach our current state of media company conglomerations.

[29] Readers will notice I have not made much effort to distinguish computer literacy here. I don't really think it's a relevant term anymore, because of its implied restriction: computers. We use much more than those to access

translate to competence, even when it concerns young learners, but research has begun to suggest that those who are indoctrinated into the active-producer norms of the internet will apply these skills and conceptual models to classic media like TV (Shirky 2010). Writing code for your own software program or painting a picture on the screen with a digital tablet are not easily reducible to the "application" or "interpretation" of information in a classical sense. These tasks involve a dimension of physical interaction, interactive and multi-step crafting and usually require attention given to social context to be meaningful. The recent decade has produced and made accessible more information and communication opportunity than ever known before, but leveraging the quantity to produce quality is necessarily an active, iterative and reflexive process of inquiry, interpretation and production.

BUILDING A RESEARCH QUESTION

The public library has a substantial array of possible social roles that translate into a variety of continually transforming service roles, including some that relate directly and indirectly to digital literacy. The ALA has contended that digital literacy ought to be of concern to libraries of all kinds, including those in academic, public and school settings. Beyond commissioning the creation of member-wide services like DigitalLearn.org and organizing a digital literacy task force, the Office for Information Technology Policy has recently published "Conclusions & Recommendations for Digital Literacy Programs and Libraries" (2013a) as a way to drive home several objectives, paraphrased here:

- **Increase investment in digital literacy** through going beyond general promotion to actual support at the local, state, and federal levels. Investment is stipulated with several key qualifiers, such as continued and simultaneous focus on traditional literacies, stress on a combination of access and skills, as well as attention to real-world impacts like classroom performance, workforce readiness and participation in civic life.
- **Develop and sustain partnerships** in order to better enable funding, sustainable and high quality programs and context-specific strategies. They suggest libraries must actively seek partners out to add capacity, extend influence and minimize redundancies.

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information these days. More often than not the term just refers to knowing how to do things like operate a mouse and show some understanding of the conceptual models taken up by operating systems.

- **Strengthen research and assessment** to help practitioners, scholars, community members and other stakeholders demonstrate the value of investments. Studies like this one are cited as key to determining success and aiding returns on future work as well as addressing abstract issues such as definitions and boundaries, learning contexts and more.

- **Increase access to programming** by enabling activities with a blend of appropriate infrastructure, awareness and reflexivity, and flexible or contextual design. The statement explicitly requires that initiatives must be "culturally sensitive and be aware of unique needs and challenges of diverse populations" (pg 4), such as those learning English or people with differing degrees of physical ability.

This call to action naturally raises several questions. Do public libraries have a similar awareness and understanding of what digital literacy entails? Are they invested in abstract understandings of digital literacy and do they have very specific metrics to evaluate it? To what extent are libraries in places like Illinois carrying out these objectives? What do they look like, in reality, in different kinds of settings? How might a scholar study digital literacy and library services in such a way that we could better understand a broader context?

This report was released after I had set out on my study, but it is no coincidence that it matches my topic nearly perfectly, as the research area of digital literacy has been escalating in importance over the past several years, which is why my attention was drawn to it in the first place. Ultimately it all starts with one concise yet rather complex central research question:

What is the role of the Illinois public library in fostering digital literacy?

Inherent to this inquiry are two assumptions that I continually examined throughout my investigation:

1. What do the roles of the public library look like in action? What are the reported service roles that relate to digital literacy?
2. How do librarians conceptualize and relate to digital literacy? What can I learn from this?

I further refined my research question by adding another filter: What does this look like in libraries that operate in underserved communities? What more do we have to learn from these places? This inquiry also had an assumption to unravel: how might someone define underserved communities?

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I chose to approach this central question as a study of the public library as an institution. This was operationalized by seeking to understand how libraries are fostering digital literacies through activities, people, policies, and infrastructure. Effectively, these four lenses formed an investigative framework for observing the context in which service roles happen. My sample, explained in an upcoming section, demonstrates what "underserved" means in the context of this study. I built off of this central question set with a series of more specific inquiries:

- What do libraries think Digital Literacy is? How does this factor into policy? Why? Is the operational definition of digital literacy evolving?
- What kinds of equipment and internet access do they have? What activities happen? How well do they work? Why are these things the case?
- Who is involved, who do they work with, in terms of both organizations and individuals, and how do they make those connections? Why do partnerships or collaborations happen or matter?
- Does engagement with the library affect the way patrons learn to use or experience digital technologies? How? Why?
- How do you measure the impacts related to digital literacy? What evidence of impacts do we have? Why do we measure it in this way?
- What might the library do moving forward in terms of digital literacy related service roles? Why and do we want that?

This list of questions may seem overwhelming or nearly boundless at first. My study doesn't answer all of them, by any means. It instead sheds some light on portions or facets of all of them. The next two sections clarify this by situating the gaps in data and detailing the research design.

LITERATURE REVIEW - RELATED STUDIES

In some respect this dissertation study is positioned as a response to the many studies on digital literacy and public libraries today. Most often these studies fall into two categories: (1) broad, sweeping initiatives that collect data comparing libraries all over the US, or (2) singular or small collections of case studies showcasing particular programs in libraries. They differ from my work for a number of reasons. First, they don't examine the mid-level (state subset) context. In Illinois, this means Chicago warps the view of the entire state for large-scale studies, and small-scale studies are often compared to the only general data available, which is typically national. I seek to better situate my data by localizing it and representing it in the terms of the conditions in which it is actually encountered. Second, small-scale studies tend to be idealized, positive cases and often overlook issues like structural privilege and system-level policies or arrangements like supportive library boards. Frequently, these idyllic stories of libraries don't feature the very real challenges libraries that serve disadvantaged populations face and provide unrealistic expectations for best practice models. Third, large-scale studies are typically less able to note the full scope of important activities or people, elements that often determine the real impact of both infrastructure assets and technology policies.

Fortunately, the body of scholarship on topics related to digital literacy programs and public computing infrastructure in libraries is considerable, especially as the library's future role continues to be negotiated. As a comprehensive literature review of all of this would be a dissertation unto itself, this section instead presents a selection of a few pertinent examples for analysis.

GOVERNMENT-DRIVEN PROMOTION

The US government formally recognizes the importance of digital literacy in stimulating the development of both individuals and communities. www.digitalliteracy.gov, a web portal backed by an impressive group of government organizations,[30] features a variety of resources, including

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[30] The U.S. Department of Commerce, U.S. Department of Education, U.S. Department of Energy, Federal Communications Commission, U.S. Department of Health and Human Services, U.S. Department of Housing and Urban Development, U.S. Department of Labor, Institute of Museum and Library Services, Corporation for National and Community Service, and U.S. Department of Agriculture.

activities/tutorials, curriculum, research, videos and more. A significant portion of these resources are specifically designed for libraries, such as exemplary programs found in case studies or instructional documents. One example is the *Museums, Libraries and 21st Century Skills* (2009) report, popular at the time of my proposal, which provides a self-assessment tool for institutions interested in guiding themselves along the government-sanctioned digital literacy development routes. The Institute of Museum and Library Services (IMLS) promotes what they refer to as 21st century skills as a compelling national imperative, a requirement for maintaining U.S. global competitiveness and ensuring personal success. Throughout the publication they continually compare 20th and 21st century library and museum characteristics, emphasizing that in the current context these organizations need to be interactive, audience-driven places. They must collaborate with other groups and assume multidirectional organizational structures, all in the name of life-long learning and education in a school system and workforce increasingly dominated by non-routine tasks.[31] The report's self-evaluation tool is somewhat vague, referring to approximate percentages that cannot quite summarize or measure complex goals, competencies and skills, but it succeeds in calling attention to several important factors: (1) institutional assets, including people, IT/collection infrastructure, programs, etc. (2) leadership and management issues, such as planning or sustainability, (3) the importance of partnering with other anchor institutions, and (4) accountability for measuring and improving all of these aspects. The result is that libraries that make use of this kind of evaluation will likely have an appropriately broad focus but probably fall short when it comes to working to operationalize contested or complicated concepts like creativity, diversity, or effective communication.

Realistically, though, if a librarian from a rural or underserved community were to read this report, they'd likely have a lot of trouble making sense of it for their own context. They wouldn't necessarily know what innovative applications of ICTs could look like in smaller and low-budget libraries, nor would they know how to run educational programs for patrons to, say, help them understand the ethical and legal implications as well as opportunities present in sharing videos on YouTube. They may not even have anyone on the staff who has ever posted a video to the internet

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[31] The report makes reference to Autor, D.H., Levy, F., Murnane, J. (2003). "The Skill Content of Recent Technological Change: An Empirical Exploration." *Quarterly Journal of Economics,* 118, 1279-1334, in claiming this shift.

in the first place. While not always the case, this is nonetheless a significant challenge when pushing for the adoption of digital literacy empowerment agendas; reports like these assume a nominal level of familiarity and participation in internet-driven culture and expectations.

NATIONAL SURVEYS ON PUBLIC LIBRARIES

As mentioned, many joint studies have inquired about the importance of public computing and information access in libraries in recent years. In a collaborative study conducted by the Pew Internet and American Life Project and the University of Illinois at Urbana-Champaign (Estabrook, Witt and Rainie 2007) researchers found that the internet is most certainly the front-line go-to source for many patrons and that people come to the library with different needs depending on their internet access at home and in the workplace. The report concluded, in part, that e-government is no longer an option, but a necessity. Findings such as this help us to understand the potential the library holds for aiding a variety of populations in crucial information access and help to supply some of the reasons libraries remain a key site for digital literacy concerns.

Perhaps the most famous collection of nation-wide and case-based studies on internet services and related policies in public libraries are the assemblage of works belonging to Charles McClure, Paul Jaeger and John Bertot. Together, in collaboration with other scholars, institutions and organizations, including the American Library Association,[32] the Institute of Museum and Library Services,[33] the Bill and Melinda Gates Foundation, the Information Institute of the Florida State University, and a number of research centers[34] at the University of Maryland, they have published an enormous amount of material on e-government, networking and broadband, and information policy in public libraries.

Of their studies, the series of national surveys[35] conducted periodically from 1994 to 2012 on public libraries and the internet are a key reference point for this project. Though the details have

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[32] And, by extension, the Public Library Association.

[33] Which previously included the National Commission on Libraries and Information Science (NCLIS).

[34] The Center for Information Policy and Electronic Government (CIPEG), The Center for Library and Information Innovation (CLII) and, now, the combination of the two as the Information Policy and Access Center (iPAC).

[35] Too many to cite here, see the numerous Bertot et al. and McClure et al. entries in the references.

varied over the years, they have helped to establish a kind of census for public computing and internet services in public libraries and contain information ranging from the basics, such as the number of hours a given library is open, to more detailed measures, such as the services available to patrons or the speed of the provided internet. The results of these surveys provide a global reference point for where libraries are (and have been), all the way down to a state-level analysis. They are ideal if a researcher wants to know what the technology-related operating expenditures for rural or high poverty public libraries might look like, or even if they want to know whether to expect digital cameras for loan in one of these places. Unfortunately, while the survey data illustrates a powerful narrative about the trends present in the midst of our information society, they don't tell us much about the individual stories that make up the numbers. Individual technology program innovations, remarkable people knit together by social capital, and the nuances of local policy are necessarily absent from such studies, which is precisely why there is an identified need for a more granular approach to better discern social impact. It is important to note that these authors are not ignorant of the limitations of the large surveys; they often call for additional research, such as investigation into the differences funding systems make in rural library service provision (Real et al. 2014). Beyond this, states like Illinois, which are in many ways drastically defined by a single city, are difficult to reconcile with the sort of data afforded by big surveys.

ILLINOIS CASE STUDIES

Few case studies specifically on Illinois *public* libraries[36] exist, particularly any involving rigorous research on workshops, programs or initiatives related to digital literacy. A notable exception is

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[36] Studies on digital literacy and other community institutions and organizations, such as community technology centers or after school programs, do exist but are not covered here. Nearly every community has a public library and nearly every one of those offers public computing. Many offer programs and services that directly relate to digital literacy but we don't have much data on this. The fact that other organizations work to address digital literacy needs often independently of the public library (and that none of this seems to be reflected in the literature) is part of the motivation behind this investigation.

the Chicago Public Library (CPL), which has been consistently recognized[37] for pioneering a totally different approach to teen spaces through YOUmedia (Tripp 2011, Larson et al 2013) and, more recently, an engagement-focused website. They are also home to the Cybernavigators,[38] paid adjunct and part-time staff who aid users in a variety of tasks on public computer workstations. Cybernavigators help patrons to both find critical, relevant information, such as government resources, as well as actively produce web content, even if it might be as simple as posting a resume to a job-finding website. They are an excellent example of a 'resource' that fosters the kind of digital literacy that often goes beyond simple computer basics (Williams 2010a, Duffy et al 2011). Williams (2010b, 2011) postulates that they may be a sign of what's to come in the world of library reference, and, like so many aspects of the public library, are a service measurably tied to social capital.

Locally, a similar program exists at The Urbana Free Library (TUFL), known simply as the Technology Volunteers, the primary difference being that they are library and information science students who work for free. Both of these programs involve an interesting dimension of policy. Volunteers or adjunct staff enable an extension of services regularly offered by the library, but do so in a more informal manner; they may not carry the same duties or obligations as an ordinary librarian (Rodgers 2010, Kent et al. 2010).

While they are seldom the object of study for articles published in academic journals, interesting or remarkable digital literacy programs do find mention in magazines, newspapers, blogs and other less formal publications. Wilmette[39] Public Library's Game Design Club, for instance, was run as a feature in the March 2009 edition of *Computers in Libraries*. The club, comprised mostly of teens, could easily be identified as what Henry Jenkins (2006) would call participatory culture: informal affiliation, expression, and collaborative problem-solving, the kind of activities that, by many definitions, are competencies underlying digital literacy. Participants learn—often from one

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[37] A John D. and Catherine T. MacArthur Foundation report (2012) references a wide range of areas of research channeled through YouMedia, including outreach to deal with bullying, the impact of digital media on ethics in young people, networked youth and participatory politics, connected learning, ethnographies on digital device use and more.

[38] More details on the program at

http://www.cplfoundation.org/site/PageServer?pagename=invest_future_learning_cybernav_co

[39] A suburb just north of Chicago.

another as much as from facilitators—to program in an environment where media production is considered as important as consumption. They tackle projects that involve cultural mash ups, game design, mathematical modeling and free and open source software (FOSS). Wilmette could be cited as an example of the public library as an informal media production lab, which might merit long-term and in-depth analysis of individual and community impacts. This kind of analysis could take many forms, including cost-benefit evaluation, mapping outcomes to timeframes, comparison to similar school, and business or nonprofit programs; or it could follow a rhetorical approach, such as presenting what Wilmette might say about our current moment of increased technological convergence (Sey and Fellows 2009).

DEPICTING THE SOCIAL IMPACTS OF PUBLIC ICT ACCESS

More recently, the Bill and Melinda Gates Foundation, IMLS and the Information School at the University of Washington have taken steps to further investigate the substantive impacts of ICT use in US public libraries. In their report, *Opportunity for All: How the American Public Benefits from Internet Access at U.S. Libraries* (Becker et al. 2010)*,* they identify worthy and meaningful impacts for patrons, and by extension their communities. They are, in effect, organized into categories that are eminent examples of social connection, education, employment, health and wellness, e-government, personal finance, and community and civic engagement. The report was multi-method and depended principally on telephone and internet surveys with tens of thousands of patrons as well as 400 libraries. It extended into interviews and case studies, which makes it similar to the two-phase approach used in this dissertation.

While the *Opportunity for All* report provides a good overview of the kinds of ways internet use in public libraries help individuals and local communities, it takes a definitively promotional position. It highlights strengths more than challenges and uses qualitative data mostly to decorate quantitative findings, instead of as the ingredients for individually told stories. The report does have the kind of focus that I would argue is akin to the angle of my project, as it pays some attention to people in specific disadvantaged demographics, such as those in poverty and those from racial/ethnic minorities, but it ultimately breaks users into a relatively vague typology based on their frequency of use of the computers. It would be more interesting to understand more about the identities of these users and the ways they actively shape and produce information as they take part in computing activities related to health, education and more—and, perhaps more importantly,

what these activities mean to them and how stakeholders judge their effect on the community. Fortunately, the Bill and Melinda Gates Foundation released a second portion of the impact study that more robustly contextualizes their case study sites in connection to their global findings (Becker et al. 2011). This material provides more insight into the relationships within the network of influences on public computing and social outcomes and provides recommendations based on these findings, such as supporting staff in technical training or collaborating with community organizations. The locations featured in this report are all larger, in comparison with the Illinois sample set of this dissertation, and the study employed a broader, deeper and more structured set of variables for study—in general appearing more deductive in design.

The *Opportunity for All* report is only one of many studies on the impact of public access to ICT and multimedia production technologies. I bring it up here because of its particular concern for libraries and disadvantaged people and because it is an empirical study that tries to illustrate discernable downstream effects. As of yet, research indicates that we don't fully understand the implications of the public access model in terms of sustainability, users, usage patterns and prolonged social outcomes, despite being in place for many years in varied form across the globe (Sey and Fellows 2009). Critics contend that commercial, market-based solutions, intensified mobile and personal computing, and the increased possibility for ubiquitous learning (Cope and Kalantzis 2009) may supplant the need for traditional forms of public computing. Consequently, one of the main reasons I frame the public library as a network of relationships and resources that foster digital literacy is because it transfers the emphasis to arrangements that lead to learning and empowerment, which depend on an array of factors, as previously stated, people, activities, and policies in addition to infrastructure. In other words, if we want to appropriately gauge social impacts, we have to paint a picture that goes beyond decontextualized or general numbers about access, as well as separate, concentrated glimpses of case studies, and work to connect the two.

It is important to pause to take stock of the discourse in operation behind much of this literature. It may not be fair to say that the politics of government, universities, libraries, and library patrons are all in alignment when it comes to the context of ICT. In fact, words like empowerment are sometimes used as tools to advance hidden agendas and mask what may or may not be contestable social transformations. Who or what the government conceptualizes as an empowered (or informed) citizen may just as well serve as a vessel for continuation of extant power rifts and

dominating social norms. Shifting the library from its traditional roles—archival, pedagogy, legitimization and gatekeeping—to what might be characterized as a postmodern orientation—interactivity, empowerment, cultural pluralism, and communitarianism—is inherently political (Hand 2005), and something that I believe will continually run up against resistance and infiltration. The internet cannot be summed up by any central discourse, but the tools used to access and make meaning of it are very often the products of commercial enterprise and thereby subject to the influences of capitalism and the regulations of the market. We see this very much in action as libraries struggle to make public goods out of commoditized information in our current phase of increased marketization (Burawoy 2005b). Battles are waiting to be fought over intellectual property produced or remixed with library assets, or systems of eBook distribution and 'borrowing.' Companies like Facebook and Google walk a dangerous line between privacy, transparency and encouragement of open access and sharing; their practices, policies and ethical dilemmas will work their way into the social impacts yielded by the public library. In one sense I like the idea of making sure everyone has the ability to share their identity and establish social connection on the internet, but in another sense I'm less excited if the only—or institutionalized—way to do this is through Facebook. As it stands right now, some of the main uses for public computers, as well as new ICT mediums like cell phones, are commercially driven interactions and entertainment. If public libraries are to be seen as institutional intermediaries between citizens and their government, and connectivity, content and competencies are a requirement for meaningful citizenship and input into globalized cultural flows (Hand 2005, Castells 1997), then I see it as our duty as researchers to move forward from descriptive analysis, as it is commonly seen in the literature above. We need to grant recognition of power, both when we establish what we mean by digital literacy and when we measure literacy-related outcomes.

RESEARCH DESIGN

Research for this project was conducted for more than a year and consequently involved an evolving, inductively-driven focus both in terms of methods and the changing nature of the sites being studied. Principally, it was carried out in stages in order to address the main gaps in data identified earlier: to achieve a balance between breadth and depth as well as address a large share of the different dimensions of the context that relate to library roles and digital literacies.

This section reviews the framing of this research as a work of social science research and scholarship in community informatics, a field connected to library and information science, and then moves on to elucidate the way data was collected and analyzed in phases.

AS A WORK OF COMMUNITY INFORMATICS

Community Informatics (CI) is a relatively recent field of scholarship, practice and activism that rose to prominence in the early 2000's, driven and developed initially by scholars in the US, UK and Canada like Michael Gurstein (2002, 2007), Leigh Keeble and Brian Loader (2001), Randy Stoecker (2005) and Larry Stillman (and Stocker 2008), Kate Williams and Joan Durrance (2008) and later by an increasingly international body of researchers.[40] Its central goal is to provide communities with the means to address community-defined needs. In community informatics these means are enabled by, or considered in relation to, information communication technologies and associated information processes.

Several of the terms at stake in this understanding are contested, which has motivated much of the discussion behind the scope and purpose of the field. Communities might be defined as historical or geographically-bound neighborhoods, virtual groups with shared practices or as distributed networks of people with shared social identities like the gay community. The call to provide communities with the means to address needs introduces another set of complications, as 'means' might include skills for individuals, resources like internet infrastructure, social connections and relationships or even ideologies or consciousness. And, finally, how needs are defined, and by whom as well as which assets they are posed in relation to, significantly

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[40] A cursory look at the Journal of Community Informatics, ci-journal.net, easily distinguishes its consistently international contributors.

determines the arrangement of perspectives and solutions. It is nearly impossible for all members of a given community to help identify and solve problems, or drive or inform research, and likewise it is nearly impossible to solve problems or conduct research that will impact all people equally or fairly. By its nature community informatics must be a negotiated process and we do our best to balance utilitarian means and needs as well as those that might be characteristic of minority or socially excluded groups. Typically this means community informatics addresses components of formidable social challenges like education, community health, civic engagement and more. Scholars in related areas, like urban planning or social work, may also take issue with the field's chosen focus on the impact of digital technologies, or, sometimes even more broadly, with informatics in general, but I would advocate, in kind with Stoecker (2005) that it is best to envision ourselves as a supporting cast in the larger field and mission of community development.

Despite these foundational and definitional quandaries the field finds a remarkable degree of unity in our methods: we are activists and social engineers because we are actively seeking to solve problems. Community informatics is interdisciplinary, so it benefits from a strong coalition comprised of critical inquiry derived from the humanities, theories and research methods from the social sciences, and design and practice-oriented problem-solving from engineering and library and information science. I believe our diversity, as well as our commitment to validate the usefulness of our knowledge in community contexts makes us a powerful and recognizable movement.[41]

In particular, the University of Illinois, as a land-grant and state institution, has a duty to serve their local and state communities through commitment to public engagement [42] and to the discovery and application of knowledge to improve and serve the greater society in which we live.

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[41] More information about how I position my work in relation to norms and conceptualizations of social science methodology and scholarship can be found in the section on Positioning My Scholarship (p. 57).

[42] See http://engagement.illinois.edu for more information about the University of Illinois at Urbana-Champaign's mission of public engagement.

Not only do we have an obligation to break out into various forms of community, but we must also help acknowledge and understand the valuable knowledge present within these communities.

This dissertation is therefore a work of community informatics in several regards:

1) It investigates how libraries and digital literacies relate to challenges that affect many communities, like public education and life-long learning, civic participation and social inclusion, job training and employment, economic stress and social services and more.
2) It seeks to inform the field of library and information science with knowledge and perspectives from active practitioners in public libraries and bring community knowledge into the scholarship of the University of Illinois.
3) It employs a blend of social science research methods, critical socio-technical perspectives and directs attention to socially excluded populations.

I set out on this project years ago with an initial research question that relied on an understanding of 'library roles' and 'digital literacy' that I knew would change. This was, in fact, the explicit purpose of the inductive approach, the goal and opportunity to better understand not only what these terms meant in the context of my sample but also why they meant this, and what we could learn from it to help libraries, patrons and communities.

I chose to break up and frame the work as I did for a few reasons. I wanted to adequately address the gap in data on libraries that are located in underserved communities so I chose a selection of libraries that could help establish the breadth of issues, but also still contain unifying characteristics and identities in their service roles and populations. I also sought to gather a diversity of data about innovations and challenges that could be shared to help the field advance its work. A series of stories about a single library might be inspiring, but not hold relevance elsewhere. A statistical report on the status of many libraries might miss those stories, however. Taking the middle ground by doing a series of case studies allowed me to hear enough stories and situate the data enough within a limited context to make more actionable data, lending credibility to the work as being more in the vein of community informatics by being more accountable to practice and implementation.

SAMPLE

As stated, a central objective of this dissertation is to examine the role the public library plays in fostering digital literacies in underserved communities with significant socially excluded populations. Therefore the first stage of data collection included a specialized sample of public libraries positioned in geographic communities with the following characteristics:

- Large African American and/or Latino/a populations
- High rates of poverty and/or unemployment
- Rural locale
- Counties outside of the Chicagoland area[43]

The sample was assembled through use of US census data cross-referenced and enhanced with supplementary resources like mapping tools.[44] A formal GIS was not employed, though it was considered as an accepted way for determining population coverage for libraries based on the characteristics of surrounding communities (Hertel and Sprague 2007). It was important to make sure the data was able to be double-checked by the constituent libraries, and that the work was replicable; to require ESRI ArcMap or similar software, while useful and cutting-edge, would be less accessible. Instead, all of the visual analysis tools used were provided for free by government, corporate and university entities and publicly available online.

The following section details how each component of the sample was gathered and explains why each characteristic is a good measure of an underserved or disadvantaged community.

ETHNIC COMMUNITIES AND POVERTY IN ILLINOIS

It is well known that south of Chicago Illinois was rife with tensions related to slavery and racism preceding, during and following the civil war. One harsh example[45] of the sentiments of the time

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[43] Specifically excluding the majority of the following counties: Cook, DuPage, Lake, Henry, Kane, Kendall and Will.

[44] The New York Times application that imposes ACS 2009 data on the Google maps API was exceedingly useful for initially identifying target areas. http://projects.nytimes.com/census/2010/explorer. Other tools around the internet supported the streamlining of work too: www.city-data.com yielded maps that could help me easily situate places within the boundaries and population densities of counties, for instance.

[45] For a more detailed account of this tragedy, as well as a variety of research on the history of Black oppression in several southern Illinois counties see "The Myth of a Free State," a website pulled together by a class of students under the direction of Professor Judith Pintar in 2005. http://communityinformaticsprojects.org/396/

is found in the story of Reverend Elijah Lovejoy, a central Illinois white abolitionist publisher who was eventually killed for his efforts by an angry mob seeking to burn down his printing press warehouse. The contemporary population distributions of Illinois are a reflection of a complicated process of settlement, slavery, sundown towns, black codes, servitude, white flight and suburban sprawl (Cha-Jua 2000, Eichholz 2004). As a result a number of concentrated African American communities exist in and nearby both major and minor towns and municipalities in the state. Like many people of color in the US they face racism in both structural and interpersonal forms.

The US has always been a country of immigrants.[46] Historically in Illinois the majority of migrant populations have settled in Chicago, but in recent years we have seen a larger number of Latino/as begin to find work in some of the rural communities spread around the state. Additionally, the Pew Hispanic Center (Passel and Cohn 2011) estimates an unauthorized immigrant population of approximately 525,000 in Illinois, presumably largely Hispanic (nation-wide 87% are from Mexico or Latin America) with a significant portion existing outside of Chicago. Nation-wide 25% of jobs in farming are taken up by unauthorized immigrants and adults among these populations are disproportionately likely to be poorly educated (Passel and Cohn 2009). This is not to mention the abundance of challenges these workers might face as a result of lack of legal representation in the workplace, or general discrimination against Latino/a groups in the US. We do not have data on the specific locations of undocumented workers in Illinois, but it is reasonable to assume that since many of them work in farming, libraries in small town and rural communities with substantial food-production related employment could serve them. Many migrant populations follow preexisting familial and cultural networks in their settlement patterns, so it also stands to reason that vulnerable populations could easily be present in areas with large proportions of Hispanics who come from high-throughput immigration backgrounds.

Many individuals within African American and Latino/a communities must deal with multiple forms of discrimination and are in certain need of information and technology resources. Though the homes of family and friends continue to be the primary (and possibly preferred) point of access

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[46] Specifically a diverse Latino/a immigrant population, which has known many names and compositions over the years. Clara Rodriguez (2000) gives a detailed account of US census counting as it applies to ethnicity in the US, if readers are interested in learning more about the validity and importance of this kind of data.

for all internet users, African American and Hispanic populations are much more likely to make use of public libraries for internet access than any other public institutions that might provide it, including schools, churches, and community centers (Gant et al. 2010, Manjarrez and Schoembs 2011). Public libraries have an obligation to their entire community, including groups that are historically and statistically socially excluded like African Americans and Latinos; therefore it was important to include these ethnic qualifiers as a primary determining factor in building a sample to represent underserved populations.

Poverty is another substantive measure of a socially excluded or underserved community. Though it is an insufficient and outdated metric,[47] one that does not accurately reflect government benefits, work expenses, cost of living, and medical or insurance fees, it has been generally accepted and used as a measure since the 1960's (DeParle, Gebeloff, and Tavernise 2011). Since libraries are often very reliant on local funding and Illinois is in the midst of an ongoing budget crisis (Kniffel 2010), high rates of poverty easily coincide with libraries that are unable to sustain service offerings. This, combined with the fact that the new measures for poverty show that the social service safety net (which I believe includes public libraries) makes a big difference in the lives of those who would be in poverty (DeParle, Gebeloff, and Tavernise 2011), means poverty is an important criterion for inclusion when creating a sample of underserved communities.

My sample draws from 2010 decennial census data[48] to provide a list of places and census tracts with a single (not combined) racial/ethnic minority population[49] proportion of greater than 20%. This list has been cross-referenced with a composite of the most recent Small Area Income and Poverty Estimates (SAIPE; 2009) and American Community Survey (ACS; 2005-2009) material to identify several target areas with a percentage of people whose income in the past 12 months was below the poverty level of 18% or higher.[50] Comparatively, the state-wide average without

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[47] One that will soon be updated, see http://www.census.gov/hhes/www/poverty/ for press releases and more details.

[48] I used the most recent redistricting data, where available.

[49] Black or African American of one race, not listed as Hispanic or Latino/a, Hispanic or Latino/a of any race, based on Census 2010 data.

[50] This measure was based on the 2005-2009 ACS data, which sometimes had high margins of error. If the lowest bound (the estimate minus the margin of error) of this measure was below 20% I fell back on Census 2000 data poverty rates for comparison – if this rate was 15% or higher I kept the entry.

the Chicagoland counties is approximately 8% for African Americans and 5% for Latino/a groups, and under 2% for all others, and poverty for all people is about 13%.[51] To further reduce the sample and provide an improved composite measure of poverty I selected locations on the basis of food stamps[52] (over 20%) and rates of unemployment[53] (over 14%). Once places had been identified I located nearby[54] public libraries. I should be clear in stating that the percentage requirements were not established on the basis of a strict measure of statistical significance, nor am I assuming a correlation between racial/ethnic minority status and poverty. Instead they served as a cut-off point with which I could limit my sample to something reasonable in terms of both size and inclusivity.

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[51] Numbers calculated manually, using a table of all counties (besides the Chicagoland ones) and 2010 census race data, and a table with all precincts and townships with 2005-2009 ACS poverty data.

[52] A measure of income and benefits (in 2009 inflation-adjusted dollars), the total households with Food Stamp/SNAP benefits in the past 12 months; the ACS 2005-2009 estimate. For reference, the Illinois average is around 8.4%, and is probably lower in the areas outside of Chicago.

[53] Percent unemployed of those in the civilian labor force; the ACS 2005-2009 estimate. For reference, the Illinois average is around 8%.

[54] This was done on the basis of simple visual measurements with maps. In most cases towns had a single library, or one right nearby. In the event of two equidistant libraries both were listed, with preference given to the one in the larger adjacent city. I did look over state and census tract lines in several cases, but, curiously, populations were usually sharply divided by them.

Location	Total population	Hispanic or Latino	Black or African American	Poverty Rate, all people
Norburry village	13000	10%	22%	20%
Paddock city	115000	5%	27%	18%
Grand Ridge city	76000	2%	23%	20%
Belle Terre village	15000	2%	62%	24%
Otranto city	153000	16%	20%	22%
Glassbrook city	3000	<1%	70%	32%
Shipton city	33000	7%	30%	27%
Aquarin city	28000	19%	40%	31%
Alburg city	5000	<1%	97%	39%
Wrightsville village	4000	3%	86%	45%
Stony Point city	27000	<1%	98%	39%
Bozeman city	26000	5%	25%	48%
Plainview City village	3000	71%	<1%	39%
Rowland Heights city	6000	33%	5%	20%
Dalhurst, two census tracts	~5000	~2-9%	~24-26%	~36-42%
Eastover, three census tracts	~6000	~0-1%	~60-78%	~29-54%
Altura, two census tracts	~5000	~0-2%	~24-36%	~27-30%

Table 1 - Ethnic communities with high rates of poverty, in no particular order. The ~ symbol denotes areas with margins of error due to small sample sizes, which required combining multiple tracts. In these cases the lower bound still qualified. Populations have been rounded to the nearest thousand and percentages to the nearest whole number in order to supply a degree of anonymity.

In cases with multiple public library locations the ones inside and nearby census tracts with the greatest percentage of ethnic minority populations were selected. See an example below for what this might look like in a typical Illinois city:
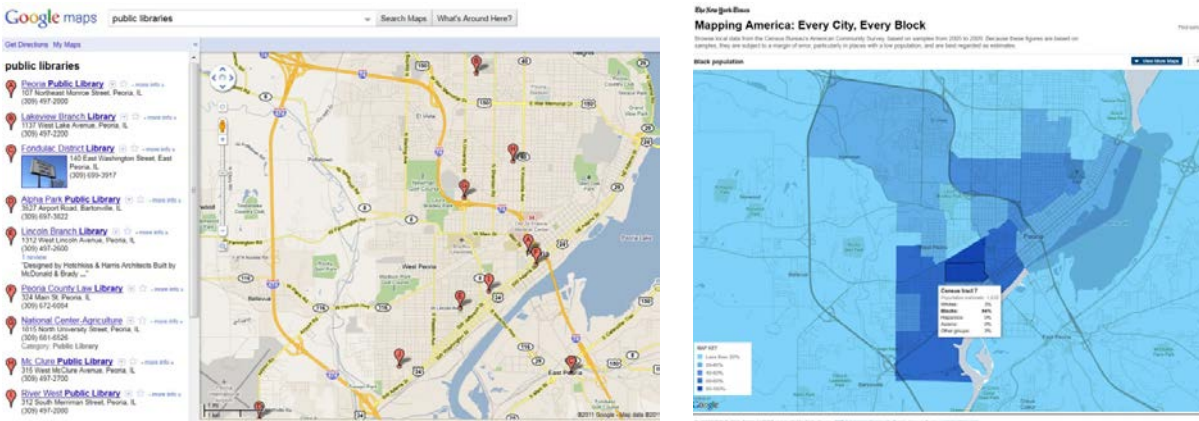

Figure 1 - Google Maps locations of public libraries (left), and a tool provided by the New York Times to visualize US Census American Community Survey (2005-2009) African American or Black population density (right).

In some ways Illinois poverty exists in its harshest form for rural areas in the south and southwest regions, where residents are typically older, less healthy and face challenges in terms of public transportation, availability of jobs, education opportunities, and affordable housing (Harper and Edwards 2004, Miller 2007). Essentially, patrons living in a rural areas have less access to some resources, and limited access to others at a greater cost. For example, in most rural communities the public library is the only available public access to the internet, and in many it is the fastest broadband in town. Additionally, adults in impoverished rural areas are often hard-pressed to find opportunities for continuing education, especially when it comes to digital literacy, and, for rural areas in particular, broadband is essential for economic growth (Stenberg et al. 2009). Compounding the issue, race and ethnicity are strongly correlated with rural poverty (USDA 2004), and often occur together. Libraries in these areas also face challenges in terms of technology infrastructure and stable funding (Real et al. 2014). I went to some length to ensure my sample included a representation of rural communities with significant poverty, more information on how I did this can be found in Appendix B.

I decided to leave the Chicagoland area[55] out of my project completely for two reasons. First, Chicago is often the dominant player in any analysis of the state. In terms of income and ethnic minority percentages it doubles or triples the state-wide averages with its influence alone (see table below). However, of the approximately 800 public libraries in the state about two-thirds of them exist outside of the core and collar areas. Any analysis of the rural and small-town reality of the rest of Illinois is dramatically thrown off by the involvement of Chicago. To understand and address the needs of these kinds of downstate communities it is appropriate to consider them apart. Second, I removed Chicago as a matter of practicality. Any project is limited by fiscal and temporal factors and to do an analysis on the level of this dissertation for Chicago (Cook County) alone would be three or four times the complexity. This leaves the door open for future comparative analysis and investigation in these areas.[56]

U.S. Census Bureau, 2010 Census: Hispanic or Latino, and not Hispanic or Latino by race	Entire State	Percent	Without Chicago	Percent
Total:	12,830,632	100.00%	4,822,742	100.00%
Hispanic or Latino	2,027,578	15.80%	257,116	5.33%
Not Hispanic or Latino	10,803,054	84.20%	4,565,626	94.67%
Population of one race:	10,619,097	82.76%	4,494,107	93.19%
White alone	8,167,753	63.66%	4,024,936	83.46%
Black or African American alone	1,832,924	14.29%	376,895	7.81%
Asian alone	580,586	4.52%	78,007	1.62%
All others combined	37,834	0.29%	14,269	0.30%

Table 2 - A comparison of racial/ethnic demographics, Illinois *with* Chicago and *without* the Chicagoland counties of Cook, DuPage, Lake, Kane, and Will.

As another example, stable, high-speed broadband coverage is ubiquitous throughout the Chicagoland area. It cannot be assumed, however, for large portions of the rest of the state. Despite

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[55] Chicagoland defined as the urban spread that includes Cook, Lake, DuPage, and Will county, with significant portions of Kane, Henry and Kendall county as well, depending on if they connect to the westward sprawl.

[56] As mentioned in the literature review, excellent work is already underway. See Williams 2010b. https://www.ideals.illinois.edu/handle/2142/14915.

the efforts of the National Telecommunications and Information Administration (NTIA) and the Broadband Technology Opportunities Program (BTOP) one can easily see gaps in coverage (see figures below). If one were to conduct a study of public libraries in Chicago, as compared to somewhere else in the state, the assumption of potential internet availability and speed would simply be different.
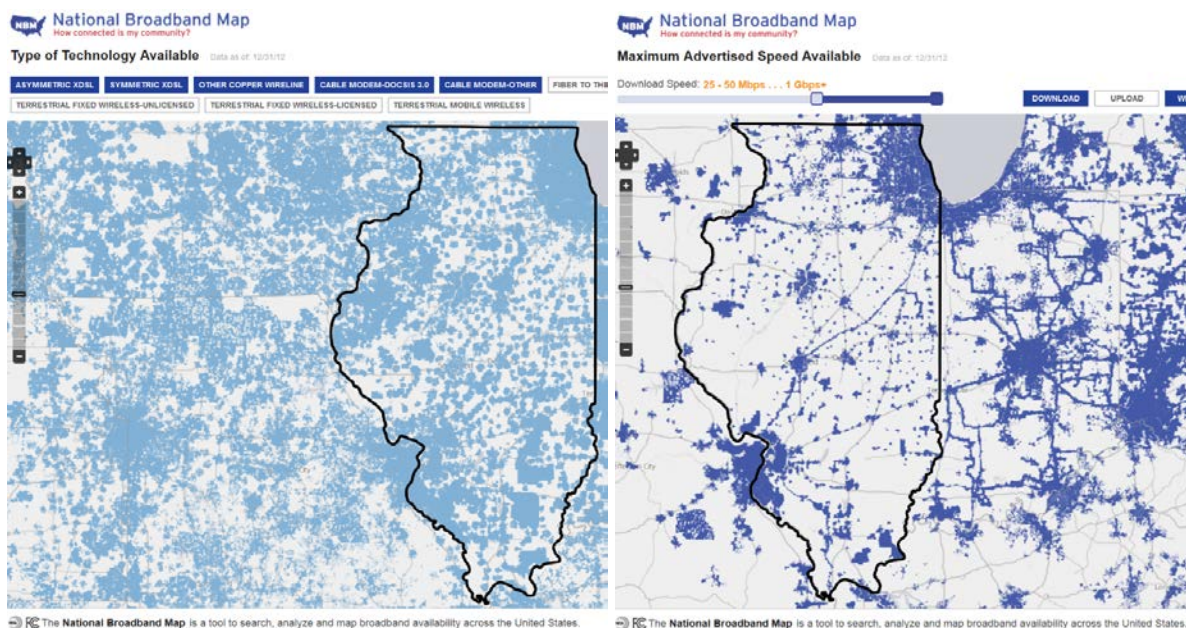
Figure 2 – Broadband in Illinois, in terms of coverage and speed, from http://www.broadbandmap.gov. There are large gaps in coverage in rural areas and some libraries may not be able to secure affordable internet that is strong enough to support an entire computer lab. Many libraries in small towns also offer the only fast and free internet available for visitors from neighboring rural areas.

DATA COLLECTION PROCEDURES

For each library I opened a simple case file, where I collected a variety of notes, literature and multimedia related to library services that could support or promote digital literacies. Before each visit I:

1. Consulted existing state-wide and national data available on the library, including the Illinois Public Library Annual Report (IPLAR) and Bibliostat Collection, L2: Library

Learning, IMLS census data and other resources.[57] I also investigated the history of the primary communities each library presumably served, which included a brief review of census reports for economic and demographic factors. Additionally, I conducted basic internet research on recent news related to the town and public library[58] as well as found information such as the largest employers in the area.

2. I visited each library's website (if available) to see how they presented themselves, their mission and their roles related to digital literacy, such as computer lab policies or online tutorials for electronic resources. In a sense this was also an implicit measure of the library's concern for digital literacies – not every library had a website and many were not in active use.

I then made arrangements to visit on a day when I could talk to the library director for at least half an hour. It was important to make a direct connection to the director, if at all possible, in order to ensure I was presented the official viewpoint and policies of the library and to also establish permission and a rapport for continued research. Each library was sent an official invitation on University of Illinois letterhead and informed of the focus, intentions, value and involvements of the research. As with most studies of this sort some libraries were harder to get to than others, requiring several phone calls, e-mails and so on. Several of the larger libraries referred me to specialized staff and a few sites were non-responsive. One location declined participation.

Then, over the course of several months, I drove to visit each library in person. Generally visits were kept to just a few hours on one day as many trips involved multiple cities and tight schedules. At each site I:

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[57] The Illinois database resources are available at
http://www.cyberdriveillinois.com/departments/library/libraries/IPLAR/home.html, the L2 resource can be found at http://www.librarylearning.info/libraries/ and the IMLS census data was searched at https://harvester.census.gov/imls/search/index.asp. Some interfaces have changed since initial data collection.

[58] Google News queries and searches of online newspapers for localities, if available, as well as Illinois Library Association reports and links.

1. Observed static elements related to digital tools, taking down notes, photographs[59] and desktop screenshots and whatever literature I could pick up. For each library I tried to draw a map of the public computing layouts and take pictures of workstations, if possible. This data collection process was similar to traditional ethnographic field methods, but much shorter term and with greater emphasis on technology use and an in-depth look at public workstations. I was able to bring my expertise in usability and technical support to bear during observations in ways not often present in other library studies. For instance, at every library I assessed computer capabilities by trying them out for a test drive and recording my notes. After doing some basic measures of bandwidth and noting aspects like what programs they had installed I spent some time seeing how tamper-proof computer security settings were in public lab arrangements – if I was able to view invisible files,[60] edit start up processes and execute programs stored on external media. I also had some sense for interface and usability concerns, noting how easy it was to find certain information and programs on the computer as well as spatial arrangements of computers that might enable surveillance, collaboration or accessibility.

2. I spent most of my time at each site interviewing librarians. I employed a flexible interview schedule (see appendix A) which evolved over the course of my research and was also adapted to each site. Interviews were driven by following the critical incident technique (Woolsey 1986), an exploratory qualitative method that relies on accounts of behaviors and events given in the words of a respondent. In other words, I did my best to avoid asking general opinions and tried to guide respondents to give examples. Unlike scripted interviews and surveys my objective was not to capture specific pre-defined variables but instead ask about the array of agents and factors that influence happenings in the library that relate to digital literacies. Therefore I recorded many kinds of stories during interviews and paid attention to a diverse set of points of observation, sometimes ones that even

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[59] Acquiring consent as required, photos never involved people and screen shots never captured personal files.

[60] This may seem innocuous but might be a privacy issue. One patron may come work on a MS Word document that includes their SSN and save it several times, only to be logged off abruptly by an automated time-keeping system. A patron following them could force their temporary save files, which are normally invisible, open for use. This isn't dramatically different than a user accidentally leaving their data on a computer or poor data clean-up policies but it is an example of a potential issue.

initially seemed irrelevant, and encouraged respondents to talk about the topics in ways that made sense to them.

The questions I chose were an attempt to capture the context of digital literacy activities and related perspectives in an operationalized form. Each contributed to illustrating some dimension of the relationships between infrastructure, activities, people and policies that form the basis of this context. They were, however, generally starting points and not an exhaustive list that was forced to fit all interviews. Many undoubtedly required follow-ups and often times respondents drifted off topic with their stories, sometimes in surprisingly good ways.

The interview question set was specifically structured around my initial focus on critical and creative digital literacies, and therefore intended to help capture the following:

- **Service population** – The first question I asked didn't have anything to do with technology. I wanted to know who the library felt they were serving and how they identified and spoke about them. I knew in many cases it would be based on their funders but I specifically asked about all groups who used the library, including those who were not cardholders. I did this because I wanted to confirm or question one of my first assumptions: that these libraries were providing services to underserved communities and populations. I continued to explore who the library felt they were serving and how they knew throughout most of my questions on programs and policies.

- **Understandings of digital literacy** – Overall, I sought to gather fundamentals behind the narrative related to digital literacy in each public library. This meant I was paying attention to many factors, such as chosen language or terms, familiarity with concepts, explicitly identified service roles and more. The goal, generally, was to understand what digital literacy meant to each library as an institution, as expressed through how directors and librarians thought about it, created activities related to it and chose to support it (or not) with policy and access to information tools. This often connected to other questions, such as if the library considered itself to be a community center or pro-active education provider.

- **Generative uses of digital tools** – One of the key ways digital literacy is distinguished from information literacy or media literacy is that it includes emphasis on interactive use of tools. While I was interested in activities dedicated to access, evaluation and sharing of

information with public computers, this was just a starting point. Many public libraries have scanners, digital cameras, projectors and color printers that involve production as part of information transfer processes. All kinds of library programs might make use of recent digital tools, whether they are run by library staff, volunteers, or if they are simply activities driven by external group activities that happen to take place in the space. They might include, for instance, a paper-based arts and crafts kids event that prints media off the web, or a group of community historians scanning photos to post them on Flickr. Generative use is not necessarily limited to the production of physical objects or electronic data, but could also include ideas. In my questions I focused less on what the interviewee speculated users were "doing with the computers" and instead the possibilities digital tools enabled, explained in examples supported and promoted by the library. The concentration on recent use of tools by groups and library programs made it possible for interviewees to look at a calendar to think about objects and undertakings instead of relying fully on memory. I complemented this measure by asking many participants what they thought about the concept of the library as an information production space.

- **Critical views of digital tools** – In most interviews I inquired about when technologies didn't work as intended or the problems people had with them. I also sought to find out ways digital tools were being used for inquiry or in divergent or deviant ways, or when librarians were finding creative solutions to deal with technological constraints. Some of my questions were also directed at understanding their chosen policies, such as limiting who could use the computers, in which ways and for how long to understand the sorts of relationships and activities they wished to promote. More often than not this led to discussions on the affordances of various services, interfaces and mediums as well as library support capacities.

- **Complements to other measures** – I made some effort to collect data that could be comparable to that collected by the survey work by McClure, Bertot and Jaeger. These studies didn't look into issues like lab layouts and modularity or what the internet's actual functional speed was, compared to its officially stated speed, and I wanted to make sure I could demonstrate the difference. I asked about what staff did to assist users with computers, to get detailed descriptions of what was often reduced to phrases like 'one-to-one' tutoring.

I began my interview by asking about programs related to digital tools, broadly defined as more than just computers, including tools of media production, and then let this flow into collaborations and community networking as well as policy and issues like infrastructure. Not every interview covered the same ground; if something was particularly unusual about a given library I dug deeper into it. At nearly every library I interviewed more than one librarian, which allowed their question sets to complement one another.

DATA ANALYSIS

In sum, the series of observations and interviews comprise a collection of cases. Case studies are a kind of inquiry into a specific social context that enable researchers to decipher the complexities inherent in true-to-life situations. They can help to establish validity by accommodating diversity and uncertainty, and they facilitate the emergence and comprehensive development of research ideas because they can incorporate multiple sources of data (Berg 2004, Eisenhardt 1989). They are often used as the basis to develop theory in an inductive fashion by "recognizing patterns of relationships among constructs within and across cases and their underlying logical arguments" (Eisenhardt and Graebner 2007, also see Eisenhardt 1989 and Stake 1994). I was drawn to happenings on account of uniqueness or ordinariness, and the application of my external theoretical frame: digital literacy. In this sense my work was somewhere between exploratory and descriptive (Yin 1994); it elicited elements of discovery, confirmation, snapshot descriptions, and emphasis on issues encountered on multiple visits and in outliers. It allowed for more robust storytelling that helped to challenge presuppositions and distinguish new constructs.

Functionally, interviews were recorded on my cell phone and transcribed for content analysis. Specifically, this meant studying, sorting and analyzing the text based on the frame of my topic. My chosen method for this was a two sweep coding process, based on Berg's (2004) interpretation of Strauss' (1987) grounded theory approach. I read through the data multiple times, first annotating it with short snippets of description and comments on thematic observations. Then, after I had familiarized myself with the material I went through a second time to cut it down to stories and topics of interest and began to build second-level codes that tracked ongoing themes. I found that this process was not formulaic, as I skipped around to different interviews and question responses to ask of the data specific and consistent sets of questions, without an overlay of classic socio-analytic categories like race or class, because those didn't always fit the frame. On the

contrary, in my experience with sociology technology-human interactivity elements are often misunderstood, overly criticized or ignored entirely.[61] I then selected a series of signature stories found in each site which illustrated different dimensions and issues related to library roles and digital literacy. I took care to avoid redundancy between sites in my stories, even though topics like e-readers came up frequently, and instead chose those that I felt were most representative or revealing of the issues at hand. Though I knew my analysis would, by nature, not be neutral I did my best to find examples of both challenges and successes, as well as opposing viewpoints and contradictions. Part of the reason I needed to be selective was that despite asking the same set of core questions at each location the data I was provided varied. In some locations, for instance, I didn't even have to draw a map of computing spaces, as the library already had a handout with one, whereas in other locations I couldn't see all parts of the library. As such the observations were considered to be as subjective and incidental as the interviews: they were dependent on the circumstantial constraints in which my visit took place. After the conclusion of the study site stories were submitted for review and scrutiny by my research committee and location and personal references were then anonymized.

This dissertation study is unusual in its methodological approach partially because of its adherence to asset-based data analysis. Earlier when I introduced it as a work of community informatics I identified the field as a study and pursuit to address community needs, and while it is true that all communities have problems and needs, starting with this as the fundamental focus tends to make a given work about remedying deficiencies and deficits, rather than recognizing and leveraging strengths and assets. Underserved communities are frequently described and defined primarily in terms of their problems, as I myself have done in the justification for the use of census-driven qualifiers. My research, however, largely reflects the reality that communities often have the tools to address their own needs, and may be uniquely or best suited to develop and drive solutions. This is not to say that structural forces are irrelevant or that there are not times when external assistance or perspectives are required, it is instead to simply strive to start the analytic focus with local knowledge. This may provide an initial impression that each of the stories included in this study

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[61] Or, in the case of Actor-Network Theory and the new sociology of associations (Latour 2005), given as much attention as any human or ideological agent in the network of patterned relations, which may be the other extreme.

are selectively optimistic or positive, but, in fact, they represent a wide range of recurrent themes and issues as reflected by members of these communities themselves.

Existing scholarship provides a significant precedent and reasoning for this perspective and approach. Starting as early as two decades ago John Kretzmann and John McKnight (1993) introduced a handbook for asset-based community development. They promoted a model for asset mapping that included local institutions like businesses, parks, hospitals and libraries, associations like church groups and interest organizations and, finally, individuals of all kinds, qualified in terms of their identities and agencies. The approach has grown over the years to include many kinds of studies and fields, finding use in social work (Lightfoot, McCleary and Lum 2014), urban planning (Dennis 2005), health (Harrison et al. 2004), community informatics (Pinkett 2000) and even provoked criticism in relation to social network analysis (Ennis and West 2010) and social good (Macleod and Emejulu 2014). Asset-based community development supplies a recognized and important perspective that is integrated into many scholarly studies of communities, and my own is no exception.

That said, my position is likely somewhere between the alignments for top-down need-oriented and grassroots asset-based analysis techniques. Clearly the concern for digital literacy has been highlighted as a kind of universal reality and challenge, but the examination of it in practice, as will be revealed in the following sections, is much less about what libraries are not doing about it and much more about the unusual and surprising roles libraries are filling and interpreting. This might also be compared to another kind of asset-oriented analysis, typically referred to as positive deviance. A concept initially explored in health-related studies (Zeitlin, Ghassemi and Mansour 1990), positive deviance refers to the possibility that in every community there are individuals or groups whose uncommon behaviors and perspectives enable them to find better solutions to problems than their peers, despite being on relatively equal footing in terms of access to resources or extant challenges (Spreitzer and Sonenshein 2004). The occurrence has been increasingly observed in multiple settings, including those particularly relevant to this study, such as education outcomes (Dura and Singhal 2009, Richardson 2004) or creativity and innovation amongst organizations (Acharya and Taylor 2012). The presence (or lack thereof) of positive deviance in relation to the factors that determine digital literacy—people, policies, activities and infrastructure—was a recurrent frame of analysis as I processed the case study data.

Finally, it must be understood that this work, at its core, is a kind of advocacy research. It pushes beyond the classic, mundane academic scope of measuring an established theory in a novel way or locating and describing an interesting phenomenon. Like other studies of this nature, it may run the risk of inspiring biased views or misunderstood generalizations (Gilbert 2004), which is why I have taken steps to intentionally contextualize all of the data in terms of limited case studies. It was earnestly and necessarily engaged with the current political climate of libraries throughout the period of study. As a researcher I did carry the advantage of being inexperienced and not overly-informed about the topic of the shifting library systems, state funding and educational imperatives present in Illinois at the time. That said, there is simply no way for a study like this to be neutral in the same sense of something like examining the movement of particles under a microscope might be. I once asked one of my advisors if she felt activist motivation behind research was unethical because it could potentially compromise the quality or integrity of her work. She responded by explaining she felt it would be unethical of her not to study the systems of oppression that were being systematically overlooked. The focus on certain or prescribed methods of data collection may sometimes serve the purpose of drawing attention away from the fact that particular data is not even being collected to begin with. This was essentially my concern for validity when I set out to frame the work in the wide terms of people, policies, activities and infrastructure when talking about digital literacy. Despite this predetermined position I still took steps to address validity and reliability in terms of more classic social science.

VALIDITY, RELIABILITY AND LIMITATIONS

A major concern throughout the process was the validity and reliability of the research. On the one hand, case studies of this nature are not intended to be hypothesis-driven replicable models, but on the other hand, the findings should still be framed in such a way that they could be easily related to if another researcher were to conduct a similar study. The previous sections have clarified the specific uses and classifications of census data, as well as the use of openly-available spatial data analysis tools to qualify participant libraries, which should make it transparent for other researchers to follow the same process. Another method employed to ensure a degree of reliability was to ask the same questions to multiple interview participants and to verify stories as much as possible by noting repeatedly mentioned cases or inquiring about a given notable story with multiple respondents. Furthermore, state-wide datasets were used when fact-checking participant

responses and on-site observations, when available, such as library assets like grant funding allocations or the number of computer workstations.

Validity is a more difficult question to address, particularly because there were so many ways definitions and understandings can vary. One perspective might be that this entire study is an act of challenging validity of prior digital literacy research, which is often survey-based or restricted by overly-specific skill-based or, conversely, widely abstract definitions. Asking participants to phrase concepts in their own words (which was my standard operating procedure), such as prompting them to define digital literacy, or the roles and audiences for their library, helped to confirm if participants were talking about the same (or different) issues I had in mind. In particular, several conflicts of conceptualization came up that are noted later in this text, in both the "And Then My Research Model Broke" findings section and also in the discussion. Another possible issue or limitation would be the use of the structured model of people, policies, activities and infrastructure. In many library settings human resources were considered to be part of the infrastructure and in others stated formal policies blended a great with social norms and cultural practices. The difference in scope and scale of official library 'activities' varied, from large scale events to independent but reoccurring moments of computer assistance. Participants were initially invited to review my notes to provide feedback, but very few actively responded. This was important because it did offer a chance to validate results and findings, but the final decision to keep locations anonymous made it less possible for libraries to control precisely what was said about their operations. This allowed for a degree of balance in presenting both challenges and notable innovations, making it more about explaining "what was happening" than acting as a platform for value-laden public relations.

As might be expected, the methods limited the amount and type of data that could be collected. In one sense the study included a useful exploratory function, as data on these locations of this sort had never been collected before, but in another sense it could not be strenuously vetted or subjected to interpretation based on cultural-immersion that might be encountered in a typical ethnography. As such readers should not take this text to be an undisputable or complete book of "truths" about each of the public libraries visited, but instead a collection of common and notable observations and perspectives assembled and presented by both myself and respondents in collaboration.

POSITIONING MY SCHOLARSHIP

The contemporary field of Library and Information Science (LIS) benefits from an interdisciplinary blend of epistemological perspectives and research traditions. As a collective area of study we claim no central set of theorists or works and rely on a variety of methodologies to carry out research. As a result, we also must (or ought to) face evaluation from our peers who come from sometimes differing perspectives. I would argue this produces better communication of concepts and scholarly innovation through a wider diversity of ideas. I felt it important to distinguish and justify my methodological orientation so that those who are interested can better understand where I'm coming from as a scholar and social science researcher.

As stated, LIS is an interdisciplinary area of study. We run the full scope, from scholars who study the abstractions beneath search and categorization systems with logic-based formal methods to digital ethnographers who chronicle and decipher the meaning of experiences, such as battling cancer with the aid of online communities, in order to posit new strategies and perspectives in healthcare informatics. To be honest I cannot point to a single book, scholar or method that fully encapsulates my research design or methodology. It is not that it was haphazard, without intention, or uninformed; it is instead that my experience with a variety of forms of social science, from sociology to human-computing interaction to education, draws me to the strengths of various lenses, and also makes me all too aware of the high-expectations some people place on various invocations of methodology. For instance, if I were to say I conducted an ethnography many might have expected me to have personally worked in libraries for a decade, or at very minimum observed from the inside of a single library for a year or more. The attention I give to observing people, activities, policies and infrastructure together might suggest the sort of analysis that relates objects and concepts known as Actor-Network Theory (Latour 2005), but I am far too invested in preexisting (and quite meaningful) social conceptions like racism or literacy to really commit to this view. It is also quite difficult to make sense of ideas as comparable agents within systems of people and objects and it likely involves sacrificing a lot of potential for work within existing patterns or conceptual frameworks that facilitate conventional forms of reliability and validity. I applied multi-stage coding to my interviews and field notes, similar to what researchers guided by the Strauss (1987) or Glaser (1992) conception of Grounded Theory might do, but my outcomes were too complex to be summed up in the discovery of a single core variable, unique theory or

epiphany. Besides, I began my endeavor with significant orientation from existent literature (and, more importantly, strong opinions) about how to focus my research, which could account for the site selection as a kind of theoretical sample, but I do not think I could qualify the outcome of my work as a truly unique "theory of digital literacy" or anything of that matter. I paid some attention to the way interviewees spoke about topics and at times related what they said to the narrative themes visible in society and literature but this was not enacted with enough frequency and rigor to associate my work as exclusively content or discourse analysis. For instance, my data collection included observations like computer lab layouts or software offerings. Rather than select a social science method 'brand name' to shortcut the process of explaining how I did what I did I chose to explain it, step-by-step.

As to how I situate myself as a social science scholar, I personally identify in many ways with what Mitroff and Kilmann (1982) characterize as 'the conceptual humanist.' In contrast to more structured science perspectives where research relies on formulaic, hypothesis-driven experimentation and replicable (positivist) study of data, or, dedication to the construction of universal, portable abstractions, I strive to ground social science in practical and more immediate applications for the measurable benefit of everyday people and communities. Generally, I desire to seek out (or produce) multiple—possibly conflicting—explanations for phenomena in lived social life. Models in science serve as useful representations of reality insofar as they encourage our conceptual imagination. As Mitroff and Kilmann state, "their purpose is to direct and guide inquiry, not constrain it." (1982:55). In other words, a diverse marketplace of ideas in an area of scholarly inquiry is a sign of strength, if one's goal is to produce knowledge. I don't go so far as to take the extreme position that thinkers like Paul Feyerabend or Pierre Duhem might pose, such as steadfastly refusing to tie ideas down to accepted theories or facts,[62] but I do appreciate the dedication to challenging the ways the academic machine makes sense of realities. Some abstractions I really do earnestly appreciate, such as the tangled mess of sociological theories on power, but I'm also all for trying to build or discover new incarnations or measures of power. I do vehemently believe in the purpose and importance of abstraction and measurement, even if it is

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[62] Mitroff and Kilmann offer an excellent explanation of the complexities behind truth by falsification if readers are interested in better understanding this position (1982:55-60). Ultimately, what this leads to is the necessity that conceptual-oriented social scientists be able to work between several often contradictory frameworks.

relative to, or housed within, a kind of perspective, but my goal matches that of the conceptual humanist: to examine and understand how science, methodology and observation can further humanity (as opposed to truth or scientific theory). It begs the question: how do we go about doing this as social scientists?

Mitroff and Kilmann provide an answer through a series of questions and concerns originally posed by John Rowan (Mitroff and Kilmann 1982:80, Rowan 1976). It's not important to elucidate on each one individually here, but what they investigate are the ethics and arrangements of power in the process of research, particularly with regard to subjects or respondents. I would advocate that researchers to recognize the political forces that support them, listen carefully and thoughtfully to external or alternative perspectives, especially those that they study, and be aware of their own motivations behind their research, to the extent that they can be. Similarly, I desire to push researchers to think critically about the uses of their research outcomes and otherwise interrogate the moral and mechanical factors beneath their study design. Consequently, I take the position that science should not reside in a privileged position in relation to other fields, but instead be cast as a valuable perspective among many methods of making sense of the world. It is not autonomous or independent of other methods of knowledge production and, on the contrary, depends upon areas like history, the study of literature, philosophy, arts and more that fabricate our cultural context. The kinds of studies conceptual humanists undertake are necessarily personal, value-constituted and interested activities, and benefit by being so. For an ethnographer to engage effectively and deeply with his or her endeavor to, say, understand how meaning appears in a given cultural circumstance, they must be significantly invested in their work and its context. They seek to comprehend their own biases, freely let their passion animate their work, and interpret on the basis of how *they* see their data in accordance with the encompassing body of scholarship. This is not to say that my work as a qualitative researcher is hopelessly anecdotal or detached from generalized systems of comparison but instead to suggest that I would like to place emphasis on validity and relevance *in context*.

What does it mean when so few scholars are studying public libraries and so many more are interested in emerging fields like information science? What do we lose when most of the research is focused on outstanding examples of success and the times the data fits the theory? Why is scholarly work often times more judged on the basis of its interpretation of, or adherence to,

informing theory, rather than on its utility for impacting policy, or, better yet, being understood by and affecting everyday people? I find that the discussion about how to answer these sorts of questions reveals more about the value of my research than, say, if I were to attempt to reveal a grand paradigm-shifting theory or a profound insight into the meaning of a singular process.

FINDINGS - STORIES

Over the course of many visits to many libraries I discovered a remarkable array of service arrangements, stories, and strategies related to fostering digital literacies. This dissertation illustrates only a small fraction of these, focusing on the encounters that most strongly relate to the development of this project as scholarship. Each set of stories illustrates some of the most interesting or frequently encountered (or frequently absent) situations and dynamics related to library roles and digital literacy.

The names of every library, librarian, location and even particular programs have been altered in order to make it difficult to directly identify specific libraries. This was done in order to protect the individuals interviewed and to make it possible to discuss a range of tensions and challenges as well as assets, innovations and stories of success.

AQUARIN

The director of Aquarin Public Library couldn't explain it more explicitly:

> "We are a cultural center for the city. I had two librarians from the Netherlands visit us one time, and they talked to me about the library being storytellers for the community. And that struck me. That's what we're really doing—telling Aquarin's story to the world and we're bringing other people's stories to Aquarin. It doesn't matter if it's in a book, if it's on a stage playing music, if it's a video, or a text on a wiki, we are projecting ourselves into the world and we are taking the world in to us and providing information access to it."

Aquarin is an unusual and notable example of the degree to which a public library can transform its mission to match the needs of their community in recognition of its embeddedness in a greater information society. After moving from a limited and failing building situation, on the brink of collapse and with a difficult financial situation, this library has dramatically altered resources and policies to fit an ever-changing social role as a center for cultural production.

The traditional method of characterizing the library's impact on cultural production in a given community is to distinguish the knowledge and consequential informed-discourses it helps to enable through the circulation of materials and provision of public space. In the academic setting this might appear as a library that enables research with databases or in the public setting it might

be a library that hosts political debates. Aquarin takes a route that is entirely different from these classical methods.

So how is cultural production here different?

ARRANGEMENTS OF POWER AND ASPIRATIONS

Aquarin's organizational structure is foundationally different than many libraries. Its importance to the community is evident in a stronger and more direct relationship to the city. As the director explained:

> "I'm considered a department head of the City of Aquarin, the way the fire chief and police chief are, so I do things like go to the city department meetings when they're had, with the Mayor and all of the other department heads, so I hear it all. So when the police department is talking about a new bust that they had I'm at the meeting… it also gives me insight into it, thinking 'oh that neighborhood is getting a little wonky, maybe we need to work with the youth in that neighborhood and do some outreach there.'"

This position clearly privileges the library, but also holds it accountable to greater responsibilities for service. In short, they act in some ways like a Park District might, providing programming in tandem with a variety of organizations, going beyond (but also including) the ordinary type, like schools, to match up with public television and departments within the government. They have actively identified themselves as a "community service organization, not just a library service organization," built on a tradition where the assistant director is consistently charged with making relationships and running events outside of the library to "make sure we always look good" in the community, literally.

A good example of this that was on their mind at the time of the interviews was a large scale music festival which happens downtown nearby the library on an annual basis.

> "So we took this thing on, we're partnered with the city to put on [music festival], and it's in four weeks, last year we got 11,000 people at this thing. And we work with volunteers, from the community and the city, but the library is raising the money to sponsor it, our staff is going out there to work it."

An event of this size and reach is extraordinarily big for libraries of even entire cities to take on, and the fact that the library was helping to fundraise, staff, record and broadcast the event over social media is even more notable.

Opening with such an impressive example is an implicit dare to critical readers who would like to exclaim that Aquarin is an outlier, an unusually fortunate consequence of luck and rightly-aligned variables. While I cannot truly state the extent to which this may or may not be the case I can distinguish them as an example of what's possible within the set of just the public libraries I selected for my sample. In a sense if we were to ask the questions, "How important could a public library be in governance and the production of social and cultural good? What greatness might they achieve in breaking out of their own walls?" we might very well come up with an answer like the above.

TECHNOLOGY ASSETS

Behind the relative social prestige of the Aquarin Public Library lies a strong commitment to infrastructure and assets.

> "Our philosophy is that a lot of the kids in Aquarin get hand-me-down everything, from clothes to whatever, and we wanted them to feel that when they come to this library they're getting first-class stuff and we want the technology to reflect that attitude…"

Based in a multi-story building in the heart of the downtown with ample space for expansion, the library has arranged spaces to match its various strategies for cultural production. There is a small space dedicated to local history artifacts and portraits of significance, a large auditorium and adjacent conference space wired for movies, music shows and recording, multiple rooms dedicated to AV production, equipped with powerful mac computers and Chroma key green walls and even a reconfigurable laptop and instruction lab. Included in their array of equipment, which has been built up over the past few years through donations and funds used from Project Next Generation (PNG),[63] are multiple HD video cameras which can be loaned to local organizations.

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[63] **Project Next Generation** (PNG; www.cyberdriveillinois.com/departments/library/PNG/home.html), is an annual grant, typically several hundred thousand dollars distributed to a dozen locations, funded by the Illinois State Library and larger LSTA. The website at the time of data collection stated: "By offering a safe environment, creating multi-

They are also serious about intellectual property and rights, an additional sign that their library is an active site of production. They have a policy for ownership of materials produced by staff, like photography, art and video and also make a strong effort to protect the content produced by patrons for various events.

Despite the impressive array of equipment at the time of interviews they did not have any established curriculum or course structure beyond the computer and productivity software basics found in most libraries:

> "It goes from a class we call mouse and keyboard, which explains 'this is the mouse, this is the keyboard, you don't aim the mouse at the screen, you have to put it on the table' all the way up through Excel."

To some degree a measure of a library's service roles manifests itself through spaces and objects. Aquarin, like most libraries, has a large number of books, a computer lab, public meeting rooms, a genealogy department and so on, but also an entire floor dedicated to digital media production and public communications, with tools like lighting gear, props, cameras, and software such as Final Cut Pro included, all in partnership with the local TV channel and in the service of recording and promoting patron productions and community events.

BRANDING

Aquarin has a history of creating with the community and has developed itself as a sort of brand name. The library has an identifiable logo, an introductory clip they place on videos and, more importantly, a reputation. They have established a local history wiki, produced a documentary on the town and run podcasts and patron-created PSA's with regularity. In other words, their name is out there. It's attached to large music festivals, showing on the television and present on the internet through social media. This certainly isn't unheard of for libraries in Illinois, even in small towns and cities; what's notable about it is that it's primarily patron-driven and community-centered.

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generational talent pools, integrating technology and advancing social values, Illinois libraries are bridging the traditional with the innovative to impact the next generation." PNG has been going on for over a decade and was brought into existence by Jesse White, the Secretary of State and State Librarian.

This presence has secondary effects. By promoting their own image and that of the city they garner attention and opportunities, despite adversity:

> "Success breeds success, I'll tell you that much. People want to be a part of success. People with money want to be a part of success... Nobody can look at [town name] and say 'They're swimming in money, so that's why they can do it.' We have one of the highest unemployment rates in the state... We have a few fans of our library besides the city government, folks who have a little bit of money who are willing to throw in some bucks to get us a couple more tablets or lights for the [film production] room and so forth."

What the director is reflecting here, is that the library, in this sense, not only brands itself but also the image of the community. The children's librarian agreed with this sentiment, expressing that they had to also connect the faces beyond the TV spots and logo:

> "I don't think we'd have half the attendance we do if we didn't get out into the community like we normally do and they see that we are the people you can find at the local Jewel or Dollar Tree. We have a lot of kids come in because they know us, our library reflects our community."

CULTURAL PRODUCTION

Up until this point I've mostly focused on the high-level alternative service roles the Aquarin library has chosen to undertake on the path to fostering digital literacies. The children's librarian helped me to understand a specific way this is implemented in explaining they seek to help kids produce, not just read and pass tests. Like many libraries their programs for youth, especially those in partnership with the school districts, are accountable to standards-based education metrics and regularized evaluation of learning endeavors. Despite this they elect to deeply integrate digital production technologies into the programs they run for kids.

One such program I was told about focused on showing kids how to access services of the library by using iPads as e-readers. They learned to use the website and then proceeded to download books of their own choosing. The librarian explained how she noticed some children were willing and able to read books they would never ordinarily bother to discover just because they were available on a technological wonder like an iPad. We both speculated this could be a particular advantage,

especially with tough populations like young boys who, in her library, were averse to getting into reading books.

She also had children, including those with special needs who were behind in their test scores, practice storytelling by recording videos of themselves, in order to help them do it in real life performance. This sort of activity may not be all that novel, akin to reading to dogs, a common story time activity in many libraries, but holds the added benefit of continued review by both the reader and teacher. As we spoke about this the librarian flipped through pictures and examples on the iPad in front of me, implicitly demonstrating her own ability to use the device. They had a constantly changing set of activities working digital tools into programming each year:

> "During Teen Tech week we have forty or fifty kids come in, we go to the schools and do promos and work to determine what they'd like to see during Teen Tech week. Last time they did three or four different digital projects. We brought the Macs down to the teen zone and these kids were able to login and create jig-saw puzzle photos after taking photos of each other. They used a website to manipulate their faces and then some took those back to school and attached them to their school logo or printed them on T-shirts."

This process is largely iterative design. They run assessments before and after program runs tied to basic literacies and standards-oriented skills, and, if necessary, rework curriculum:

> "There's the pretest and post-test I mentioned. If we see improvement, when we're planning for PNG, we do these regularly, we keep it consistent and grow it. If it doesn't change we determine if we need more time and testing or if we need to go back to the drawing board."

And the children's librarian wasn't shy to explain to me that sometimes programs are a failure or are frustrating. They often struggled with consistency of participation and preserving enthusiasm, especially with older kids, some of whom would only go to certain kinds of popular events.

Teens also find outlets for expression through use of digital technologies, as exemplified in an event the director explained to me:

"We had this big poetry slam, and we have a lot of kids who are under social and economic stresses in this town. We had 200 people show up, and probably 40 kids read their own poetry – we recorded it and one of our staff members edited it into a cool video, their poetry, and it goes online. And so these kids, their poetry, they're talking about dealing with gangs, they're talking about absent fathers, they're talking about their dog. It's funny, their range—they still have these Mayberry concerns of, you know, I love my cat and I don't want to get hit by a gang. No matter what bad things happen they still have these core little kid concerns, and at the same time they're worried about pregnancy. I want to put that all out there. I want people to see that and know we're confronting that stuff head on. So the kids, they express themselves, it's on the web and now somebody in Madrid Spain can listen to a poem from a kid in Aquarin."

The process here is powerful because the program fluidly interconnects the ways these teens leverage and experience technologies.

THE JOB OF A LIBRARIAN

I'd like to start with a quote from the director that I personally find inspiring but might be very scary to others:

"We don't hire people who've worked at other libraries. Unless they can divorce themselves from whatever they have decided libraries are, because I see us as people who are completely wiped clean of the meaning of what a library is and then I send them out to change the world."

The working group at the Aquarin library includes an educator who worked 25 years in a prison, a transition librarian dedicated specifically to stranded youth ages 18 to 25 and a teen coordinator "librarian" who wasn't even a librarian by official professional standards:

"Our teen coordinator has two years of an associate's degree at a community college, not an MLIS or Bachelors. He grew up in this town and was practically raised in this library… I know him, I know what he's capable of, I know that he's bright, creative and organized. All of those librarian practice things you can learn we can teach him. But you can't learn to be a kid who grew up in the hood in Aquarin without a mother and who was homeless

for a while… Since we hire people from this community that by default gives us programming that's reflective of [the needs of] the community."

All of these employees don't fit the norm for the kinds of staff we typically encounter in libraries. Not only are their credentials different but they've had to have positions created to match their rather unique skills and access to the community. These were the same people (in addition to the children's librarian and others) who were working with patrons, from teens to young adults, to engage in digital cultural production. They themselves needed to be versed in a variety of skills, technical abilities and multitasking. The director told the story of a shelver helping a department head with computer-based graphic design as an example of the sort of open learning environment they promoted in order to foster digital literacies amongst the staff. Others sought resources online through a subscription to Lynda.com or traveled to the Apple store and other off-site programs for formal training. They were generally encouraged to work on side projects during their regular duties, using free moments when off the desk to follow their passions:

> "It's amazing the productivity you can get out of people when you say "What is your mission in life, what have you always wanted to do?" Answers like "teach kids, produce videos, write a book…" They will cram the thing that they love to do into the smallest amounts of time and do all of the library tasks you want if you will pay them to do that thing they love to do."

The approach sounds strikingly similar to the logic used by many academic institutions. They ask a lot of their faculty, in exchange for a flexible and self-driven work environment. It can be dangerous, lack of monetary compensation for additional work rendered in the name of love, but it reflects the social norms of their library: self-empowered and passionate people need only dive in.

I can't say in truth that this is automatically different from many other libraries, there's certainly no shortage of dedicated and passionate professionals out there, but what does seem remarkably different, and possibly dangerous, was the almost-libertarian approach to it. Workers were expected to just be able to control the vast network of information and people around them to learn how to use and leverage technologies for their jobs and the benefit of the community. Normally I'd say this relies on people who've been brought up in a hugely privileged 'geeky engineer'

background but in this case we see it amongst people who are very much anything but that. The only commonality seemed to be that they had enough of an empowerment mentality to drive themselves and others to learn, and enough interest and foresight to see digital technologies and community services as an appropriate target.

SERVICE PHILOSOPHY

What is most striking about Aquarin is their overarching service philosophy. While most of this was clearly relayed and stimulated by the director it could very much be seen in talking to the other staff as well as observing programs and infrastructure in the library. Aquarin is constantly questioning and redefining its image and service roles:

> "What I see as library profession-oriented people, are people who believe libraries exist for library's sake. That you don't need to justify yourself beyond the fact that you're a library and that libraries are inherently good, it's something that they just see as self-evident. I don't. Because I'm a department of the city, we're always talking about taxes, we're always talking about how high the taxes are in Aquarin, we're always talking about how we're earning it."

That the library in Aquarin is concerned about proving its value is nothing of note on its own; hundreds of libraries face this challenge on a yearly basis. That it is willing to rethink how its value might be expressed, how it might change itself to be valuable in other ways (as opposed to measuring itself with other metrics) is more unusual. While this may not initially seem too seriously out of line with how most libraries think, the director provided a much more potent example in explaining the kinds of potentially drastic changes they're willing to make to ensure their role is justified, even if outside of norms:

> "We don't have a reference department anymore. We accepted the fact that Google has murdered our reference department. Instead, we now have an adult services department that does most of our programming and coordinates all of our community engagement. We're making a much bigger bang, impacting the community, giving much more service back because of this adult services department than we would with a reference department.

This is the sort of decision that shocks other libraries when they hear about it. Aquarin is not just going above and beyond to offer programming and cultural production from the community and outside of their walls, but they are doing so at the cost of services that are often cherished and considered central to the role of the library. They aren't just riding the luck and profit of successful networking and advantageous resources, they're making sacrifices to make their operations possible, without assuming they're automatically good. Often reduction to the core collection of a library is seen as an attack on the foundations of the institution, as the director relayed effectively:

> "I've sat in library meetings and had librarians say 'What are we going to do if the books go away?' And I say, 'I don't care' and they think I'm being a smartass. And I really don't care, if the books go away then that means something better has been invented to get the data to us, the information to people. We'll use whatever that is, to carry information to people, I'm not really frightened about my job prospects.

And this is really at the core of the issue, an understanding that the social roles of the library include being in the business of disseminating information to facilitate cultural production, and that this does not necessarily have to translate to being in the business of collecting, organizing and sorting books. It positions the library in a more proactive role, being the institution to create venues and relationships for information transfer—cultural exchange—instead of merely being at the mercy of dependence upon a single medium or technique.

There are costs to this, clearly, as solid physical books provide a sometimes useful limitation to quantities of information. Only one person can have a book at a time, and right of first sale is a legal standard that makes it permissible to circulate materials after purchase. e-books represent a potentially frightening challenge to this, as they are technologies imbued with external values, proprietary norms and artificial limitations, as will be discussed in the story of the Shipton public library. The same follows suit with cultural production through the creation of videos, web resources and the hosting of events like concerts or conventions. The library must be prepared to renegotiate the norms related to intellectual property, measurements of service value, and how to equitably enable the community to engage with and express information in these forms.

Such a new arrangement is perhaps more of an optimistic embrace of the crisis culture Buschman (2003) identified as central to the identity of librarianship:

"The editor of the newspaper was interviewing me and asked me about the future of libraries, and I said I have no idea what the future of libraries is going to be, that's what libraries are like now, and what I told him was that I want to keep this library light on its feet, not overly committed to anything, that way we can stop doing it and turn."

This is where the model of digital literacies feels like it has substantial traction. The library must be able to fulfill social roles, like acting as a cultural production center, not just in relation to the varied needs of its community and patrons, but actually propelled by them. In other words, librarians must be literate—adaptive and conversant—in digital technologies in terms of culture, critique, construction, creativity, civic duty and more to constantly be transforming service roles. These service roles in turn work to instill the same digital literacies within patrons and the greater community.

SHIPTON

What is often considered the most sacred and fundamental service role of the public library is the collection, organization and circulation of books. Though libraries have broadened their materials categories over the past half century to also include various forms of audio, video and media like microfilm, the book is still revered to be the foundational component of most library collections. Books, as pointed out in the interview with the director of Aquarin, may not always be around in such a prevalent physical form. During the time of data collection most libraries in the sample set were struggling with the recent popularity and rapid adoption of e-readers. They faced a range of difficulties with the devices, including managing and affording the acquisition of content, identifying and supporting key audiences, understanding and operating interfaces as well as actually purchasing and making the e-readers themselves available to patrons, either through circulation or events.

Shipton Public Library faced the same challenge most of these libraries did, in terms of determining how to best make books available in alternative forms for an evolving reader population. What set Shipton apart, however, was their perspective in addressing this task. Their approach showed signs of being both critical and adaptive with e-reader services. More remarkably, however, Shipton's services expanded to include an entirely different dimension: directly supporting blind and low-vision users who were mostly home-bound in accessing

materials through the state-funded Talking Books program. Their struggles and strategies with these service provisions revealed that their efforts fostered digital literacies as much amongst the staff as they did amongst patrons.

E-READERS

In Shipton e-readers had been on the rise:

> "I can't tell you how many times around Christmas we get the knock at the door and it's a woman holding a Kindle and her kids bought her this e-reader, but the kids or the grandkids never showed her how to use it."

Regardless of whether or not Shipton wanted to be tech support for people with e-readers they had become it. In a town with an unusually high number of elderly people and a large number of unemployed persons in need of stronger technical skills, the library was clearly the place to go. The director told me about some of their initial workshops, which were quite well attended:

> "And this past year we had this other staff member, she was younger, and she was wired in like everybody of her generation and one of the staff members in the Children's department has kids and they're all wired with all kinds of devices and the two of them asked me if they could do a workshop for people, breaking it down to Kindle Fire, Nook tablets and iPads. They had between twenty and thirty-five people specifically interested in those devices."

The demand was so much that these same librarians eventually established a blog and series of videos to help patrons and staff better understand how to use them. What's equally notable about the director's statement here, is the perception that certain members of her team were 'wired' as a result of their membership in a generation. This is reminiscent of the concept of digital natives, the assumption that "kids these days" just automatically think differently and pick up technologies. Though the director later expressed she was aware of the range of digital literacies possessed by different individuals, as well as the role of socialization and culture in determining the adoption of technologies, she was still frustrated with the way demand for digital technologies had strained their capacities and the seemingly endless struggle to keep up to speed on the latest. The library's

fight to help patrons make use of e-readers included an internal struggle to make sense of their evolution themselves.

Shipton found that many patrons were ill-equipped to use online resources to learn how to use e-readers and so the adult services librarian I spoke to had prepared handouts to enable them to download books through their web service:

> "Initially there wasn't as much help for it, so I did this thing [showing me the handout], tailored to us, to our library. And a week after I got done with this they changed the interface. And it's still generally valid because of the concepts, but when I talk about specific parts, like on the lower right corner in the blue bar… now it's different, and I haven't changed those yet. But yeah, those are on our website, so I tell people when they're trying to do this, if I'm talking to them on the phone I say can you get on to the internet right now and I guide them through and I show them the home page and I tell them to look for an icon and so on. And this Kindle cheat sheet, because the way you acquire through Kindle is different than other devices, this opens up another set of instructions. And this one has changed too, unfortunately."

As he said this to me I could sense a degree of disillusionment in his voice. He had set about the task of teaching patrons who often depended on a background of ritualistic step-by-step learning how to use a service and interface that required adaptive strategies and experience-based intuition to operate, since it was always changing. A handout couldn't be updated easily to reflect those changes but it was necessary, since a library staff member couldn't always be there to walk them through it. They even prompted patrons to take a step back and ask if the e-reader was even necessary at all. At the time titles were considerably limited, and the better solution might not have been to learn the latest interface, but instead to think about the best source for the books they wanted:

> "When [the adult services librarian] last did a workshop on it he explained that My Media Mall has 5000 titles and our library has 175,000. If you really want the full offerings we have what's in the library as a bigger fall-back."

What these quotes reflect is both dedication and healthy skepticism. They had to be willing to continually strengthen and update learning resources for users, but also know when it was worth their time to do so. While Shipton didn't always have the people or resources to fully address patron needs for e-readers, they took a refreshingly proactive approach to a similar problem with talking books.

TALKING BOOKS

Blind, disabled and elderly users sometimes have trouble getting to the library and even once they're there computer search systems may not be accessible. Many libraries boast home-delivery services but these merely drop a stack of books on your doorstep, which is a problem if you don't have a library card, don't know what you want or can't actually read text. The state of Illinois offers the Talking Books program, which is a first step towards addressing this issue, but the library took it further, as the director explained:

> "Our outreach department is the go-between with the talking books program. We do a lot more hands on rather than just let folks deal with the computer alone. It is intended to be computer-based so you can do it without a person, but the audience is different from what they think. The blind or physically handicapped people may not understand or be able to use the technology that ends up on their doorstep or in the mail."

Previous generations of talking books were simple cassette players, but the latest iteration had moved to a lower-cost digital model—a model which depended not only on users owning their own computer, but being able to use it, sometimes requiring large-format displays or screen readers, technologies that are far from commonplace. Shipton capitalized on the service opportunity to establish an outreach department built entirely around bringing not merely library materials to users in their homes, but the support and guidance of librarians as well:

> "Well the overall service is if you can't get to the library we'll take books out to you. There's one on one, we have volunteers who go to 5 different houses on a route and deliver books and pick up what they don't want anymore and bring back requests and then a nursing home or senior apartment complex they'll setup in the activity room every two weeks and spread out books and people come in and people can check them out remotely. Now we have a Verizon wireless connection, they take a laptop out loaded with the

software to check things in and out and they can go live with our system to check things out immediately… Well and sometimes they try to show people on the laptop during those library sessions how to use our catalogs and services."

The library reported serving between 200 and 400 people per year as talking book or special needs home-bound users. They brought a variety of kinds of materials to them, including large-print books, talking books and other audio books, but the experience was very much individualized. Instead of being left alone to try to navigate hard-to-read interfaces or try to order items over the phone they could work in-person with librarians and volunteers, establishing relationships that enabled more effective readers advisory, and, consequently, higher potential for learning and enjoyment. This is particularly appropriate with elderly users, who may not feel very empowered to act on their own. The librarian I interviewed even reported that running the service this way enabled patrons to remain more connected to their friends and family because they could inquire about and seek out more recent titles, giving them something to talk about. Even if they weren't always able to operate computers themselves they could learn to indirectly leverage their potential by using the librarians as proxies, making it possible to develop cognitive digital literacies without reliance on computer basics like typing or using a mouse, or something that requires even more training, like a braille interface machine.

STAFF PERSPECTIVES

The question remains: how did Shipton arrive at this service model? A consistent theme throughout interviews with Shipton was their willingness to try a wide variety of programs and service configurations, which involved a certain degree of risk-taking. They elaborated on many of the typical challenges libraries in their position might face: establishing a permanent space for computer classes, promoting robust educational and workforce development activities online (as opposed to just flash games and social media), constructing and facilitating an effective teen space, engaging students to help with technology as service learning, production of media through Project Next Generation activities and more. On the one hand hearing about all of the things that needed to be fixed reminded me of how crucial problem-solving and social services are to public librarianship as a profession, but on the other hand it was uplifting to note just how empowered they felt. It wasn't just that they were facing an endless stream of problems, it was also that they assumed they could be solved, and that with enough iteration and commitment they would be.

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Both of the librarians I spoke to expressed frustration with the times it felt like they weren't breaking through but also grounded their evaluation of activities and services very much in the recognizable cases where they did.

Beyond the optimism there was a hefty sum of placing their conditions in perspective. When asked about why they were focused on moving beyond books the adult services librarian told me this:

> "I think that, getting back to that idea earlier – this whole idea of public libraries picking up slack and not just being a depository for books anymore, it's an area where we can remain relevant. Particularly since, unless you live in a university town or something, you're going to have to pay for [computer training] much of the time."

The director said something similar:

> "I see two things, one is helping people make the transition – or at least providing the tools and information on the tools they need, and the other thing is to provide the most accurate, reliable information we can… A new technology comes out, everybody is crazy for it, but ultimately, they'll find that 'well it does this but not this… and so you have to also get this.' And so I think ultimately for libraries we make room for the technology if it's appropriate for needs."

Shipton identified guidance through both community engagement and teaching (or mediating) technologies as part of their evolving mission. They didn't see this as mission creep, but instead as a refined form and appropriate use of limited resources:

> "I think one of the mistakes we often make, one thing I got out of this [refers to book from PLA training], when determining these service roles, they say 'Oh we know what you're thinking, you're thinking how can you do this on top of what you're doing now?' and that's the point you're not going to continue doing all of the things you're doing now – you'll do some of it—circulating materials for instance, but their point, which is a very good one, many libraries try to be too much to too many people. Instead of doing 20 things in a mediocre way it's probably better to do fewer things and do them well."

It was already striking that they were actively and formally engaged with considering the PLA's perspectives on new service roles (they had even had some staff members attend training), but even more clear they had benefited from their integration. Shipton had limits in terms of its space, staff skills and funding but managed to find ways to help underserved populations in specialized forms regardless. They provided these services with critical consideration, with regards to the high-level urging of the ALA and PLA, but also with their own internally-driven thoughtfulness. This meant they were selective about what they adopted:

> "I went to a workshop held by the Chamber of Commerce, and there was an accountant who was going to explain doing accounting via the cloud, and it was really convenient for them, because she could go to where the client was and tap into whatever she needed… She explained that it's very secure and your data is kept separate and if someone wants access to your information they have to get a court order. And I said Homeland security doesn't need a court order."

Later the director added:

> "Now we're subscribing to [a database] and we get access to 2500 magazines, so long as we pay every year. So we're paying for the same magazines, basically, every year, as opposed to purchasing and having them forever here. If we can't afford them anymore then we have no magazines. It's that easy to destroy a collection, it goes away, poof!"

The director's perspective here wasn't to outright reject these technologies out of fear or distaste, but to note the real, identifiable disadvantages evident in them. To really empirically ground her concerns she would need to reference data, but at least some preliminary material suggests she's correct, like the ALA's investigation of the Patriot Act's impact on libraries[64] or the influence of

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[64] See
http://www.ala.org/Template.cfm?Section=ifissues&Template=/ContentManagement/ContentDisplay.cfm&ContentID=32307 for a collection of resources on this issue, driven in large part by Leigh Estabrook.

companies like Apple and Amazon on e-reader and e-book formats and prices and the possible impact they have on the market, affordability and access.[65]

Formal research data may not always be the sole motivation for directing choices, of course. The adult services librarian expressed to me that a lot of their struggle was comparable to their patrons' experience:

> "You know most people just appreciate that you take the time to try to answer the question. I've found also that when I don't know something, and I admit it, I don't get somebody with attitude who says 'well you're supposed to.' They almost always say 'I hear ya.'"

Both librarians recognized the complicated social construction of people's interactions with devices. An interaction that was similar to what had been mentioned to me at multiple libraries around the state was pointed out:

> "Part of it seems to be that people are seduced by this stuff, not just older people, kids too… the [nearby middle school] bought a whole bunch of Kobi readers and got several of these things from a grant and they were loaded with public domain books and they interviewed the kids – and these kids were reading books that they'd never read in print. One kid was reading Moby Dick, one kid was reading Beyond Good and Evil by Nietzsche and he said he enjoyed it! No kid in 7th and 8th grade is going to pick up these books and read them ordinarily, but it's the screen, something seducing about the screen. I don't really understand it and wonder if maybe it'll wear off."

This statement was the sort that underscored the library's definite interest in taking an active approach to enabling learning and information access. Corporations, governments and individuals are all out to pursue different kinds of information-intake agendas; the library can be a conscientious and community-minded player as well by continually seeking to understand these forces and act based on directed inquiry and thoughtful observations.

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[65] Many articles exist on this topic, a fairly recent example was a lawsuit involving price fixing: http://www.wired.com/2013/07/apple-ebook-price-fixing/

Shipton's willingness to be flexible and adaptive with their service model was just one component of the equation. Their ability to do this depended largely on digital literacy skills and competencies within the staff—not just preexisting but also the ability to learn them. They would start with something like a challenge to service, like long downloads for patrons who don't even have computers in the first place:

> "And it [talking book files] takes forever to download, it must be real time or something, so we're still wrestling with how we serve people and deal with copyright and counting issues that prevent service and circulation."

And then start coming up with strategies to solve this problem that might require additional learning or challenging the boundaries of the rules:

> "…but the main problem is that most of these patrons don't have computers, so what we thought what if we had a download station in the outreach department and she could, on a patron's behalf, with written permission, download titles for them. We thought what would be really cool would be to put multiple titles on a regular flash drive, so we got a cable, and jury-rigged it to be able to plug it in, and reversed engineered this thing, but the problem is that the player is setup so that if there's more than one folder on there it won't play anything, not even the first one, so apparently it's protected, which was a bust, but at least we could buy a bunch of flash drives for cheap, and give a person five audio books on flash drives, each with different downloaded titles, and then we could have blank drives here at the library, and while he has five in the field we prepare five new titles to take to him when we go to pick them up. They wouldn't let us do that because we couldn't get into the patron's account, even with their permission. It's too bad, because the technology could enable us to provide so much better service but we can't because of these restrictions."

Just reflect on what the adult services librarian is doing here. They're way past the question of determining the social role, enabling information access for patrons with disabilities, and even deeper than the service role, providing audio-format books with guidance. In this instance the

librarian is refusing to accept the artificial limitations of the technology that ultimately end up hurting the patron and attempting to reconstruct the meaning and purpose of the 'technological black box.' Their endeavor is fundamentally representative of critical digital literacy and reliant on community engagement. They even made efforts to ask for help from other libraries:

> "I did talk to a state library person in [nearby state], because they bought machines and found a way to get around the system, they evaluated what was out there and which would work best for patrons, but it was a huge undertaking, because they were doing it in addition to the talking books program. They were feeling like we did, they wanted to be ahead of the curve, but we didn't have access to the tools that would teach us so we could teach somebody else."

Ultimately, despite perspectives, networking and perseverance the library did find limits in terms of their people:

> "A lot of it comes down to people. [the library in another state mentioned earlier] had two tech-savvy people. We were able to offer e-reader classes because we had two tech savvy people. We could go forward in a lot of different directions, but when we have somebody who already has an interest or skills in something then we can move faster on that particular thing. You have to give people the world a piece at a time."

Their recognition of this need came well before the OITP report on the importance of supporting digital literacy in libraries. During the interview I felt like they were implicitly asking me for help:

> "It's great you're doing research on this – because increasingly public libraries are picking up the slack, for a lot of things that government used to do and is not doing any more, and digital literacy or media literacy, it's an important thing we need to be doing but we're not being given additional funding for this, we're having to pick up the tab on our own time, we're having to train ourselves and that's the challenge."

And it's true, I wished I could be there to help them. The real answer, however, is bigger than the individual agency of the librarians providing these services. It also includes a dimension of structural support and policy-based changes, issues I will develop more so in the discussion.

NORBURRY

Small towns in many states live and die as the result of investment by major employers. In some cases a given city or town may depend completely upon the work opportunities provided by a single manufacturer, institution of higher education, or military base. When a crucial employer closes up or shrinks operations in one of these types of locations libraries often suffer. They typically need to help large numbers of suddenly vulnerable and unemployed people find jobs by searching and filling out resumes online and yet they must simultaneously deal with funding and staff cutbacks due to decreased tax revenues. Librarians find themselves doing more and new kinds of work, and may not always have the time to help patrons as much as they'd want or need.

And at the same time libraries also face demands to spur innovation in response to changing times and technologies. Many librarians feel underequipped to know how to rapidly assess and adopt technologies and others just don't feel like they have time or money in the budget for R&D.

Community engagement, unsurprisingly, can provide a partial answer to this sort of crisis. Libraries that have a strong referral network and relationships with social service agencies can better transfer patrons to services outside of the library. Libraries can also be receptive to accepting help in the form of volunteers and donations provided directly from the community. All of the sites discussed thus far have been notable in how they've gone out of their way to break out of the library building and get into the community physically. Community engagement does not have to always look like this, however; sometimes welcoming and supporting community-driven assets can enable libraries to improve their services roles to reach patrons in new or creative ways.

Norburry Public Library was precisely all of these things. Though their town was more than a decade past the catastrophic closure of the former major local employer they were still dealing with significant volumes of patrons with very limited computer skills. Like many other libraries positioned in recovering or struggling communities they sought to find new and positive ways to engage and aid the populace.

SOFTWARE POLICIES

The library director here was clearly nervous to talk to me. She knew I came from a town with libraries running dozens of programs with the benefit of outstanding LIS graduate students. She knew that my University background and context made me privy to thinking about programming

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with the latest in digital technologies and most of all she knew that my experience in critical scholarship meant I would ask a lot of "why" type questions. After spending some time reading over my interview schedule, she felt comfortable and we began talking.

Our interview covered most of the basics, including service population, technology assets, the future of the library and so on but the director was quick to admit that she did not consider herself to be a very 'tech savvy' person, explaining "I don't even have a cell phone." She found herself continually struggling to adequately assess and evaluate technology-based services for her library, a task that required she depend on the expertise of others. Rather than rely exhaustively on distanced outsourcing companies the library invested in individuals, such as their technical librarian, a local consultant and volunteers, in order to put the community first. This line of thinking led them to surprising policies:

> "One thing, for our computers, a lot of people want the nicer Microsoft products, like Microsoft Office, but those are sometimes out of our price range, so we don't have those software programs on our staff machines, instead we use Open Office, and just put the more recent Microsoft Office on public workstations. We obviously need our staff machines to be able to handle our needs, but we can deal with worse programs behind the scenes, it's more important to us to provide the better resources for the community."

This attitude of putting community needs first, despite limited resources, was also present in the composition and layout of their lab. They segmented several computers into study carrels and also had a circle of computers for collaborative work in the Children's section. More notable, however, was that they deployed a number of operating systems, including OSX, Windows and Linux:

> "Our library felt we should make the public more comfortable by providing more types of machines, so they could use whichever they prefer. A neat thing, something else I like about this library, is that we have Linux on some of our machines, especially for our OPACs and the computers in the back in the network room, it's a neat blend going on our network."

Of most of the locations I visited, open source software was not a frequent occurrence. Computers that were individually managed and careful considerations of interface were not typical, and yet

here they were, in a library managed by someone who did not consider herself to be very digitally literate. They were able to arguably provide better service for less economic investment.

SOCIAL CAPITAL

The secret behind all of this, of course, was a relationship network. The case of the computer management policies outlined above was made possible by a consultant:

> "We have a contract with a gentleman, he's not library staff, but we ask him for two hours a month to do computer work for us, sometime he works more, and he is interested in Linux and that's how we've got in to that. It's really been fantastic, it's saved us money and we're really fortunate to have his direction."

This consultant provided his expertise for far less than what he made with his other job with a nearby research center, as a kind of social service to the community. This was not an isolated case, however; the library had been accepting donations and testing community-suggested policies for some time now. An older example was a gaming machine that stood solo with a joy stick attached:

> "The gaming machine is actually a flight simulator, and we have a Cermanski section, an astronaut from Norburry, who died, and his family set up a memorial fund for him, and it was purchased with those funds. All of our other computers, except for this one and the card catalog computers we ask people to sign up with their library card – the flight simulator we still ask people to ask at the desk before they get on it, but the family asked that anyone be able to use it when they donated the machine."

In some sense one could surmise that the library was just lucky to receive donations from the local community, but the impression that I developed over the course of the interview was that it wasn't just 'luck' that got them equipment and time from people, it was that people knew they'd make good use of it. Another story helped to illustrate this:

> "This year we were donated five e-reader tablets, new, and a laptop, for our library to use… it fell into our laps, this guy walks into the library with a box of stuff and says he's donating it to the library, and doesn't want anyone to know who he was, and says it's all brand-new stuff and it's yours and walks out. Thankfully someone on the staff knew who he was and we confirmed it wasn't something that fell off the back of a truck and it wasn't stolen."

Norburry may not have had the funds or interest to purchase tablets on their own. The person who donated them knew not only that they'd be used, but also that he would be able to actively influence the service directions of the library by donating them. Norburry was not a library with a fixed set of 'we just organize stuff' sorts of services, it was one interested in being responsive and supportive of community involvements. Clearly both of these donations still fit well within the general scope of social and even service roles of their library, but they both pushed the library to offer small innovations in their services. The tablet donation resulted in a petting zoo where patrons could don touch-capacitive gloves to learn about the various ways to get e-books, and they were later adopted by the Chess club for use as timers for bug house. It may not initially seem like a very big deal, but it's different from many libraries where staff are overly concerned about adhering to rules, very specific understandings of asset use and are fearful of change. The community of Norburry could more directly control the library, and in turn the library gained assets and improved services as a result.

Social Capital can be defined in a variety of ways,[66] but is generally regarded as the notion that networks of relationships between people have value. It is often thought of in one direction: how a single person might leverage norms and favors to their benefit, but when enacted in and through the relationships and services mediated by the public library it might be better characterized as the production of social good.

VOLUNTEERS

Many libraries rely on volunteers to fill gaps in services, particularly the need to provide patrons technology assistance. Norburry was no exception, as their technical librarian explained to me.

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[66] Coleman (1988) envisioned social capital as aspects within a given social structure that facilitate individual or collective action; influence and change generated by networks of relationships, trust and social norms. This concept is not particularly new, and has been complicated over the years, being famously problematized by Putnam (2000), who theorized social capital in the form of strong relationships was diminishing in the American public sphere, and Granovetter (1973), who suggested social capital might be measured in the form of varying strength of ties or connections to others. Social capital lends itself well to social network analysis and is often considered one of the ways we can measure community in a given context.

Frequently, however, patrons needed more time and help than a single librarian could give them, especially if there were others in need of help. She told me about this with a story:

> "We still continue to do computer tutoring with people, in fact today we had two of them, and it's funny because you were talking about how libraries help to define things, digitally. We had someone come in today and she says "I've got to go on to an unemployment website" and we get a lot of that so I have an idea where to find it, and she says "well I understand computers, don't worry," so I go back to the front desk, but she picks up the mouse and starts doing this, in the air. [Motion of waving the mouse around like a remote] and I said 'So have you used a mouse before?' 'Yes' 'Well have you used a mouse like *this* one before?' And ours don't have track balls in them but even with optical mice you need it on the table, and so I say to her let's try it this way."

She directed the patron to a Mousercize (an exercise with a mouse) website to help them get a handle on the device:

> "It's good because it helps them learn but it gives them some dignity because they get to be the one in control, and by the time they're done they can control a mouse and cut and paste. And this was a good hint from another library. I wish I had time for this lady today, but I had to be at the front desk, but luckily we have volunteers, and I told them they'd be able to help her learn to use the computer but she'd have to make an appointment, for a dedicated half an hour appointment. But it's frustrating, because I had a line of people at the front desk, and I knew this lady was not going to know how to do this, but it's difficult to tell someone you don't have time for them when you want to help them."

You can get a good sense of how layered something like this is here. The technical librarian had learned how to be respectful and patient with patrons, which was as important as having knowledge about computer operation concepts. Her knowledge of existing resources allowed her to save some valuable time, as well. She was able to setup a tutoring appointment with a library volunteer for them, knowing that they'd need a considerable amount of help. Appointments were typically customized for individual patron needs, which allowed them to better understand how to help:

"Today we had a young man who wanted to post things on YouTube and he had a whole line of questions, but his mom isn't allowing him to get a Facebook account until he learns from us, which I thought was a good responsible parent thing, but later I found out the reason she's having him do this is because she wants him to get on Ebay and help them make money for the family… He understands computers, he's a junior high student, but we've only worked with him for probably an hour, and I sent my volunteer out there, and I'm getting to a point where I'm thinking I don't understand this guy, my volunteer is a male closer to his age and they might understand each other."

This example is interesting because it shows how computer tutoring may not always be so straight-forward. On the one hand there's some concern for patrons feeling comfortable in learning from a peer, and on the other hand there may be multiple agendas going on behind a patron's interest in learning. Navigating these sorts of situations requires more dedication than a librarian pressed for time could offer.

Most of Norburry's volunteers were assigned there to perform community service of some kind, through schools or as restorative justice or similar programs. This meant many of them were assigned tasks, which was fine, as they could fit into existing library service roles, but the more exciting way that volunteers contributed at Norburry were the ones who brought in their own influence to alter services. The technical librarian told me about one such unusual individual:

"We have people like the gentleman who does animatronics, which is great… he started talking to me about some of the things he likes to do, and he likes animatronics and he understood the summer reading program was 'Reading is so delicious.' He said 'can I make you guys something that will talk and you can record on it?' and it took him a while to figure out how he'd kind of do it, and it came together and at first we were skeptical, but we were really surprised."

A volunteer helped the library to advertise their summer reading program by actually building them an interactive display, shaped like a gingerbread man, in the library:

"Yep, it's made out of Styrofoam and computer parts and he had this old laptop that won't do much besides run the gingerbread man – and it sits in the closet and just runs this display,

and that's it… He just came in and it's one of his passions. At his church he's built huge turtles and controlled them and everything. And in reality everything he's paid for – the paint, the foam, the computer, the time – it's free help and he's been a real jewel for us."

The contraption sat near the front of the library and used recordings made by the staff to announce various activities and events. It was reported as being fairly successful at capturing the attention of patrons for a variety of events over time but also as potentially becoming quite annoying due to the sheer repetition of messages and interactions. What's more notable was how willing the library was to work with this volunteer to let his passions shape the space for the better. Though he didn't teach patrons to use digital technologies with this project he did help to engage and teach the staff about what he did. At the time of the interview they were looking into determining if they could do something similar as an actual program:

> "He's the kind of guy who wants to build stuff. He wants to do a steampunk style MIDI synthesizer, for instance, okay, so this is his vision—he doesn't understand the music or how it works, but he said 'I would love to teach a class here at this library on how other people can do the same thing.'"

They were also considering relying on him to help teach their other volunteers, to build the technology tutoring services of the library. His qualifications were as much about social skills, confidence and cultural familiarity as they were technical competencies or fluency in digital literacy cognitive models:

> "And this guy is good with kids, too. In the military his job was teaching computers and application, but this makes him good with kids – he's a communicator, it's one of his gifts... The other young man volunteer, watching those two together is really great. It's generational and they really understand each other and they have a good time. They stand there swapping stories and so on, exchanging knowledge and tricks, solving problems."

Again the point here is not just that Norburry was lucky to have help from such skilled persons or even that they presented strong evidence for the impact of social capital. The role of the library that was so notable, in this case, was their willingness to facilitate, curate and explore how to offer services to foster digital literacies.

Many libraries struggle to find ways to meet the needs of service populations who are absent from their buildings. As seen in some of the prior examples, one strategy to address this issue is to run programs in locations outside of the library, another strategy might be to facilitate volunteers to help bolster and alter services within the library, and yet another strategy might be to bring library information online for use by the rest of the world. Sometimes these efforts involve a dramatic configuration of policy and library culture, but they don't always have to be so involved. For Dalhurst Public Library, meeting people where they are, both physically and emotionally, is central to their daily operations. This perspective and associated service strategy might be a bit radical, but the resultant library roles and activities were really down to earth. The difference lies in a recognition of people's emotional states, something that's generally not addressed in any formal statements about service. The director made the baseline for their inspiration for this quite clear when I asked her about who her service population might be:

> "My other beef, I'll just say this while we're at it, there are several states in the US, where there is no underserved public. If we're going to throw all of the libraries up in Illinois in a huge upheaval as we have [a reference to the system reorganization at the time] then let's do it right and let's revamp the legislature so that if you're a citizen of Illinois you are served. Because here we are, we're a municipal library we're only serving the citizens who pay the taxes to support this library. Other people can come in to use this library, but they can't check out a book unless they pay a non-resident tax. We're a rural library, we're surrounded by this huge rural community, but they're not afforded the same access as local citizens are. What I don't understand is why that can't change. Indiana has a county-wide system, so anybody in a county can go to any library in that county, or really the state, and find services. That we have such a large unserved public really frustrates me.

This frustration, the director's drive to meet people in terms of their actual need, regardless of surrounding circumstances, appears to be the philosophy behind many of Dalhurst's programs. This broad concern for people's wellbeing is not uncharacteristic of libraries but its interpretation is where it stands out.

One of the key demographics that is often less-present within the library is patrons ages 35-50 who do not have kids but do have full time jobs and stable income. Many of these individuals might commute in to a given location for work, staying there for many hours at a time, making it difficult for them to visit a library nearby their home. These also might be the individuals who see the library as less useful or relevant in their lives, the sorts who may believe the library is just full of old books and that all recent and useful information is online. The Dalhurst library attacked this by developing a program inspired by the Chicago Public Library, as explained by one of the involved librarians:

> "For the e-reader petting zoo we basically go out into various local businesses, usually restaurants and coffee shops, because we've found we get the best response there. We take e-readers and we have a tablet now, too, a Motorola Xoom, we got out of a Small Business Administration grant through the Illinois State Library… what we do is go out into the community with our e-book lending library software and we try to show people what they can do and talk to them about the different kinds of devices that are available and how the digital library works."

Pop-up libraries and library programs in cafes are not strikingly new, but this sort of e-reader outreach was somewhat unusual. When I asked about how they distinguished this from other engagement activities, they explained:

> "The difference is that it's technology-based, we're taking a laptop with us and signing people up for library cards. We're basically taking the library to places - a lot of people don't come in to the library, so that's how we're reaching people who might not typically know what we have for services, and we've found that e-book lending is one of the things that many people who don't come into the library might be excited about. One of the best ways for us to communicate about that is to go out into the community and raise awareness."

This was one of the first examples of Dalhurst meeting people where they were. The library wasn't necessarily out to convince them of the worthiness of paper books, or to try to pull them into the building to drive door count. They knew that many of these folks wouldn't have time or interest

for programs actually at the library, so they'd just meet them for lunch, and make their persuasive pitch there. Setting up in a lunch-time break setting fits well with the concept of recreational reading with e-readers, too. What's equally notable, though, is that these programs were also a way to foster digital literacies – helping patrons to access information via new mediums intentionally and with guidance, through the library asset base. Though many of the patrons at the cafes might have been on average more tech savvy this did not automatically mean they all were.

MEETING PEOPLE WHERE THEY WERE

When I spoke to the archives librarian, she went straight to the point with an impressive declaration:

> "Okay, well we have 11 thousand images that are digitized."

The sheer image count was striking, especially in the context. Before me sat an older woman, a veteran of this small town library. Surely, I thought, she must have had help, so I inquired.

> "I did most of them myself, but I also had a volunteer, a former librarian, who would come in, she was retired, and would come in one afternoon a week and worked on the negatives, and I'd do the photographs and the glass plates, because I was worried she might break those accidentally."

So, in other words, her help was an elderly person, not some young guy from tech support across the way. My surprise at this circumstance was revealing of my assumptions about digital literacies and age, but as it turned out over a few years these women managed to amass a pretty impressive community history collection. They did so largely in response to patron requests and with patron input, soliciting photo donations from a variety of people around the town, sometimes having to sift through hundreds contributed by just one person. What was more impressive to me is that it drove this librarian to develop skills and competencies that she might not have ordinarily acquired:

> "I taught myself through Adobe Photoshop for dummies and it took probably 3 or 4 years to get them all completed, and once they're on a separate hard drive and then I burn them to discs, they're stored off-site…They're stored off-site, because the original library burned to the ground in 1958 and took the archives with it, so they are now stored on disc as TIFF files at city hall, so if the worst happens those photos are still there."

The use of Photoshop for restoration and the concept of digital backup (as opposed to classic archives and preservation typically found in small libraries) seems only natural, but is actually considerably more than most libraries are willing or able to commit to these kinds of programs. The traditional role of establishing and curating community memory through the library resulted in digital literacies and professional development for this librarian that were both voluntary and remarkable. At the time they were in the process of also learning how to best bring this collection online for the public. The director indicated that it would be a good way to increase traffic to their website as well as engage with populations not directly present in the library. The archives librarian had noted that one of the reasons to make copies was that people valued the photos so much they'd occasionally have problems with theft, demonstrating the emotional value of the photos to patrons. They also noted the possibility for fundraising to continue these operations, as patrons could visit to print out copies for themselves, but an online album order service might be compelling.

THE STIGMA OF COMPUTER BASICS

Like many other libraries, Dalhurst called upon youth volunteers from a local institution of higher education. As the director explained:

> "There's tech tutors, that's a volunteer program that we set up with Sawyer College. Students over there are supposed to be involved in the community and so we have a little program where they can come over, do some training, and then our patrons can call us and set up an appointment with a tech tutor, for just about anything they want. It might be hobbies, it might be setting up e-mail, figuring out an e-reader, and so they set up an appointment and they have an hour of that tech tutor's time. And they can ask for another hour, and some of these young people, but mostly older people, end up building quite nice friendships.

This arrangement was in many ways similar to Norburry and others that have these sorts of partnerships with volunteers, but with the notable exception that their student help disappeared during the summer. It did, however, allow them to work with patrons for longer periods of time based entirely on their needs. The program had taken the place of computer basics classes, which were reported as diminishing over time by the computer support librarian:

"We have offered basic computer training here, when I first started here I offered it regularly and we had lots of people attend but that has slowly dropped off to where the audience we target for those classes are smaller numbers. The local Goodwill offers computer training for anyone who is a job-seeker, so people who want formal classes and training we send to them. The classes we offer are generally for people like seniors who want to be able to e-mail their kids. As I said we haven't done those in a while, because the audience is shrinking."

This librarian, who had been there for years, noted that she didn't think the shrinking audience was primarily due to a decreasing lack of need or increasing aggregate level of computer literacy, but instead frustration and shame. A long exchange explains it pretty well:

"L: The biggest problem, for us, is that they need it and they need it now. And that's where the tech tutors are very helpful. I used to do resume workshops, and it included how to write a good one, how to do it electronically and then on paper, and almost no one ever came, but we still get people who come to the desk and have nothing ready, no information, they've barely used a computer, and they need a resume right now.

J: Do you think it's that everyone is used to immediacy now, like McDonalds, you get your food instantly, you go to Google you get your information instantly? Is it a culture of just expecting everything to be easy and fast?

L: I don't know, I could not believe it when it happened. I think some of it is this lack of patience, I also think some of it is people who are embarrassed and don't want others to know how much knowledge they lack. There are people younger than me who don't have computer skills, it's a taboo or something. I tell them that they're not an idiot just because they didn't grow up like some people today. They shouldn't feel bad about lacking competencies, but it's like illiteracy used to be, or is, people who are ashamed to admit they can't read. They have to do literacy tutoring in the basement, to hide it, and that's the way computers are going. Our society acts like everyone has a smart phone, everyone has a tablet or e-reader, computer and e-mail, and that it's all intuitive and that any idiot can sit down and do this stuff, and I see that mentality as a problem, unless your library is richer and has more staff to meet people one-on-one."

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The director also noted the degree of reliance on others for tech help needs, citing the example of her 80 year old mother who wouldn't be able to get airplane boarding passes in the future. To some extent the elderly have and will always need assistance with some tasks in life, but this raises a really key question when it comes to digital literacy and library roles. We often construct the issue in terms of skills possessed and competencies gained, giving cursory attention to issues like confidence or culture and instead focusing primarily on the comprehensiveness of services provided, content issues in curriculum and various access mediums. However, what the librarians stated here is that there are significant behavioral and perspective issues that complicate confidence. You have people who are inhibited in their learning by fear, and who may just rely on others to be a kind of access point and aide for information, introducing potentially problematic dependencies. If the library is not open the patron cannot get help, if the volunteers are on summer break then they cannot get enough help and so on. This ultimately defeats the idea of the library as a bootstrapping model where patrons are empowered to help themselves, and instead creates ritualistic and relegated relationships between patrons and services. In many cases in-need patrons of many ages may come from backgrounds with inadequate education, where they were not encouraged to learn through self-directed inquiry or problem-solving, but instead by copying and following everything they were told or read. Some patrons may also be fighting even larger issues than a lack of education and practice, such as learning disabilities or mental illness. It's certainly more acceptable for the elderly to be regarded as 'naturally' unable to use computers, but when you have younger people who also run into difficulties but who hide it, there are systemic problems that go beyond generation or access.

PADDOCK

The ALA states that "in order to assist individuals in the independent information retrieval process basic to daily living in a democratic society" (ALA Council 2013, section B.8.7) they must include instruction on the use of libraries as one of the primary goals of service. They encourage libraries to approach this from a life-long learning perspective, working with children throughout their years into adulthood with both professional and personal growth. The use of libraries, however, has become increasingly complicated as services have expanded and information has taken on additional forms. Instruction doesn't just include learning how to conceptually and physically use a card catalog system anymore, but also an understanding of computer-based input systems

(generally mouse and keyboard, but possibly touch and other interfaces in the near future) as well as search systems for file management and the internet and the concepts that go along with it, like that files and locations like the desktop are abstractions, that the internet has no official beginning or ending and so on. As a result many libraries have felt the need to integrate formalized computer instruction into their service offerings, especially those located in areas with substantial populations and regular demand. Of the libraries I spoke to throughout my research all of them serving populations greater than 40,000 had a dedicated computer lab and some kind of regular course offerings, typically at least input and internet basics but also often resume workshops.

Paddock Public Library fit with this norm, being a library system serving a substantial population through a number of branches. Instead of relying on tutoring by volunteers, like many of the libraries previously-mentioned, Paddock chose to provide services through leveraging grants, partnerships and responsive programs. In this way they were able to take existing assets and enable them to go as far as they could.

Due to time constraints I was required to run my interviews with Paddock as a single focus group. Participants are distinguished by a number followed after "L" in exchanges. L1 was the branch manager for the location I was visiting, L2 was the system IT director, and L3 helped to manage programs.

PROJECT NEXT GENERATION PARTNERSHIPS

Funding from Project Next Generation, the digital literacy state stimulus grant commonly found at most sites, is flexible and different sites choose different strategies when allocating the money. Many choose to invest in infrastructure that remains operational over the years, with only its first use being for the kids in PNG. Items like laptops, cameras and e-books are in high demand for a wide variety of library programs and so this makes sense as a cost-saving strategy for libraries. Many libraries, however, find that equipment alone is not enough to create programs for learning technologies and invest in supporting people from their community by hiring them as mentors for youth participants.

Paddock leveraged a variety of assets to accomplish a scope of activities and acquire a wide set of assets, which in turn enabled them to foster partnerships with different kinds of organizations. They first explained the scope to me:

"L1: We did a whole lot. We've had computers, scanners, different types of cameras, in almost like a classroom setting, where they'd take pictures, download them, and then present them to parents in public. As far as computers, we've done many things, like looking up materials, creating newsletters, Powerpoint presentations, etc…"

The program had historically been quite successful, due in part to its changing nature, and Paddock had been involved since some of its earliest iterations for over a decade. The program was fully packed every year out of necessity, as the branch manager explained:

"L1: It's hard to say no, because of the clear need for parents in this community that may not be able to afford a tutor or may not have a computer in their home."

What it enabled, ultimately, when combined with a powerful social network, was partnerships, like at the time of the interview a recent engineering program.

"L1: Working with the mentors and with the kids and we did an engineering program, where the kids were able to focus on different aspects of what an engineer does, create that data on the computer, and present it… We have several mentors, they're all from [large local company], one is an engineer and two are IT, so they're very aware of the CAD program and were able to instruct the kids on that. We all sit down, come up with the ideas, what we're going to do for each session, 10 weeks, and then we break it down as far as what the kids are going to do in a particular week and we go with it."

Through a combination of grants and funding sources Paddock developed what was a really unique program amongst all of the libraries I surveyed, especially at the time: classes to teach youth from diverse and underserved backgrounds engineering and software skills. Many of the libraries I had visited ran programs with PNG but they were often lighter-hearted and more fragmented, without the benefit of active technology professionals teaching them. When I asked about outcomes and student engagement it became clear they were seeing at least some impacts:

"L1: I have a student page here who started the program in 6th grade and she's now graduating from high school, this is her first year at [college] and she wants to be an engineer. The process happened because of volunteers – mentors - here and the ability to access people with knowledge and insight that they might not ordinarily run into. It all

works out - I think that's a testament to itself that the program is very successful in the urban setting."

Programs like this could justify the importance of libraries not only in affecting learners in terms of life pathways and guidance but also in terms of expected measurable standards, like the Technology and Engineering Literacy assessment in current development by the National Center for Education Statistics. Clearly the library was able to benefit from having a high-tech organization locally that was willing to work with them, but it demonstrates that cooperation with businesses in areas of powerful economic growth and development might be a better strategy to enable youth to develop new skills and explore career possibilities.

Paddock's work with the local company was only part of the recipe; the other ingredient was of course the participants themselves. For this they turned to the local schools for assistance, which was revealed when I asked about their recruitment techniques:

"L1: Well there are several things we do. First there's word of mouth, because we've been doing this for 10 years now. We also do flyers which get passed out into the community and in the schools— [laughter amongst the three]

J: I'm noticing some laughter, what's all that about?

L2: At our all-staff meeting this morning the director singled out a comment that (L1) has better relationships with the school teachers in the district than any of our other librarians do.

L1: Yeah when I do flyers I'll help to establish relationships, talk to the principal, maybe get a list of kids who might really benefit by participating in a program with us and we might take it from there."

She related that it was more than just getting the word out by talking to people—all of the schools in the area as well as other youth organizations—but actually offering substantial cost and resource savings to partner organizations by pooling assets:

"L1: And those organizations are looking for a computer lab, a way to help the kids in the area, looking for programs – from story times to where they read books to see if they can

find comparisons and create journals. I think the technology aspect will always be a part of the library, and it will grow through the help of different organizations. We want to partner, because in the area we're serving here at [Paddock] there are so many different organizations and they all have different agendas, and we had to go out and make it known that we're not competing, so we can partner and make kids' lives better."

In this way Paddock could both avoid taking away kids from other groups as well as target individuals with known needs. Effectively this facilitated a referral and continuing support and education network for the youth involved on a regular basis. They thought this was especially important because the library was able to offer digital tool assets that many of these kids would not otherwise have, compensating for a disparity which would put them at a disadvantage, comparatively:

"L3: Well it's a private school and they do some scholarships and things but still every student has to have a laptop. So when we went there last week every kid had their books and laptop.

L1: So now where does that put these kids here? At a disadvantage. That's why we do as many programs as we can in technologies and mentoring and all of that, so we can close that gap just a tad, because they're just so far behind when it comes to technology. So we do as many programs as we can and without PNG I don't know – we've been doing it for so long, but I guess if we didn't have it we would have created something like that, just because of the need that's in the community. I don't know if we would have been able to go on with it, because the money we're getting, the computers, scanners, cameras, I don't know if we would have gotten all of that, but even without there would have been some sort of structured class on teaching them something about technologies, because it's just such a huge divide between, which I think will always be there. I can't see technology not also being a part of the library."

The private school the librarian is referring to above not only required students have laptops, but Apple note-books at that. The price of a single one of those could provide two or three Windows laptops, underscoring the sheer degree of advantage and difference between the populations of youth. The branch director's comments here are also revealing of their commitment to battling this

access and skill divide. They identified it as something they'd be willing to do even without the grants and partnerships, it was just that important. In other words, Paddock's commitment to fostering digital literacies amongst youth through library programs existed on its own, but they were able to make more impact by leveraging partnerships and grants.

RESPONSIVE PROGRAMS

Paddock, like most public libraries at the time of the research study, was invested in providing computer learning classes for adult patrons as well as the evolving PNG programs for youth. The benefit of having grants enabled them to find flexibility and learning opportunities in this service provision. They offered what was a larger array of topics than most:

> "L3: We were given computers under the agreement that we'd do classes, Microsoft classes, a GED class – that was a failure, which is a whole other story—and a job skills training class and a photography and Photoshop class."

As indicated above, some classes didn't work out so well, while others were considered a solid success:

> "L3: The grant enabled all of these. We did two sessions of that, the first session, the MS class was booked full, and we had somebody from the community that we ended up paying to conduct the class, but we had twenty stations and twenty people plus a couple of kids that sat side-by-side with their parents and worked with them and stuff."

When I inquired about why a given class or program didn't take off I was told that much of it had to do with finding the right talent. In the prior section it was clear that existing partnership networks allowed the library to find the right people to both attend and run the PNG programs, but without such an experience and network base they needed to spread out and experiment. The person hired to teach the GED class, for instance, checked out a book on it just prior, read it, and then attempted to teach it, without being sufficiently prepared. They also tried putting out a call for volunteers, but it was difficult to find people with the right experience available at the right hours, and to get them to be dedicated enough they needed to offer some kind of small stipend. They understood they could be proactive, but ultimately community need and talent would be only somewhat determinable:

"L2: Offering these classes is still a trial – a live and learn experience. We had never had classes in that lab before, it's the first time we had been able to run a program with dedicated space like that before."

Topics and instructors were only a portion of the battle, too, as they found too many similar classes offered in a short time span would result in dwindling participant numbers. Finding the right pacing and getting enough word out to match it proved to be an iterative process. They were also willing to try to connect assets and strategies from the PNG programs to the adult services:

"L1: e-readers are popular for those who can afford them, because here I have had maybe 2 questions about e-readers, and so that's hard. With this grant, PNG, what we had thought about doing was purchasing e-readers, and so we think we can teach the kids how to download and hopefully we can get enough where we can have a class outside of PNG, for the public, we're going to try to do that as well. We'll start with PNG, because that's the first purpose for that money, helping the kids, but then we might be able to use the equipment for other activities in the library. It's a slow thing – my future for the [Paddock] branch library, the digital future, it's going to be a very slow process."

Interestingly, what the librarian was illuminating here was how the process was both very rapid and slow simultaneously. On the one hand they were constantly buying new technologies and trying new programs, even some as cutting-edge as Photoshop or CAD, but they also had to determine their outcomes and impacts over the course of years, tracking the development of kids, watching participation numbers go up and down, and ultimately working with a range of people and technologies to find the best fit. The rapid change was of course made more possible by the grants, but ultimately these were also just a reflection of a lively library deeply committed to improvement.

ALTURA

Altura Public Library faced a daunting situation. They were located in a town in the midst of economic decline, troubled by rapidly falling real estate values and diminishing tax revenues. Their financial situation meant that they would have fewer choices moving forward and would need to seriously reduce their staff, and consequently their services. What they chose to do, given their reduced funding, however, proved to be an interesting strategy: they decided to focus their limited

funds and place greater emphasis on online services, but with an investment in simultaneously proactively supporting the public in making this transition. This included joining an e-book provider consortium, increasing access to a wide variety of databases for patrons, offering curriculum through a third-party online course service and investing in computer basics classes to enable more patrons to participate in these evolving services. This approach is not entirely unique, as many libraries across the US seek to reduce costs through outsourcing and by shifting services online, but Altura's approach to it was remarkable because they were keenly aware that many users, often those most in need, would be unable to effectively make use of internet-based services on their own. Unlike the wealthier suburban communities bordering Chicago many of their patrons could not be assumed to have access to their own personal computers and smartphones. To compensate for this they also invested a substantial portion of their limited personnel time in forming community networks and teaching computer literacies.

LIMITATIONS

The director's outlook was not exactly what you might call cheerful:

> "I said I was optimistic about the future of public library service, because of the services it provides to the disadvantaged. I guess this means I must be a pessimist about the notion that we will not have the disadvantaged with us in the future, and I suppose that's true."

In a sense this statement accurately reflected the conditions in which the library found itself, a town with closing businesses, empty buildings and significant populations of recently unemployed persons. The library was even more important in struggling times, but found it increasingly difficult to take a strong role in providing programming, due to staff limitations. As the director described their digital literacy related services:

> "Unfortunately, with the exception of a class here, a little extra help there, to me that still adds up to a passive role."

The library was quite limited in what it could do. Their full time staff had been reduced by two at the time of the interviews and they were only able to offer part-time pay to the youth services staff person, making it impossible for Project Next Generation to continue in future years. This

relegated them primarily to a role in providing access to materials, though the director hoped they could remain flexible enough to alter this role in the future.

As with Shipton, the Altura Public Library director was also wary of subscription-based services in general. They had chosen to settle on a consortium for e-books, for instance, to help lend weight to the collective bargaining power of libraries in the area, but knew it was a risk:

> "Do you know about [e-book] cooperative? Generally so it works so that you put your money all in one pot—and it's a good deal – but your public doesn't have any priority for the titles you buy."

This kind of concern echoed throughout all of their decisions, as they worked to make up funding cuts through contracts and alternatives. The director had come from a time when the library possessed their collection and wasn't against a transforming set of information resources, but was reluctant to lose control. Less emphasis on their collection meant less justification for their impressive building space.

ACTIVE EDUCATION

As stated Altura Public Library had dedicated money to additional online services in anticipation of reduced staff and service offerings. The adult services librarian I spoke to explained their new efforts. First, they made strides to increase their public computer access, through grants:

> "We got $2600 and we targeted it to develop a learning center learning lab and we specifically stated we were going to use it for training and jobs issues. We have it in place, it's a lab of six machines that are separate from the machines out here for the public. And we use it for our computer classes that we've been teaching."

This allowed them to do small but entirely dedicated classes for computer literacies. These were the necessary prerequisite for their second objective, digital resources:

> "In addition to the [computer] lab – we were able to purchase a few additional databases that were jobs-related that we put on that, and that includes things like [bilingual career database name] and [business news database name]. We added a database called [language learning database] – it mimics Rosetta stone – it's a training tool, and about 20 of the

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languages offer a version that is ESL, so for people who are coming in to this country for people that don't necessarily have the best English skills it gives them the capability to learn, but all of this is if a person wanting to do it."

Many libraries offer self-serve databases, but Altura's decision to invest in online learning software as well as their decision to strongly promote and support it, was quite recognizable. Their choice to enable and encourage patrons to take classes signified an actualized commitment to envisioning the library as an active education-provider, even if it were an under-resourced one. Their objective was not to directly compete with offerings of community colleges, but provide a venue for life-long learning with more active and engaging online tools:

"One of the databases that we've got is called [online course service] and it has about 500 classes that people can take and they actually can be a for-credit situation, there is a professor at the other end who grades you. You have, I think, four months to complete them, typically… it's everything from something like Excel and Word and PowerPoint and Medical Record Keeping and Bee Keeping and using a digital camera. It's not always things that are truly 'traditional' educational in nature, but also things that are more personal development. But all of them offer you an instructor at the other end who will help you answer questions and grade you and everything like that… there are papers, there are assignments; the digital camera class requires you upload photos and send them to your professor."

The motivation was fairly clear: the library considered active patron engagement to be essential to successful use of their services. This is decidedly different than the position many libraries often take, which is to consider their collection and databases as a read-only resource. A librarian might refer a patron to a book or get them started online, but in traditional settings it is up to the patron to summon up motivation and guide themselves through the data. This depends strongly on a pre-constructed set of self-teaching skills and independent personality, traits that some people from backgrounds with less education or privilege, like elderly or unemployed blue collar people, may not have, especially with regards to technology. The adult services librarian even went so far as to explain the fundamental tie between active education and information resources explicitly to learners:

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"When I teach the class one of the first things I ask is 'why am I in a library teaching a computer class?' And the answer is two things, we have a computer-based catalog to find books, first of all, so if you as a patron come in and can't use a computer you have to depend on librarians to find things for you, which might be an issue, if people are reluctant to ask a librarian about an issue, there are a lot of topics people are just not comfortable with, talking to a friend or a stranger about. By not having that capability is that people limit their ability to get to information. The other part of it is the databases, we made a decision here to not purchase print copies of items, and move to databases instead, so if you can't use a computer part of our collection and services are inaccessible to you. We want to make sure that if you walk in this door you can use what we've got here. It enables people to get the most value out of the library."

In summary, the library approached the issue by (1) ensuring online resources weren't just lists of documents, but also included guided information experiences and (2) trying their best to teach patrons to use their entire collection as more of it was shifted online. But they also knew this was not enough.

A COMMUNITY ENGAGEMENT CAMPAIGN

One of the major benefits to the migration of services online was that cardholders could make use of resources from their homes and other public computing locations by logging in. The Altura librarians knew this wouldn't actually happen unless they found ways to make sure people were both aware and equipped to access the various online classes and databases, and so they did what libraries often do to advertise and started posting flyers and leaving advertisement bookmarks in lent materials. They were still very concerned, however, that this wouldn't be an ideal way to reach populations that were not present in the library, not very wired at home or simply not able to make use of web applications on their own. They worked to address this issue by working with a network of local organizations:

"I've already started to talk to the offices in town like the employment security office, in fact we're going to do a program with them. We're arranging for those kinds of support offices to have library cards so people can sit and use them in their office and get access to some of these tools. I have talked to [acronym], the regional office for disabilities, and they

were very interested in it, I need to do the training for their staff. I'm going to talk to our housing authority, too, because they have multiple buildings with labs. They need to know they can get to the website and use the resources we have online, because everyone there is a resident, but even still the building will have a card for them. We're going to talk to the Boys and Girls club and we're going to do formal presentations for all of the schools. I've been talking to people at the Adult Ed program and even some unemployment agencies. We really want to get people to the kinds of materials and resources we've included in the online services."

They also made efforts to work with the local business development council and chamber of commerce to encourage both employers and employees to make use of the online services. At the time of the interviews much of this engagement was either in-process or about to begin, and as a result they didn't have any use numbers or specific plans for collecting feedback. As a community organizer who has observed many organizations create online resources under the motto "build it and they will come" I actually thought their approach was appropriately proactive and simultaneously shared a healthy degree of skepticism. The librarians expressed that they would have appreciated having the staff and funding to actively lead more classes using more of the online resources, either in the library or elsewhere, but determined their only reasonable approach given limited staff resources was to educate opinion leaders and organizations. Ultimately, however, they knew that successful use of their resources depended upon patron and partner participation. Whether or not it worked out, as well as the reasons for that outcome, is a chapter for another study.

BOZEMAN

So far most of these sections have illuminated strategies from a perspective of examining the composition of activities and equipment assets that relate to fostering digital literacies. Some attention has also been given to libraries and librarians who have let their perspectives drive their institution in new directions by being flexible, particularly cognizant of social injustices, or quite proactive in engaging their communities. Bozeman Public Library was akin to many of these libraries in these regards. They were actively involved in their community, so much so that they even coordinated city-wide events that featured as many programs in the span of 11 days as many libraries do in a half a year. They were successful with raising grant funds, found organizations to

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donate assets like laptops, and even ran workshops on building websites or photo editing. They were also keenly aware that buying new technologies could only be accomplished responsibly if they were also deployed with appropriate plans for maintenance and human staff to teach and engage patrons with them. The library made use of a volunteer from a local university, much like Dalhurst, and cooperated with important anchor institutions related to health, public media and social services, similar to, but on a less-involved level as Aquarin. While all of this was notable and impressive what actually struck me as the story to draw out from this library was a pair of policy implementations that seemed to elicit an oppositional set of values: freedom versus restriction.

PERSPECTIVES ON INTERVENTION

The director seemed to exemplify a person who was seriously invested in keeping an open mind and maintaining transparency. We spent most of our interview time in one of the only separated parts of the library, but the rest of the building was almost like a large studio. From the outside it wasn't quite apparent: the library had thick stone walls and not a lot of windows, with a sort of boxy feel, but from the inside it was another place entirely, as the director explained:

> "There's nowhere to just sit and be isolated, but at the same time I think it offers something different. You can stand in the middle and see everyone who is in here and there's all this natural light and all of these high ceilings, that offers a certain kind of symbolism, that this is a community space, it's not a space to go be isolated and quiet and just read a book— you can be like that if you want to, but you don't have to be that way, it's easy to feel connected. You can see the entire spectrum of Bozeman all in one moment."

They went on to explain the variety of people they'd see in the library, from students and professors to the recently unemployed and homeless, to moms picking up books with kids after school, to outpatients from a local health facility seeking a place to rejuvenate intellectually. Besides keeping an open rapport with a wide network of community organizations in town the director wanted to keep a good rapport with people in general, by facilitating a space that would be truly open to all:

> "You see a lot of people in here using the computers, and a lot of people in here using their own computers with the wifi, and I don't think it's because they don't have access at home, I think it might be because they don't want to live on their couch—they want to be

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somewhere. Our library, and I think libraries in general, are moving more in the direction of being a community center, that is focused on education, recreation and community-centeredness, dialogue and that kind of thing. Some of the programs we have here have a community salon type of feel, where we bring people together and talk about what's been going on in the world, or what we've been through as people, a collection of stories from people and being able to talk to one another. It's also the only place you can go to and not have to consume anything. You don't have to buy a coffee to be here, you don't have to buy other things, you don't have to interact with other people, but you can if you want to. Most of the places you go in the world you can't just loiter or hang out, but you can come to the public library and just be."

This perspective really seemed contrary to what I was hearing more and more frequently in other libraries. Most staff at other institutions regarded interactions between different populations to be frequently problematic, like kids making a racket and bothering the elderly, and didn't see this as an opportunity for interaction or for being ever-present in a place teeming with life. This notion of the lively and welcoming library opposed the traditional dominion of the "shush" librarian that many of us might have in our heads. It was also different than the idea of specifically targeting certain populations through policy or space design. Instead of segmenting departments and sections the space might have felt more like a commons or plaza. This clearly wasn't without costs, as the director mentioned they'd have to do traffic control sometimes, but it was a resoundingly positive view for the relatively small but open space they had.

The youth services librarian I spoke to offered a similar view in her strategy for engaging the kids in Project Next Generation. They had spent several years trying to bus kids in from low-income areas and more-or-less forcefully recruited participants and enrolled them in a rigorous schedule of activities. They eventually found that they were spending so much time on behavioral problems that didn't want to be there that leaving it open to whoever wanted to join would create a much more stable mixture of participants from a variety of schools, classes, races and backgrounds. What was most notable, however, was their time schedule: open with a 15 minute snack, followed by 30 minutes of a guided activity that could be changed on the fly if required and completed with a full 45 minutes of free time for homework or games. In other words, the majority of the time was open to create a sort of unstructured teen hangout zone that happened to have technologies:

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"The kids want to be here, they want to do what they're doing. They feel like they own this place. They're here to have fun – if they're not having fun then we're going to do something different. I want them here just to relax and have fun."

[she laughs]

I laugh because it's not relaxing."

She went on to state that she felt it was alright that they were largely playing games and that ultimately everyone was happier, parents, librarians and kids alike, if they focused first on achieving a certain atmosphere for the space and activities, and let learning goals be a second objective.

She also chose to approach general computer help in a similar manner. Rather than hold specifically-scheduled classes and workshops, something they had done from time to time with limited success, she regularly hosted open help hours for whoever wanted to come in. My expectation was that she would often be overwhelmed by people seeking help, as I am when I'm assisting classes of people at a time with computers, but when I asked about this she explained it had never been too much to handle:

"I have this nightmare, where I get 20 people in here and I can't help any of them. Really that's never happened. Almost everyone leaves with at least tools. A problem with a lot of technology classes is that they just educate 'the steps,' but I try to show them how to do things on their own, how to do research, how to Google."

The more I inquired the more I understood her method – she would help people one-on-one, with enough assistance to get them started and working on their own. It wasn't a rush to meet everyone's needs instantaneously, it was a setting in which learning happened incrementally, without a rush. This tactic worked well for the elderly adults in her computer basics classes, while the 'hands-off' method succeeded with the kids. It may have been actually less about the specific issues at hand, but more about how their own attitudes shaped the learning processes: they were relaxed and accepting, so people felt more comfortable and, consequently, accomplished more.

The previous arrangement of examples would have been much less notable if it weren't in juxtaposition to a series of policies that, on the flip side, seemed very controlling. When I asked if their internet was filtered, the director told the story of her colleagues at a former library:

> "The level of sexual harassment in that library system was pretty intense… from patrons printing out and picking up sexually explicit materials so the librarians would see it, watching hardcore porn and sitting in the station and masturbating. It took a while before they setup a policy, they had no policies whatsoever that restricted what anyone did, but when I was still there they set up a policy that dealt with public display… since the public can see what you're seeing you couldn't look at sexually explicit material on the library computers because you'd be showing it to everyone."

I could tell the director was pretty bothered by what had happened there. In the case of the library she had spoken about the staff had revolted and were considering legal action, so far as she knew. Clearly this was a situation where the "live and let live" sort of outlook illuminated earlier would not stand:

> "To me, having a filter has not been the ethical dilemma that I assumed it would have been and it has actually made it so we don't have to approach people. If someone is looking at porn on an internet computer so that they can get a rise out of someone and if it's your job to walk up to that person and tell them to stop then you are basically putting yourself in the position of being the target of their harassment. To ask staff to do that, to approach a person that's being sexually deviant on purpose—you're putting them in an unsafe situation."

She went on to explain that filters did much of the policing work for them, and that they hadn't yet run into a patron who hadn't been able to access the content they needed. The assistance from automation wasn't present only in the form of filters, they also employed a time management system and had become advocates for it:

> "I would tell any library this, if they're looking at getting a time management system on their computers and they're looking at the cost, I tell them it's for the safety of their staff.

If they get mad at you or don't want to get up you have to tell them again and again until they get angrier and angrier at you."

Clearly they felt these systems helped to save them work as well as maintain a positive rapport and atmosphere in the library. Restrictions weren't just present on devices inside of the library, however. The youth services librarian explained their willingness to circulate e-readers to the public depended upon content restrictions they had imposed on them.

"J: It's unusual you're willing to loan out Kindles in an area that has what we might identify as a substantial distressed or underserved population.

L: Right, with no deposit, too. We've just started though, we may not get them back, we don't know. There is some psychology with it, we've found. Most of them have books already loaded, and the concept is that a patron that's not very tech savvy might find it intimidating to download, so it's okay for them. If you've purchased books to customize it you might be less likely to return it because you've put your stuff on there, giving you a sense of ownership, whereas if you don't have an account and you're just reading some irremovable samples, you're more likely to bring it back. This is why libraries want to block patrons from putting books on there."

Obviously they hadn't established a track record to determine if theft or hacking would turn out to be a problem, but this way of 'demo-ing' the e-readers by providing a static selection limited the use in a way that presumably would be manageable for the library.

So what do these two sets of policies mean, when positioned with one another? Is Bozeman Public Library inconsistent in its policies? In my view this isn't the case. What lies behind each one of these is a reliance on letting conditions and policies structure experience, as opposed to people directly impacting it. The architecture of technological, physical and information arrangements helps to determine the way people learn to use technologies, participate in programs that involve them, and otherwise become socialized into a more digitally-literate self. The process through which patrons engage with the library relies on their comfort, and all of these policies were in the service of creating safe and stable circumstances.

PLAINVIEW

The very first library I visited taught me to ask a very important question that wasn't originally on my interview schedule: who do you consider to be your service population? The reason, of course, was that this library had a very different take on their service population than most, but it turned out to be a useful area to explore with most libraries because it revealed something about who they were most concerned about serving. Some libraries were very hardline about it, claiming to only serve people within the borders of their specific municipality whereas others expressed a desire to serve everyone in the area but admitted they could not really do that. Other libraries interpreted the question in terms of their presence in different demographic groups or used it as an opportunity to discuss the ways they ran programs outside of the library. Plainview stood out from all of these, because, as it turns out, Plainview isn't a stand-alone library, it's a branch with something of a double identity. Plainview's ambiguity in its labeling, service area and interpretation of service roles made it not only one of the most unique cases I encountered, but arguably one of the most successful libraries reaching in-need populations with emergent technologies.

THE SERVICE POPULATION

The first thirty minutes of my interview with the system director were filled entirely with the story of how she and the library came to their current circumstances: a two-building system covering a strip of service area with pockets that dipped into several municipal territories, led by a rather outspoken former school teacher. This identity, as it turns out, was the main impetus behind the library's unusual arrangement. She explained to me:

> "Chicago doesn't really feel this as much because most of their library areas butt up against one another so they all have library cards and service. Down here it's a little different, rural areas, farms, most of us became libraries through municipalities. I personally think this is a symbiotic relationship that does not work. My driving force was that everybody could get a library card without having to pay at the front desk. Kids would come in from a local school or visit and want a book and I'd have to tell them that their parent hadn't paid for service, which would have been part of their taxes and so they'd have to pay it at the front desk and it would become a key issue, because they'd refuse or be unable to pay. The kids were hurt by this and parents didn't understand this. Districts are so political, you have to

be aware of why the school district is separate from the city that you're in which might be different from the library."

What the director wanted was a single, unified library service for all people in the neighboring school district area. When the library split from the municipality to become independent they drew up coverage such that there would be as few library service gaps as they could handle, so that service would cover a range of different types of people in terms of ethnicity and class. This resulted in the construction of a branch library, the Plainview City Library Center. This sort of decision is strikingly unusual in comparison to most libraries, who often try to arrange their service boundaries on the basis of optimal taxes or funding within civic borders. In the end, the system ended up serving two populations, one that was 95% white with 17% below the poverty level and another with 72% of people of Hispanic, mostly Mexican background and a poverty level of 40%. This is notable considering the pattern of racial and ethnic segregation in Illinois, as neighborhoods and even towns tend to be mostly black, mostly Latino or mostly white. Library programs and assets were able to be shared amongst all locations, with the objective of making the most out of them for all people, and also to encourage mixing of ideas and patrons. The local director for the Plainview City branch explained that they had to be careful with this expansion, though, because they didn't want the people of Plainview to feel as if they were being colonized by a neighboring community:

> "We've also tried to convince the community to take ownership of their library, even though it is a branch, so we named it of the community, "Plainview City Library Center" because we wanted the community to embrace us, which was difficult in the beginning, because this community keeps to itself. To get them to embrace an outsider group that comes in is harder."

The hesitation is somewhat unsurprising because of the likelihood of immigrant and undocumented worker populations in the area. The service gamble and particularly activist director, however, seemed to have paid off well for this library system and the community as a whole. It allowed them access to a very wide variety of grants, including a playground donated by a large sports team, a transparent skeleton anatomical model that could loaned out to schools and

a host of technology and literacy-related grants. The system director, of course, attributed this largely to a very supportive and visionary library board, in addition to her committed team.

COMPUTER-AIDED ACTIVITIES

When the Plainview City library first opened up, they not only had to gain the trust of their surrounding community, but they also had to establish their own brand:

> "Some of them didn't really understand what a library was, and many were disconnected from technology. 50% drop-out rate for high school, adult literacy issues in the area, we had to start from ground zero, forget technology, we had to help them understand what the library could be for them. The fact that they could come in and get a library card and reach out to information through our internet terminals was a huge impact for them, in this small community."

Internet was generally not very available in this area, as it was largely rural and not a very enticing market for the big telecom service providers. The grants brought in by the library system enabled the construction of a pair of T1 lines, which actually made the library the most powerful internet in the area, but much of the community was not in a place where they could make use of it, yet. When I asked the branch director about what kinds of programs they ran related to technologies she told me a couple of stories to help me understand the sorts of information and literacy needs that were present in the community. The first, was a sort of reference question:

> "I was asked about an animal in their backyard. They wanted to know what it was, if they should be scared of it or if they could eat it. So we used books on animal identification for this area. Most of the people here are Hispanic, from Mexico, the animals they might see here are different than the animals they may have previously seen, and this was a very important question to this man. So that helped me to determine how to grow my collection."

In most libraries these days this kind of question would be quickly answered by paging through a few bursts of Google image results, but this patron wasn't yet ready to learn how to use a computer or surf the internet, they were actually still learning the language and local context. The director would work with patrons interested in fixing cars, identifying foods at the grocery store and even starting a community garden, typically information inquiries that were a little more old-fashioned

and DIY. Another, more unsettling story, was given when I asked about how the kids were engaging with technologies within the library. She had asked the local school board how she could best prepare kids for participation in school, and was busy considering activities like geometry basics or song games and instead was told:

> "I was absolutely amazed with the answer they came back with when I asked them, was they asked me to teach the kids to read, write and recognize their name. This was preschool."

So her first story for me, in response to my questions about digital literacy, was that she helped the kids learn how to spell and write down their names so they could sign up to play on the computers. Many of these kids didn't have parents who could read to them at home, either as a result of lack of language and basic literacy skills, or as a result of working multiple jobs just to make ends meet:

> "We do use technology with them for school. Since their parents are Spanish speakers they don't really have homework help at home. When they need homework help they come here, and I told them whatever they need to succeed to ask for it here. So we put together this whole cabinet full of homework supply help – pencils, binders, paper, crafts items, poster board, calculators—because they would come to us with these homework assignments and then not have what they needed at home to do it. So we'd go over how to plan out their assignment and do it and I'll let them print for free if they need it. This way we're helping them to incorporate art and technologies into their classroom projects, so they can keep up with kids who might have these at home, already… It was a big thing when they figured out they could print in color... we at first had just black and white printing at 10 cents a page and then later added color printing at 25 cents a page. They would print off photos in color or pictures they had created in MS paint or something else, and then they'd want to laminate it, so we got a lamination machine."

And this is what was perhaps so interesting about this library. I went from a meeting with the system director on the first day, when I was shown a pile of advanced tools like digital video cameras, graphic drawing tablets and e-readers, to a meeting with the branch director on the second day when I was told many of the people here were totally new to "the culture" of technology. The kids had enormous access to resources but were starting from a very disadvantaged position to

begin with. This made for an especially opportunity-filled setting, one the library had begun to learn how to exploit by designing library participation incentives. The first, which had apparently regularized the body of kids that I observed that day and was told was ever-present in the library, was a video game hang out space. They gathered several console videogame systems via donations, equipment many of these kids would never get to have at home, and would roll them out for gaming sessions. They were so successful because of attendance and noise that they actually had to start segmenting the times of their availability, to give other patrons some peace and quiet. At the time of interviews the new system being considered was reliant on kids accumulating points via participation in library programs, points that they could spend on items like digital cameras at the end of the series. I was told that some kids had accumulated so many points that they weren't sure if they'd even have enough places to spend them, the program was actually that popular, convincing kids to essentially live at the library.

Plainview wasn't only helping kids by easing them into use of technology resources, they assisted adults, both patrons… and even librarians:

> "We work with a group called the [immigration assistance organization] and they experienced cutbacks too and now their closest office is in [city], which is about 3 hours away. So we devised a way to do Skype meetings, so we use this room here, and bring in a computer and whoever the appointment is for and I get the computer and Skype started for them and they usually have very little in the way of computer skills and it's just amazing to them that they're talking to someone far away on the screen with Skype… The most amazing story about that, is because I thought I was servicing the immigrants here, from Plainview City, but I actually had a person walk in here, and there was a delay, we were waiting for people on the other end, and so I started talking to the person who was waiting, it was a family, a mom, a dad and a child, just small talk and it turns out they were from [small town an hour north], and I said 'why would you come all the way to Plainview City?' for a meeting with someone who is maybe only 2 hours north west of them, but their answer was that that difference of an hour was significant and this was the place to go. As a librarian you can imagine what my next move was. I picked up the phone and called the library in Jerseyville and asked if they knew they had this need and the librarian had no clue they had any immigrants in their town whatsoever. So I gave her the contact

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for the [immigration organization] and if this family needed any follow up help they could do their meetings from that library… Our small town of 2600 is servicing someone from an hour away."

It was common for Plainview to help teach whole families. Often they'd see children of all ages, so their aims for Project Next Generation were rather versatile but also exceedingly optimistic:

"We're starting on the very basics here but they will hopefully take the kids as far as their imagination can take them."

Their goal, ultimately, was to engage kids with varying ability levels and experiences with digital production activities that might lead them to careers. Their plan was pretty vague, as it was still in the works at the time of the interviews, but their general scheme was to get the kids to learn to make videos, meet guest speakers from all over the area, and Skype between the two library locations to collaborate.

Plainview is the sort of library that makes it clear to me as a researcher that constrained studies like this have to be just the beginning. How did their PNG plan work out? Were the adults able to start using Skype on their own after regular orientation? How well did the tablets and media production equipment hold up with so many patrons using them? What did the kids do with the 30+ cameras they earned with points? Many libraries I encountered in my sample had only just begun to actually take advantage of more recent digital technologies with Project Next Generation, despite its relative age as a grant program. The section on Grand Ridge Public Library reveals part of why this might have been the case, but my impression is that another significant reason was that we had reached, for many communities, the tipping point in terms of social norms and production technologies: they felt they had to be more than public computing access.

TECHNOLOGY AS SPECTACLE

The social norms, unfortunately, also reveal questionable associations in the social consciousness of patrons. While the videogames were an excellent way to get a mass of kids engaged with the library, initially, one also has to consider: the kids were in the library to play—consume—games, not learn from books and the internet. It's not necessarily a problem when the library becomes a center for entertainment, but when its core definition becomes this to some patrons we might

wonder where some of the other perhaps more noble social roles slipped off to. The point incentives were similarly troublesome, in their own way:

> "One of the items they can work towards was this camera, for 30 points, and immediately being teenagers they were trying to devise a plan to get the most amount of points for the least amount of work, to basically game the system. So one little boy checked out 30 items, thinking he could get a point for each, but then had to find out you can only get a maximum of one point per day for check-outs."

While the point system did seem to genuinely get more involvement from some kids, it also detracted from the intrinsic value and motivation for others. They weren't in the library for the sake of programs or perhaps even reading the books they borrowed, they were after points for a camera. The spectacle and desire for the shiny new technology device was the lure, not the knowledge, learning or time spent with friends. The library was certainly aware of some of the problems with the social norms surrounding how people learned to adopt these gadgets into their life, and tried to construct programming to help prepare them to deal with it:

> "I had the Plainview City Police come in and talk to the children about internet safety, because it's a topic their parents can't talk to them about. Their parents may or may not even be using the internet or know what it is. To talk to children about the proper way, the proper etiquette of using the web in a positive way, when they were done they were given a little homework assignment where it gave them scenarios they had to respond to, like bullying online or people they don't know reaching out to them online and all of these different scenarios and the kids would have to say what should be the proper response to those things."

On the one hand this activity might have helped to inspire critical perspectives, but on the other hand I get the impression that it might have been unrealistic. From my experience working with kids in a sea of internet norms and technologies that change on a daily basis, I suspect kids could encounter cyberbullying in games and through memes that the police officer wouldn't know how to help them to identify. It required years of experience studying social informatics and being a member of the UIUC campus for me to successfully decipher racism behind the complicated "Ima

Chargin' Mah Lazar" Chief Illiniwek meme,[67] something that most undergraduate college students never picked up on. It's not always bad to meet people on the internet, either. Learning these nuanced concepts and contexts would not be the kind of thing that can be accomplished in the span of a workshop, but instead via consistent socialization. The library's intentions were of course in the right place, but just like their deployment of various advanced technologies, they all depended on their work with the kids on a regular basis over time.

The main reason I bring this all up is that it seems like Plainview was struggling with the fear-spectacle dynamic with technology that many other libraries were at the time. On the one hand they knew it contained such amazing possibilities, ones they didn't fully understand and perhaps even feared, but on the other hand they were sometimes unsure how to most appropriately deal with them. In light of this I thought the director said something that was very wise:

> "I've been here since 1995. So I told my husband I'm looking at 2015 as my retirement and that would be 20 years, to be here that long and hand it off to the next generation. I'm looking for next generation librarians to be here. My time will have been, I'm still creative and pushing forward, but I'm having to have a lot more help than I used to have, I used to understand technology like the back of my hand, but I sometimes can't even start anymore."

The trend for many directors is to stay in place for as long as they can, for many, like Belle Terre, into their 70's or older. This means many libraries have veteran staff that may have been overrun by the rapid change that's transpired in the past few years. Some react by defending themselves with Unions, as was seen in Grand Ridge, others just ignore it, as was the case with Eastover, and still others build their entire strategy around it, like Altura, but it seems like relatively few reconcile that their time has passed and pass on the torch. It's even more interesting that this system director wished to do this, given how unusually successful and groundbreaking she had proven to be.

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[67] A multilayered episode, see my work studying Facebook, Social Capital and the Chief at http://theFacebookproject.com/research/jeff/publications/socialcapitalchief.html

When I was told many of the patrons were learning technologies for the first time and came from another culture without much exposure, I naturally asked if the library found some interfaces and associations were more natural than others for their population. At the time there was a lot of talk on the impending departure from the use of metaphors in interface, like the Windows 8 move to clean and bold minimal layouts, compared to Apple's textured calendars that looked like a real object. Clearly much of this is just associational, as no one actually searches with a magnifying glass or saves to floppy disks. Yet we still use these as icons, and it is possible metaphors were very important for people coming from a totally different social background and/or language. The branch director indicated that without metaphors, they wouldn't have been able to teach them at all:

> "Teaching them the concept of virtual e-mail versus real life mail is hard, but if you don't have those metaphors they'd be lost entirely."

She explained that the hardest part in helping the adults was breaking the language barrier with metaphors. You could use a translator to help with words but concepts, ideas and phrases don't always transfer directly, which meant she had to spend more time helping each one. A source of frustration was that it might be the only time she'd see such a patron, as their schedules wouldn't permit attendance in classes. The previous method for libraries would of course be that the traditional reference librarian would hand the patron a book and "empower" them to learn on their own, but it really didn't work like that for people at this library:

> "You can't exactly be a self-learner on technologies, there's a gap there… You can't just give them a book – if you hand them a huge book and then tell this person, who may or may not speak that language very well that they need to read this huge book, which many native speakers would struggle with, to figure that out they're in trouble. Just about by the time they figure that out a few months from now there's another book this big that they have to read about the new version that's better than the other one, but you don't know why. It's just moving too fast for books with this."

Truthfully this is probably the case for most technology learners, not just those who are ELL. Books were equally unsuitable for many of the kids when it came to how they learned technologies, too:

> "I think a lot of it has to do with the generation we're seeing right now and culture. Instant gratification and how they get there is they absorb so much through visual interactions. They don't have the patience or time in mind to read a book, they might get all of that in the flash of a picture… If there's something they want to learn about or do they will go look on YouTube and find a visual of it through image search. When we're doing homework assignments I've done the same thing, I do a Google Image search to try to help them explain what they're looking for, paging through images to identify ideas goes much faster sometimes, faster than reading websites or flipping through books. The kids are doing this kind of thing all of the time – they won't read about how to do 'such and such' on a bicycle, they'll want to see a video of it. I don't see adults doing that. I see them coming in asking for books or spending time reading, but that won't always work for technology."

These information-seeking behaviors are nothing new to scholars; it may be faster to convey information visually with pictures rather than text. Some might see the lack of reading as a representation of the downfall of our educated society, but I'd probably just advocate we have to have tools to shortcut the information overload and this is one of them, with its affordances, good and bad. The attitudes among learners the branch director saw were quite typical of the same contrast found in just about every other library, as revealed in an exchange:

> **"**If I put one thing on the screen the adult will sit there and ask me every single question on every single thing. "What's this, what's this, what's this?" Heaven help me if I have a desktop full of icons. They'll want to know what each one does and then not end up getting anywhere, they won't try anything or explore, they get locked in their seat. By this time the kids would have tried 20 different things. If the adult gets to something and it doesn't work they want to know why, they want to know why it's not working. Kids may not care why.

J: Those are both important approaches though, right? The kids exhibit a lot of flexibility and curiosity in their computer use, and might be faster or more efficient, but the adults are more inquisitive and critical in their thinking. The ideal is a person who is able to do both, simultaneously, right? I guess both need a person who is persistent and motivated.

D: I think what I see more is the adults getting frustrated, and wanting to throw their computers out the window into the backyard. I end up seeing the children evolving, they're more okay with having less control and reacting, they have no fear. They are also able to ask each other about how to solve problems and share knowledge and suddenly three kids are working on solving it, while their parents sit there totally afraid of it."

I could only speculate as to if this difference between adults and kids was compounded by language and immigrant culture shock issues or if really it was more prevalent. Perhaps new generations just learn to be more adaptive and collaborative across the board.

BELLE TERRE

As an institution the public library is stuck somewhere between influencing social structures and being subject to them. The difference individual librarians make is of course important, but at the same time libraries establish service roles to ensure impacts are more sustained and regularized beyond any given individual. Much of this text so far has focused heavily on libraries that are making advances in library services in ways that are flexible, unusual, and driven largely by the unique innovations that individuals within those libraries and communities produce. It's worth considering, and examining, however, the cases when libraries are unable to do this, either against their best intentions and attempts or as a result of entirely different conditions and perspectives.

A SLIGHT VARIATION ON CLASSES

Belle Terre Public library is representative of the former. Located within one of the most impoverished areas in the state, the library is more like a rural location in some ways than a small town. The director and staff told me about their arrangement of computer classes, which were enabled largely as a result of savvy grant writing:

"Well the adult programs we've had – we got an EDD grant – Eliminating the Digital Divide. I've been working with a group from [acronym], we work with [college], and they

teach classes, and they're rather expensive but it was kind of nice because they bring laptops from the outside and then we set up a computer lab, and I have people sign up for classes. Last year I think they taught 10 classes, and I think I'm going to do the same thing this year, because that's really helping the community a lot, because a lot of people come in here and they don't know how to turn on a computer, how to create an e-mail, they just need so much attention, very little background."

These classes were nothing out of the ordinary, just covering the typical computer basics encountered at most libraries—word processing, e-mail and internet—but they were somewhat unusual for a library of this size because they were taught by external organizations that were brought in and participants were provided laptops for use during the class, making it possible to do without having a specifically dedicated lab space in various parts of the library. The director required that staff lacking computer basics skills also attend so that they could better help patrons one-on-one later on. The staff noted to me that they not only learned about the various software programs in the classes but also how to best teach the concepts to learners – leaving space for questions, organizing the presentation of information logically, providing handouts, and more.

When I inquired about the composition of attendees I was led to understand that the context they were dealing with was different than many libraries. The participants weren't always the elderly typically encountered in computer basics classes in many other settings. Instead they were often impoverished individuals who needed the experience badly to get jobs—some of whom might have also been elderly. She explained:

"Yes, I sign up something like twenty because I'm lucky if 12 come. I understand why airlines overbook flights, because so many people never show up, and I call them and remind them that class is happening tomorrow and they say "oh hey I'll be there" and then they still don't come. I guess because it's free they don't care as much."

She said it was a challenging mix—she would call patrons in advance to remind them and find that their phones were disconnected. They'd be able to make one class one day but not get off work to come on another. Part of the reason she chose to bring in outside help was that they could provide a certificate showing that participants had learned something, an item very prized amongst individuals who were quite desperate to find jobs. She said she wasn't even sure that all of them

were going to be able to use their newly learned skills without practice but just having the sheet would provide some measure of confidence. The library staff explained to me the kind of patrons they often worked with:

> "Some folks – we have a literacy program here – what you have is that they don't have a GED yet and they have children, so when they come in to take their tests they'd be about 2nd or 3rd grade level abilities that are adults now, that's the hardest part, when they're real low level. A lot of times when they're filling out applications they don't understand what's being asked, besides knowing how to get through the program or knowing what it is. Reading itself might be difficult for them."

In other words the library wasn't just providing services for a diminishing generation of elderly persons, but a steady stream of people who had been underserved for much of their lives. This matched my experience working with libraries locally in Champaign, where some of the folks who would need help went beyond just a lack of familiarity, but actually faced learning disabilities and a lack of literacy to start. This isn't to say the users felt all that disempowered; in fact they also behaved in ways that matched the teens I encounter on a daily basis:

> "The computers are so slow, and then what happens, is they'll click-click-click until it freezes entirely because they think it should be going faster, or they'll get out of something because they think it's not going to go, they don't have the patience sometimes. Or they jump from computer to computer because they think another one might have faster internet and we have to explain that they're all on the same system."

What's notable in this series is that the library faced an audience that altered the ways we might talk about fostering digital literacies. Patrons needed opportunities to develop confidence, establish cognitive models and learn to effectively problem solve, but they found these within just the realm of computer basics. There was no advanced video editing, deployment of e-readers, comprehensive digital archiving or anything like that, and yet the library could still be said to be tackling part of the question of digital literacy.

Not every library has the advantage of a collaborating local university or other supply of talented volunteers. The director had made some efforts to engage the local high school for help, but had not found much support:

> "I've been trying to set something up with the Kiwanis here in town but it hasn't gotten very far. A lot of the people coming in to the library want to write resumes and apply for jobs online and don't have a clue what to do and so I've been trying to get something out to them, because they're always looking for something for their high school kids, and I'd say 'High School kids they know all about computers, they were raised with them' so what I wanted to do is have a clinic and have people come in to the clinic and have the high school kids sit with them and help them apply for applications. So far it hasn't gotten very far, but I thought that would be a mutually beneficial thing."

It wasn't clear how much she had actually continued to pursue a collaboration, but it was apparent that the perspectives of the individuals in question mattered. It wasn't an issue of if high school students had the requisite knowledge (if they were 'digital natives' or not, an implied assumption), it was an issue of motives to volunteer in the first place. Much of the town seemed reluctant to fully engage in the library, despite the director's efforts to reach out to them. Another example was explained when the director spoke about a digital camera they had been provided from a grant to promote small business:

> "D: I try to play up the library, I went to the Chamber and told them about all of the equipment I have, and they said that was good but nobody from there has contacted me.
>
> J: What did that look like? Was it a meeting full of people you didn't know, and it was hard to present?
>
> D: That's kind of what it was, I just made an announcement, and they almost brushed me off just saying 'alright that's good, thanks.'"

It seemed that she may not have been taken very seriously by this group. All of the reasons are of course not entirely clear—it's possible partnership would require long-time relationships or perhaps these organizations had different needs, but the librarian was at least trying to be pro-

active. This led me to wonder about the general reputation of the library. When I asked the director about her perspective I unearthed a really important exchange:

"J: Do you think the role of librarians is going to change? From being like archivists who are just book providers from behind the scenes to public librarians who have to connect to people actively in their service. Do you think that's going to be the change?

D: I think that's going to be more part of our future than it used to be. We're not just going to sit behind the desk and stamp the dates anymore, we have to enhance their lives in a different way rather than offer them different reading materials.

J: You sound a little sad about that.

D: No I'm not sad, it's just scary. Now, I worry about that in our community, that I'm not reaching enough, that I'm not feeling their needs enough."

This moment seemed to represent what I felt when I visited many libraries around the state. The library was a long-standing institution in most places I visited. It had a brand, a reputation and a way of doing things. Even when a given librarian or director wanted to cause a shift, they were still doing this amidst their surrounding conditions. This director certainly felt pressured to find ways to alter their services and community connections, and indeed she had overcome much of the funding barrier through assistance from grants, but she still faced other structural issues. I continued by asking her about the differences between the library staff and her patrons:

"D: I wish I had more African American employees, because the ethnic make-up of the village has changed so much, it's 75% African American now and I only have one person on my staff that's African American.

J: Is that more about number of people applying? Why do you think that is?

D: A lot of people just haven't left. I've been here 7 years and I'm the newest member of the staff, we just don't have much of a turn-over. One woman is 80 and she's worked here 35 years.

J: Wow.

D: I have another woman that's 76 and she's worked here over 20 years. A lot of people have been here over 10 years. So I mean the community has changed since then, but… whatever. Most of the people are local."

This seemed to suggest a partial answer to my inquiries about the library's struggles. On the one hand it was a place of stable employment for people who had been living in the town for decades. They had invested in this place, made it their own and established its meaning in the eyes of their community. On the other hand it meant that when the community rapidly changed around them it caused a significant gap between employees and patrons, certainly in terms of race, but also quite possibly in terms of class, age and education as well. Likewise while the community changed demographically the job market and knowledge economy shifted as well. Computers, the internet and cell phones had become parts of daily life and information access—but only for some, it was not even throughout this community. Understanding the varied needs of the individuals and connecting these up with rapid technological change was therefore difficult. The director was aware of this, and tried to find ways to reach out, retrain staff and otherwise guide the library, but this was all in the face of a confused array of conditions subject to fluctuating community composition and broader social norms. This particular case of attempting to overcome structural hurdles was a good reminder that the redistribution of money and personal agency is not always enough.

GRAND RIDGE

Most of the challenges faced by libraries reviewed in past sections have had a great deal to do with structural factors and limitations. Many libraries are understaffed or under-funded, or face rapid demographic or technological change that outpaces their own rate of change. A lot of the stories highlight particularly adaptive librarians and Project Next Generation programs that successfully responded to digital literacy needs amongst patrons. Grand Ridge Public Library showed evidence of challenges when it came to adaptive librarians and PNG programs. Their issues seemed to be rooted primarily in internal library dynamics.

Despite its troubles Grand Ridge was well-established in providing classes related to various technologies for patrons. This matched the views of the then Adult Services librarian, who explained why she positioned her services as she did:

> "Just to be able to be a good citizen, you need to be able to know how to access certain things that you can only get through your computer and if you don't have one at home, you're going to come, hopefully, to use one of the computers here. So to me that's one of our main missions, is to be able to help people to be better citizens and if they need digital tools to do that, then we need to be the ones that help them get there."

One of the librarians who worked for her echoed the sentiments, further explaining the scope:

> "We're trying to get them at least to the basic levels of media and computers… but then also knowing the cutting edge. Because we do, also, have people who come in and 'Hi, I want to switch my computer over to Linux. 'Do you have a book on this? How do you interact with the Ubuntu Desktop?'"

Providing guidance and instruction was so important that they had actually recently split their reference service into two desks, one facing the open computing area and the other facing the open floor and stacks, for general reference inquiries. They had hoped this would result in a better division of labor, but it hadn't worked as intended as much as they would have liked:

> "Everyone who is at the desk has to be knowledgeable about this thing to be able to help the patrons. I would say, of the questions we get are on those two desks, it's probably easily 50% having to do with some sort of technology of any kind."

Some patrons didn't want to wait in line for help so they'd just stride over to the other desk and ask for computer help there. The reason they separated the desks was twofold: first to try to innovate in layouts and arrangements to better meet patron needs and second to address labor and skill considerations, an issue that I will return to in a moment.

The range of regular computer classes the library offered in its separate dedicated lab was impressive, to say the least:

"Every month, try to do computers 101, keyboarding and mouse use, usually a Word one, and basic internet, those are kind of the four core classes. We almost always do those four and then we have more advanced classes, mostly based on what our patrons asked for. If they say, 'Gosh! We don't know about Google Docs' we will develop a class on Google Docs. We are now doing a blogging class which has been sold out for the past two months. We're just teaching them, 'how to use Blogger' and talking to them about 'What is a blog?' We almost always do a Kindle class, we do EBay, we do images, external jump drives, how to buy a computer, 'how to just defrag a computer and clean it up.' People want to know about security and stuff like that, so really, it's everything."

Most of the classes were well-attended, the other librarian I spoke to remarked that they had three times the anticipated demand for their initial e-reader classes. I was intrigued at how they stayed connected to patron demand and so I asked how they went about developing courses:

"If you've decided, you got patrons asking for a class on e-Bay, how would you guys go about will people instruct that class?

L: First, we probably say, besides and send an e-mail saying, "Hey, we're really getting a lot of questions about eBay. Does anybody know anything about it?" and, inevitably, one of my staff members would say, "I don't really know, but I'm interested in learning." or somebody would e-mail back and say, "I know a lot, what do you need?"

This process, however, sounds easy when it's encapsulated in limited quote snippets like those above. It's as if the library offered this astounding array of classes and help and just invented the programs as they needed with a little bit of extra work and knowledge networks. Or, so we might think, until we dig in a little deeper.

A DIVIDED SHOP

I was initially surprised at how openly frustrated the librarians I spoke to were about the working conditions at their library, until I started to read more news reports from the Public Library Association (PLA) publicly recognizing some of the tensions. It was clear the struggles were fairly public, so they didn't have anything to hide, but at the same time they were likely representative of similar issues at other libraries that might be less willing to discuss them openly.

Unions fill an important function in most industries as they protect the labor from profit-motivated decisions that are detrimental to employees, decisions often motivated by disconnected groups like stock holders or hedge funds. Library unions are a little unique in this regard, as the public library is not a for-profit institution and generally has a heritage of great respect and value for its workers. The recent two decades have seen continued reframing of library goals in terms of economics and "the bottom line" (Buschman 2003), however, and this, combined with the library's increasing common ground with IT service related fields, where unions are less frequent, has resulted in what I contend are alternative circumstances. In a sense the requirements of the field have changed: we need librarians who can fill a wide variety of roles and carry out many kinds of tasks, technical, human and materials-related and who can quickly adapt to new contexts in order to fit the continually transforming needs of the public. This issue isn't only related to the information revolution: public libraries have also become a more prominent part of the social safety net as other components have shrunk ever since the Reagan administration. As discussed in previous sections libraries often employ much older workers who may not have had an education that prepared them to deal with constant change, especially change in technologies. Library science is also impacted by an inconsistent credentialing system, as there are a few types of Master's degrees and degree-holders may differ greatly in the kinds of skills they possess, and may or may not belong to a library-connected Union based on their qualifications.

In the case of Grand Ridge it was explained as a significant tension:

> "We're a divided shop here. I have union staff that do not teach, four of them. One of the four does teach. Then, I have 5 librarians that do teach classes. Of course, I can force them to do whatever I want. I can say, "Here's a classroom and topic. Teach it." But, library assistants, if it's not part of their job description, they can volunteer to teach it, but I cannot ask them to teach a class, even if they have great knowledge in that area."

The issue in Grand Ridge, as it was explained to me, had a lot to do with both staff technical skills as well as Union solidarity. On the one hand it would seem fair that a contract should be renegotiated if a person's job duties were to change substantively, but on the other hand for this renegotiation to require a system-wide change with months of bargaining seems unreasonable. There are requirements to protect the labor, such as if they'd be supplied training resources, paid

for their training time and given ample time to learn what they needed to. There are also requirements to make it possible for the library (employer) to successfully provide services, like if they're able to move staff between divisions, alter their mission profile to fit new needs without incurring prohibitive costs and, perhaps most important in the case of Grand Ridge, if they're simply able to operate a collaborative and comfortable environment where workers wouldn't be afraid to pool resources and communicate. Individual employees were able to volunteer their services, but this was a little dangerous as one wrong move or miscommunication could cause fall-out and disputes:

> "I have one union employee who's just very interested in doing these kind of things, wants to and comes to me and says, "Can I teach this class?" or "I want to do this." As long as I verify that they're coming to me and they're willing to do it, then I can, but I couldn't then go to the person sitting next to him and say, "Okay, you are going to now do it, too." Because then, I would get a grievance against me that I was making them do something outside of their job description."

In many libraries this might be related to technical and social skills. It seems cruel to ask an elderly woman to learn how to teach MS Excel when she's just barely figuring out e-mail and has never taught a class on anything before, but in Grand Ridge it wasn't exactly an issue related to abilities:

> "And what's interesting is that anyone of the people in my division, regardless of if they are a librarian or library assistant, could teach any of those classes. They are all knowledgeable enough to teach, all of them. It's just that I can only make certain ones of them teach them."

It seemed as if it was a matter of pride and solidarity for some employees to respect the boundaries. There was also evidence, by the way both librarians spoke about cross-library programs, that communication between departments was also complicated by the Union-imposed limitations. There are times that coordination between services would have certainly helped:

> "There's no internet access upstairs [in the children's section]. There's no public computer that they can go and their kids can play while doing their thing. All that's up there are

restricted game computers. I've got kids literally walking across tables downstairs that I have to manage and supervise because their parent's trying to get something done."

The fractured staff made it hard for them to have a coherent sense of identity. The Adult Services librarian expressed that it was a challenge to define their roles in part because they were pulled in so many directions, even just by requests for classes alone:

"I struggle with that a little bit simply because I do want to be everything to everybody. If they come and ask me for this, I want to be able to help them with that. But, I think sometimes we have to say, 'Okay. What are the resources involved in doing this? Does anyone have knowledge about it? Is it something we can reasonably offer to an audience that, is there enough of an audience? Is this just one person wanting to know how to build a website? What's their motive?' If it might be for small business, that might be different than 'I want to start a family blog to share with my grandkids.'"

When I asked her about how the director went about establishing library service objectives, and if they included a vision of the library as an information production space or education provider, she elaborated on the reason why each department felt pulled in a different direction:

"I don't think that she has a clear direction from her board either as to which she should solidly be working on or focus towards… a good library has to know what it wants to be and where it wants to go and then they have to anchor everything on that. We don't have that here. We're kind of grasping at straws as to what our bigger picture and our role even is."

Some of this appeared to be related to the library's responsibility to the city. When I asked how the library staff roles were determined it was indicated that it was a complicated process that took place, in part, in city hall. As I understood it this made for a sort of politics-style type of management, where many players and forces helped to determine what the library did, as opposed to just the director or board. As much as I'd like to liken this to democracy it was more adversarial than that.

The director left not too long after my visits to this library; it was clear that the tensions were one of the reasons she didn't want to meet with me individually. I would have to go back to conduct

more research and interviews, but from what I could tell from reading news reports the situation worsened, reached a breaking point with negotiations and layoffs, and is now on the slow road to recovery.

PATRON DISCONNECT

One of the other struggles Grand Ridge faced, besides issues with internal communications and job assignments, was conducting and acting on feedback and evaluation. It seemed, like many services, the library varied some in its operations. The Adult Services Coordinator indicated she collected feedback from classes, but when I asked one of the other librarians about her process I was given a different representation:

> "J: What are the hallmarks of success? How do you go about evaluating whether or not services are working? This can be formally in classes but also like these moments that you're helping—
>
> L: Haven't
>
> J: Say again?
>
> L: Haven't.
>
> J: Oh, you haven't? You haven't been able to evaluate most of your tech help?
>
> L: Yes. The only evaluation I have is if they don't come back for more questions.
>
> J: Okay. In the classes, do you guys do evaluation sheets or there?
>
> L: Used to.
>
> J: Not anymore?
>
> L: Usually the evaluations were rate stuff like 1-5 and whether handout's useful and was the teacher. And people are like "It was great." "That's nice." "What class do we have?" "These are great."
>
> J: So, it doesn't feel like it's all that valuable?

L: Right. You're like, "Well, I didn't do horribly. Yeah." But you're not really sure what you could have done better."

This seemed to indicate that providing patrons with questionnaires after classes was a much worse way of understanding their needs. The Adult Services director seemed to assemble most of her information from talking to patrons and from the kinds of questions they were getting at the desk. On the one hand this quote suggests libraries ought to seek out patron needs via different methods than just asking them, but on the other hand it successfully relates what was an issue that seemed to come up a few times in the interview: the library staff had trouble connecting to the patrons in general.

Some of this may have had to do with the language and approach, as I consistently heard the phrase "customer service" uttered in interviews, which might have implied thinking of patrons as users of a product, as opposed to members of a community. The patrons might have in turn seen the librarians as service-agents like a person in a check-out isle at a grocery store, as opposed to an educator or guide. I was given examples of times patrons expected the librarians to write their resumes for them, or:

"I've had a lady pushed her phone across the desk at me, she looked at me and she said, 'program my voice-mail.'"

One of the staff members I spoke to seemed to be generally frustrated with the activities of the users she had to deal with on a day-to-day basis. I asked her what kinds of technology service changes she'd like to see in the library and was told:

"Probably having a dedicated staff person who is always on the floor to sit the computers. For the people who are like, 'Whoa!' that need you to discourage them from clicking on the blinking thing that says 'You have a new message!' or 'You have won!' You don't click on that. Sort of as a one-on-one for the people who aren't going to improve their own education about the computer. They might be pretty content with playing online poker and Facebook. Then, they don't really want to interact with anything more than that."

This led me to ask her if the patronage of the library and services she provided there matched her expectations coming in:

"I think I was surprised at how many people don't know where the spacebar is on the keyboard for job searches. It was overwhelming and sad… I knew that they are going to come in for job searches. But I didn't know that you would have to teach them how to use the mouse first."

Upon inquiring about her experience in her Masters program I was told that she had grown up in a different sort of library-service context. Going from her experience elsewhere, to school and then to the Grand Ridge Public Library was a severe shift:

"[Library school] was really great at fostering enthusiasm and sort of a shiny concept of what [libraries] could be. Then, you come into the library and you're like 'I think I have to go flush that toilet.'"

The Adult Services director relayed that she often encountered staff who had trouble understanding patrons or who were less than excited about certain parts of her job. She explained that she grew up in a town that was considerably more diverse and wished she could see more of that diversity amongst her staff. She spoke well of the library staff person who was willing to help with the computers:

"I've got one African-American staff member, I really wish you could meet him, he's the library assistant but he's going to library school. Very non-traditional, served in the army, has a bachelor's in – his minor's in African-American studies but his bachelor's was in I want to say it was Sociology so it wasn't humanities but he has a very different background rather than a traditional, right out of college student. He's an excellent staff member and just has an interesting way of coming to libraries, but was hired in as a library assistant so he didn't work his way up. I would say, he's probably, of all my staff, the one that's most kind of in touch with what folks need out there, especially in terms of the using the computers and how to help them with that sort of thing."

This was the same staff person who was willing to volunteer outside of their Union duties. It was likely his connection to the needs of the patrons was part of his willingness to make his job to provide services for them, as best as he could fit in with the rules.

So far every story I've told about Project Next Generation has been about its success in connecting kids to digital literacies. PNG at Grand Ridge had been in action for quite some time, but apparently faced some harsh difficulties along the way. Much of it appeared to be due to internal communication and responsibility issues. The people in charge of the program varied from year to year as it was passed on by those at higher levels of the organization. One of the librarians I spoke to explained:

> "I don't like the program. Because I work with teens, I had to go with it for the two and a half years that I have to before I finally got out of it. I'm rather glad that it's been cancelled as a program because I don't think it quite worked. I think one library that I've seen— Aquarin, they did exactly what the program was supposed to do and it's fantastic. For the rest of us, it's very frustrating because librarians who don't use digital cameras, don't do editing, don't know even the software, or how to try it out and then mentor kids about it."

At the time of the interviews several libraries thought PNG was potentially going to be canceled state-wide, and others simply thought it was going to get moved from them to another library. One of the aspects of the grant, for better or for worse, is that it did not stipulate specific uses for the funds. Libraries were allowed to apply them flexibly to cover the cost of staff, infrastructure like broadband or for buying equipment to support programming. This meant that the success of the grant was largely left in the hands of the individual library. Most libraries I spoke to had the same problem Grand Ridge did with enrollment:

> "We have the highest enrollment of teens when we did movies and digital cameras and how to edit because that's the cool thing to do. We tried to do that over and over again. But, because none of us knew how to do any of that, didn't work out so well... people get burnt out because the students aren't engaged. Sometimes they get dumped here, the parents just dropped them off after school"

One obvious approach to solving the recruitment issue was partnership with community organizations, which Grand Ridge also tried, with limited success:

"This last semester, it took a very long time to get it organized and find a group that was willing to work with us…we've done it both ways, where we just kind of put out an all call for whoever wants to be involved."

And later added:

"They kept having to cancel because they had other activities that they had planned for the kids. They did not place enough importance and priority on the project either."

Beyond the acquisition of a reliable audience they also ran into problems with the technologies and the skills to use, teach and trouble-shoot them:

"We have lots of problems. They're a lot to do with technology. The video cameras that we have, can only be downloaded on one computer in the building. And when that person is no longer a mentor…"

Or another time:

"And then, the day before that software would have been erased from the lab computer without letting us know. So, suddenly, we couldn't do that. There were some problems in the structure."

I asked if she felt like they were given enough support to develop the skills and documentation for curriculum over the years it sounded like it wasn't adequate:

"We were given plenty of time and support to learn it ourselves but are not familiar enough with windows movie maker or what have you…They're just expected to do amazing things with technology that you should be learning over a semester in a college course and we just didn't have time because we usually only met for maybe an hour a week."

I explored the topic further by asking about guidance provided by other libraries and the state library itself:

"We do meet once a year and then maybe twice a year, interact with the other PNG locations around the State. I've seen things that really worked and we each steal each other's ideas of things that work. I have seen it work and I have seen it not work so well."

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The Adult Services director hadn't been very involved in PNG, possibly as a result of its fractured deployment, but had high opinions of it based on her experience with it at her prior library. She highlighted some other dimensions:

> "There are other funding and administrative issues with the state with the program that make it difficult to carry it out, i.e., they don't give you the money until two years after you're supposed to be carrying out the program. That's an issue for a library that doesn't have the money up front to do the program. There are also internal administrative issues with it, in that, it's written because we so desperately need the equipment for other stuff. They think 'Oh, by the way, we'll make it work for PNG also.' We internally here call it the slush fund because it's used to upgrade and buy equipment that we need for everyday services… it's frustrating when we see, you know, this really should be going specifically towards these kids."

Grand Ridge's experience was different from most of the other stories I encountered. While many faced the same issues, like staff skills and youth engagement, most locations didn't view it as a failure. It seemed that in previous years a lot of the funds might have gone towards general computer services instead of youth-specific allocations (like broadband or purchasing laptops), but a lot of the recent implementations involved hiring staff or purchasing multimedia equipment that wasn't purposed for general library use. There were many issues indicated here, however: lack of a dependable participant base or partners, lack of consistent objectives or programming, lack of staff skills and investment, varying contexts that made information and strategy sharing troublesome, as well as administrative and implementation issues.

ROWLAND HEIGHTS

On paper Rowland Heights had a population of about 6000. The director estimated, based on the numbers she was given from the school district, that it was actually around double that. The library was faced with an unfortunate Catch 22: they were serving a larger population than they had funding for, but simultaneously needed to develop effective and innovative ways to reach out to and effectively help the immigrant populations in town. The situation was similar to what many libraries across the US are now facing: a single large employer in a relatively rural area with recent waves of immigrant workers, some undocumented. Many of the immigrants lived in fear of

deportation (INS raids happened occasionally), many of the white people who had been living in the town for decades didn't know what to think of them, and the library was stuck in between all of this. The library was also positioned as an intermediary between generations, as the older residents who were on the library board sometimes took issue with the younger patrons making more use of digital technologies (which had access to resources in more languages) instead of books. Given all of the various people and interests in the town, the Rowland Heights Public Library needed to establish itself as an ambassador. They did this through addressing several of the aforementioned dimensions: being flexible for immigrant groups, encouraging dialogue, helping the youth to connect tech to traditional library roles like archiving and intentionally hiring locals with specialized skills.

GENERAL STRATEGIES FOR SERVICE

Many of the strategies the library undertook as part of its role as an ambassador were not directly related to fostering digital literacies. If they were to get patrons into the library in the first place they needed to help the library to suit their needs and make them feel comfortable. One of the immediate issues was of course library cards. Many immigrants did not have any form of identification that reflected a permanent address. They would move frequently and live in temporary housing and often did not have drivers' licenses or stubs from utility bills, so the library established an alternative card assignment program: they would mail a registration card to a patron-provided address and when the patron came back in with the card they would be verified and provided a library card. Another story she told me involved a patron who asked to repair a damaged mailbox in order to write-off their library fines. Though they weren't an immigrant the director's willingness to bargain was an example of the kind of flexibility that was common. She also did her best to casually observe what people were doing in the community, so she could better grow her non-English language collection, in order to get patrons to actually make use of the book collection instead of just the computers. One such example was when she realized many were buying houses in poor condition and fixing them up. She soon ordered a few books on home repair in Spanish and explained to me that they had been checked out non-stop ever since. Though this helped to boost circulation a bit it wasn't the only way she could connect immigrant groups to the older residents. A small group of seniors regularly met for a discussion roundtable and she made efforts to invite representatives to come talk and share information about their cultural background.

Though the effort was just with a few people and featured mostly safe topics it was still a symbolic recognition of the value of exchange of ideas and coming together as a community.

DIGITIZING THE DEAD

Rowland Heights was also a recipient of a Project Next Generation grant, and consequently sought to help underserved youth learn digital technologies to improve their chances of a bright future:

> "Our hope is that they'll go on to college instead of just seeing [local employer] as their only option."

It wasn't just about teaching skills, however, it was also about making strides to connect together different parts of the community:

> "Our kids in that group out of 10 to 12 kids usually 8 to 10 are of Latino descent, a lot of them are 1st or 2nd generation well a lot of them are 2nd or 3rd generation immigrants… The kids are a lot better at mingling and talking to each other and doing things together than the adults are so it's kind of funny to see the difference between the two."

Every Friday night they'd participate in projects, this year involved media production and archiving:

> "I take them out a couple of times a year to the local cemeteries and we take pictures of headstones, which sounds really morbid and weird but the kids love it. I wasn't sure at first if it would go very well but they absolutely loved it, they thought it was the coolest thing ever."

They'd then upload pictures from the PNG-purchased digital cameras to findagrave.com and provide information about the photo. They'd learn about metadata, history and get to run around outside and release energy. The first run was setup to help the kids discover that the town used to be dominated by German immigrants, to help them understand that the current immigrants there were not the first, nor were the old folk the true 'natives.' The next assignment was even more interesting:

> "They're each going to pick a prominent business person that we can find a headstone for out there and then research them and find out where their business was. We can look those

up in the old city directories and see what's there now and where they lived and what was their family like and if we have a picture of them in the high school yearbooks—we've got those back to 1909. At the same time that helps us digitize our archives so it kind of helps the library but the kids think it's really cool too."

Not only were the kids learning to use a set of information resources, digital and physical, in a mystery-solving context but they were secretly being turned into volunteers who would learn about community history—learn about the history of the older people in town who didn't know what to think of them. At the end of the series they'd then present what they did to their parents and the director was considering how to best show their work online.

HIRING

It was clear, though, that the director could not do everything she wished to do on her own. Many libraries determine that they can reach out to Spanish-speaking populations simply by hiring staff who are bilingual, but what Rowland Heights found is that they needed staff who were bilingual, able to reach out and gain trust, provide effective instruction and have a solid baseline of technical skills. This is a bit of a departure from the ordinary bill of talents for libraries that typically might involve items like cataloging, reference, love of books and so on.

The PNG staff (mentors) were temporarily hired for the project, and both local. The first was someone the director had known as a high-schooler who was enrolled in community college nearby and the other was a teacher at one of the local schools. They were chosen largely on account of their connections, as much as their credentials:

"For PNG I have two really good mentors that work with PNG who are fully bilingual and who know the community really, really well... they tell the parents who their kid is going to be with and where they're going to be and what they're going to do and they get consent and they actually visit the home… in a lot of Latino cultures that's how you do things you don't just send the paper home."

Despite all of the work with cameras and staff gaining the trust of the parents they still weren't able to overcome the fear of posting photos. They were also only present for PNG, which is why the director eventually hired a similar person on to her staff. Finding someone proved to be

difficult, as most could make comparably more money with the major local employer, or travel elsewhere if they had more specialized technical skills. The director eventually hired a family friend who was young but just technical enough to learn how to teach and do many of the things the library needed with digital literacy related services. His description of the job was fairly typical:

> "When people come in and they need to use the computer I help them get logged in and sometimes they need some assistance, like navigating the web, so I help a lot with that, show them step-by-step where to go. Recently since we've started e-book services we've had people come in asking how to work their devices and we go through the help website from our computer, we go through the steps. Sometimes we bring out Kindles and we give them some help on that."

What was less typical were the kinds of questions he fielded:

> "J: Can you be more specific about the kinds of information people are searching for? Health information or job postings or other examples?
>
> L: Well those two right there, a lot of immigration information about citizenship and residence, too."

It was clear that he had gained the trust of even some of the undocumented workers in town, by nature of his own background and investment in the community, and also because of other structural factors, as the director begrudgingly explained:

> "If they had their choice between a Spanish speaking woman and a Spanish speaking man they would rather ask a man."

A lot of the immigrant population's trust relied on an image of what a person qualified to help them might look like, which unfortunately also included a dimension of sexism.

He indicated he wanted to see others like himself have the ability to express more ownership over the space:

> "I lived in [location in Texas] and there it's a big Chicano population, back in the depression era there were giant murals painted to express heritage. There was a library downtown that was all covered in murals, it was a lot of books and things that represented

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literacy. Here in town I'd like to see something like that, a group of people could show some pride by painting a wall with what they think represents the town."

This vision of a mural contrasted to the one that adorned the wall in the room adjacent to us, one that had been donated and featured a kind of generic fantasy theme familiar to many people who had grown up in the US. It wasn't a bad mural by any means, artistically it was impressive enough, it just wasn't representative of the kinds of stories or folklore many of the recent immigrants might have appreciated more.

Somewhere near the end of the interview, as I was being told about his aspirations to teach himself more about computer maintenance to save the library money on consulting, he made a remark that stuck with me:

"The only reason I never got into being a librarian in my hometown is it required a degree, you had to go to City Hall and take a test. Here in town I just apply and it's about what I know, not the degree."

This is an issue I will return to in a future section, but it's interesting to contemplate what knowledge he meant. Was it about his network of who he knew and what he knew about a typical library patron's culture? Was it that he was able to teach himself how to fix computers or that he was a good one-on-one tutor for information searching online? Or was it just that he knew Spanish? How many of these things can be taught or represented with a degree?

OTRANTO

As libraries face more and more challenges framed in economic terms they have been turning to alternative service models to cut costs. Two common strategies are (1) to outsource infrastructure services, such as IT support, and (2) to consolidate library branch systems by merging locations and shifting collections online. Otranto Public Library resisted both of these trends because they felt the benefits of localized support outweighed the cost-savings of substitutes. This is remarkable because, at first glance, it seems like these decisions are in opposition to a vision of a new, streamlined and technology-powered library of the future but upon closer inspection they instead illustrate a different interpretation of it.

As useful as it may be to identify underserved populations within a given location with the use of census tracts and statistical or GIS analysis tools, they don't really reveal the meaning of what it's like to live in these places. The librarian representative at Otranto explained it to me in a way that someone who has lived there would:

> "At Otranto there's this divide, it's more than just the digital divide or the economic divide… there's this river and there's the west side and the east side, and you will see if you drive over there, you can see a lot of new homes, new businesses, new construction and it does look as though the resources are all targeted to the east of the river. The west of the river, the founders started there, the college used to be here, the YWCA, all of that has moved east. The boys and girls club even moved out, instead of using these beautiful buildings and land over here, all of the resources, to create more updated facilities they just shut down and move east."

In some towns it's the railroad tracks, in others it's a big road and in a few it might be a municipal boundary, but the theme is the same: the low-income people of color live on this side, and the privileged white folk live on the other side. While the sundown towns of former eras have been formally eliminated, the echoes of these demographic arrangements often still remain. Otranto historically relied on a branch library system to provide services in specific locations around town, to help deal with these disparities.

At the time of the interviews they had been taking heat for considering a plan to weed out a large portion of the collection and offer more services online as well as potentially close some locations. For some public libraries this kind of plan appears as the optimized path to the future. In the Chicago suburbs of DuPage County, for instance, some municipalities are dominated by patrons who, on average, not only own their own computer, but also a tablet or e-reader and smart phone as well. These patrons rely on owning a car to commute to work or get around town and typically have powerful broadband at home. In these settings a consolidated single library location with substantial services online might make a great deal of sense; they could drive a ways to get to the library and would appreciate all-hours online access of information and "on-the-go" self-checkout systems based on RFID. Many of them might be wealthy enough to prefer buying all their books

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and media, rather than invest taxes in collection resources for everyone. In Otranto, however, it appeared that neither population, east or west of the river, was ready for this sort of future just yet. The librarians I spoke to were almost scared to talk to me about it because they didn't know what was going to happen due to the blow-out that had resulted in swamped town hall meetings and published articles. It seemed none of them were directly responsible for the plan, and though they saw merits in it, they were saddened because the public took what was a draft to be a given reality and revolted. The situation escalated as the Union got involved and misinformation was a danger.

As a result of the scuffle the library was under a lot of scrutiny and, as usual, they were facing everyone's favorite insufficient evaluation metric, circulation:

> "[Otranto] is smaller, and politically you have board members who look at numbers, how many people come to the library, they're looking at the statistics, and they point out that the circulation is not high… what they don't see is the community. When people come here it's a community experience."

And this is what the librarians at the Magnolia Branch expressed to me was most-often overlooked. Their location was generally under-resourced and had faced potential closure in years past. Their circulation counts were poor, but their door counts, and more importantly level of engagement in the space were worth noting:

> "You have a group of people who come and read the paper and sit around the tables and talk about the news and that's the daily thing to do. When the children come in they all know each other, they all gather around the computers, they work with each other. It's a neighborhood, it [the library] lives inside of a neighborhood, and those are numbers that can't be captured, the content of the interactions that happen here are different than what might happen out in the east branch, which is in a retail area, by Target and box stores, it's not a neighborhood feel."

The librarians took ownership of their space, which is why the recent drama was particularly scary for them. I got the impression that without this branch the west side of town wouldn't have had any representation or influence in the library system. It felt to me much more like relationships than 'customer service.':

"It's a difficult thing, because I'm African American, so I'm invested, it's my community, it's my area, if it hadn't been for a library like this—you think about how do we become librarians? We had to have a great experience – we had to go to a library where we saw people like us and welcomed us and we had to have that experience of finding out this is what we want to do."

The staff also indicated they didn't have enough powerful advocates, either:

"You don't have board members or directors or people who can make change happen [here], they're not necessarily invested in the community here, there's a disconnect… it's not personal for the board. The city appoints them, and all that."

So given this dynamic the library had to go to bat for itself:

"We also need the people-people and those who know how to go outside of the library to bring people in to the library. Not only that, if we're going to bridge any gaps we're going to be out there. We can't just be behind our desks, so that's kind of what I do. I try to make sure I'm out in the public, doing a lot of outreach, sitting on boards, talking to people, begging for resources…"

This was followed by nervous laughter, as the program coordinator didn't literally beg for resources, but indicated it sometimes felt like she had to go to great lengths to build numbers in order to rally support for the library, and it wasn't always very easy to figure out just how to do that:

"If you're not dedicated to pushing the numbers your library branch will suffer, because that's how their resources are based, but what can we do? What class do you go to know how to raise the numbers? It doesn't exist. You might have to go to the minister's fellowship and the community centers and pack bags of books and check them out there, make displays, do programs outside of the walls, but you might not know how to do that unless someone comes in to teach you."

What this truly was about, the program coordinator alluded to, was cultivating the library as a symbol in the community. This status was what was really important to them and how they chose to evaluate their success:

> "Even though maybe the community doesn't necessarily come in and check out a lot of books if they feel the library is going to be closed or if it's threatened they will speak up and they will fight for it, because they really love and value it. And they value it for other reasons than just the fact that they want to check out books or use computers, that's the part that the rest of the community doesn't get."

Just as a public park might give a people a sense of pride or a kind of local identity, the library provided this as well as a place for people to gather, exchange information, and, most importantly, feel like they belonged. This atmosphere was crucial to enabling people to come into the library in the first place and likely contributed to successful and frequent use of the computers, which, like most libraries, were in use much of the time. It also provided the foundation for the kind of technology-driven future the librarians at this location had in mind.

LOCAL IT

Most of my interviews were conducted with directors or youth and adult services staff, but at Otranto I was able to talk to a dedicated IT staff person. Many libraries didn't have someone like this, even those the size of Otranto. I was able to ask all kinds of questions specific to IT policy decisions, but most of them had the kinds of answers you might expect:

> "In terms of computers I've got a budget, for all locations, and what I do is I always try to make sure the equipment is up to date. I go through this RFP and I fill all that information out and tell them I want a certain processor and so on."

Other than helping the library to make more efficient and customized IT provisions the tasks seemed pretty similar to other institutions. At the time of my visit they were discussing how to best integrate charging stations for cell phones of various sorts, as many patrons who visited the Magnolia branch didn't bring their own laptop but did bring along a smart phone. I thought this was relatively insightful back in 2012, as the demand has only grown since then.

Perhaps more interesting, however, was that the IT services librarian was also responsible for a great deal of the training. They didn't teach patrons technologies, but instead 'taught the teachers' in advance and let them develop more patron-specific programming:

> "Every time we get a new technology that's going to be implemented in the library then we go ahead and do the training. That way the staff are more comfortable using the technology. We don't want to just let them go on their own to work with it, so we do have some structured classes."

A recent example that was on-going were e-readers, which Otranto was beginning to loan to the public, which meant many staff needed to know how to support them. The librarian also explained to me that it was better to conduct training in-house so that they could edit and remix existing training materials (with permission) to actually match their specific needs and circumstances. When I remarked that I was surprised that their IT was not outsourced I was given a somewhat surprising reply:

> "I'm glad we're not, it's a benefit to have us here because when you outsource something, especially with IT, you have that concern with security. I think it's safer to have your own IT staff, and there's a type of dedication though that you run in to."

I was expecting and unsurprised by the dedication. Clearly people from a community are more likely to be committed to it and better understand its needs (like user populations who use cell phones instead of laptops) but I thought it was unusual that they also felt it was more secure to have internal IT. For Otranto it seemed to indicate a certain degree of trust, as it's more comfortable to have people you know being given access to sensitive issues like patron data. I also suspect it facilitated better training, as they could ask questions as colleagues, rather than as students for an external consulting expert.

ANOTHER LIBRARY OF THE FUTURE

So if Otranto wasn't destined to become the outsourced digital library media hub version of the future, what was to come of it? The program coordinator had some ideas with a different spin:

> "I'd like to see a mini YOUmedia center, or some kind of setup that uses advanced and emerging technologies, just a mini center, so that people here could do job searches and

creative things with their own talents, the musicians, the poets, the authors, because you have people who do everything from repairing cars and houses to you know, who come here, they all use the computer… if we had laptops or tablets available for people, something for people to use other than just the computer, other technologies to upload videos and do Photoshop and more databases and a variety of things, built into regular computer classes here."

She also added that these kinds of changes would offset some of the issues related to computer time-limits, as it would provide more entertainment and dedicated machines for long-term tasks. Similarly (but separately without prompt) the librarian tasked with IT weighed in on the idea:

"More like meeting rooms, social gathering areas, as a community center. The physical building will get smaller. Also programming will change. It will be more important to have different programming available, as opposed to just strictly computer classes. We'll offer activities like digital photography. We're in the process of trying to get [auditorium space in town], it's more of an artsy thing, right across the street from the main location. It's actually getting donated to us, we're going to have an event to see what the public's opinions are on what we should do with it."

Both of these visions share some aspects in common. They suggest that the library would like to expand its role as a place of community gathering and increasingly organized education, as well as involve itself more actively in the production of culture and media as well as application-specific computing. I will return to these topics more in the discussion, but it's important to note that they were recognized as strategies that were compatible with the branch system and also that they differ strongly from the stereotype of the "drive-thru online library" model.

AND THEN MY RESEARCH MODEL BROKE

For the majority of the sites I visited data collection worked out as planned. A letter was sent in the mail in advance, e-mails and phone calls followed, interviews were scheduled, and site visits were arranged. Sometimes a given site did not respond immediately, usually under the impression that they would not qualify as a result of a lack of cutting-edge technology programs, but in most of these cases once I made it clear my interests were in the full scope of activities and perspectives they were willing to receive me.

Still, there were a few locations I could not visit. Rather than drop or dismiss these places as "outliers" I thought it more appropriate to consider them as an opportunity to discuss some of the gaps and drawbacks in my research and analysis. It would be too easy to let them be yet again skipped over and not turn a critical eye on myself as a biased investigator. It's easy to talk about successes. It's not easy to talk about challenges, but it's still possible. What this section focuses on is neither: these are occasions when my framework or approach didn't work, along with some valuable findings related to this.

HAZARDOUS ASSUMPTIONS

The first of the missed sites came up quickly, when I was declined by Glassbrook Public Library. My standard preliminary research on Glassbrook found a library located on the edge of a river in a town with a continually conflicted history. According to census data it fit most qualifications of what I had considered to be 'underserved' demographics: an ethnic minority community in a rural setting with high rates of poverty and unemployment and also troubled by crime and a declining population. A few months prior they had been assisted by the US Army Corps of Engineers, when the decision was made to destroy a set of levies to alleviate flooding, at the cost of destroying several nearby farms on the other side of the river. News coverage of the event suggests that the occurrence revealed tensions related to racism in the region. I later discovered a recent documentary about the town, read through a number of articles, and found additional evidence of severe poverty, racism, and, most pertinent to me, a distrust of outsiders. The community had been mistreated as a sort of spectacle by many writers, chronicled as a kind of abandoned town and preserved piece of history. A telling example was the Tired Pony, a Portland-style coffee shop, bookstore and co-op, pushed by Redditors,[68] that had tried to establish itself in the town to help the locals but eventually failed due to a lack of support, theft and other economic challenges. What the people of Glassbrook wanted and needed, it seems, was not an indie coffee shop, but at the same time the majority of the material written about them online was from outsiders, not locals, so it was hard to tell.

To me, this didn't seem like a fair evaluation. Who was I to walk in to the town with assumptions about the importance of the internet, digital tools, the needs of patrons and questions about the

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[68] Reddit is an online news website with a series of niche communities.

roles of the library? It's difficult to determine when inquiry about an institution as a collection of people, policies, activities and infrastructure becomes an unwarranted judgment from a privileged outsider culture. The ALA provides guidelines for global service objectives but the trouble with such sweeping standards is they may not adequately or appropriately address the conditions in every given local context. Let me be clear: I can't surmise anything about Glassbrook Public Library's reasons for declining participation in the study or make any significant statements about its services, but this does function as an important reminder of my position as a researcher as an outsider who may come from a dramatically different culture or background, a status that will impact me even before I set foot in a given library. It is also a demonstration of the sheer range of conditions in which public libraries operate. Any discussion about the service roles of the public library likely includes assumptions about what libraries should do and what libraries are capable of doing, but not all libraries may match these assumptions and we can likely learn a great deal from those who don't.

DIFFERING CONDITIONS

I ran into similar circumstances during my work with public libraries in the Hopkinton county area. At one library, the director was changing over at the time of my contact. They were so hard to get in touch with over the phone and e-mail (presumably busy and understaffed) that I eventually had to give up trying to track down a good time for an interview, though I was approved for a visit. I did stop at the site over a year later just to make my regular observations: number of computers, layout, software, literature on computer classes and so on, which still contributed to the comparison in the next section. Upon walking in, before I could say anything, I was told that the event I was looking for was just down the hall. From what I could tell I was the only white person in the front of the library at the time; peering down the hallway to the meeting room, I saw a notice about some kind of political organizing meeting. Obviously I wasn't a regular at the library, but I also believe I was at least partially identified as an outsider because of the color of my skin and because of the way I was dressed. I don't feel this was any sort of negative prejudice, probably just an assumption of why a person like me might be in this library, but I found this was often the experience when I visited libraries in underserved communities—I was pretty obviously identified as an outsider right as I walked in. This underscores my prior point more poignantly: my ability to get robust or reliable

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data from interviews and observations was in part influenced by my ascribed identities and cultural fluencies.

While waiting for a computer guest pass at the same library I found myself in line behind an elderly lady who was asking the staff person at the desk for help to scan an advertisement for a choir. The staff person explained that they didn't know how to help, and when I later asked them how many of the library staff were qualified to help patrons with computers they told me just one, and gave the name of the director. When I probed about activities I was told the director was responsible for all of the technology-related programming in the library. Meanwhile, I felt bad for the patron who wanted to scan the flyer, so I attempted to help them, but we found the power supply for it was missing and the computer it was next to didn't boot. This story has at least two points of significance. First, it appears like it could be another example of a library where only one person has the skills to help with even just computer basics. This isn't all that unusual, except this library served a much larger population and employed a much larger staff than most of those that are so limited by human-capital. Second, my ability to observe and inquire was often altered by my interest in actively helping to solve problems, even when I wasn't asked to. This reflects a sense of privilege and agency, but also a potential blindness: I may be sometimes too interested in unpacking the problem to solve it, rather than see how *they* make sense of and otherwise deal (or not deal) with it. Had I asked the staff person who helps patrons before I went about trying to solve all of the issues I might have yielded a very different response. Similarly, if I had been more clearly from their community or shared other identities in common they might have presented other information.

Another library in the area made clear other kinds of issues that might make research difficult. While driving around looking for its location I became lost as a result of outdated Google Maps records. My car was rushed by a man who tried to open the door at an intersection and while driving in an adjacent neighborhood in what appeared to me to be a low-income housing project I was told "Go home white boy, you're in the wrong part of town." When I did finally get to the library, which I had never been able to reach through phone calls or e-mail, I found the door was guarded by an angry looking stray dog. I couldn't find any hours on the door and it looked like it was closed, and had been so for some time.

I don't write about these experiences to solicit pity or to provide fuel for negative judgments. I include them because many researchers would dismiss them as 'outliers' or scrap them on the basis of not being rich enough in data. These experiences help illustrate some of the sheer variance in conditions and opportunities present in Illinois for those seeking to gain access to library and computing resources. The state ranges from some of the richest communities in the nation, found in places like DuPage County, to the places like the urban prairie of Hopkinton County. Part of the reason locations like the Hopkinton area remain underserved is that they are not always fully included in research studies, like this one, that may inform policy makers and program developers.

The last location in the area that I visited wasn't an official library. Instead, it was a volunteer operation that had risen up in place of a library that had closed its doors a few years ago due to financial issues. It was housed in a converted church, adjacent to a youth outreach program tied to a larger non-profit, and was run by volunteers. A couple of years prior I had visited the operation to help update and install computers and to assist volunteers in organizing and cataloging their book collection. I couldn't formally interview the library staff because there were none, officially, but I did talk to some of the people there and go through my usual process of computer observation, note-taking, photos, literature collection and map-making, with permission. Despite little funding or formal organization, this library had at least still managed to remain open and had even taken steps to better integrate the youth organization and the library service area over the years. The sign-in sheet was perhaps most-telling, however. Patrons were required to sign-in and indicate what they were doing during their visit, and a look down the sheet for the day revealed about a dozen names, all with the description of either 'volunteer' or 'computers' written next to their name. This isn't to say that the book collection was going unused, as this was simply a one-time visit, but it does suggest that the computers were a pretty important part of the library's service. A look-over of one of the workstations exposed they hadn't had their software updated very much since my earlier involvement, and had numerous personal document and image files saved to them, but they clearly were still working and being used. My impression was that at least in the case of this volunteer library, even in its barest form with minimal support, the library provided three identifiable services: a place to hang out, books and magazines to read, and public internet access and computing.

There was one other location outside of Hopkinton County that I would have liked to include stories from but was unable to. It was dropped due to incomplete data in the form of corrupted interview recording files, but is worth mentioning because the site still held a valuable lesson. This library was one of the few with ample space and also had a larger staff size and funding base. They faced significant challenges in terms of serving a sporadic and often low-income population, but the way they handled it seemed to account for some portion of their struggles.

A restructuring in years prior had resulted in the closure of one or more branch locations, and the echoes of this decision were still evident. The tone of the interview with the director (the only data that wasn't corrupted) was unusual, as the central issue with this library is that it seemed to situate itself as in direct competition with other social institutions in the area. It went beyond just the fear of competition with other organizations, but actually included direct acknowledgment of and participation in rivalry itself. As a result, the school system and even nearby bookstores chose to independently run their own reading programs and local political disputes disrupted literacy initiatives involving the library. An informal "local" library had cropped up on the edge of town and other people were willing to drive to alternative library locations out of protest. Evidence from the interviews strongly suggested the library was struggling with community relations.

The director identified the purpose of library programs as primarily a way to drive circulation counts, their main chosen measure of success, which generally overall resulted in less programming. They explained their library had been positioned differently in previous years, as another director before her had put it, as a "cultural center," which they had intentionally moved away from. When I asked about the conception of the library as a production space or place of education, I was told that it was to be a "school of the people" but not a social services center, and that they were not in the business of actively teaching but instead providing a kind of self-service location. There were small sets of isolated computer carrels scattered about, but no dedicated instruction space, save for a small appointment-based career center, which was matched by minimal digital literacy related programming. They had a teen space filled with magazines, but noted that it generally went unused, as it also wasn't a significant place for programming. The director felt that "kids these days" just were not able to sit down and read like they used to. She further explained that people who did not attend their location often did so because they were

looking for a smaller, "local" feeling atmosphere where they could feel at home and connect to people they knew. The director then went on to speculate about the poor qualifications of the people volunteering at other informal library locations, suggesting that their backgrounds were questionable and that they might cause people to receive a bad impression of librarianship.

It might be possible to condemn this library as a "straw man" of sorts, but we should think about it in the same way other challenged locations have been considered: in terms of its context. The difference is that in this case the library itself was not subject to severely limited infrastructure or human resources, but instead the philosophy and policies embedded in it as an institution made it less compatible with my set of questions and assumptions about digital literacy. Their emphasis was fundamentally on the storage and circulation of traditional library materials.

WHAT THIS ALL MEANS

This gathering of missed data-collection locations is itself a source of information. In order to foster digital literacies libraries must have regular open hours, operational equipment, staff with time, skills and resources to enable activities to happen, and, most of all, an acceptance of the importance of emerging norms of technological, educational and civic participation. It is not a coincidence that some of the most low-income communities with the largest proportions of African American populations were those with libraries not well represented in my study. Their views and understandings of digital literacy, their strategies and programs related to digital tools and their efforts towards community engagement are not accounted for as dedicated sections in the site findings, and as a result this research suffers. I cannot claim to tell a comprehensive story of these underserved communities, by any means.

My identities and perspectives as a researcher are notable in part because they limit my chosen method of research. I'm a resident of Illinois, but not of most of these individual communities, and I most certainly have biases and privileges. For many research sites I could visit and assume a regularized level of professionalization amongst LIS-educated individuals, but not all sites had people with MLIS degrees, and many of them had earned their degrees three or even four decades ago and had not kept in touch with the academic culture or network. In the case of Aquarin, this de-sync was good, as it allowed them to break institutional and service boundaries, but in the case of most of the libraries that were "incompatible" with the assumptions beneath my method, it

seemed to be more of a problem. This affected my ability to walk in and "talk the talk" in a significant way, about as much as being white, male, relatively affluent or young might have.

Ultimately, I think this all demonstrates the importance of context and culture in determining library service roles. Many of the patrons in these communities did not choose to—or were unable to—spend limited financial resources on internet service at home, though some may have had it through cell phone service. A few years prior I went door-to-door collecting survey responses for a broadband grant proposal targeting a nearby region and about half of the respondents I spoke to indicated they simply didn't use the internet on a regular basis, either by lack of need, interest or access. It seems absurd to talk about ideas of helping patrons like this build their own personal website, program an Arduino,[69] or use internet databases or e-books in place of visiting a library in search of physical materials. This is not to say they couldn't or wouldn't be able to ever do these things, it's instead to stress that all of my exciting talk about digital literacies is housed within certain assumptions of culture that may preclude those in less-privileged areas. The gap is illustrated through my personal identity as a researcher and LIS professional, in terms of socio-analytic categories such as race, class, age and other possible identifiers, and also through policies, expectations and structural conditions that determine life for those facing structural oppression in this part of our state. It serves as a reminder that the role of the public library, in fostering digital literacies or doing anything else, needs to be determined by the context of the community. On the one hand we can look at a library's ability and willingness to conduct community engagement, but on the other we can look at a community's capacity or opportunity to have a functional library and digitally-minded staff in the first place.

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[69] A small board electronics device, known as a microcontroller, used for specialized tasks, Arduinos often serve as an introduction into hardware programming.

FINDINGS - LIBRARY COMPARISONS

The trends and issues found in the individual site stories were often recurrent and they were also not the only variables I examined during my visits. As stated in the research design I spent time drawing maps of spaces, counting and testing computers, and poring over printed and electronic materials. Considered together, combinations of these attributes represent a general impression (or metric, even) of the state of these libraries. The measures in this section are not intended to be exhaustive, rigorous or comparable to all types of state or national data, and that's the point, really. The subjectivity and variance revealed in their collection as well as the dimensions they represent that are otherwise absent in other larger official studies not only reveal drawbacks, they implicitly form a critique. Number of computers or time spent on a computer will never determine the quality of an information experience, just as circulation counts will never render the value of an individual book for a given patron. Nevertheless overviews provide an interesting lens when discussing recurrent themes found in interviews and site observations.

OVERVIEW

The following data comparisons are from the summer and fall of 2012 and as a result may not be current representations of each library. Clearly libraries vary considerably in physical size, and some locations employed branch systems, whereas others were centrally located in a single main library. See the table on the next page.

Library	System Legal Service Area Population	2010 Census Block Service Pop Est	Total System Operating Income	Total System Operating Expenditures
Bozeman	26,000	32,000	1,000,000	900,000
Plainview City Branch	35,000	12,000	1,300,000	1,000,000
Belle Terre District	15,000	17,000	300,000	300,000
Grand Ridge	76,000	74,000	3,400,000	3,600,000
Altura	26,000	26,000	1,200,000	1,400,000
Shipton	33,000	45,000	1,600,000	1,600,000
Norburry	13,000	13,000	500,000	400,000
Aquarin	28,000	29,000	1,900,000	2,900,000
Paddock Branch	115,000	20,000	7,300,000	7,100,000
Wrightsville Community	4,000	6,000	0	0
Otranto Magnolia Branch	153,000	16,000	8,400,000	7,000,000
Eastover	116,000	133,000	3,900,000	4,200,000
Rowland Heights	6,000	11,000	100,000	100,000
Dalhurst	32,000	30,000	1,500,000	1,400,000
Stony Point	27,000	29,000	unknown	300,000

Table 3 - General library attributes related to service population and funding, in no particular order. Populations have been rounded to the nearest thousand and incomes to the nearest hundred thousand, in order to supply an additional degree of anonymity.

System Legal Service Area Population – As of 2012, based off of the official state data at https://harvester.census.gov/imls/search/index.asp, provided to give an indication of the kind of scale of community the library serves. This differs from a library's actual capacities, such as building size or number of branches, but does help establish a sense of "how big they are" as it relates to how many people they serve.

2010 Census Block Service Population Estimate – The population of census blocks in the area surrounding the library that included people likely to seek service there. In many cases this included blocks that were not part of the 'official' service area but that did not have another library nearby. All blocks were mutually exclusive and selected based on what librarians indicated was their primary patronage. This measure was especially important for branch libraries, where they were not intended to serve the entire community—the block estimate gives a better understanding of the size of the community they more specifically serve as compared to the whole system.

Total System Operating Income and **Total System Operating Expenditures**– Provided to give a sense of the financial assets at a given library's disposal, used, unused and with possible external subsidies or savings revealed. Per-capita estimates are not given, as they rely on official (not actual) service populations. These are also based off of the state data at https://harvester.census.gov/imls/search/index.asp. Note the wide range in available income and expenditures, which is not always in direct proportion to population served.

Official service populations are often different than actual. This was revealed in several stories, such as invisible undocumented worker populations or people from rural areas with no library nearby who would drive in. Readers will notice the aggregated populations for the census blocks immediately surrounding the library differ considerably from the endorsed service population in several cases, most of the time illustrating how the library is likely under-resourced relative to its need. The estimates here are conservative, as they only count census blocks bordering the library area; towns without libraries just down the road would only increase this number further. The fact that I could even do this is one reason this study has a relatively unique sub-state level of analysis. In dense urban areas (like Chicago and the surrounding suburbs) library service zones all bump up against one another and so it's not entirely clear who might use which library. In small urban localities and towns it's pretty easy to look at a map of the metropolitan area, note the single library that serves the entire location, add up the total population there, and determine if the official service population is dramatically different. In those cases it's pretty likely that there's a portion that is not being recognized for service.

It was unclear what the difference between library income and expenditures always represented. Many had additional sources of funding or mandates, through grants or other municipal

arrangements that complicated these values. It's particularly striking to note the differences between libraries of similar size populations, however. For instance, both Aquarin and Stony Point serve about 29,000 people but the former has about 10 times the expenditure budget of the latter. This is one indication of the sheer wealth disparities in Illinois because *both* of these libraries had fewer assets than most of those located in the suburbs of Chicago.

INFRASTRUCTURE

A reminder of the original conception of the digital divide, a library's ability to foster digital literacies among patrons is determined to some extent by the resources and equipment they have available. While I was able to compare some attributes to those collected publicly by the Public Library Funding and Technology Access Survey (Bertot et al. 2012) I specifically sought out some unique measures. See the table on the following page.

Library	Dedicated Computer Instruction Lab	Dedicated Teen Tech Space	# of Public Use Computers	Classroom Set of Laptops or Tablets	E-readers & E-books
Bozeman	No*	Temporary	12	Yes	Yes
Plainview City Branch	No*	Temporary	10		Yes
Belle Terre District	No*	No	15	Yes	Unknown
Grand Ridge	Yes	No	28		Yes
Altura	Yes	No	42		Yes
Shipton	No	Yes	13		Yes
Norburry	No	No computers	8		Yes
Aquarin	Yes	Temporary	43	Yes	Yes
Paddock Branch	Yes	No	36		Yes
Wrightsville Community	No*	Yes	8		No
Otranto Magnolia Branch	No	No	8		Yes
Eastover	No	No computers	25		Yes
Rowland Heights	No	No	11	Yes	Yes
Dalhurst	No	No	21		Yes
Stony Point**	No*	No	21		Unknown
Illinois Average**			18		64%

Table 4 - Digital literacy related assets by library, as observed during the time of visit.

* Possible to easily isolate a small group of computers.

** Status in fall of 2013

*** Based on Bertot et al. (2012)

Dedicated Computer Instruction Lab – If an isolated room was available for teaching dedicated computer classes. Some libraries were able to isolate small groups of computers for classes by using laptops or offering classes during times or in spaces that were not ordinarily open to the public.

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Dedicated Teen Space – If the library had a separate and dedicated teen space of notable size where youth could hang out and carry on activities besides reading (not just a teen "collection" space) that involved digital technologies like consoles or computers. Some libraries converted public meeting rooms and auditoriums to fill this role on a regular basis.

# of Public Use Computers – The number of desktop computers, internet-capable or not, available for both adults and children. This should be considered an estimate; at any given site some computers might not have been functioning or it is possible I might have missed some when making my floor plan maps. Does not include laptops or card catalog access machines.

Classroom Set of Laptops or Tablets – If the library had a set of 8 or more laptops or powerful tablets of a non-e-reader type, like ipads available for patron use. Patrons could be children, adults or both. Libraries with sets of laptops demonstrated considerably more flexibility with digital literacy related programs in and outside of the library.

E-readers & e-books – Simply a measure of if the library offered e-readers for patrons to borrow, either within the library or to take home, and if they subscribed to some kind of e-book provision service, like OverDrive or other consortiums. If a library offered readers it typically had to support them by teaching patrons and staff how to use them.

Examining the commonalities and differences in some of the infrastructure present in the observed libraries reveals some points of interest. Branches attached to larger systems had a disproportionate amount of resources, in their favor. Plainview, for instance, wouldn't have even existed without help from a neighboring town. Paddock's Branch had a spacious, brand-new computer lab and instructors who came in, both of which were setup and maintained by people at the main location. Otranto could draw on the e-reader resources and IT support of the whole network. In other words, library systems with branches enable a more equitable spread of services and assets throughout a community, especially those with large populations or service areas.

Public computer terminals and broadband internet access appear to be near-ubiquitous in Illinois. It was essential in even the most under-resourced and rural libraries I visited, though there were significant variations in internet infrastructure. For this set of libraries the number of public use computers did not appear to scale proportionately with population. One of the premises in the

sample selection was that state-wide averages would make it difficult to make comparisons possible for individual libraries. In Illinois less than half of libraries reside in densely populated urban locations, whereas the others are serving small towns and rural areas. If the Illinois average for public internet workstations is 18, how does a small library know it has enough computers? Similarly, how might a larger library know it has too few? Clearly one sound answer to this query is to measure open computer time and frequency of use, but the data here allows us another way to evaluate what might be "typical" or "expected" for a library. The form in which the computers are arranged is also not represented by the total number: different layouts promote different kinds of services and experiences.

Libraries with dedicated computer labs, laptops or spaces that could be isolated were better able to offer formal computer classes, typically for adults. Many libraries built these spaces in response to program and service needs, but to some extent it worked the other way around: dedicated and flexible computing spaces opened up opportunities for new kinds of activities like tech-driven teen spaces. Whether or not a library has a computer instruction lab supplies a crucial layer of detail when addressing the question of how many public internet access workstations a library offers—it directly relates to how they can be used. Some libraries have a lot of computers, which might cause people to assume they also have a lab, but this is not always the case.

While some libraries had dedicated teen spaces, they often appeared to just be for a space to make available books and magazines of possible interest to teens, not spaces designed to help teens feel comfortable and engage with information or learning activities. As a researcher I found it particularly odd—when have the majority of teens ever, technology or not, been excited to come read quietly in isolation in a library? The temporary teen spaces assembled in meeting rooms and auditoriums seemed to automatically benefit from the unassuming format because they weren't built around text materials as the focal point, they were built around desired social and learning activities and interactions. Many libraries recognized Chicago Public Library's YouMedia as an exemplary teen space, both because it's teen-driven and because of its seamless integration of technologies, but many libraries didn't know how to achieve anything comparable. The reasons included the typical reasons like lack of funding, space and equipment, but also other less distinguished factors, like a lack of staff with teen-friendly personalities, digital literacies, diverse demographics or existing networks with teens.

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When I asked about technologies and programs related to digital literacy nearly every library explained they were offering e-readers. This frequently resulted in teaching patrons how to use the devices or make informed decisions about which ones to buy, but also meant that they weren't really teaching active information production, instead just another form of consumption. Since many libraries weren't able to offer many e-books, due to a lack of strong bargaining positions with publishers, they were effectively encouraging patrons to buy books online instead of get physical ones at the library, a service that ultimately was hazardous to the social norms of their own institution.

Libraries in my sample set were also often afraid to loan out e-readers (or multimedia equipment of other kinds) to patrons, as they expected the devices were costly and could be stolen or damaged. I did not speak to any libraries that had tried this and found it to be cost-prohibitive; they were all too new to the service.

COMPUTER CAPABILITIES

Library	Broadband Test	Wireless Test	Office Version	OS	Alternate Browsers
Bozeman	3.87	1.08	MS 2007	XP/7	Firefox
Plainview City Branch	2.06	Timed out	MS 2007	XP	Chrome
Belle Terre District					
Grand Ridge Public	0.34	0.17	MS 2010	7	Chrome
Altura	30.8	0.89	MS 2010	7	
Shipton	17.8	2.63	OO 3.3	7	
Norburry			Many	Many	Several
Aquarin					
Paddock Branch	4.66	0.19	MS 2007	7	
Wrightsville Community	0.03	None	MS 2010	7	Firefox, Chrome
Otranto Magnolia Branch		1.36		7	
Eastover Library	14.64	4.94	MS 2007	XP	
Rowland Heights	4.02	3.8	OO 3.3	XP	Firefox
Dalhurst	31.63	0.09	MS 2003	XP	Firefox
Stony Point**	40.29		MS 2007	7	Firefox, Chrome
Illinois Average	*				

Table 5 - Computer and internet capabilities and flexibility.

* 36% of Illinois falls within 1.5-3 mbs, another 35.5% of Illinois has greater than 10 mbs

** Status in 2013

Broadband Test – A simple demonstration of broadband download speed at the time of visit, using www.Speedtest.net. This rating was *not* rigorously tested but instead values are provided to

demonstrate the sheer variation from quoted speeds during a typical operation time. The particularly low values (Grand Ridge, Wrightsville) were probably situations in which the entire internet pipeline was being utilized by some kind of intensive bandwidth-demanding application, like Netflix or a virus. I did ask libraries if their wireless shared the same line as their desktop internet but they didn't always know. Blank values were circumstances when I was unable to actually test this on a computer.

Wireless Test – Another simple demonstration of broadband download speed gathered at the time of visit, using the iOS application version of Speedtest.net on my iPhone 4S. Only one measure was taken and always with the main public wifi network (there was never a case when there was more than one available). Higher numbers could indicate sites with either more powerful wireless or less use of wireless devices, and may also be related to proximity to the router. Plainview timed out because the network was being hijacked by someone outside of the library, likely. The director was trying to figure out how to stop this at the time.

Office Version – Some libraries chose to invest time or resources into more recent office versions, while others saved costs by use of open source. Many libraries expressed an interest in keeping up with the latest Microsoft Office production software, so when they ran classes they could better prepare learners for getting jobs.

Operating System (OS) – The operating system available on computers. At the time of data collection Windows XP was still being supported by Microsoft, but was considered obsolete nonetheless, as it was over a decade old. Only Norburry deployed Apple computers or Linux.

Alternative Browsers – The installation of alternative web browsers (as opposed to Internet Explorer, the Windows default) may be a reflection of more knowledgeable or conscientious systems managers. Chrome is lighter weight and better for older computers and Firefox is open source and facilitates a well-established range of plugins. Technical individuals often see choice of web browser as a cultural indicator of expertise. Older versions of Internet Explorer were common on many of the Windows XP machines and were a possible security vulnerability.

No library had the most-cutting edge equipment across the board. Even those with Office 2010 and Windows 7 were not the latest generation of hardware. Many libraries were running XP to

maintain compatibility with their imaging, security and other software solutions, but this aging OS was increasingly vulnerable, representing a certain irony in this relationship. Several libraries even fielded equipment that dated as far back as 2005 or 2006. I was able to run a variety of operations at many libraries that could have been used to exploit machines or steal patron data, such as executing applications (a keylogger,[70] for instance). Many shortcuts were not blocked if you knew the run commands. In some cases computers may not have been actively managed at all. I was able to find personal files dating back several months or saved passwords on popular websites. In other cases the opposite was the case, computers were overly restrictive, causing problems like users being logged out when they clicked the start button, to find that they didn't have the password to log back in and that they had lost all of their remaining session time.

Broadband was often very strained and could easily be hampered by HD video streaming if rate limiting systems were not in place. It never measured in at full-speed at any location I visited. Similarly I counted both fewer and more available and functional public-use workstations than were reported in databases online. This means reported numbers were likely often estimates or simply inaccurate reflections of reality. This is important to note when trying to determine the value of a library's IT assets in a comparative manner. The average broadband speed at public libraries may not mean very much if the average available broadband while under duress is considerably volatile. Likewise it's great if a library has the potential for 20 fully-operational internet computers, but if 5 of them are consistently bogged down by viruses or spyware the measure becomes more questionable.

PEOPLE

Whether or not people were available to help patrons with learning computers or other digital devices helped to determine if a given library was able to foster digital literacies.

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[70] A software program that runs invisibly in the background and records user keystrokes. Sometimes used to capture passwords and information like credit card numbers.

Library	Dedicated Computer Help Staff	Technology Volunteers
Bozeman	1	1
Plainview City Branch	0	0
Belle Terre District	0	0
Grand Ridge Public	2+	0
Altura	0.5	0
Shipton	0.5	2+
Norbury	0.5	2+
Aquarin	1	1+
Paddock Branch	1	0
Wrightsville Community	0	0
Otranto Magnolia Branch	0	0
Eastover Library	0.5	0
Rowland Heights	0.5	0
Dalhurst	0.5	2+
Stony Point*	0	0

Table 6 - Number of people who support learning digital technologies.

* Status in 2013-2014

Dedicated Computer Help Staff – Librarians or regular staff who had substantial time (half [0.5] or full [1]) for patron technology assistance, programming and classes directly woven into their job descriptions. This included staff who would teach classes or commit to previously-arranged computer help time with individuals. It did not include staff who were part of the larger library system but that did not spend the majority of their time at the branch I visited, or who just trained staff.

Technology Volunteers – People who did not work for the library but who provided services for free of their own accord, or as a community service or class requirement. This included volunteers who would help patrons to learn technologies as well as library staff themselves, and sometimes included youth and college students.

Nearly all libraries had reference staff who would provide point-of-access assistance but few were able to afford or find qualified librarians who could teach or run digital literacy programs as their dedicated role. This role was in demand at nearly every location but was typically not high-enough priority for libraries to replace other staff, retrain them or dramatically rearrange funds. I did not specifically count staff who trained only other staff, as this was too murky of a measure—many staff would share knowledge and take part in this process somehow, no library had any one person in charge of teaching everyone else. If there was an IT department usually these people would take on much of this responsibility, while in other cases outside help would be hired.

Good volunteer (or even paid) help was hard for libraries to find. Many had volunteers to help with shelving or events like book sales but few had those with the skills and appropriate time to help with digital literacy programs. Other libraries had issues with volunteers being unreliable or lacking in teaching skills. Volunteers also varied considerably by location, as described in the findings sections, the only consistency was individuals attached to universities or colleges with service-related missions.

Many libraries found people (and other resources) to help with digital literacy services through partnerships with community organizations. This frequently occurred in the form of youth provider organizations connecting youth to Project Next Generation programs, but also took place in instances like Aquarin's partnership with the local Public TV station. This finding also matches a general rise in partnerships across the state (Bertot et al. 2012).

Volunteers were often hired in to the library, unsurprisingly. Sometimes they would start out as a teen helping people with computers or as a student working there as part of a class. The volunteer work was a way for them to establish connections and demonstrate their value.

ACTIVITIES AND POLICIES

Many activities and programs happen in public libraries that reflect the development of digital literacies. These were sometimes formal events and other times informal—but regular—occurrences. They most often occurred in the form of individual computing, workshops or classes but were sometimes reported as clubs or as facets of other activities.

There's certainly no way to directly and universally measure a digital literacy 'policy' in a library but I did make an effort to look at some of the factors, internally and externally driven, that do impact the creation of library policies that influence how a library might foster digital literacies. This included factors like grant-imposed agendas, the way(s) the library approached helping patrons and the extent to which they were invested in facilitating digital content creation. See the following page.

Library	Project Next Generation or Eliminate the Digital Divide*	Digital Literacy Programs for Youth	Beyond Basics for Adults
Bozeman	Yes	Yes	Yes
Plainview City Branch	Yes	Yes	
Belle Terre District	Yes		
Grand Ridge Public	Yes	Yes	
Altura	Recently		
Shipton	Yes	Yes	
Norburry		Yes	Yes
Aquarin	Yes	Yes	Yes
Paddock Branch	Yes	Yes	Yes
Wrightsville Community			
Otranto Magnolia Branch			
Eastover Library			
Rowland Heights	Yes	Yes	
Dalhurst			
Stony Point		Unknown	

Table 7 - Grants and programming specifically related to addressing the digital divide/literacies.

Project Next Generation or Eliminate the Digital Divide – These were the two most impactful digital literacy related grant programs that provided resources in libraries in this study. Upon applying for and accepting grant funds recipients had larger obligations, such as providing internet access for more patrons or helping both youth and adults learn skills. Nearly all of these libraries expressed a sense of digital literacy that matched at least that of the Digital Literacy Task Force (American Library Association: Office for Information Technology Policy 2013b), if not several elements of the Belshaw (2012) model, and had expanded their technology portfolio beyond simple desktops and e-readers.

Digital Literacy Programs for Youth – Organized activities specifically for teaching youth how to use recent digital technologies such as computers, cell phones, video production equipment and associated software. These most frequently happened in the form of Project Next Generation events and typically were for older kids, grades 6-12. They were different than classes for adults in that they typically did not focus heavily or exclusively on office production software and generally assumed participants knew how to type, use a mouse and navigate the internet or e-mail, activities that were the foundation for computers basics provided to adults. Only a few libraries offered similarly advanced activities like Photoshop or video production to adults and these were rarely organized classes.

Beyond Basics for Adults – Defined as activities and programs to help adults learn technologies beyond the basics of device concepts and operations. Activities such as how to type, use a mouse, employ a word processer, navigate the internet and e-mail were not counted, neither were activities like learning how to download an e-book to an e-reader, play simple flash games, chat on the internet or transfer pictures off of a digital camera. Eligible examples would include media production with Adobe Premiere, building computers and installing an OS, learning to program (code), setting up a website or Ebay postings for a business or editing pictures or graphics with Photoshop.

Without the Project Next Generation grant almost none of these libraries would be able to conduct digital literacy related programming. It was the most influential structural condition beyond the sheer influence of changing social norms, and the equipment purchased by it was almost always used by libraries for a multitude of programs and services. The grant was particularly effective because of its decade long history of resource provision, which supplied a kind of sustainability vital and rare for many libraries. A few libraries also benefited from Department of Commerce and Economic Opportunity "Eliminating the Digital Divide" grants, which typically supported internet, computer and instruction resources. These were less consistent and often went to other organizations in a given community rather than the public library, but when present were often described as just as impactful.

All libraries taught computer basics, but there was a difference of what 'basics' meant to each of them. Typing and mouse use was always considered basic. Operating System interfaces and file

management as well as searching the internet for information were also often considered basic. The category could also expand to include e-mail and using MS Office programs. Given frequent patron needs I personally would advocate that we add internet chat (or Skype), file transfer to USB drives or cameras and use of social media services to the list of "basics."

The general theme with digital literacy programming in libraries was 'advanced fun stuff' for kids and 'basics or essentials' for adults. This seems, at first glance, a little odd, as the people who teach kids to create videos could probably do the same with adults, but what it suggests is that the general audiences who use the library are in different places. Adults who want to learn skills like computer programming or graphic art design with tablets go to organizations like community colleges, whereas a lot of teens can't find enough of this in their school curriculum. Perhaps libraries, like society, aren't as invested in life-long learning as they are in K-12 education.

Library	Point-of-Use Assistance	Formal Classes	One-on-One Sessions
Bozeman	Yes	No	Yes
Plainview City Branch	Yes	No	Yes
Belle Terre District	Yes	Yes	Yes
Grand Ridge Public	Yes	Yes	No
Altura	Yes	Yes	No
Shipton	Yes	Yes	No
Norburry	Yes	No	Yes
Aquarin	Yes	Yes	Unknown
Paddock Branch	Yes	Yes	Yes
Wrightsville Community	Unknown	No	Unknown
Otranto Magnolia Branch	Yes	No	Yes
Eastover Library	Yes	Unknown	Unknown
Rowland Heights	Yes	No	Yes
Dalhurst	Yes	No	Yes
Stony Point	Yes	Unknown	Unknown
State Average	**78.70%**	**37.90%**	**37.10%**

Table 8 - Library survey comparable measures of computer assistance.

Point-of-Use Assistance – Libraries where reference librarians or other staff would help patrons informally with computers as they happened to have questions. This help was short-term and typically involved easy tasks like printing or finding a resource online. It was comparable to the national survey (Bertot et al. 2012) but higher amongst libraries I observed (nearly 100% as compared to the state-wide 78.7%). This is perhaps the case with my sample because it did not include many extraordinarily small and rural locations, due to the poverty and ethnic population requirements.

Formal Classes – Dedicated classes for learning computer basics or other skills related to digital literacy, taught in a dedicated lab setting at an arranged time. This number was comparable, both in terms of definition and frequency, to the state-wide average.

One-on-one sessions – Computer or e-reader tutoring sessions arranged on a case-by-case basis with patrons. Librarians would be wholly dedicated to the patron during this time. This measure was also both comparable in terms of definition and frequency to the state-wide average.

Similar to the notion of "computer basics" there's a spectrum from incidental walk-up help and one-on-one tutorials. Classes may be more like open exploration sessions or involve one-on-one help too. It's interesting that, in my determination, virtually all libraries were providing walk-up help, but other measures roughly matched the averages throughout the state. Part of the reason point-of-use assistance occurred regularly is that it is typically simply part of library reference services now. Reference desks were located nearby public computing labs in nearly every library and a large volume of reference questions relate to computer and internet information-seeking tasks.

Many librarians, especially directors, wished they could offer formal classes. This suggests that many libraries, whether they realize or embrace it entirely or not, have come to see themselves as part of the educational infrastructure in their communities. The "do it on your own with a book" philosophy may be increasingly supplanted by a "do it on your own with Wikipedia" perspective, but too many patrons need to learn socially to actually establish adaptive literacies. Libraries throughout the study were facing such regular requests for computer help and instruction with devices that they frequently felt it was expected of them to get people the education needed to get online. It wasn't that there weren't other education providers in the area who could help with computer basics, as many locations had nearby community colleges or social service organizations, it was the library had many inherent advantages: an automatic and diverse audience, free access to existing infrastructure, and, more importantly, a known brand and duty to promote literacy.

Library	Tutorials and/or Literature	Facebook	YouTube Content	Digital Community History or Archival
Bozeman	No	Active	No	Unknown
Plainview City Branch	Yes	Active	No	Unknown
Belle Terre District	Yes	Low activity	No	Unknown
Grand Ridge Public	No	Active	Low activity	Unknown
Altura	Yes	Active	No	Unknown
Shipton	Yes	Low activity	No	Yes
Norburry	Yes	Active	No	Yes
Aquarin	Yes	Active	Active	Yes
Paddock Branch	No	Active	Active	Unknown
Wrightsville Community	No	No	No	No
Otranto Magnolia Branch	No	Active	No	Unknown
Eastover Library	Yes	Active	No	Yes
Rowland Heights	No	Low activity	No	Yes
Dalhurst	No	Active	Low activity	Yes
Stony Point	Unknown	No	No	Unknown

Table 9 - Activities related to digital production by library staff.

Tutorials and/or Literature – Many libraries stocked how-to guides in paper format related to computer and e-reader use. These were especially important for at least two reasons: (1) they could give them to patrons to get them started when a librarian was too busy to provide long-term or dedicated help and (2) they acted as a kind of reference or reminder for patrons who had forgotten what they learned previously. Many libraries also used these materials internally to train their own staff or as notes to teach patrons. Interestingly the Bertot et al. (2012) study looked only at online tutorial resources, which were relatively infrequent in libraries across Illinois (22%), as contrasted to the 44% paper-providers encountered in my sample. Note that these may be a low estimate, as

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I both physically searched for and verbally requested tutorial materials, but some library staff may not have known about all that was available.

Facebook – If the library had an active (posts made at least once a month) Facebook page at the time of data collection. Facebook is (and was) a part of daily information-intake for many patrons, and many libraries used it to post photos and information about events as well as patron-driven content. In fact, some libraries chose to use Facebook instead of their own website. One of the cultural components of digital literacy is the adoption of technologies on an everyday basis. Libraries could both engage with and teach patrons to be active participants in social network systems. Low activity was less than one post per month, on average. Generally pages were either entirely dead or vibrantly alive.

YouTube – If the library had a YouTube page and published videos with patron-driven content. This could be considered a sign of patrons communicating and expressing stories with digital tools, a typical measure of literacy.

Digital Community History or Archival – Many libraries had centers and online resources dedicated to the preservation of local history. These typically involved the digitization of content (patron-contributed or pre-existing collections) with scanners or cameras as well as the provision and support for services like Ancestry.com. In some cases it extended into collaborations with local museums or historical societies.

It seemed like most of the computer and e-reader help literature was written in applications like MS Word, instead of on web pages that could be printed. Most libraries had only just begun to migrate to providing these documents in both digital and printed form. Much of this had to do with how libraries treated their web presence: if they saw it as a warehouse of information and broadcasting platform or place of co-constructed learning and conversation. Even those that leveraged resources like wikis still had problems generating and sustaining patron participation.

Facebook and YouTube presented interesting challenges for libraries that revealed some about the norms of the institution. On the one hand patrons both used and wanted to learn about these services but on the other hand the ways that people use them, notably sharing and processing experiences through a range of content mediums, was sometimes interpreted as oppositional to the

traditional role of the library. Librarians were often very worried about patron privacy or perceptions of "neutrality" and did not want to post photos or strong opinions on their pages. Some libraries dodged this issue by allowing patrons to post or tag their own content to the library page, but this introduced a layer of liability, about as much liability as those who posted photos of their own events assumed. A lot of small libraries got away with posting photos of participants and library events with informal agreements or understandings and, as of the time of my interviews, nobody had ever been sued, only, at worst and in rare cases, asked to take photos or posts down. This may mean the laws about privacy and image rights may be out of sync with social norms. Chicago Public Library may yet shake this trend up with their recent shift to a webpage that resembles Pinterest, complete with staff-provided reviews that liven up and diversify Readers' Advisory.

Digital community history and archival operations were present in about half of the libraries. They varied some in how much content was patron-produced and how much was curated by librarians. They often involved classes or tutoring for how to use Ancestry.com. Sometimes projects culminated in physical displays in the library or virtual displays online. These kinds of programs provided a motivation for many elderly persons to learn more about digital technologies.

HARD-TO-MEASURE VARIABLES

I regularly asked about or sought to measure several topics that proved to be too hard to pin down as categorical variables. Sometimes these turned into stories, but not always, so this section addresses the remainder.

As mentioned in my research design, I did try to test the security and privacy limits on public access machines. While I could say something about the success and failure of certain techniques I think it is better not to—I have no interest in encouraging unethical or criminal behavior. The main point is that a lot of libraries had security vulnerabilities and they should take care to inform patrons of the risks that should be associated with public computers in a way that will enable them to be reasonably mindful, not fearful. Libraries were already reporting numerous elderly patrons who were afraid of—but generally ignorant about—identity theft.

Most libraries were increasingly forced to be a replacement for government and social services. Not every library indicated they understood e-government as a concept, but many gave examples

of helping patrons to find forms and learn how to use service interfaces. Generally e-government needs were so diverse that they could not offer standardized classes, most of it required prolonged one-on-one support and referral to other community agencies. What's more is that a lot of the librarians expressed that they felt stressed and strained by all of this—they were not qualified to act as a consultant for a person's taxes or help them with mental health care or legal advice. On the one hand they knew they might be the only person who could provide assistance for these vulnerable patrons, but on the other hand they were afraid of liabilities and frustrated with the absence of human-provided government assistance.

Many libraries, not just Grand Ridge, had Unions that played a large role in determining library policies. These affected issues like work conditions and hiring practices, as might be expected, but also decisions related to librarian training, volunteers and general determination of services. Like e-government, the struggle to balance supporting and controlling unions reflected diminishing protections and social safety nets broadly in society. In some ways they represented an invisible third faction in determining policy, beyond the library staff or administration and general public.

Videogaming was present in the form of programs and/or dedicated consoles or game computers in several libraries. It certainly has a lot of cognitive benefits, like inspiring problem-solving, persistence building, collaborative information sharing or learning various computer and visual interfaces, but game design is even more beneficial. Putting together a game, electronic or otherwise, involves computational thinking and technical writing for the determination and implementation of rules, art and graphic design for the production of assets, imagination and critical inquiry for the development of stories or settings, or marketing and persuasion to generate adoption. And this is just to name a few outcomes. Professor Scott Nicholson of Syracuse University has researched the topic comprehensively.[71] Libraries might start with bringing games into the library in general, and move towards game design in tandem with other media and information production activities.

Games also represent a potential hazard for libraries as much as they might a boon. Unlike most print literature (or even movies on DVD), which is produced by a wide scope of people and on a

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[71] See http://www.scottnicholson.com/ for publications, examples and other material on this topic.

vast array of topics, popular computer and console games are often related to competition and violence and are designed with boys in mind.[72] This is changing as the field of types of games and gamers widens but many libraries that deploy games as a method to bring in youth find themselves with spaces dominated by aggressive boys. It may be possible to guide and curb this, as is indicated in the study of Bozeman, but it takes a high degree of investment, time and familiarity that many youth librarians may not have.

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[72] And they might reinforce any number of other structural inequalities related to race, gender, sexuality or nationality. Though many scholars have written on the topic I think the most accessible, relevant and recent commentary can be found in the work of people like Anita Sarkeesian (https://www.youtube.com/channel/UC7Edgk9RxP7Fm7vjQ1d-cDA) or Bob Chipman (http://www.escapistmagazine.com/videos/view/the-big-picture/4719-Gender-Games). Videos like these, while not recognized by peer reviewed journals, will go a lot further to convince skeptics and reach more gamers than a lot of feminist scholarship.

DISCUSSION

Every library I visited had at least one unique story to tell. These individual stories, as partially revealed in the library comparison tables, were often representative of recurrent themes that I encountered in many locations around Illinois and that have been recognized by the ALA and in formal publications. Collectively considered, the findings reveal a number of important dimensions of library service roles and constituent factors like infrastructure, people, policies and activities.

This discussion section is just the beginning of what might be said about my research. It presents some of the theories that might address the "why" behind the findings and also helps readers to think about how they can apply them in the context of the field of library and information science.

TOWARDS BUILDING A BETTER THEORY

One way to determine the value of a dissertation lies in recognizing its connections and contributions to theory. I believe my work goes beyond conceptual models for digital literacy or ways to assess library programs. It is data on what libraries are actually doing in a particular kind of context, what's working and what's challenging. What happens when we consider this data as if it is in conversation with the existing and developing theory on digital literacy? What are some of the other areas of scholarship and theory this might relate to? What questions does it open up that were less visible before? This section searches for answers to these questions.

FROM DIGITAL LITERACY TO DIGITAL LITERACIES

In my initial proposal I posited that digital literacy is best understood as a fuzzily bounded and dynamic set of social practices that foster critical social awareness, as well as measurable knowledge of and creative command over relevant digital tools. This resulted in the qualified *critical* and *creative* digital literacy that became the impetus behind my initial investigative focus. While this definition retained a lot of persistent value, I continued to seek a better framing of the concept throughout my dissertation research.[73] Engaging with the ways public librarians think and

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[73] The word 'creative' is often understood in the sense of creativity, the process of hatching worthy and original ideas, which actually would lend itself considerably to the critical awareness component, a mindset that requires some measure of divergent thinking to be performed well. At the time I did not require that 'creative' include uniqueness or discovery, just conscientious construction of objects and ideas, with the possibility that they may also be innovative

talk about the concept, as well as consulting a framework provided by Douglas Belshaw (2012) highlighted several major issues that are worth considering when working to define digital literacy:

1. Digital literacy certainly has more dimensions than are captured in my first definition, which, despite being broad, assumes or de-emphasizes too much. As a concept digital literacy continually changes in response to current technologies, social norms and both scholarly and every-day conceptions of literacy in general. The goal ought not to be to try to invent one literacy to rule them all, as Belshaw relates, instead it is more appropriate to acknowledge the intersectional and fluid nature of the study of digital literacy and think about the conceptual assemblage as *digital literacies*, in the plural, as introduced earlier in my literature review and in Belshaw's thesis (2012). Belshaw's version commands an additional degree of utility, because it promotes a comprehensive yet easily accessible set of eight elements: cultural, cognitive, constructive, communicative, confident, creative, critical and civic—to which I would like to add one more, **curious**.

2. Examples and heuristics really help others to understand what digital literacies entail. Fostering critical social awareness, for instance, requires an understanding of the surrounding cultural context and what might make a given application or expression of information relevant, adaptive, or even revolutionary. A solid way to drive home the meaning of these very subjective terms is to explain them with, or in relation to, evidence-laden stories.

In other words, this calls for a simultaneous broadening of the scope as well as a simplification of the terms. My purpose is not to craft yet another definition, it is to help us better understand existing ones by looking at the context of the library.

Let us just explore the topic pragmatically, for a moment. Literacy, as a term, is often used as a word that is interchangeable with 'competency,' but it is most useful when it is rendered in a social context. If we say digital literacy is like computer literacy, for instance, we might arrive at metrics like the ability to click quickly and accurately with a mouse, or type a certain number of words in

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or even deviant. In fact it is probably better to think of it as two distinct elements: **creative** (divergent thinking) and **constructive** (building).

a minute. While these tasks are notably measurable, they quite clearly fall short of really measuring your actual ability to comprehensively or even appropriately use a computer. They're really just a kind of gauge of 'input skills,' and it's hard to draw distinctions related to knowledge or learning with them. Should we also worry about how fast someone can text on a cell phone? How about their ability to use a TV remote or touch-screen e-reader? Drive a car safely with a GPS on the dash? Inputs and even rituals with various technologies are not what literacy is about, though they may be a prerequisite, similar to access. Literacy is about knowing how to think and knowing what a given tool, device or medium means in a performative context. Not just being able to know, create and express, but to know, create and express with a purpose and in an adaptive manner as an intentioned process. This understanding is consistent with its frequent presentation in scholarship (Belshaw 2012 in citing Carneiro 2002 and Holme 2004, Finn 1999, Freire 1970, Taylor 1993, and many others).

We might, for instance, say digital literacy is the ability to use ICT's or networks to locate, evaluate, use and create information. But this doesn't really capture digital storytelling,[74] in its entirety, does it? Someone is not just "creating information" when they make a digital story, but they are also creating an experience—cultivating a relationship to an audience or fostering reflective personal development. They do this in kind with achieving the effects they want from an arrangement of tools and media. Another example might be building an "internet of things"[75] device at a makerspace. There are tasks in this kind of project that involve digital environments and interpreting media, such as programming an Arduino or designing and then printing a custom case in 3D, but it's not just a one-time application of knowledge, it's an iterative prototyping progression that requires conceptualizing a problem or need, imagining an answer and then having the attention, patience and persistence to reimagine it many times and explore the multifarious

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[74] Expressing a story with multimedia by using tools like digital cameras, Photoshop and AV recordings that can be deployed in a variety of mediums, from podcasts to websites.

[75] The "Internet of Things" refers to individually identifiable devices all connected together through wireless networks and artificial intelligence. This includes conceptions like a 'smart home' where you might inventory your refrigerator at home from your computer at work, which might in turn tell the backseat of your car to reconfigure to fit more groceries. In other words devices that can all talk to one another over the internet to respond to needs and circumstances.

knowledge and skill dependencies uncovered throughout the process. Digital literacy is a composite and interactive process.

My favorite way of exploring what I mean above is by discussing what I've been lovingly referring to as the "Twidale Heuristic."[76] Most people in OECD countries learn how to read when they're young. Later on in life when they get a new book they don't go to take an entire class on how to read the new book, they already possess the ability, such as strategies for sounding out syllables and making sense of sentences in context, to read it. Digital literacies should be much the same way, and yet, in a peculiar fashion people often lack the abilities that would enable them to just pick up a new technology or interface and "read it like a book." The issue is of course double-sided, the object or interaction structure is equally to blame for such troubles, but ultimately what the constellation of digital literacies represents is this: literate people should ideally be able to pick technologies up and learn with, engage and find value in them on an ordinary basis.

It's a lot more complicated than this, as my use of the word heuristic would imply, but I think it gives a clearer goal. It may seem like magic when a kid is just able to start fiddling with a cell phone or computer and quickly begin to leverage its functionality, and indeed this is part of what inspires some of the notion of digital natives, but it's not at all magic, it's a combination of a variety of digital literacies. We certainly don't think it is magic when a person picks up a book and starts reading it. I'd like to strive for a worldview where we don't regard digital technologies with fear and classify them as sorts of mystic and undecipherable things.

The book comparison is also interesting because it very easily lends itself to complications. Literacy in its traditional form is reading as well as writing, but people learn how to write in different formats or for different audiences. We read and write in different languages or with different nomenclatures that really do require classes and even with all of the classes in the world I'm not convinced I'll ever fully understand the writing of scholars like Michel Foucault. The idea here is not to elicit a perfect analogy but to promote the goal: a solid foundation of digital literacies that enable day-to-day functionality as well as adaptive learning, expression and so on. With this in mind, let's cover the eight C's I introduced in the beginning of the section.

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[76] Because, as you might guess, Professor Twidale first explained it to me this way.

Douglas Belshaw (2012) tackles the question of defining digital literacy head-on in his aptly titled thesis "What is Digital Literacy." Covering a wide variety of sources and perspectives, many of which overlap with the material previously encountered in my own research, the text thoroughly demonstrates the "continuum of ambiguities" in which varied definitions of digital literacy reside. The term not only means something different depending on your field, context and culture but it has also changed over the course of time and may be a spectrum state of being within an individual. Interestingly, it continues to be an amalgam that is used and expressed with some evident explanatory value and practical impact, despite not constituting a single coherent social theory.[77] Ultimately, Belshaw promotes a matrix of intersecting digital literacies, with emphasis on the plurality and lack of hierarchy, grounded heavily in his comprehensive review of the literature. They are as follows:

1. **Cultural** – Similar to the 'negotiation' concept proposed by Jenkins et al. (2006), literacies are socially constructed and given meaning within a social context. Technologies help to define, and inversely are defined by cultural discourse. A person's ability to fluidly use and benefit from digital technologies has as much to do with their knowledge of and participation in the surrounding culture and expectations as it does their specific set of operational skills or access to gear. For instance, Twitter is a remarkably simple use of an expression medium but to comprehend and leverage it effectively requires embedding oneself within a given internet-based culture and structure for expression – # tags, @ replies and retweets all arose in a largely organic fashion, and Twitter requires a degree of familiarity with audience interests and platform capabilities to know what's worth tweeting. It will likely keep changing rapidly, which is also part of the culture. It is remarkably different, and yet similar to, other information exchange environments like

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[77] For digital literacy to be a valid definition, framework and theory Belshaw suggests that it must feature a consistent measure of utility (actionable application), a retrospective element (credence to the underlying concept of literacy), metaphorical element (situated) and digital element (dedicated to the medium). He finds that it fails to do this as a unitary construction.

Wikipedia, where co-construction of knowledge also happens with a varying level of formality. Learning how to learn, to apply or develop cognitive models with digital tools, is reliant on situating oneself within social contexts. It's not just recognizing what the digital tool or medium can do, literally, but how people accomplish activities with the tool, why and what it means.

2. **Cognitive** – Perhaps the mainstay of traditional literacy, a person's ability to employ cognitive toolkits or mindsets to engage with information, mediums and physical tools. This pertains to a person's psychological composition and may also include behaviors that are in part cultural, like the ability to direct and sustain attention effectively (see Rheingold 2012). From my perspective cognitive literacies would address the bulk of skills and competencies most often associated with information literacy, such as identifying and locating data with strategies like recognition rather than recall. For instance, you might cast it as a person 'thinking with the internet' by expanding their memory and personal knowledge by taking advantage of knowledge networks to obtain, inventory and apply information more rapidly (see distributed cognition, in Jenkins et al. 2006, or some social practice-based examples in Harlan et al 2012 or El-Zanfaly 2013). Other examples might include computational thinking (Papert 1980) or metaphorical conceptualizations to enable the effective use of abstract interfaces (Kress 2003).

3. **Constructive** – Part of the problem with phrases like "apply information" or "create with information" is that they do not imply digital literacies should go beyond 'purely digital' constructions. Part of what I assert literacy entails is that people be savvy enough to create and assemble information, dynamic digital artifacts (or texts) and also work with abstract constructions that aren't singular or static concrete entities, like ideas or relationships. The process of construction, for instance, could include moving from brainstorms to sketches to digital blueprints to physical prototypes in an environment like a Fab Lab or makerspace. Most of these sorts of processes are iterative by nature and thus it would include comfort and familiarity with remixing, reappropriation and a permanently beta[78] state (Lessig 2006,

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[78] Permanently beta (Neff and Stark 2004), in this context, refers to the regular state of instability of digital products. Take Google: it never has a final released version, but is instead an interface with a continually changing and wildly complex set of databases behind it. What's more is that the consumers, the users of Google, have a strong role in

Neff and Stark 2004, and Jenkins et al. 2006 address versions of this) and overlap with comprehending and employing systems of inheritance and attribution. Constructive digital literacies, as I conceptualize them, rely on a key condition: the ability to generate, modify, repurpose, remix and otherwise assert control over the mediums these ICTs depend on and exist in. This requirement may be extreme, but can be cast as a long term goal, much as justice and equity might at first seem farfetched. If individuals can program, design, hack, and build software and hardware then they have greater control over the means of knowledge production. They can participate in liberating movements like Open Source (Chopra and Dexter 2008), dismantle oppressive social structures knit into digital architectures[79] (Lessig 2006) and help to maintain the innovative context that enabled the proliferation of the internet to develop in the first place (Zittrain 2008).

4. **Communicative** – Just as a simple definition of basic literacy embraces reading as well as writing, digital literacies fundamentally involve expression. Constructing something may not preclude having that something actively or purposefully convey information, though often these dimensions overlap. It likely relies on the shifting forms of input abilities, like using a mouse, typing, tapping on touch screens and so on, but requires social apprehensions such as awareness of an audience, grasp of message formulation processes or subjective bits, like tone and implication, or signs and signaling. More restrictive definitions of media literacy that categorize 'digital technologies' as just ICT's likely focus heavily on communicative literacies.

5. **Confidence** – Another kind of attitude or perspective, one clearly tied strongly to culture, a sense of agency enables learners to practice, experiment, inquire, speak out, and engage in all of the other activities that comprise application of the digital literacies outlined here. Knowing that an action in MS Word can be rolled back with the "undo" button or having the experience to recover deleted files can lead a person to approach tasks in digital environments differently. Much of the debate on digital natives has revealed that what is

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influencing the way the system develops. The internet is made up largely of these kinds of feedback and innovation systems.

[79] To reiterate, Lawrence Lessig argues that the internet heeds four constraints: social norms, the flows of markets, law, and the way its systems, interfaces and channels are constructed; their architecture.

actually determining or mitigating learning and action in digital environments is fear (or lack of it). Belshaw suggests that "individuals who successfully capture the Confident element of digital literacies understand that such literacies are *mutable*." As an activist scholar who believes agency is the optimistic and alternate point of attention to structure, I cannot stress enough how much confidence matters in determining literacies: it makes us consider how to empower an individual, in addition to adjusting structures. The result is paying more attention to the emotional and affective components of the process of learning with digital technologies, as well as their effect on motivation.

6. **Creative** – A topic explored with Robinson (2011) earlier, creativity is often cast as a kind of elusive and rare skill that is bestowed to people 'naturally' or 'as a gift' (Ferguson 2011). In some ways this false discourse might just be a reflection of the fear people have in some dynamic or unstable mediums or contexts, due to never having been taught or encouraged to be creative as a child in formal schooling (Robinson 2011). Generally creative literacies revolve around at least two main characteristics, (1) divergent thinking, the process of generating contrasting and non-sequitur ideas and (2) doing this with a functional balance of frequency, persistence and reflection. In other words creativity can be both taught and practiced by coming up with a lot of new ideas in an iterative and rapid fashion.[80] Clearly these literacies tie into many other social dimensions, like dealing with failure, the fear of change or aversion to risks, self-efficacy or social agency, inquiry and experimentation and more. Creativity connects to a wide variety of other literacies, as it typically involves the process of copying forms or ideas, transforming these and then combining them into something different or redefined enough to be called new (Ferguson 2011).

7. **Critical** – Belshaw touches briefly on the critical literacies component by noting the transformation of literacy practices over time and throughout various semiotic domains, citing Walter Ong (2002) and Laura Gurak (2001), but I believe it's actually much bigger than this. Other authors identify literacies that may be similar, like judgment (Jenkins et al. 2006) or crap-detection (Rheingold 2012).

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[80] Advocates for Design Thinking (Brown 2008, Fawcett et al. 2013, and IDEO 2014, to name just a few) identify a variety of methods for this.

Critical social awareness is the component that keeps this model outcome-oriented. It is not unlike the objectives of critical pedagogy expressed by Finn (1999), suggesting that educators must work vigorously to decipher and dismantle the oppressive structure that has come to characterize modern stratified education and push for authentic dialogue between teachers and learners. This need for a critical mindset goes beyond teaching young students in schools, extending to people of many ages and cultures,[81] and also beyond the domain of skill acquisition—to aiding learners in becoming aware of their right (and capability) to transform reality (Freire 1970). In order to empower, literacy should be an avenue for individuals to better understand how their identity and agency rely on, and produce, cultural forms. Contemporary introductory sociology classes refer to what is essentially the same concept when they teach students about C. Wright Mills' (1959) *Sociological Imagination*: critical consciousness of the relationship(s) between experiences, of individuals and communities, to social structures and processes.

In other words, people become more digitally literate by approaching technological tools critically,[82] and this process deals with a moving target. What has been liberating literacy in the past—simply knowing how to read—has become domesticating literacy, a mere requirement to be plugged in to the system, but not command power within it (Finn 1999), and there is no reason to think this trend will not continue with each generation of digital technologies that involve communication. I would posit leveraging the internet is the new facet of this issue. People ought to engage in making sense of information access, communication and production tools in terms of some relevant fundamentals:

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[81] I mean this in the same sense as explained by Braga (2007): Resistance Theory (Giroux 1983, 1988) compels us to move past issues of 'social reproduction' to rescue notions of agency and resistance, as motivated by the work of Gramsci (1971). It is therefore important to engage all social groups in the process of social critique to forge alliances that promote progressive political actions – a clear connection to the following civic component.

[82] Banks (2006) refers to this as critical access: "Members of a particular community must also develop understandings of the benefits of the problems of technology well enough to be able to critique, resist and avoid them when necessary as well as using them when necessary" (42). To frame critical analysis of ICTs as access is a cumbersome appropriation of the digital divide rhetoric. It is probably more accurate to describe it as literacy, even if the critical qualifier may be redundant.

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- The ways they affect their capacity to assert identity. Which people and discourses are excluded? Is there possibility for meaningful communal participation or collaboration?

- Recognition of the limitations and opportunities afforded by the cultural context surrounding a given tool. How might power or social norms be structurally embedded in devices? What steps could be taken to change or improve the situation?

- Meta reflection on this process of sense-making and evaluation: how is it we come to see certain discourses, and why might this matter?

There are certainly more avenues of critical inquiry than explored here, the above are just a few examples. Your average youth is not going to look at a video game and automatically think about it in terms of power, but they might be able to learn to ask questions, like why Mario is always saving the princess and not the other way around, to start them down the path of this sort of consciousness. Scholars like Haraway, Bijker, Cowan, Pinch, Wajcman, Vaidhyanathan and many more in the sociological field of Science and Technology Studies (STS) provide countless examples of these kinds of critical perspectives.

8. **Civic** – And, finally, as is implied by the relational nature of critical and communicative literacies, we do not operate within a vacuum, our experiences take place within the context of a civil society, hopefully one whose development we influence and support. Social innovations like Wikileaks or the use of Twitter in the Arab Spring are not only interesting, but they're intentional movements that represent (and require) a degree of digital literacies in the participants and content producers. Recent research suggests the process of civic engagement happens as a fluid mixture of online and offline activities (Smith 2013). In many countries E-Government is on the rise, sometimes even required for citizens, and the scope and boundaries of civic participation may even be gradually bursting out of national boundaries. A recent Partnership for 21st Century Skills report (2014) aptly states:

> "Citizenship today means more than understanding the roles of government and voting in elections. It means making sense of local, national, and global events, trends and information, and acting safely, responsibly and ethically in online forums. Citizenship requires a wide range of knowledge, 21st century skills and experiences for effective

and productive participation in the democratic process, community life, education and workplaces."

In my view this element represents an agenda to build empathy, perspective-taking, civic duty or participation and advocacy into the array of digital literacies; it pairs quite well with the aims of community informatics.[83]

9. And, as a modest attempt as a scholar to help advance, clarify and strengthen this framework I would like to add one more: **Curiosity**. Now in some sense to say 'curious literacies' doesn't really sound appropriate, but if we think of curiosity as the mindset and lifestyle that embodies and emboldens inquiry it becomes a different quandary entirely. Every single one of these literacies and derivatives can involve the formulation and asking of questions, even if just implicitly. So much so that curiosity can actually act as the basis of an entire model for learning: inquiry based learning. If we conceptualize curiosity in this way we are provided with a process that is situated, personal, action-based and social (Bruce 2009, Bruner 1965, Bruce and Bishop 2002), a cycle of developing and engaging with knowledge relationships in a range of settings. See the figure below:
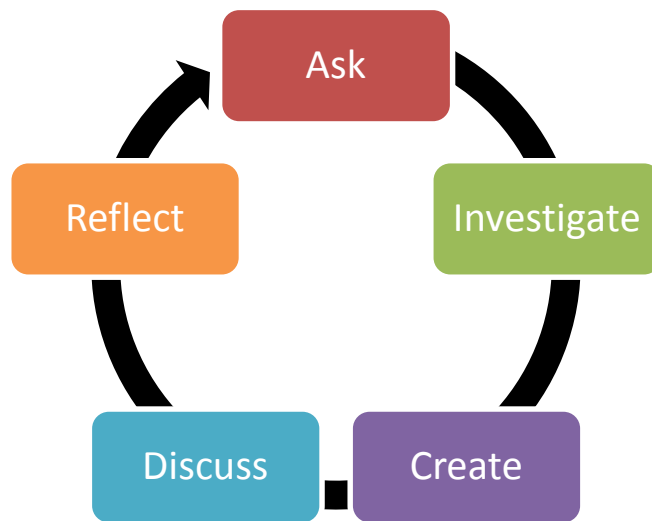

Figure 3 -The Inquiry-Based Learning cycle, as presented by Bruce (2009).

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[83] As well as calls for action by other sources, such as The National Task Force on Civic Learning and Democratic Engagement (2012).

Clearly one activity does not have to explicitly lead to another, and not all steps are always necessary, but it's easy to see how the eight elements of digital literacies characterized above could fit into the cycle. I believe curiosity can successfully provide the impetus behind the learning and socialization of many if not most of these dimensions of digital literacies. A wonderful example is found in the process of play, which I will later revisit, but for now I mainly want to underscore that thinking about curiosity helps us to add a component to the conversation: motivation. The reasons people wish to learn, what allows them to develop patience or be persistent or guide their attention is a crucial part of the topic.

SPOTTING THE EIGHT ESSENTIAL ELEMENTS

So the question remains: is Belshaw's matrix a useful frame for thinking about what public libraries were accomplishing in the stories from the previous sections? Does this work support the notion that it's really digital literacies and not digital literacy? I believe this to be the case.

Aquarin was a remarkable mixture of the elements and powerful example to lead with. Grade school children were taught to leverage interaction and expression with devices like ipads for digital storytelling, helping them to work on cognitive and communicative literacies as well as develop confidence with tech tools at an early age. They learned navigation by touch and icons or how to tell stories and give opinions about books. The teens who participated in the podcast poetry slams added a cultural component by learning how to prepare their words and experiences for (and into) the culture of the web. Involving patrons in public TV production contributed a constructive component, as participants filmed and remixed media, which also took on a creative aspect with tasks like designing effective PSA's. The staff that guided them through all of these activities were largely driven by their curiosity and willingness to let inquiries into technology lead them to advancing literacies and library programs.

Shipton, though a very different context, also featured a similarly strong array of literacies. The librarians themselves showed a willingness to critically assess technologies through critiques of the progress narrative, proprietary controls and reliance on the web for services like the cloud or talking books. They worked to spread this knowledge to patrons as part of their service as information experts. Bringing volunteers and tech services to the homes of patrons who might otherwise be excluded enabled them to develop awareness, familiarity and eventually confidence

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using online systems. It also represented a grasp of civic literacies through a strong commitment to digital inclusion: blind and elderly patrons were being signed up online in their homes to participate in the library.

Norburry had staff and external help with the critical and cultural literacies to enable them to position open source software and provide a variety of computer types to optimize patron interaction preferences. The volunteers who built the talking gingerbread man supplied an injection of creativity, construction, and deviant communication, which was all driven by the thrill of inquiry. One identified benefit for participants in this project was the development of computational and design thinking with the iterative creation of circuits and interaction systems.

Dalhurst met patrons where they were, both figuratively and physically, working to provide confidence with technology to those facing stigmas or limited opportunity for experience. Their digitization operation was not only construction of digital community history to be moved online but it was also a way to inspire civic participation with digital tools: patrons were invited to contribute to and draw upon the heritage of the community. It embodied a degree of cultural literacy too, as patrons learned ways computers might be relevant to them or how they are entitled to be a part of remembrance and representation on the web.

Paddock chose to instill confidence in young learners through mentoring made possible by partnerships. The kids in their PNG program might not have ordinarily been able to foster the constructive literacies related to engineering, but they were exposed to them by the facilitators from a local corporation. The library staff's willingness to experiment running different kinds of technology-related programs in an iterative fashion also suggests a form of cultural literacy as well as curiosity-inspired discovery.

Altura critically recognized the cultural shift to provision of information and education services online and reconciled this by reaching out to social service institutions and in-need populations to ensure their participation, which reflected civic literacy. They knew that in order for their new services to work patrons required cognitive models, cultural familiarities and confidence to depend on web-based systems. Participants in online-learning also supported communicative literacies, such as the ability to connect to others within a class that is distributed, asynchronous and largely participant-initiated.

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Bozeman revealed an opportunity for curiosity and creativity through their free-form PNG programs. The library's understanding that the learning of technology often happens informally may have also been a kind of cultural literacy, membership as believers in the DIY method. On the other end of the spectrum the structured computer interaction systems might contribute to instilling values like equal opportunity participation in the web, with a duty to preventing harassment or infringing on the rights of others.

Plainview worked with an immigrant population with very different needs in terms of cultural and cognitive literacies: they didn't think about what technologies meant or did in the same way. They opened the door for the library to help use Skype to enable communicative literacies or Head Start curriculum to raise awareness of civic participation happening with the web and notary services. The kids started with applying basic uses of technology for school projects in a generative manner, like printing.

Belle Terre took to the fostering of computing logics by crucially affiliating themselves with mobility as a model, while still striving to boost confidence with input and software basics. Their stifled attempts to connect media production technologies to businesses and schools represented a dedication to civic literacies.

Grand Ridge featured the same computer essentials available at many libraries, designed to deliver patrons experiences for iteratively tuning cognitive literacies and building sureness, but capitalized on these to offer those in social media and multimedia production that could promote cultural and communicative literacies, as well as possibly civic participation through e-government assistance. Their Union challenges and issues with PNG also may indicate a lack of curiosity and confidence amongst some staff, particularly with regard to constructive literacies.

Rowland Heights needed to fight to match up the social implications of technologies with the underserved parts of their population by hiring people better positioned to be ambassadors. Their PNG program digitizing the dead in turn yielded a really clever experience that thrived on curiosity, drove communication and related participants to facets of culture.

Otranto operated an in-house IT team that engaged in constructive remixing to better communicate with and train staff on technical systems. Their vision of a YOUmedia type space

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indicated a desire to bring patrons into a participatory digital experience with their library, so that the identity and ownership they exerted through situating the library as a symbol might be extended to the web and beyond.

The examples above are incomplete. They represent only a small fraction of the ways the framework might be applied to each of the sets of stories. The purpose of it, like any other typology, is not to treat them like checkboxes each site or activity should seek to fulfill, but instead consider them as lenses to consult or spectrums to bear in mind. They fuel questions librarians and scholars might ask. How is this program requiring or affecting communication skills? Does this policy for digital tools underscore a commitment to certain civic values? What is the extent or limit a person is being constructive (generative) in performing an action with a tool? In each story we can see evidence that some component of the library institution—people, policies, infrastructure and activities like programming—is influencing how patrons develop digital literacies.

Spotting potential is really only the start, however. To some extent seeing what patrons create or taking note of what librarians understand and do is itself a measure, but following the process of how digital literacies are fostered in any one individual (or community!) is grounds for another (perhaps my next) study.

The 8+1 C's framework is important for another reason, besides the story analysis it supports. It's inherently value-laden: the stories it draws out suggests that digital literacies are often intrinsically social or participatory as well as generative. This may indicate an alternative vision for how the library affects the construction of knowledge or the arrangement of power in society. This is particularly pertinent for the sites that did not appear like they were heavily represented above, the vantage point of just considering digital literacies doesn't address the full story.

I'd like to return to the first part of the central research question: the *role* of the public library. Throughout data collection participants conceptualized it in a variety of manners. An incomplete list of metaphors for library service, as encountered in interviews, includes the following:

The Public Library is…

- Here to provide or facilitate information access

- In the business of disseminating information

- A space that is a community center

- A collaborator network (or negotiator of this network)

- Functional DIY education

- An education provider

- Opportunity for exposure to new perspectives

- An advocate and authority on critical inquiry

- A place of information storage, preservation and discovery

- A place of production—information, knowledge, culture, ideas and even objects

Readers will probably notice I've intentionally arranged these conceptualizations, all of which were explicitly encountered in interviews, in pairs that may seem a little contrary. This is because they reflect an ongoing tension that was persistent in nearly every library I visited: the extent to which the library has an obligation, or right, to be an active player. Invariably when I asked questions about the library's role in promoting critical or creative digital literacy[84] I was met with a representation of this dialogic relationship. On the one hand libraries often wanted to be in a position to offer unfettered and unjudging access to materials on controversial topics like sexual health but on the other hand they also at times wanted to take a stand in advocating on issues like literacy or the importance of book-driven learning. The conflict, considered in the context of all of the research sites collectively, was bigger than the age-old debate over neutrality in collection

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[84] Once again, the roles identified in the literature review that fueled my interview questions: (1) enabling the acquisition, critical evaluation and need-relevant use of information, and (2) encouraging the expression of creativity through the creation and sharing of multimedia content.

building embodied in selection versus censorship (Asheim 1953), it infiltrated nearly every service or social role the libraries considered. It is less, as Buschman (2003) suggested, that the library is in a permanent state of crisis over how to reconcile the integration of the information revolution into its identity, and more that the public library has an identity crisis in terms of its need for proactivity. Just as literacy is arguably incomplete if you teach someone only how to read and not also how to write, fostering digital literacy requires more than opportunities for access to information and materials, it is realized and reflected in information use, expression and relation to relevant application in daily life.

To understand what I mean, let's think about some examples from the site visits to assemble a list of library roles.

1. **Assisted Public Computing**. The notion that libraries are expected to provide broadband internet access for free is nothing particularly radical or new. Within the sites I visited all of them, even those who were struggling with funding or staff or other limitations, maintained that this basic service was essential. In other words, the barest and most minimal definition of the library was that it was books *and* internet, not just books. However, this reduction to materials and tools neglects perhaps what is really the most essential component of the library: librarians. A more contemporary vision of the most fundamental service role is that the library is a place of guided public computing. That is librarians were tasked with bringing some of the same service roles familiar to them— organizing books, sharing materials, helping people learn to read—to the context of using the internet and digital technologies. They struggled with some of the same questions, like censorship as a corollary to internet filtering, or how to best design patron experiences with information. Whatever the issue was, in the end the library's role became a negotiation of how much intervention or proactivity was required by librarians. In Bozeman they opted for structural enablers and limitations built into systems, like time management software or unstructured open time for teens. In Norburry they relied on providing patrons a choice between different operating systems and offering them a mixture of open source and proprietary office productivity programs. In these cases librarians attempted to assist the general public in their computing operations by avoiding direct interaction or intervention. They felt it was best to guide from behind the scenes through policy and architecture. By

contrast in Grand Ridge they recognized active help for computer users was so important that they even dedicated a specific computer help desk to it. In Paddock, Altura, and Grand Ridge they offered a variety of classes to ensure that every patron could not only visit the library to find free internet access but also visit the library to take a class on how to use the internet for activities from doing budget spreadsheets to photography. Similarly Dalhurst, Bozeman, Norburry, Rowland Heights and Paddock used staff and volunteers to enable long-term one-on-one guided computer tutoring sessions. Not all libraries managed to accomplish this service objective, however. Some were unable to keep up their equipment to make it possible for patrons to use it successfully without intercession with a librarian. Others simply didn't have staff with skills or time to ensure assisted public computing could always be available. In most of these libraries it wasn't assured for all populations. The sample set for this dissertation relied on socio-analytic (census) categories to identify and qualify socially-excluded populations but the field experience suggests that these are just a start. Some libraries did well to help teens and kids learn about technologies, while others helped out-of-work patrons fill out resumes and still others ran computer basics classes with the elderly. Typically a given library wasn't able to get to everyone in need they might have wanted to: undocumented workers, people with disabilities, undereducated elderly, troubled teenagers, people of color and more. The assistance part of the public computing service broke down when librarians were ill-equipped to connect to those who were in-need, and, as underscored by the deficit-focused language in the categories employed in the last sentence, unable to see them in terms of assets and opportunities. Sometimes the library recognized assistance limitations and took efforts to minimize it, like Grand Ridge or Aquarin's non-traditional hiring, but most of the time those who weren't able to be helped either weren't present or were simply ignored. Ultimately the way we might best see the first form of service role would be to frame it as assisted public computing *for all*.

2. **Community Networking**. A phrase I heard consistently throughout interviews was that the library was going to become more of a community center in the future. Much of the time when this was explained librarians were thinking of it in terms of space for activities, which is the classic implementation and role, but increasingly it was more in terms of the library acting as a community services hub. In this sense the library was the source of

assets, people and ideologies, but it was also charged with the role of meeting people where they were. In the case of Plainview this meant literally installing a new branch location in an area without any service and driving exchange between locations. In Belle Terre it was structuring the computer lab as laptops (and bringing in external teaching groups) so it could be a more fluid service. In other places it was about bringing library resources out of the library and directly to people, like the Shipton talking-books delivery to homebound patrons, the Dalhurst e-reader lunchtime workshops for people with 9-5 jobs, the Altura database training at social service institutions or Aquarin's wildly popular library-led music festival. In all of these cases the library acted as a leader and expert: they helped organize the effort through formidable sets of relationships and advocacy and also enabled it to be stronger by providing people with technical expertise. I use the word leader because this networking often involved a dimension of significant risk-taking and vision. Many of them tried out arrangements continuously and iteratively, consistently refining their objectives and building a better model of service. In Paddock this meant entirely renovating the set of libraries and trying new programs each year, but continually doing so with pre-established ties, like partnerships with the local schools. Even in Belle Terre, where attempts to lead collaborations with other groups in town didn't work out, the library was still invested in this role as a community technology mediator and enabler. A community networking vision was behind the volunteers in Norburry and Bozeman that helped to allow those spaces to be more welcoming and robust community centers. Aquarin had rebranded itself so well that people in town began to associate the library as an uncontested community programming entity and in Otranto the library's integration with the local neighborhood and role as a symbol resulted in people's willingness to fight for its existence, when necessary. All considered, the second form of (emergent) service role would be to act as a leader in community networking, in order to fulfill the library's role as a community center.

3. **Generative Learning**. The newest of the roles set in relation to proactivity was the question of how to best foster learning. Libraries have long affiliated themselves as allies to education in providing information to help understand and solve problems but the foray into digital technologies and associated digital literacy services has positioned them to now promote tools, relationships and experiences to enable better practice-based learning. Sometimes it was little steps, like Rowland Heights providing books on home repair or

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Plainview giving kids free multimedia homework supplies. Other times services were entirely reorganized around production-based erudition. Aquarin had digital storytelling with podcast teen poetry, video book reports on ipads and youth-designed public TV clips. Rowland Heights and Dalhurst invited community members (kids and adults, respectively) to participate in discovering, organizing and presenting community history through archival and digitization tools. Norburry moved into physical production with experimental and rapid prototyping techniques, like the talking gingerbread man comprised of small soldered electronics and a computer controller. The third, and in my opinion most exciting, form of service role was to become an active and practice-based education provider.

Once again my ordering here is intentional. Being a leader in community networking wasn't necessarily reliant on being able to assist patrons in public computing activities, but ideologically they build upon one another. A library cannot just give a patron a computer, they have to help them with it, too. They can do more than just participate in a community program, they can help lend it expertise and leadership where appropriate. They can move beyond merely immersing patrons in exposure to culture, they ought to help them learn how to understand and intentionally produce reflections of their own culture. In each instance we see libraries taking on more responsible and assertive roles.

This conclusion is especially important for libraries that work in underserved communities. These libraries may have had fewer resources and greater challenges but they often took this as an opportunity to provide better services. The patrons they aided were more than willing to help themselves and their communities, but they also benefited more from the digital assets, guidance and networks found in the library. The stories in this dissertation illustrate the complexity and scope of driving innovations and managing struggles in places without all of the odds stacked in their favor.

It is this core challenge, encountered time and time again, that leads me to what is perhaps the most fundamental implication for theory in this dissertation: **fostering digital literacy is a function of community engagement**. In other words, a public library's role in promoting and cultivating digital literacies is predominantly a result of their active community engagement. At first glance this may not appear to be a particularly earth-shattering point of discussion. The reason

it's important is not the content of the statement, but the order—the causality. Digital literacy itself is not a given or static role. It is not the same as safely assuming books will promote literacy if merely made available, because we can expect everyone knows how to read and write. Schools ensure people are literate but they cannot currently ensure people are digitally literate, and there is even less assurance for people outside of the formalized education system. Just as I would agree with Finn (1999) in advocating that we need to make literacy dangerous again by ensuring it includes the ability to think critically, I would also assert that merely providing opportunity for information access through internet terminals, e-readers and computer basics classes that just teach patrons how to follow scripts to operate software programs is insufficient. Grappling with this reality is truthfully what inspired me to broaden and deepen my understanding of digital literacy in response to my data over the course of two years. It is also what led me to the work of David Gauntlett, a scholar who interprets my favorite explanation for why I believe community engagement is tied to digital literacies, because it connects theory to practice.

MAKING IS CONNECTING

Gauntlett's thesis, based largely on the ideas of John Ruskin, William Morris, Karl Marx and Ivan Illich, is well-encapsulated by his book's title: *Making is Connecting* (2011). Fundamentally, he argues for the significance of creation, the generation of virtual and real things by everyday people. Like Robinson (2011), Gauntlett attacks the idea that the world of thinking (theory) should be separated from the world of doing (application) in some kind of archaic industrialism-era fashion. He suggests that to have creativity and craft contained in (or by) formal institutions and fields, like professional art, theater, dance, programming, writing and more, is to further the illusion that everyday people cannot be part of meaningful cultural production, when, in fact, they're perhaps as responsible for it as any news media, educational or governmental force. The explosion of interest and sensation over the Web2.0 "brand" (Scholz 2008) represents a challenge to many traditions of cultural construction, and Gauntlett is careful to note some of the downsides, such as the danger also identified in Baym and Burnett (2009), that collaborative production may be

unrewarded or exploited labor, of a kind.[85] Nevertheless he makes three points that are worth elaborating:

- In the case of creation, both on and offline, we need to think about more than just tools of craft, but instead underlying values, structures (he calls these platforms) and communities. The ease of use, access and affordances or capabilities for a given tool are certainly worth noting, but Gauntlett's book is intentionally full of examples of people connecting to people, by making in various contexts, in relation to certain norms and cultures. It is not a case study of any particular technology of the moment, it is all about emphasis on learning and meaning-making experiences.

- Imperfection and amateur work is not only acceptable, but it actually may make us happier. Unfinished works, failed first-time and iterative learning activities, rough remixing projects, and so on are all potentially productive. What is most often important is the personal and affective aspects of a work or use experience, which effectively spur an increase in valuation (Norton et al. 2011). Gauntlett finds ties in the literature on individual happiness to the process of freely-chosen, goal-oriented creation projects, including emotional support, communal recognition and social, mutual appreciation in feedback, self-awareness and more. As is also noted by Singer et al. (2006), happiness is strongly tied to motivation and successful learning in formal education, as well as the process of life-long learning.

- Gauntlett's analysis emphasizes that making necessarily leads to connecting. The general assumption of participatory or maker culture is that it is inherently social, because individuals usually share and learn from others in virtual and physical communities. For

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[85] In their study Baym and Burnett noted that often respondents didn't see things this way. Not all activity must be rewarded in a monetary form. In fact sometimes the best rewards are not possible to quantify in that way. Scholz gives an argument similar to what Castells or Buschman might say: the discourse and ideological framing around Web2.0 as a zone controlled by the everyday person is a tool of those who control the space of flows, the technocratic pro-marketization elite. Substantively, ability to contribute content and establish connections does little to disassemble structural oppression like racism, sexism and the like. The alternative demographics of the web (which has in part led to the digital natives scare) and the existence of powerful counteractive forces like international hacker communities do make for some social change, but not the egalitarian liberation it was once dreamed (or purported) to be.

some perhaps the act of making may involve periods of isolation, but it is ordinarily conducted in response to (or embedded in) social and cultural contexts. Indeed "art for art's sake" may not even be possible. No ideation happens in a pure vacuum, nor are anyone's actions totally irrelevant or immune to relation to social constructions. Creation and learning with or around other people, is not the limit or fundamental driver, however. It starts, fully, with inquiry and assistance: individuals that help one another along the way in their projects. This is the very same reflexive, inquiry-based learning process identified earlier. In this process people forge meaningful connections by establishing and transforming ties with one another, which in turn affects social capital. Though tracing the importance of social capital is challenging, Gauntlett suggests that this is how to best take a sociological viewpoint on aggregate wellbeing. If we are truly moving more towards a society with democratization (and ubiquitous capability?) of production and people are better connected as a result, then we can use social capital as a measure of this more empowered public, both in terms of ideologies and capacities.

Gauntlett finishes with a chapter on Ivan Illich's work on deschooling[86] and the social roles of the tools of creation.[87] An education system based on connecting by making would look radically different than our current artifact of the industrialization era, and would involve more direct skill-sharing and exchange-based teaching, and peer matching or mentorship. Public libraries in this system could be essential and proactive facilitators of life-long learning provisions and programs. The vision behind this, which I think beautifully captures the necessity for digital literacies, and the possibilities of making as connecting, is stated best by Illich (1973:21) himself:

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[86] In *Deschooling Society* (1971), Illich effectively anticipates the crisis of education as presented by Robinson, only, as would be reasonably expected, without emphasis on information society. He proposes a radical reformation of education.

[87] Titled formally, *Tools for Conviviality* (1973), the book is largely about having the power to shape one's own world, the dangers of organizing human interests into systems and institutions, and the way that tools could apply to both of these issues. Illich defines tools rather broadly, from individual instruments used to produce or effect something, to larger entities such as a hospital, all of them are means to an end.

"Tools are intrinsic to social relationships. An individual relates himself in action to his society through the use of tools that he actively masters, or by which he is passively acted upon. To the degree that he masters his tools, he can invest the world with his meaning; to the degree that he is mastered by his tools, the shape of the tool determines his own self-image. Convivial tools are those which give each person who uses them the greatest opportunity to enrich the environment with the fruits of his or her vision…a convivial society should be designed to allow all of its members the most autonomous action by means of tools least controlled by others."

In this statement Illich demonstrates the necessary connection between critical self-awareness and active creation. When people become cognizant of their desired and imposed identities they are better able to act with direction and conscience—critical perspectives provide the impetus to envision the world, and one's part in it, as they wish it to be. Gauntlett and Illich propose a vision of society filled with empowered, confident, self-directed people, who purposefully use tools largely of their own design or control. These participants connect with one another, not just in terms of communication or information sharing, but also through making and remaking[88] both content and the technical systems through which it flows.

The views espoused by Gauntlett and Illich might seem a bit lofty, but they were both ahead of their time. Illich illustrated the possibilities for learning, as well as the possibilities dismantling of traditional institutions of education, that are ever increasingly coming true in emerging contexts like the web. The public library's many roles in facilitating the development of digital literacies are another example of this. The vast majority of the stories in this study included the connection between patrons and librarians, and while the ties varied considerably from case-to-case they collectively reflect a measure of the health of these communities. Not health in the traditional sense of the medical condition of individuals, but health in the sense of what Gauntlett means when he identifies that the learning of tools or technological systems is fundamentally tied to structural conditions and emotional outcomes. There are a wide variety examples of connecting by making, some quite literal, such as the volunteers and librarian who became better

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[88] An alternative phrasing of this might be subverting. Finding and making "hack-arounds" to systems of content sharing is a way of remaking and exerting control on them.

friends at Norburry while building a talking gingerbread man, or Aquarin's partnership with public TV to deliver teen-created PSA's. Other stories included the questioning and remaking of systems of content delivery, both socially and technologically, like Shipton's efforts to hack their talking books and directly deploy library computer services in the homes of users who might otherwise be socially excluded, or Altura's dedication to providing guided online learning system access to every social service organization in town. Often the best cases of libraries playing a major role in fostering digital literacies through community engagement involved instances of connecting by making that were positive in both political and emotional terms.

IMPLICATIONS FOR PRACTICE

An important question remains: what should public libraries make of all of this? To start, let's return to the recommendations presented by the ALA task force on Digital Literacy (2013b):

> "The nation's libraries reach and serve individuals of all ages, income levels, and ethnicities. They serve as information hubs, conveners, and collaborators within their educational and community contexts. They provide venues in which patrons and students can engage with, discuss, share, remix, and create information, going far beyond access to research and materials." (pg 3)

Many of the research findings in this dissertation not only seem to verify the quote above, but also directly support the ALA's proposed guidelines. The only objection I might make to this statement would be that I don't believe libraries are just venues to facilitate information transfers. A strict definition of information might reduce the conceptualization to "facts" or sequences and patterns of things, while broader understandings recognize it to be a resource, commodity or even constitutive force (Braman 1989). All of these descriptions emphasize information with a sort of impersonal level of abstraction that, in my opinion, deflects attention away from very real physical objects and people that interact in a space with ideas or information. To suggest that libraries play a role in promoting and cultivating digital literacies is to also suggest they can and do have an impact on the making of things and relationship building between individuals. I revisit the ALA's guidelines below with this distinction in mind.

It goes without saying that increasing investment in digital literacy would help libraries to better foster it, but it's more nuanced than this. Libraries can start by considering Douglas Belshaw's (2012) set of digital literacies in terms of their own context. The ALA guide naturally focuses a great deal on cognitive and performative components often already associated with understandings of information literacy and, though they also emphasize inclusion and participation, they don't break it down in the same way. Asking librarians to consider how they might inspire curiosity or confidence or cultural exchange with technology-related programs will yield different results than if one simply suggests they help people to work on software operation skills for job opportunities. As several of the interviews reflected, it seems much of the reason libraries don't offer advanced computer learning classes for adults is that they haven't even thought about what they would do in them. In other words, investment begins in helping library staff and patrons to think about what digital literacy entails and means to their public in the first place. The stories exhibited in the findings section go to lengths to demonstrate some of the variations this might include.

Project Next Generation and the Eliminate the Digital Divide grants provided by the state were the main reason any digital literacy related programming besides computer basics was happening at any of these libraries. These state-supported initiatives propelled interest, awareness and ability through funding libraries and by connecting them to concepts—for over a decade! The long-term commitment by the state enabled sustainability as libraries were able to amass equipment initially on a regular basis, allowing them to shift investment to people and programs in later years. It is important to note that the state reached out and invited groups to apply, to ensure money went to some of the places it was needed most, even if these places were not entirely equipped to seek support on their own.

Hiring staff to teach and run programs with digital technologies, or dedicating large portions of current staff time to these tasks, really influenced the stories and examples I encountered. Nine of the libraries I visited had someone doing this at least half-time and all of these libraries offered either one-on-one help sessions or classes or both. Libraries who are less able to find funding to pay staff directly may be able to dedicate effort to finding effective volunteers. This strategy didn't always work out in all cases in my sample, but a given library won't know if it's possible until they try. Staff training is equally important, in this regard. Investing in professional development

should go beyond teaching librarians about how to work certain devices or software but also include teaching them how to instruct and engage, how to relate to patrons and how to learn tools on their own. Just as it is important to teach patrons strategies and not rituals, it is important to enable librarians to be adaptive and proactive.

If we look back over many of the case study examples we can find several instances where digital literacies intersected with "traditional" library service roles: preservation of community history, helping users to better access and get more value out of reading materials, establishing the library as a community center, assisting in research and so on. Increasing investment in digital literacy related services does not mean uniquely forming and supporting isolated or individual "computer" or "maker" programming, it can—and should—be done in parallel with the development of other service role investments.

DEVELOP AND SUSTAIN PARTNERSHIPS

The majority of stories libraries told that had to do with digital technologies included partnership with some sort of organization. Sometimes it was public schools who would refer participants for PNG, other times it was institutions of higher education that might supply volunteers. Circumstances were better for seeking grants or donations or having sway with the local government for many libraries that actively pursued partnerships. In a sense this is just a reflection of social capital, the value of relationships of varying strength between people and organizations, but I observed it playing a part in library capabilities and orientation in nearly every location. In addition to organizations it was also often ties between individuals specifically.

Several libraries found that their collaborations in the community included an added benefit on top of offering more programs or finding specific audiences: they reestablished the brand (or reputation) for the library. When libraries would run an event at another location or go to a patron's home or post patron-created materials online, they would alter how people in the community saw them, and what they thought their roles entailed. This was one of the ways they could enable new partnerships and open up avenues for new sources of funding. In this way they enacted what I mean when I say "be in conversation with your public."

I was definitely the only university researcher to visit most of these libraries in the past decade, if ever. Only a few regularly sent employees to ALA conferences or were even aware of the digital literacy task force. The academic world would do well to focus more research on libraries far away from major cities or Universities—we'd learn just how limited some of our ideas are to an absolutely crucial realm of practice. The "ivory tower" stereotype is too often true in the scope of LIS, where we spend a great deal of energy investigating abstractions and dispensing critical perspectives.

Most libraries reported that the main modes of assessment imposed upon them were related to numbers like circulation and headcounts. They were not equipped to measure patron impacts by other means, some hadn't even thought about evaluation at all. Project Next Generation, the grant that was responsible for remarkable digital literacy activities at over half of the locations, had recipients send in reports that mostly included limited descriptions and budgets. The grant had no standardized format for report presentation and comparison, or publicly recognized measures of success. They posted no pictures or examples of projects created by youth at various locations, though they did later add links to a few library-run PNG websites, and were unable to send me outcome data when I requested it. State-based efforts like this should help to provide guidelines for evaluation and then act as platforms for dissemination of that information. Ideally evaluations could be tied to related standards, such as Common Core objectives in education, and also reflections of inclusion like participation and diversity. Taxpayers need to know if their money is being invested well, and, more importantly, such sharing of information could inspire other libraries interested in embarking on similar projects.

That said, libraries shouldn't be deterred from taking their first steps to foster digital literacy, even if they don't fully understand what they're doing. Most libraries indicated that doing something, going from 0 programs and 0 patrons to some was better than nothing at all, especially for something this important and that they wouldn't be able to learn in any other way. The system director for Plainview stated it in a manner that reflected the wisdom and drive she had accrued over the years:

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"If there isn't anything and you add something and one person learns something then that's a success already. When you're in a community that has nothing you give anything and open their mind up. With a 50% drop out rate for high school, these children talk about it as 'if they graduate' and never about college. If we can open up their minds in any way, shape or form by any exposure and they have one spark that produces them to be the first one in their family to go to college that's a success. I can't measure that in this moment in time, but I can hope I can plant a seed that will cause this to happen in their lifetime. I don't worry about measuring that success, I trust that it's going to be there."

The kinds of long-term studies required to determine the impacts of learning with technologies were outside the range of possibility for a lot of these libraries. Instead, libraries took risks and then figured out if what they did was working in an iterative fashion rather than plan formal evaluations in advance. This meant they often operated reflectively and reflexively, not always in a formulaic fashion.

One trend that might help public libraries in the task of research and assessment would be to engage in "Design Thinking" as a strategy for the development of programs, spaces, staff capacities or patron engagement. Many examples and models exist that can apply to specific scenarios, such as how to foster inclusion and technology learning in collaboration with immigrant youth (Fawcett et al. 2013) or establishing community-planned spaces for making and media engagement (IDEO 2014).

Please see Appendix C for some additional potential guidelines for program evaluation.

INCREASE ACCESS TO PROGRAMMING

Libraries can invest in spaces that meet patron needs. Displacing collections to reduce shelf space for repurposing can be challenging or complicated, but adding a dedicated computer instruction lab or teen space with computers will go a long way to helping a lot of underserved patrons get more value out of the library. Circulation counts aren't exactly comparable to program participation, but many more libraries in the study had more trouble having enough computers available all of the time than having enough books in their collection for everyone. Most of the locations that reported success with fostering digital literacies had made significant changes to their spatial arrangements that met changing service priorities.

Possessing equipment besides desktop workstations and e-readers often stimulated libraries to run unique programs and offer new services that could promote digital literacies. Scanners enabled digitization of community history, video cameras led to patron-produced films (cultural production), laptops allowed instruction to occur in new places, ipads swayed kids into digital storytelling and so on. The affordances of other devices can contribute to the realm of what's possible, especially when combined with the right person and context.

Literacy was a continuum for most libraries. Teaching a patron to search their e-mail required they knew how to spell a given word. For the libraries with immigrant populations or kids who weren't getting enough opportunities in school, teaching fundamentals came first as a requisite point of "access" to programming. Home-bound seniors sometimes needed to understand what the internet was before they'd learn to type and use online services or databases. For many it was more about getting over fear or learning to ask questions that was needed. It was always important, for the libraries I spoke to, to meet people where they were, and then go from there.

IMPLICATIONS FOR LIS EDUCATION

The help desk manager at the UIUC Graduate School of Library and Information Science, Jill Gengler, once said that the kinds of people she wants to hire (and inspire) are "positive problem solvers." I don't have enough words to express how much I agree with this sentiment. These are the attributes of the people I met in my research who truly helped to foster digital literacies and enabled their libraries to have visible impacts. Throughout the process of the dissertation I couldn't help but compare my experience with graduate studies in LIS to what I was observing in the field. I had the privilege and honor of attending and working with one of the highest ranked institutions in the world in several capacities: as a student, researcher and instructor for several years. Throughout most of the period I frequently struggled with feelings of being an outsider or rebel because of my consistent desire to focus on practice and optimism (solutions), which was often regarded as unscholarly, naïve or arrogant. At one point it even led me to reject affiliating myself with librarianship entirely, but the better answer, I later determined, was to take ownership over what I wished for my area of study to be. In that vein, I posit that LIS must address several major issues:

Identity. LIS has a branding problem. Too many people think librarians are the rigid old ladies who go "shuuush." They think libraries are boxes full of books and inert silence. They don't think of public TV production centers, talking gingerbread men or the building as a hard-earned symbol of social justice for an African American neighborhood, or as many of the other possible associations present in the stories of my site visits. We need to alter what libraries and library and information science means to people, and we can do this by teaching—socializing—our future public librarians with professionalization that emphasizes human and technology services as much as reading materials or organization. Libraries should bust out of their walls and into their communities and on to the internet to be heard and seen differently.[89] As a field of research we need to think and talk about ourselves differently as well. Instead of defining the field as being in a state of crisis over information needs, we can construct it as being in a state of proactive responsiveness. We are not the handmaidens for information merely here to serve other fields, we are innovators and leaders with all things connecting people and information.

Diversity. Public libraries serve patrons of all kinds, and yet library science is continually one of the most homogenous areas of study. This is true in terms of nearly every socio-analytic category (race, class, gender [90]) and often in other ways, like personality types or disciplinary background. The impacts of our lack of diversity is sometimes surprising, like when it results in intolerance for conservatism, Christianity or optimism, and also sometimes very unsurprising, such as assumptions of default whiteness or expecting every student to own a smartphone with an unlimited data plan and penchant for checking email. Of the librarians I spoke to over half of them expressly and independently indicated they did not come from a background in the humanities. They were from fields like IT, business, education, social services, art and communications. Some of them were even a little disorganized and many of them showed that they appreciated change and yearned to be flexible. A few even said they weren't all that excited about books. Above all

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[89] A developing array of strategies for this can be found on the ALA website, at http://www.ala.org/advocacy/advocacy-university/public-library-resources.

[90] See http://www.ala.org/research/librarystaffstats/diversity for some relatively recent statistics for the overall profession, or http://dmi.illinois.edu/stuenr/index.htm#race for a very recent representation of the University of Illinois at Urbana-Champaign. This may be in part due to the field's position as an exclusively graduate area of study, but the graduate level in the social sciences, arts and humanities show that the severity needn't be the case.

they were able to connect with patrons as diverse as they were, and found assets and opportunities in the knowledge and needs those patrons had to offer for library services. Our ability to relate to communities, patrons and technologies, as well as our motivation and capability to teach and innovate, is reliant on our diversity.[91] There are many trajectories for tackling issues of diversity in LIS institutions, including altering recruitment strategies, better supporting and sustaining students, recruiting and funding faculty of different backgrounds and crucially working recognition of the importance of diversity into curriculum, particularly information science classes and projects.

Research and Teaching. A large share of research that comes out of iSchools appears to be on academic libraries and academic topics. Much of the curriculum and body of publication focuses on critical analysis of important issues, like discourses in literature or methods of information organization and abstraction, but not active and direct implementation of solutions and services in fields related to information. If the study of library and information science is to actually inform what goes on in public with information professionals then we should be working more actively with institutions beyond the academy. This includes researching with partners like corporations, schools and community libraries and emphasis on areas like community informatics, digital literacy and usability. Practicums and internships are a well-recognized method to engage master's students in this, but PhD and faculty-level research and scholarship must follow suit as well. Like many areas of study PhD's in library and information science often do not go on to fill tenure-track positions at research universities, and consequently experience in practice-based and teaching settings can be very important, it ought not be seen as a 'distraction from true scholarship.' On the other hand, research methods are not evenly taught in many institutions. Master's students may not get the opportunity to learn about how to conduct social science (or other kinds of) research and PhD's are often not familiarized with action, participatory and community-based methodologies common in fields like health, education or psychology.

Several times throughout my research I was asked by librarians (who already had a Master's degree) if my school offered any continuing education for librarians who wanted to better

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[91] The ALA explicitly promotes this ideal with examples like the diversity standards for the ACRL, http://www.ala.org/acrl/standards/diversity.

understand what they were doing or who wanted to develop innovative programs like makerspaces in libraries. There is an enormous opportunity for life-long learning in LIS education that can be built upon pre-existing frameworks like online course systems or organizations like the OCLC to ensure that a given librarian's degree doesn't have to be stamped with a certain vintage. Just think of what might happen in an LIS research center explicitly set up to be a public (or corporate or school) library program and systems innovation lab![92]

THEMES FOR FUTURE RESEARCH

A good dissertation provides both insight into processes and knowledge as well as opens up questions for future scholarship. This section addresses several themes and paths of inquiry.

FROM A SOCIOLOGICAL PERSPECTIVE

The research goal of this dissertation is to better illustrate and understand the role of the public library in making digital literacies possible. This capacity and process cannot be considered independent of the larger social structures that determine the norms, boundaries and potentials of the institution, however. In essence, it is important to note how one individual library or another triumphs or struggles, but also what these stories might mean sociologically.

One important but unsurprising high-level observation was the diversity of the underserved and socially excluded people aided by digital literacy related programs. My sample was built largely on the premise of rather sweeping and generic census categories, but did not include a focus on specific age groups, disability status, education or kinds or degrees of employment and class, other than unemployment. Throughout the case study stories we can find examples of concern for people of many socio-analytic categories that ought to be considered underserved, including the elderly, people with unstable work conditions, non-residents from rural areas, undocumented workers, ELL immigrants, drop-out teens or kids with limited educational opportunities, individuals with multiple jobs, GED-seekers and more. These identities and conditions were often overlapping and complicated but nevertheless they nearly all needed a degree of help from the library in developing

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[92] The Harvard Library Innovation Lab (http://librarylab.law.harvard.edu) might be an example of this. Admittedly I'm more excited about the development and deployment of in-person programs than online systems. The Center for Digital Inclusion (http://cdi.lis.illinois.edu/cdi) here at the University of Illinois may be an example of this.

digital literacies. The lack of familiarity with culture, processes and techniques related to the use of information technologies was even referred to as a kind of identity and disadvantaged category itself, but was so varied in its occurrences that it was impossible to think of it in the terms of "digital native" and "digital immigrant." An obvious conclusion that might be made based on this observation is that LIS scholarship should continually examine and renegotiate the shifting categories and patterns of social exclusion found in underserved library service populations in order to best address the needs of many kinds of individuals. Another, likely more interesting avenue could be to push our scholarship to advocate and actively reform the conceptualizations. In other words, rather than responding to predetermined categories of need we might assist in spotting emergent and intersectional statuses, such as how digital literacy needs might specifically manifest in relation to socio-analytic categories like race or poverty, and set the stage for the kinds of strategies that might be employed to respond to these challenges, as well as the pitfalls and inhibiting normative conditions. I believe my research does some of this, but really each situation could merit its own specialized study.

Management structures mitigated the degree to which libraries were able to innovate and respond to different dimensions of patron need. Most library directors brought up their relationships with their board as one of the primary drivers or deterrents of change, especially when it came to developing service roles and responses to technology. The social organization and leadership culture of the library in general, such as how much authority and responsibility was distributed or decentralized, or the degree to which people communicated with and trusted one another, locally or through the web, played a key role in shaping outcomes. On the one hand the case was frequently made that people, activities, policy and infrastructure that supported digital literacy were hampered as a result of structural boundaries such as funding inputs and external rules, but on the other hand social norms, structures and policies were seldom identified as enablers. Instead the stories of success typically emphasized the individual agency of librarians and stakeholders over state or nation-wide grants and agendas, even in situations where grants were involved and very likely did provide the basis for progress. In several of the case studies the library director offered little in the way of leadership to pursue funding for digital literacy programs or support staff in activities or with appropriate policies, but if they were sufficiently hands-off with a team comfortable operating independently they were able to yield notable results regardless. In other words, there was no single

chosen model for strong leadership, in terms of centralization or distribution, or IT systems adoption or control of information flows, but it did have to be driven from somewhere. The libraries stuck at a point of near-collapse were largely so because of a complete lack of supporting individuals at all, much less ones with leadership traits (team players, outreach-oriented, process-aware, flexibility-inclined). A lack of consistency or consensus over successful management models best suited to the cultivation of digital literacy suggests a very open question, one that could be of particular interest to scholars in social informatics, as the inception of the area was based largely on the study of ICT's affecting the structures and processes present within organizations (Kling et al. 2000, Day 2007). Naturally this might also fall into the realms of business informatics or information systems, where the focus might typically be on impacts of computerization or information systems strategies in corporate or traditional government settings, instead of libraries struggling in underserved settings with ad hoc arrangements of people, technologies and services.

In some sense this may be a form of what Eric Von Hippel (2005) refers to as the "democratizing of innovation," when users and direct service providers alike are increasingly able to innovate for themselves, in coordination with existing assets, to match their exact needs. It may represent a transformation of the library as a 'provider with patron needs' to something more like a collective that leverages and negotiates a combination of internal and external resources to match problems at multiple levels: library as customer, patron as provider, or many types of library staff members as providers of many kinds of services. The mere everyday use and reappropriation of technologies by (or in relation to) marginalized groups has been frequently identified as a form of overlooked innovation (Eglash et al. 2004). Scholars have explored the topic in the realms of education (Eglash et al. 2014), communications (Harlow 2014), media production (Fouché 2012) and more. As well-indicated in this study, libraries represent yet another site where the investigation of these processes may take place. Comparison to the actions and activities in other settings could make for a compelling meta-analysis.

Money was also an issue of concern in most of the cases. One would logically expect most of the case study sites to be locations suffering under economic stress, as they were selected on account of poverty levels and unemployment, but there was also a great deal of innovation that would not have otherwise occurred if it weren't in response to huge financial constraint. In a sense many of

these libraries resembled a sort of micro-entrepreneurship type environment, and several of them might have employed techniques encountered in, or that might be valuable to, those invested in the social entrepreneurship context. No business would ever think they could thrive by merely cutting a number of services without investing in new areas or taking risks with new enterprises. Grant-writing and cost-sharing for many included collaboration with new organizations, many of which didn't fit the classic 'library partner' role. Others let volunteers shape emerging services and provide free labor and donations. The libraries that did well in the cash-strapped conditions in these case studies were those who moved forward less conservatively. Those that could not be adaptive were less able to produce compelling stories. Furthermore, the responsive startup model for libraries is intertwined with the fragmented identity crisis, much like it might be in business settings. As the library reinvents its brand in many communities it does so in direct response to information-related problems (the easiest way to innovate, in a sense, is to work on the problems at-hand), and these problems vary widely from community to community. Fostering digital literacies might be a common goal in the majority of cases, but it's still a leap from the traditional notion of the library being a contained place of books. Reforming roles and pursuing new paths for financial sustainability might run in-kind with other radical philosophical arrangements, such as re-envisioning the library as an entity in conversation with its public(s), as opposed to a docile facility or education reference apparatus. In a sense it summons an intriguing question: what might a responsive startup look like if it weren't a company positioning its identity in the name of selling a service or widget, but a government entity seeking to further knowledge and social inclusion? Both are seeking money that is not assured to them, but for different purposes and with different sorts of investors. How might strategies between corporate and library models be shared, contrast or otherwise inform one another?

The measurement of social capital is sometimes considered a way to judge the extent, composition and condition of communities. The theory of the strength of ties (Granovetter 1973, Gauntlett 2011), for instance, is an interesting way to go about measuring community engagement and impact of public libraries. For instance, what characteristics do librarians consider to make for 'strong ties' to a partner or collaborating institution? In the general literature on social capital we find people are most willing to ask their strong ties for financial assistance, perhaps the library is the same. Possessing a diverse arrangement of weak ties might enable a job-seeker to find

employment faster. Would a library with many weak ties do better than one with fewer strong ties in accomplishing some tasks? It's possible that some sets of ties might help a library fit better into emergent roles, such as having a diversified funding base or reliance on volunteer labor, or conjuring up enormous sums of funding to build computer labs or campaigning to keep a small branch open when threatened with closure. The literature on libraries and community engagement certainly recognizes social capital (Vårheim 2014, Cox et al. 2000, Griffis and Johnson 2014, Johnson and Griffis 2009) but, to my knowledge, it rarely attempts to construct comparative strength of tie metrics for large-scale or systematic comparison. A study of the library as an institution, in terms of its roles, could fit well with a strength of ties analysis.

The history and culture of the locations I visited determined a great deal. Obviously any town has a story and an arrangement of forces that has shaped it over the years, but the relatively small and rural locations with dependence (or former dependence) on a specific industry or two frequently determined the way of life for libraries and their users. For locales with universities and colleges this seemed to result in some ability to transcend traditional issues of geography and power (as Castells' might put it, nodes in the space of flows) and thus necessitated more of a desire and need to build resources and services around facilitating digital literacies. For others this meant they were off the grid in multiple ways: regionally remote or isolated, with shrinking populations and diversity as a result of outbound migration, and also separated from culture, knowledge, communities and ideologies present on the internet. In some ways this situation was reminiscent of international aid operations, where some piece of infrastructure or social program might be brought in to solve problems without first understanding what people in a place are actually doing and requiring to improve their lives. Libraries were better positioned in their own settings to identify gaps in human and physical resources and to create self-sustaining operations with enough support for learning and use by those affected. In many cases, particularly those with a mixture of flows of resources and influences, external assistance was unnecessary and even unhelpful, but in some cases, such as those where basic infrastructures and human capacities weren't even present at all, it was possibly the only hope for change.

Shifts in demographics and labor are often spoken of as reflections of changing economic paradigms. There is the idea that the industrial revolution gave way to the service economy and eventually the information revolution. Education institutions like libraries have regularly regarded

themselves as key components of workforce development in each economic landscape. And indeed in previous eras this may well have been true, but, as is noted distinctly by C.G.P. Grey (2014), in reference to ideas posted by Brynjolfsson and McAfee (2011), Cowen (2013) and Pistono (2014), the proportion of newly created 'technology' jobs has been relatively small in comparison to the total number of laborers in other longer standing service and goods-producing fields, such as retail, food and transportation.[93] Increasing automation at all levels, including computers that can drive cars or serve cups of coffee as well as artificial intelligence that can find, organize and interpret all kinds of information, or pen news articles and even write code is likely going to cause massive rearrangements of the labor force. In one sense the library is already dealing with this issue as it seeks to work with and in relation to the internet, but in another sense the growing population and reduction of labor needs in key fields is bound to spur more unemployment and need for life-long learning. Some of the librarians I've spoken to have acted as if it is only a matter of getting past helping to get the elderly online but these upcoming fluctuations in jobs and disparities will affect many people of all ages for several generations. There will be a great need for research into revitalizing economies in small town and rural settings most affected by the amplification of automation and the library could be a site of study for this. I am certain that scholarship related to usability and the learning of information systems will grow in-kind, as for every new technology we add new problems surface and new gaps in knowledge arise. Library and information science fits neatly into this niche.

DISCOURSE INTERSECTIONS

One of my original dissertation proposal ideas was to examine the ideas apparent in the discourses exhibited in interviews. In a sense the philosophies and topics discussed in interviews can be seen as if they are in conversation with larger conceptualizations apparent in literature. Digital literacy, for instance, is clearly one of these, but there are others.

Buschman (2003) writes about disentangling the "language of economics" from the mission of acting in the public sphere, and nearly every librarian I spoke to felt compelled to both engage in

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[93] The top ten largest occupations in the US include very few areas that deal directly or specifically with advanced computer technologies, see http://www.bls.gov/oes/current/area_emp_chart/area_emp_chart.htm for more information.

the language of economics (referring to library 'customers' or 'value per user' and similar phrases) as well as number-based metrics. Librarians rarely verbally indicated they had to be accountable for a given book, computer or program's value to a patron in terms of its ability to enable them to be a more successful member of society but they frequently spoke about how much money they saved patrons by possessing materials or offering free classes. They went about considering services often in terms of 'government versus business' and were quick to express their interest in avoiding competition. The frequently-mentioned notion of the 'personalized online library' seemed to indicate interchange with the idea of the unlimited customization and specialization promoted in Anderson's (2008) presentation of the long tail or Von Hippel's (2005) democratization of innovation, where providers and users are tied together in the co-construction of new and effective services. Libraries considered themselves a key part of democratizing the tools of information distribution and, to some degree, digital production, leaving only the need to connect supply to demand in order to fill niche interests. As it was encountered in discourse, library directors typically spoke with an assumed facet of our changing economic landscape: that the internet and digitized information will provide individualized solutions for all of us, including what to read or even more controversial proposals, such as providing the "right" information.

There was also a lot of recognition of structural barriers and oppression. Many of the interviewees spoke about poverty in terms of its pervasive effects on communities and its embedding in systems of politics and economics; seldom did I ever hear a librarian blame the 'poor' based on shortcomings or attitudes (Rank 2005). Given that the library is an institution charged with promoting social good this is perhaps unsurprising, but it's still an important participation in a specific progressive discourse. Even still there were times that librarians would refer to a kind of 'us' and 'them' in reference to certain socially excluded communities. Sometimes this was on account of simple differences in staff or ideological composition, but it was also likely telling: unity was not always present in language, much as it was not always present in practice. When the topic was shifted from 'those in need' to the question of digital tools there was considerably more variance in the same kind of acknowledgement of structure in technological systems, like Lessig's (2006) concern for architecture. This contrast was somewhat interesting—it wasn't the user's fault that they were in poverty, but it was their fault they didn't know how to use the computer. We'd

blame the "system" for their relative oppression, but not the (computer) "system" for poor usability.

In many interviews when I asked participants about their definition and understanding of digital literacies they confused or conflated the term with computer literacy, media literacy or information literacy. Some redefined the term while others questioned its utility or even speculated about its possible role as a vessel for other discourses or agendas (and with good reason, Belshaw 2012 confronts this challenge directly in his dissertation). Grasp of a specific definition did not seem to consistently impact arrangements of services or policies; vague arrangements of "digital" concepts were enough to inspire action, which lends weight to the notion that a plurality of literacies is ideal. In a way I interviewed a variety of people in massively under-resourced settings who might often be considered deprived and 'backward' and yet they were frequently thinking deeply about issues of library roles and identities as they relate to the ways people ought to leverage technologies. Most of these libraries did not have the funding or interest in participating in larger library and information science conferences, but the absence of representation of their wisdom and experiences may be a significant loss for the field as a whole. In particular the libraries referenced in the section on "when my model broke" should be telling, as the stratification in resources and ideologies permeates our profession. It is difficult to win grants by focusing on fundamentals like funding to keep the doors open and the staff paid but for many libraries fulfillment of these essentials would enable them to take the next steps to enter into the conversation about responding to needs for digital literacies. There is likely some room for critical analysis here. Much like Virginia Eubanks (2007) found very important intersections and insights for challenging assumptions about the digital divide by calling upon voices that often go unheard, librarians in many settings and with many backgrounds could help to inform the way we make sense of digital literacy (or digital literacies). I believe my work sheds some light on this, but additional questions might include the best ways to include their wisdom into the construction of policy or questions and assumptions driving future research.

Some librarians referred to digital natives explicitly but many others spoke as if 'they' were a kind of assumed reality, less in the way that Palfrey and Gasser think of it, as a defined population (2008) with certain characteristics and determinants and more as Bennett et al. (2008) characterize it, as fear and moral panic. Not only were their cherished book collections under threat, but the

entire profession (and even perhaps their way of life) was at stake as a result of the 'technology' generation, the ambiguous group typically spotlighted as digitally literate when I asked about definitions. Many librarians and patrons alike regarded this same vaguely-defined technology, especially e-readers and smart phones, as a kind of momentous spectacle. They referred to it as a causal force with agency and unstoppable momentum, invoking a progress ideology that had cadences of technological determinism, futurism and globalization all rolled up into one. Participants were often fearful or mystified, or both.

Clearly the way librarians talked and thought about these kinds of ideas would make for many opportunities for a very academic-oriented study. Comparing libraries on the basis of those that challenged or accepted certain discourses would make for a deviant, but likely brilliant, theoretical sample. What happens when you take all of the libraries who, say, choose to emphasize a personalized and online experience at (or with) the library and see if their users are reading more? Would these same libraries manage to persistently help a broad and inclusive arrangement of patrons, or would it just be those who identify with 'internet culture' or other classifications to be explored?

MODELS FOR LEARNING

A central theme of this dissertation (and the supporting literature review) has been the role of the library as an alternative education provider. Perhaps the biggest on-going challenge to the relatively old, but continually radical idea of "Deschooling" society (Illich 1971, Papert 1993) or other similar fixes to the stagnant public education system is to present realistic and achievable visions for what modern learning contexts might look like. The library may be a happy medium for this sort of innovation, for two reasons. First, it is an established institution with a kind of brand name and value set friendly to investing in literacy and learning. It gives a human face and a physical space that make new models of 'DIY learning with the internet' easier to adopt.[94] Second, the library itself needs to be subject to much of the same caliber of revision as the public education system. Innovations in digital literacy curriculum development and the design of information experiences require risk-taking and experimentation, which can be done with much lower stakes

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[94] For more on my reactions to systems like Digital Aristotle or Sugata Mitra's "Hole in the Wall" project see http://duenos.net/whats-missing-in-digital-aristotle-re-cgp-grey-and-the-limits-to-learning-with-the-internet/

and broader life-long learning opportunities in the library context. Libraries, if nothing else, tend to be good at studying data to organize and document it, which is a clear and present need for this.

One example might be emphasis on play. Play has long been recognized as an effective method of real-life modeling and "learning by doing" which is free of the daunting or dramatic effect of tests or graded materials (Singer et al. 2006). In the revision of Papert's original *Mindstorms* (1993) it was noted that iterative and interactive (constructivist tinkering and play) learning with use of computers not only impacted cognitive development but also made an affective impression, ultimately conjuring up motivation where it wasn't present before. Clearly this was explained in Gauntlett (2011), and scholars have already begun to investigate the implications for play and learning specifically in the library setting, where it has grown considerably (Nicholson 2009).

Most of the activities driven by Project Next Generation involved a significant dimension of play, but many of them went unevaluated. The regular gaming events and activities that occurred at Aquarin and Plainview were typically recognized in terms of their enrollment and participation but not their learning outcomes. It is here we find what I believe to be a compelling area for research. Do gaming and play occur differently in the library setting than they do elsewhere? Might the intrinsically social and public environment alter its composition or participants? Does the library's dedication to archival, multiculturalism or literacy impact which games are made available and what is expected of them? Are libraries able to act as "readers' advisory" for games (an arguably greater source of cultural influence for many youth), or better yet are they able to promote remixing and creation of games themselves? More radically how can libraries invoke games and play with services beyond youth? How might "play" be recognized as a principle behind adult services or in creating systems for information reference? Why has this, as of yet, proved to be too challenging to be commonplace in Illinois public libraries?

On the other side of the fence in nearly every library I found examples of what was often referred to as "training" but perhaps should have been conceptualized as learning. Using the reference frame of digital literacy helped to chase respondents away from credentials associated with certain abstract sets of knowledge (e.g. engineering, computer science), and instead focused them more on skills and practices, but only reflected and unearthed their perceptions on processes of learning in a sort of tertiary way. Information overload was explicitly and implicitly identified as a recurrent

challenge, and in most interviews the challenge of librarians themselves needing systems for absorbing, sharing, managing and generating with information technologies was forefront—many had the natural tendency to want to achieve a certain level of mastery themselves before desiring to offer knowledge to the public. The "let's jump in and go and learn together as we go along" that matches many participatory cultures on the internet starkly contrasts with the "well-read people know how to find you all of the answers" context sometimes preferred by librarians. I suspect there is potential for a great deal of study within just the internal world of the library. "What is the role of the library in fostering digital literacies?" could be more specifically developed into "How do structural conditions, cultural forms and individual personalities shape a librarian's ability to develop their own digital literacies?" Even in just a single library this would be chock-full of material, but a comparative setting between widely contrasting libraries could yield data that would extend and strengthen what was begun in my study.

CONTINUING TO CLOSE GAPS IN DATA

The case studies related many examples of struggles with the growing metric culture surrounding libraries. As suggested earlier, directors were quick to enumerate the ways funding was tied to various measurements, which was entirely expected, but a more compelling inquiry lies in determining how to better address the issue. While airing grievances and formally recognizing them in research studies such as this might on some level be useful in its contributions to awareness or of cathartic value to participants it's not much of a realistic solution. Likewise urging society (or researchers or librarians) to shuffle away from relying too much on quantitative comprehensions of the world might fit in stride with trends in postmodernist humanities and social science of the past decade but it's not entirely realistic for a civic institution influenced by forces beyond the public.

A third answer may lie in designing metrics that better address outcomes and impacts, and that will be actively understood and adopted by municipalities, library boards and directors. In the field of education this sort of evaluation quandary is dominated by discussion about standards (as are certain conversations within library and information science, such as standards in data and collection organization and sharing protocols) and a great deal of resistance has been one of the results. There are certainly consultants and advocacy groups (like the ALA) that are striving to

make for change based on research but, as observed by the relative isolation encountered in so many locations, their wisdom isn't always hitting the ground.

From the very onset I felt my study on whether or not the library played a recognizable role in fostering digital literacies had to be measured, at least in part, by evident impacts on patrons. Most libraries of course had examples of how they determined they were affecting people, which generally spoke for themselves, but I wanted to also directly observe what patrons were doing and saying to get a better handle on this. I took this pursuit with me into an additional case study at a local library that directly connected to the work exhibited in this dissertation but ultimately chose not to include it here simply because of issues related to data quality and the fact that the research subjects were in a setting that was not distinctly underprivileged in terms of the same conditions like poverty and social exclusion found at other locations.

Next iterations of my scholarship could easily focus on interviewing, observing and examining works produced by patrons to get an idea of where they stand with (or what they think of) digital literacies. Ideally, as was painfully learned in my related local case study, this would be done in connection to existing programs, but in a capacity as a dedicated researcher, not a role as a primary leader or technical support. It's hard to walk into a situation knowing a lot about how to make digital literacy happen and to instead merely study it, warding off frequent requests for help by community collaborators. Nevertheless, studies of spaces where underserved patrons share it with those who are more privileged could offer a unique and compelling angle, especially with regards to solution-focused research like my own.

IN CONCLUSION

I believe the resounding impact of my research is what it reveals about the aspects, process and importance of public libraries in engaging their communities in a multitude of ways, in order to foster many kinds of digital literacies. I hope readers will find the case study stories and overall work to be action-inspiring as well as thought-provoking. For me personally this knowledge has led me down the path of university public engagement, where the ideas and questions raised by my scholarship have a daily and identifiable impact. I urge others to find similar modes of utility for the text, and continue the mission of inquiry with and for communities.

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APPENDIX A: INTERVIEW SCHEDULE

This question list varied by interview and changed in response to evolving needs and findings as research progressed. Questions marked in bold were always asked of at least one librarian at each location.

[Confirmation of hours, location and service area, data that might be missing from pre-visit research]

1) I'd like to learn about programs and activities that have happened in the last year in your library that made use of digital technologies. When I say digital technologies I want to stress that I'm interested in use of both equipment owned by the library, like the public access computers or library-loaned cameras, and also personal devices, like mobile phones or laptops that people, volunteers or librarians might bring in for a program. *Follow-ups could include:*

- Can you tell me a little more about that program? What are its goals? What kinds of people participate (age, interests, not things like names)? Who organizes it?
- How does this program benefit from use of digital tools?
- What kinds of problems do programs run into because of their use of digital tools?
- *Optional, if they, or I, get sidetracked:* I want to make sure I get a full representation of the programs in your library that use digital tools. Can you give me a list?
- How are programs and services like these marketed, documented and evaluated?
- Why do these programs happen?

Realistically, I'm not expecting a big list from most libraries. In fact some libraries will probably say something like "nope, we don't have any programs that use the computers," which will make me resort to probes like:

- What programs, in general, do you do?
- Are you sure?
  - Does someone ever look up information online during programs?
  - Do you take pictures of events? Are those ever shared online that you know of?
  - Are there any library activities where people make things?
- Do any programs (or services) take place, in full or in part, online? (homework help?)

- Are there temporal patterns to programs? Afterschool, summer, seasonal jobs, etc…?
- Are there any programs you've heard about that you would like to do?

2) Are there any informal groups or organizations, like say a Boy Scout troop, club, or visiting class of students that run programs in your library that use digital tools?

- How did they come to be connected with the library? Why is the relationship in place?

3) Does anyone (staff, volunteers or an external organization) help patrons with the computers or other digital devices? Are there classes or tutoring?

- For staff who help with the computers:
    - What are the sorts of things people seem to be doing on the computers frequently?
    - What kinds of questions/requests do you get the most? Are there any needs for help that go unfulfilled?
- Who takes care of the library computers and other digital equipment?
- Why do you think these things do/don't happen?

4) *[For the library director]* **How does the library see its mission in relation to digital communication and media production technologies?**

- How are library digital technology policies determined?
- What factors influence the decision to acquire more equipment? (space, cost, maintenance, staff, bandwidth, electrical outlets, adequate already)?
- Can you think of any big factors that encourage or discourage your library from running new programs that use digital technologies?

5) What are the restrictions for use of the public internet workstations or loan-equipment?
Possible follow-ups:

- Time limits?
- Security on workstations (login, wipe policy, can users save files)? Internet filter or firewall?
- Who are the computers available to? Any requirements (age, library card holders)? Informal contracts with users for use? Do librarians actively encourage use?

- Do you have any rules for people who bring in their own devices or data?
- For all of the above: Why?

At this point I'll have heard about a lot of the library's infrastructure through stories. These questions may be changed or omitted depending on what I already know.

6) Finally, I wanted to ask just a few short questions about your library's infrastructure.

- What kind of internet do you have? (wireless, broadband speed)
- Are headphones, speakers, a projector or a scanner available for patrons or programs?
- Any assistive technologies for people with disabilities?
- For all of the above: Why? What enablers/points of prevention?

APPENDIX B: RURAL AND IMPOVERISHED COMMUNITIES IN ILLINOIS

This section is included for transparency reasons and because it might also be helpful for scholars looking to qualify areas for study as I did.

I was unable to find a single[95] satisfactory measure of rural poverty in Illinois, so instead I have relied on data and definitions from multiple sources. In a national perspective Illinois is a relatively rich state, especially compared to the southern US. We only really catch the tip of the Mississippi River poverty chain, and most of the US Census sanctioned poverty research groups[96] don't include Illinois in their focus. Southern Illinois is the site of our worst rural poverty, but it is also covered in state and national parks, which obscure accurate data analysis. Rural census tracts vary considerably in size for their populations, and may have very uneven densities throughout. Collecting accurate data becomes a delicate balance between depth and breadth, as the more granular the investigation the higher the margin of error (few data points), and larger areas (county-level, for instance) cause impoverished areas to be blurred out, and, further, they may have multiple public libraries within their boundaries. Beyond this, definitions of rural vary somewhat even within the census data, and at the time of the sample selection we were on the cusp of yet another update to the standards.[97] To compensate for the complexity of what it means to be rural I have selected census tracts on the basis of a categorization scheme generated by the Rural Health Research Center[98] at the University of Washington, known as the Rural Urban Commuting Area (RUCA) codes. These codes, based on Census 2000 data and 2004 ZIP codes, are a way of showing commuter traffic flows between census zones of metropolitan, micropolitan, small town and rural status. In other words, the areas with the highest codes, small town and rural, are the ones furthest away from major populations; they are the people who live furthest from resources and who have to be the most self-sufficient. I cross referenced the RUCA list with the census tracts with the

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[95] See http://www.raconline.org/info_guides/ruraldef/ for a fairly comprehensive breakdown. Three government agencies, the US Census, the Office of Management and Budget and the Economic Research Service of the USDA all employ differing definitions.

[96] See http://www.census.gov/hhes/www/poverty/links/index.html for more details.

[97] See http://www.census.gov/geo/www/ua/2010urbanruralclass.html for more details.

[98] http://depts.washington.edu/uwruca/index.php

highest ACS 2005-2009 measures of poverty[99] (over 20%), food stamps[100] (over 20%) and rates of unemployment[101] (over 14%) to identify rural areas that are likely to contain underserved individuals. I then, finally, confirmed areas visually and on the basis of census definitions.[102]

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[99] Percentage of families and people whose income in the past 12 months is below the poverty level, all people; the ACS 2005-2009 estimate.

[100] A measure of income and benefits (in 2009 inflation-adjusted dollars), the total households with Food Stamp/SNAP benefits in the past 12 months; the ACS 2005-2009 estimate. For reference, the Illinois average is around 8.4%, and is probably lower in the areas outside of Chicago.

[101] Percent unemployed of those in the civilian labor force; the ACS 2005-2009 estimate. For reference, the Illinois average is around 8%.

[102] With assistance from John Cromartie and Shawn Bucholtz, who created an effective summary of the various definitions of rural applied to Illinois, using the Census 2000 Summary, see http://www.ers.usda.gov/amber-waves/2008-june/defining-the-%E2%80%9Crural%E2%80%9D-in-rural-america.aspx#.VRjvuuGOUZw.

APPENDIX C: A MODEL FOR PROGRAM EVALUATION

The series of sections in the discussion are vague and focused a great deal on scholarly concepts and literature. Like the ALA report I presented some guidelines, albeit ones backed by the stories and data in this dissertation, that serve more as ideas to jump off of rather than concrete steps from which to proceed. I felt an obligation to go further than that. Based on investigations done during later related research, and on the different programs and methods I heard about during interviews, I've assembled a series of questions a librarian could ask themselves about a given program to help think about how it might foster digital literacies from the Belshaw (2012) perspective. This measure is not intended to supplant the ordinary consideration of goals and outcomes, but supplement them.

1. Which **tech skills** did patrons practice or develop as part of this program? Think in several frames: applications (Windows, Internet sites, Photoshop), activities or competencies (device operation, programming, graphic design, 3D modeling, information seeking), and disciplinary concepts (geometry, formative inquiry, logic, design, iterative experimentation). This will allow you to identify value from a variety or perspectives, and better present or negotiate its purpose with different parties. It may also help equip you in considering what skills or areas should be considered prerequisites or next steps. These abilities should not be limited to cognitive (computational thinking), however, which leads to the next category.

2. What were the **social dimensions** of the program? Was there teamwork or collaboration? Was the communication process about negotiation, persuasion, dialogue, inquiry or other forms? What social dynamics (groups or identities) did participants bring in to the program, and how did this impact it? What knowledge and cultural assets did patrons have? How did participants focus their inquiry? For instance, were there questions that went beyond "how do I do ____" and expanded into those related to control, power and assumptions? If so then this might be a dimension of critical pedagogy. See this as a chance to think about this program in terms of its meaning to participants, and its meaning more generally in your community or our society.

3. What individual **perspectives or behaviors** did patrons display? Were they persistent, focused, patient, fearful or curious? Give examples. How might this relate to motivation?

What seemed to determine confidence? How were ideas shared, remixed and given attribution? The way participants interact with one another and reflect emotions may play a key part in impacting how they learn and what they get out of activities. We often focus a lot on digital literacies just within the realm of 'what users are doing on the screen when we should be thinking about their whole process of interacting with the devices and people involved.

4. What are your **measurable outcomes**? How many attended and did you take pictures? What did patrons design or create? Is there multimedia or expression that can be shared or compared? Did they come in asking different questions than they left asking? Did they have a next project or next step in mind? Are they able to learn on their own or teach others? How do you know? Does this program contribute to civic participation or social good? Do patrons know that? If it's not the first program in a series, have patrons begun to change the questions they're asking?

Clearly this is a whole lot to consider for a given program or event. What I'd suggest, is to pick just a single category or one or two questions from each and use those to create a preliminary metric. The choice of questions and evaluative focus will certainly be determined by the goals and agendas of the library, but also will certainly be influenced by what fits the event, instructor and participants. Start by trying to fill it out yourself and then think about ways to build it into data collection, like observations, surveys, computer log analysis or casual exit interviews. Make sure patrons are aware of your evaluation efforts and invite them to include their voice if they feel it should be. Most important: collect feedback in stages and regularly, so you can learn to do it better over time.