THE DESIGN, DEVELOPMENT, AND DEPLOYMENT OF THE NATIONAL LIBRARY SERVICE'S DIGITAL TALKING BOOK PROGRAM AS A SOCIO-TECHNICAL PROCESS

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ABSTRACT

The Digital Talking Books Program was developed between the 1990s and the 2000s to replace the Analog Cassette format, which had been developed during the 1960s to allow people with disabilities to access reading material. The Digital Talking Books Program was built around flash memory technology. The reasons for which the National Library Service for the Blind Print Disabled (NLS) supported their decision to employ this technology were as follows: (1) at that time, the flash memory technology was considered "state of the art"; (2) the format was sufficiently durable to be mailed via the United States Postal Service. This study examines the design, development, and deployment of this technology as a social-technical process. It will further explore NLS's Digital Talking Book Program and Digital Talking Book Player's development and implementation processes based on three perspectives. The first is the **Patron's perspectives**, and the second is that of the **Technology/artifact perspectives** (Digital Talking Book Program, Digital Talking Book Player, and Adaptive/Assistive Technologies). The third is constituted by the **Policy perspectives** (stakeholders, laws, and regulations: On the local, state, and federal levels, international treaties, NLS's policies, and congressional oversight). This dissertation will examine how these three perspectives interact to create and influence policy using social informatics as a theoretical framework. Additionally, these interactions are influenced by stakeholders who were involved throughout the decision making process; all these factors guided the planning and execution of the current program and the Digital Taking Book Player's design and will impact the plans for a new Digital Talking Book Program and future designs for a new Digital Talking Book Player. This inquiry utilizes qualitative case study methods by analyzing documents using NIVO 10, which as a Computer-Assisted Qualitative Software Program (CAQDAS) that was used to examine NLS and the

Digital Talking Book Program. This dissertation will apply the three perspectives to argue that the design, deployment, and deployment of NLS's Digital Talking Book Program is a social-technical process.

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LIST OF ABBREVIATIONS

Advisory and Outreach Centers	AOCs
American Council for the Blind	ACB
American Federation for the Blind	AFB
American Library Association	ALA
American Printing House for the Blind	APH
American National Standards Institutes	ANSI
American with Disabilities Act	ADA
Association of Specialized and Cooperative Library Agencies	ASCLA
Assistive/Adaptive Technology	AT
Blinded Veterans Association	BVA
Braille and Audio Reading Download System	BARD
Braille and Talking Book Library	BTBL
British National Bibliography	BNB
Canadian National Institute for the Blind	CNIB
Cassette Book Machine	CBM
Chief Officers of State Library Agencies	COSLA
Children's Internet Protection Act	CIPA
Commercial Off-The-Shelf	COTS
Computer and Internet Use Supplement	CIUS
Computer-Assisted Qualitative Software Programs	CAQDAS
Current Population Survey	CPS
Digital Accessible Information System	DAISY
Digital Book Machine	DBM
Digital Talking Book Machine	DTBM
Digital Talking Book Player	DTBP
Digital Talking Book Program	DTBP
Duplication On Demand	DoD
Federal Communications Communication	FCC
Frequent Asked Questions	FAQ
Government Accountability Office	GAO
Hawaiian Library Association	HLA

Information and Communication Technologies	ICTs
Information System	IS
International Convention on Economic, Social, and Cultural Rights	ICESCR
International Convent on Civil and Political Rights	ICCPR
International Federation of Library Associations and Institutions	IFLA
Library Services and Technology Act	LSTA
Libraries for Blind and Physically Handicapped	LBPH
Libraries for Blind and Print Disabled	LBPD
Library of Congress	LOC
Marrakesh Treaty to Facilitate Access to Published Works for Persons Who Are Blind, Visually Impaired or Otherwise Print Disabled	Marrakesh Treaty
National Library Service	NLS
National Library Service for the Blind and Physically Handicapped	NLS/BPH
National Federation for the Blind	NFB
National Information Standards Organization	NISO
National Telecommunications and Information Administration	NTIA
Norwegian Library for the Impaired	NLB
Non-Government Organizations	NGOs
Optical Character Recognition	OCR
Public Access Technologies	PATs
Royal National Institute for the Blind of the United Kingdom	RNIB
Social Shaping of Technology	SST
Social Informatics	SI
Special Library Association	SLA
Swedish Agency for Accessible Media	MTM
Swedish Library of Talking Books and Braille	TPB
Telecommunications Device for the Deaf	TDD
Universal Declaration on Human Rights	UDHR
United Nations Educational, Scientific, and Cultural Organization	UNESCO
United Nations Convention on the Rights of Persons with Disabilities	UNCRPD
United States Code	U.S.C.
United States Postal Service	USPS

Works Progress Administration	WPA
World Blind Union	WBU
World Intellectual Property Organization	WIPO

CHAPTER 1

INTRODUCTION

1.1 Introduction

There has been limited research regarding the National Library Service for the Blind and Print Disabled (NLS). Recent studies by Bonnici and colleagues (2009, 2015) surveyed NLS librarians concerning their patrons, services, technologies, career opportunities, and training in working with disabled populations and the technology that NLS employed. These surveys asked librarians very few questions concerning the technologies that NLS uses to serve their patrons. Studying these technologies is extremely important because NLS serves approximately 500,000 individual readers through more than 850,000 reader accounts. Very few studies have been conducted on the subject (Office of the Chief Financial Officer, 2017, p. 145). Compared to the tremendous size of the NLS patron population, few studies have built on Bonnici and colleagues' groundbreaking work (Rose, 2018a).

I have over six years of experience working as a Reader Advisor at the Michigan Braille and Talking Book Library in Lansing, Michigan. While working as Reader Advisor and watching the first distribution of Digital Talking Book Players to veterans and patrons whose ages were over 100 years, I was encouraged to study how older patrons would accept this new technology.

I read important studies in this area (Bonnici, Maatta, & Wells, 2009; Nelson, 2003) while working as a Reader Advisor that influenced my research and showed me research in how older adults with disabilities were using NLS's technology was possible. As I was applying to the CIS program, I viewed and read this dissertation on the CIS website, which influenced me to apply to the program: Hachiya, K. (2011). *Older Japanese adults and mobile phones: An applied ethnographic study.* I originally planned to study why older adults who are patrons of NLS were resisting or reluctant to use the new Digital Talking Book technology, using the Technology Acceptance Model as my theoretical foundation.

By the end of my second year of the CIS program, I realized that it would be hard for me to do this type of study. I decided to research how older patrons were using the Digital Talking Book Machine. However, trying to do this research as a publishable paper or as a dissertation was outside of my resources. When I attended Dr. Rich Gazan's CIS 704 class and Dr. Wayne

Buente COM 633 class, I discovered another way to obtain the patron's views about using the Digital Talking Book Program and Player. By asking NLS Librarians their opinions about the Digital Book Machine (DBM) and their viewpoints about their patron's use of this technology, I based a lot of the questionnaire that I used for my survey around the Bonnici et al. (2009) paper. Still, I noticed that she did not focus on NLS's technologies and how they affected patrons based on NLS Librarians' experiences and opinions. I decided to use social informatics as my theoretical foundation because, for me, it was the best way to study how patrons, NLS librarians, network libraries, and other stakeholders have influenced how the technology was designed, developed, and deployed

In 2018, I was hired as a Librarian IV, as the Head of the Public Services Section Division for the Hawaii State Public Library System's Library for the Blind and Print Disabled in Waikiki. The NLS/LBPD libraries are funded at the national level. The delivery of services is decided at the state level; each state administers the service to fit its population's needs, and the service structure varies between states (Bonnici et al., 2009: 516). States with large populations and large counties may have several service points, such as Subregional Libraries or Advisory Outreach Centers within their system. The smaller states with concentrated populations may have one service point or a regional library providing services to the entire state (Bonnici et al., 2009: 516, Network Service, 2011).

Both libraries have their similarities: both libraries are Regional Libraries, which run the service to fit their state's needs. For example, each library is part of state government and administers Subregional Libraries or Advisory Outreach Centers (AOCs) within their state or region. Hawaii has one subregional (which is located in Guam), and Michigan has 10 AOCs. Their differences are the Hawaii Library for the Blind and Print Disabled is one of the 53 branches of the Hawaii State Public Library System; the library system is an agency within Hawaii's Department of Education (Hawaii Public Library System, 2021). The Michigan Braille and Talking Book Library is an agency within the Bureau of Services for Blind Persons. The bureau is within the Labor and Economic Opportunity (LEO), a department for the State of Michigan (State of Michigam, 2021). The number of patrons both LBPD serve to reflect the size of their state's population. Hawaii's population is 1,415,572 based on 2019 United States Census Data (Bureau, 2021). The number of patrons Hawaii LBPD serves is as of March 1st, 2021 813[1];

[1] Data from NLS'NLDB database

Michigan's population is 9,956,852 based on 2019 United States Census Data. The number of patron's Michigan LBPD helps is as of March 1st, 2021 9,5056[2]. My publishable paper focused on surveying NLS Librarians to see if the DBM was meeting both their expectations. This dissertation takes the research to the next step by looking at NLS nationally. However, I researched NLS from a local point of view. Using my experiences as Head of the Public Services Section for the Hawaii State Public Library System Library for Blind and Print Disabled, and my experiences as a Reader Advisor for the Michigan Braille and Talking Book Library, I show how NLS policies, procedures, regulation, services, and technologies affect patrons on the local level.

By examining how this agency plans, designs, builds, and implements these technologies, this research project is critical for the agency's stakeholders (librarians, library staff, NLS's management, patrons, disability advocacy groups, the United States Congress, Library of Congress, state and local governments) who all play a role in the process. Apart from the stakeholders, several additional factors affect the process: economic, legal, organizational, political, social, technical, and even international human rights-related concerns.

This dissertation argues that researchers need to consider these factors and stakeholders when examining the development process of information and communication technology (ICT) because they are all interconnected. "The design, development, and use of an ICT are contextualized and socially-situated. The social and historical contexts pervade every element of an ICT from conceptualization to design to implementation and use" (Sawyer & Tyworth, 2006, p. 52). The social context, in this case, should be investigated from a perspective that incorporates all stakeholders and other factors. Kling, Rosenbaum, & Sawyer (2005) assert that researchers must examine how human and social factors influence society's use of ICTs (2005, p. 53). For instance, particular ICT users may employ the device's features or the device itself beyond the designers originally envisioned in its usage. An example of this is provided by how people with disabilities are adopting newer technology, such as Android phones, e-readers, iPads, iPhones, laptops, notebook computers, personal computers, smartphones, and tablet computers as adaptive and assistive technologies that allow them to have or maintain a quality of life that could have been difficult without these devices. People with disabilities enjoy using these consumer electronics, because they are widely adopted in society, and it allows them a

[2] Data from Scott Norris, Manager of Michigan BTBL

sense of belonging or identification.

A sighted person uses their smartphone for a variety of personal and professional reasons: making calls, texting, email, browsing the Internet, listening to sports-related broadcasts, music, podcasts, watching and streaming videos, online banking, shopping (for goods and services), paying bills, navigation, obtaining information, gaming, reading, and accessing government or social services (paying taxes, social security), among other things. A visually impaired person uses their smartphone for similar tasks and routines; however, they may have to use the accessibility features on their phones: text to speech, text enlargement options, or applications that will allow them a measure of independence in their daily lives.

People with disabilities, disability advocates, and disability researchers assert that the use of ICTs allow the disabled to live their lives with a degree of freedom and minimum assistance from their families and caregivers. It can further help them to improve their quality of life. This includes disabled individuals' ability to enjoy and pursue the same careers, hobbies, pleasures, and education that people with no disabilities pursue and enjoy, or they may wish to continue doing the activities they could perform before their disability.

This dissertation will focus on how people with disabilities, especially individuals who are unable to read standard print or have print-related disabilities, use Digital Talking Books to satisfy their need for information. Additionally, they use Digital Talking Books for similar reasons for which people with normal sight use printed materials: business development, business opportunities, career opportunities, education, health information, hobbies, job training, leisure reading, personal enrichment, travel, and professional development.

Maatta and Bonnici (2014) defined **print disabilities** as provided here:

> An individual with print disabilities cannot effectively read print because of visual, physical, perceptual, developmental, cognitive, or learning disability. Individuals with severe print disabilities are unable to successfully access or navigate books or documents and other materials in a print format (physical or digital) without some form of assistance, whether technological or personal, while those with mild-to-moderate print disabilities may need modifications or adaptations to successfully use print (Maatta, Bonnici, & Chen, 2014, p. 497).

The International Federation of Library Associations and Institutions (IFLA) and the United Nations Educational, Scientific, and Cultural Organization (UNESCO) agree that this is a great problem. IFLA estimates that there are 285 million blind and partially sighted people in

the world; this includes 21 million people who reside in the United States, while this number does not include millions with print disabilities due to physical impairments or organic reading impairments such as dyslexia. This implies that millions cannot read a book, magazine, or website, and less than 5% of all published material is accessible to people with visual impairments and less than 20% of websites are accessible for the print-disabled (Marlin, 2014, pp. 21–22). NLS's mission can be perceived as the United States' attempt to help resolve the global problem of providing reading material in accessible formats for printing disabled individuals.

This dissertation gives advocates, researchers, and people with the accessibility/disability community an insight into how NLS developed policies, services, and technologies that were designed for that community.

This study informs the accessibility/disability community about how NLS's policies, services, and technologies will impact their community. This year and over the next two to five years, NLS plans and implements new policies, services, and technologies. For example, how will the new patron eligibility requirements and the expansion of medical and health professionals who are now allowed to certify a patron's eligibility to use the service will impact the community? The second example of these changes is NLS's plan to have patrons use their own devices to access NLS services, which will affect the accessibility/disability community's use of NLS's services. These changes will influence the relationship between the accessibility/disability community and NLS for years to come.

1.2 Why Should Researchers Study the National Library Service for the Blind and the Print Disabled?

One reason for studying NLS's Digital Talking Book Program is to investigate in what manner this technology affects our society. As the size of the aging population increases, there is an increasing need for technology that can allow those who have become disabled to maintain the same quality of life and follow the same pursuits and occupations as before.

1.2 (a) There is a Lack of Research on NLS and Current Research in the Field is Dated

A second reason for the examination of the design, development, and application of NLS's Digital Talking Books is a lack of research and literature on both the NLS's Digital Talking Book Program and the NLS's Digital Talking Book Player. There is a necessity to research concerning this technology since its use by NLS's patrons has influenced NLS Libraries

services to their patrons. This technology influences ways in which NLS and its libraries conduct their day-to-day operations and how this technology effects NLS's development and design of future technologies that will be employed to serve its patrons.

Additionally, this dissertation is contributing to the literature in the field, apart from the work of Bonnici and colleagues (2009, 2015) and Rose (2018a). The existing research in this area has become dated and further research concerning NLS is required.

1.2 (b) Studying the Process NLS Employed to Determine the Type of Digital Medium and Digital Format for the Digital Talking Book Program

The third aim for this study is to examine the planning, design, and implementation process for the Digital Talking Book Program by investigating how NLS determined the type of digital medium and digital format for the Digital Talking Book Program. NLS was compelled in the 1990s to examine the analog recording and playback technology it was currently using, because the analog cassette format, which was developed in the 1970s, was becoming obsolete (Cylke, Moodie, & Fistick, 2007; National Library Service for the Blind and Physically Handicapped, 2006). Especially with the introduction of digital recording technologies in the 1980s and the widespread use of formats such as compact disc or CD ROM, flash drive, and magnetic drive technology, this issue becomes more concerning

In 2003, NLS decided to replace its analog cassette books and Cassettes Book Machines (CBM) with the Digital Talking Book Cartridges and the Digital Talking Book Player (DTBP, built around flash memory technology). The Digital Talking Book Program was introduced to NLS's patron population in 2009 (Library of Congress, 2008, p. 150). NLS had to replace this technology because the maintenance of CBMs had become increasingly problematic since suppliers who produced the CBM components charged the NLS higher prices because either the firms did not produce the components anymore, or the CBMs were no longer being manufactured. Additionally, there were limited suppliers of analog audio cassettes.

The consumer market had already progressed to digital technology. For NLS libraries, it had to become increasingly difficult to maintain the CBMs, because the volunteers who performed the repairs on the CBMs at the local NLS libraries were former Bell Telephone repair persons who had retired from the telecommunications industry (National Library Service for the Blind and Physically Handicapped, 2003). The problem the libraries faced with the volunteers were numerous: some volunteers became physically unable to perform the repair work, or they

decided to pursue other hobbies, some moved away from the NLS library they volunteered at; others passed away.

NLS's patrons were aware of consumer electronics (CD Players, DVD players, mp3 players, among others). The increasing availability of third party assistive and adaptive technologies raised patrons' expectations that NLS would eventually create a digital player similar to consumer electronics and encourage third-party assistive and adaptive technologies to be available in the marketplace.

1.2 (c) Discussion of the Legal, Political, and Human Rights' Influence on NLS's Decision-Making Process

The fourth aim of this dissertation is to discuss the effects of legal, political, and human rights on NLS's decisions regarding ways to provide this technology to its patrons. (1) NLS is an agency authorized by the Congress under 2 U.S.C. 135a–135b (Pratt-Smoot Act) to provide free library services to its clients across all 50 states, United States territories, the District of Columbia, and all U. S. citizens residing abroad (Library of Congress, 2008, p. 147). (2) To use this service, individuals who could not use standard printed materials due to temporary or permanent visual or physical limitations needed to apply for the service (National Library Service for the Blind and Physically Handicapped, 2012). (3) When NLS made decisions regarding its technology, the agency had to justify its decisions not only to its parent agency, the Library of Congress (LC), but it was also held accountable for its decisions to the U.S. Congress because LC/NLS requested Congress to appropriate money for the Digital Talking Book Program.

The Marrakesh Treaty to Facilitate Access to Published Works for Persons Who Are Blind, Visually Impaired or Otherwise Print Disabled was ratified by the U.S. Senate on June 28, 2018, the U.S. Congress during 2018 and 2019 passed two pieces of legislation to implement the treaty: Library of Congress Technical Corrections Act of 2019 and the Marrakesh Treaty Implementation Act. The NLS implementation of the treaty has affected the patron eligibility criteria, which allow people with reading disabilities to apply for NLS services without a Doctor's certification (Keninger, 2020). Under the treaty's provisions and under the statutory authority of the two statues, the treaty's provisions broaden the criteria for people with disabilities who can use alternative formats provided by NLS and other "authorized entities" (Ex:

Book Share and *Learn Ally*) to those who have print disabilities, under section 121 of the Marrakesh Treaty Implementation Act.

> The MTIA reinforces section 121's mission and changes some of its key terms and definitions to comply with the text of the Marrakesh Treaty. For example, the term "blind or other persons with disabilities" is now "eligible persons," which is then defined as someone who is blind, has a perceptual or reading disability, or has a physical disability affecting their ability to read (Temple, 2018).

As a result of the U.S ratification of the Marrakesh Treaty, NLS in October 2019, has changed the name of the service to **National Library Service for the Blind and Print Disabled.** NLS Director Karen Keninger said. "We also heard from members of the public through emails, in-person interactions at events and channels such as Facebook. In keeping with the strategic plan of the Library of Congress and our alignment to its goals, our new name is patron-centric. As with all of our work, it puts the emphasis on the people we serve. It picks up on the language used in the Marrakesh Treaty, which refers to 'persons who are blind, visually impaired, or otherwise print disabled.' And it removes a word, 'handicapped', that has become dated and that some find offensive" (National Library Service for the Blind and Print Disabled, 2019e).

Before the Marrakesh Treaty was negotiated and signed by the contracting parties in 2013, there were several United Nation's (UN) treaties and conventions that had to be considered in formulating policies relating to people with disabilities: the Universal Declaration of Human Rights (UDHR), the International Convent on Civil and Political Rights (ICCPR), the International Covenant on Economic, Social and Cultural Rights (ICESCR), UN Convention on the Rights of the Child, and most recently, the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD) (Cox, 2012; A. Rekas, 2013; A. P. Rekas, 2013; Shaver, 2015; Temple, 2018). These UN treaties and conventions form the basis for the "Right to Read". This "Right to Read" obligates the state to allow its citizens the right to produce printed materials, disseminate printed materials, and read printed materials regardless of the subject. The government should encourage the publication and the dissemination of these materials. The state should not censor these materials, and under the UNCRPD, the state must publish and distribute information in alternative formats to make them accessible for people with disabilities.

1.2 (d) The Print Disabled's Right to Information based on the Right to Read as an International Human Right

The political context has affected the availability of print materials in accessible and alternative formats for the print disabled. As I discussed in the previous paragraph the access to knowledge through the written word is a fundamental human right because "the ability to access the written word is essential to the realization of many human rights. It provides the foundation for the right to political involvement, freedom of expression, the right to education and the right to access culture and take advantage of scientific progress" (Rekas, 2013, p. 383). Shaver argues that:

> …The right to read is better understood as a more specific application or interpretation of broader rights already recognized in international human rights law. These more generic human rights include freedom of expression, the right to education, minority rights, the right to science and culture, and children's media rights (Shaver, 2015, p. 5).
> Cox, Rekas, and Shaver assert that these rights were articulated by the Universal Declaration of Human Rights, reaffirmed repeatedly through various United Nation's treaties and conventions (Cox, 2012; Rekas, 2013a; Rekas, 2013b; Shaver, 2015).

UDHR holds no legal force but is implemented through treaties, such as the International Convent on Civil and Political Rights and the International Covenant on Economic, Social and Cultural Rights, UN Convention on the Rights of the Child, and most recently, the United Nations Convention on the Rights of Persons with Disabilities.

Rekas states that "Within the penumbra of all these rights is an implied right to read, for none of them, are fully possible without the ability to access the written word" (2013a, p. 47). Shaver further suggests that the Right to Read does not form an additional right to the list of rights recognized in the Universal Declaration of Human Rights, "Instead, the right to read can be justified as an application or extension of these well-established human rights" (2015, p. 10). Shaver further argues that the Right to Read is an extension or application of the following rights: freedom of expression, the right to education, children's media rights, minority rights, the right to science, and the right to culture (p. 11). Shaver further contends that when "…placing the right to read in the proper context. The Right to Read is best understood as a specification of broader human rights principles enshrined in the UDHR and later binding covenants" (p. 11). Rekas and Shaver both contend that even though the Right to Read was not written down in a major human rights document, the Right to Read is implicit. Shaver argues that this right lies at the juncture of these rights (p. 25).

Shaver maintains that with the exploration of these rights as the foundation of the Right to Read and further specification of its ideas, researchers and scholars can clarify the extent of the state's duties as entailed by this right (Shaver, 2015, p. 25).

> The right to read is best understood in terms of three dimensions: *liberty* (the freedom to read and write), *capacity* (the ability to read and write), and *availabilit*y (effective access to reading materials and platforms for communicating with others through writing). Although the *liberty* and *capacity* dimensions of the right are widely recognized and respected-both normatively and in practice-the *availability,* dimension remains today as the greatest barrier to wider enjoyment of the right to read (Shaver, 2015, p. 25).

The author contends that the *liberty* dimension implies that the government must not censor the publications and websites its citizens want to read or visit and that the state must provide or at least allow the publication of printed materials in minority languages (Shaver, 2015, p. 26).

Shaver asserts that the right to education under the UDHR, the Convention on the Rights of the Child, and the International Covenant on Economic, Social, and Cultural Rights signifies that the government must provide universal education to it its children. However, it should not interfere with the private education of children (Shaver, 2015, pp. 13–14). Even though this right is "Not necessary for basic human survival, it is an essential enabler of a wide range of other human rights" (Rekas, 2013a, p. 47; Shaver, 2015, pp. 13–16). Shaver claims that under the UDHR, the Convention on the Rights of the Child, and the International Covenant on Economic, Social and Cultural Right, for example, the state must provide textbooks for children's education. Further, the state must enable and encourage the production of children's literature, necessary for both their education and cultural growth.

Cox (2012), Harpur and Suzor (2104), Rekas (2013a), Rekas (2013b), and Sganga (2015) contend that the access to knowledge and the right to culture for people with print disabilities can be found in the International Covenant on Economic, Social and Cultural Rights. The ICESCR's Article 15 recognizes that access to culture is a fundamental human right. The United Nations Convention on the Rights of Persons with Disabilities Articles: 4(2), 21, 24, 30, 30(3) 32(1) list the legal obligations under the UNCRPD for all state parties who have signed and ratified the treaty and are required to take all legislative, legal, and administrative steps to implement the rights recognized under the treaty (Cox, 2012; Harpur & Suzor, 2014; Rekas, 2013a; Rekas, 2013b; Sganga, 2015).

However, the problem with these treaties is trying to solve the problem of access by providing people with print disabilities access to materials in alternative formats, however, it is the problem of how to provide the print disabled with the materials that they need. The lack of printed materials in alternative formats for people with print disabilities has created a "Book Famine" which is " a term coined by the World Blind Union to draw attention to the fact that less than 5% of books published annually are accessible to print-disabled individuals" (Marlin, 2014, p. 21). The World Intellectual Property Organization (WIPO), the United Nations Copyright agency, drafted and approved the treaty on June 28, 2013. Under the treaties provisions 20 contracting parties or countries, which had signed the treaty, had to ratify the treaty so that the treaty can become legally binding. The 20th country, Canada, had acceded to the treaty in June 2016. The treaty became legally binding to all countries that ratified the treaty on September 30th, 2016 (World Intellectual Property Organization, 2016).

> The treaty was adopted in Marrakesh, Morocco, on June 27, 2013, by several member-states of WIPO, but worldwide ratification has taken years. The United States, for example, signed on as a contracting party in October 2013, in order to ratify the treaty, Congress first had to evaluate the implications for existing U.S. laws. Also, the Senate is required to provide advice and consent prior to the United States joining any treaty (Abbott, 2019, p. 32).

In a culmination of these efforts, senators Chuck Grassley (R-IA), Bob Corker (R-TN), Dianne Feinstein (D-CA), Bob Menendez (D-NJ), Kamala Harris (D-CA), Orrin Hatch (R-UT), and Patrick Leahy (D-VT) last March (2018) introduced the bipartisan Marrakesh Treaty Implementation Act (MTIA) to Congress.

"That is what [MTIA] does, it revises the Copyright Act to meet the terms of the Marrakesh Treaty," explains a Frequent Asked Questions (FAQ) recently posted by the U.S. Copyright Office.

> This legislative process took five years partly because legislation, in general, tends to move slowly, and also because Congress consulted with various stakeholders, including those representing the blind communities, the publishing sector, and the library communities, on the proposed legislative language (Abbott, 2019, p. 32).

"Following passage in the House and passage by unanimous consent in the Senate, President Donald Trump signed MTIA into law last October 2018 and signed the treaty ratification papers in January (2019). The papers were then deposited with WIPO, and the treaty was scheduled to go into effect here this month (May 2019)" (Abbott, 2019, p. 32).

NLS had initiated several policy decisions to implement the provisions of the treaty and the MITA: NLS will exchange materials only in the digital format and NLS will not share hard

copy Braille materials, the Digital Talking Book Cartridges, and the Digital Talking Book Machines. NLS will not grant access to Braille and Audio Reading Download system (BARD) to groups who provide resources to the print disabled in other countries that have signed the treaty, NLS will share materials that it has recorded in its studio or recorded by NLS contractors, however, it will not share commercial books unless the publishers' grants permission and NLS will not accept request direct requests from individuals who are not U.S. citizens, but refer them to organizations that serve the print disabled in countries that have signed the treaty (National Library Service for the Blind and Print Disabled, 2019d). In addition, due to the treaty's language and the two laws that implement the treaty, NLS is currently modifying its criteria for people who are eligible to use the service to include people with reading disabilities. NLS is removing the need for a medical certification by a doctor for people reading disabilities to be certified to use the service (Keninger, 2020; National Library Service for the Blind and Print Disabled, 2019c, 2020a).

1.3 Statement of Purpose

This dissertation explores the process of development and implementation of NLS's Digital Talking Book Program and Digital Talking Book Player based on three perspectives. The three perspectives are the **User's perspective** (patrons, from this point forward users will be referred to as patrons), the **Technology/artifact perspective** (Digital Talking Book Program, Digital Talking Book Player, and Adaptive/Assistive Technologies) and the **Policy perspective**. The **Policy perspective** studies the Digital Talking Book Program and the Digital Talking Book Player from the stakeholders point of view: Advocacy Groups for people with disabilities, such as The American Council for the Blind and National Federation for the Blind; Legislative stakeholders on the Federal Level: NLS Staff, Library of Congress, U.S Congress, Government Accountability Office (GAO); finally on the local level NLS Librarians, Network Libraries (including their Staffs and Volunteers) and the Library Administering agencies on the local and state levels the Chief Officers of State Library Agencies (COSLA). This **Policy perspective** study federal statutes, regulations, NLS policies, and the Marrakesh Treaty to Facilitate Access to Published Works for Persons Who Are Blind, Visually Impaired or Otherwise Print-Disabled (Marrakesh Treaty) and how these stakeholders, laws, regulation, and polices have impacted the Digital Talking Book Program planning process and the factors that will influence how NLS is planning the future of the program

1.4 Research Questions

This study investigates the ways these three perspectives interact to affect NLS's Digital Talking Book Program and Digital Talking Book Player's development and deployment processes. A descriptive case study methodology will be employed to analyze the process. The research questions that guide the study are as follows:

1.4 (A) Research Questions that will examine the Patron's Perspectives

(1) What are the differences between the patrons' perceptions of and use of assistive/adaptive technologies and NLS librarians' perceptions of their patrons' use of assistive/adaptive technologies?

(1a) What are NLS Librarians' views on their use of these technologies by patrons?

(2) Is NLS fulfilling its mission statement, "That All May Read" and the Right to Read by using the Digital Talking Book Program and Digital Talking Book Player to serve NLS's patrons?

(2a) Is NLS fulfilling its mission statement and the Right to Read by using NLS's services and local NLS/LBPD libraries to serve NLS's patrons?

1.4 (B) Research Questions that will examine the Technology/Artifact Perspectives

(3) The Digital Talking Book Player has been in service for NLS since it was distributed to its patrons in 2009. NLS is planning to replace the current player.

(3a) What are the features and options that patrons and NLS Librarians would like to see in the new player?

(3b) What is the influence other stakeholders had on the planning process (Advocacy groups, Assistive Technology Companies; General Accountable Office, Library of Congress, the U.S. Congress, etc.).

(4) How has the use of third-party assistive/adaptive technologies, the use of consumer devices (i.e., e-readers, smartphones, portable computers, and tablet computers); the use of broadband, and wireless Internet services affected the Digital Talking Book Program?

(4a) How have these technologies impacted the patron's use of BARD?

1.4 (C) Research Questions that will examine the Policy Perspective

(5) Stakeholders have argued that NLS needs to broaden its patron eligibility criteria and allow people with reading disabilities, such as dyslexia/ reading and writing difficulties to use the service: how will this inclusion affect NLS?

(6) Do stakeholders believe that NLS and its network libraries fulfil its mission statement and the right to read utilizing its current technology and services?

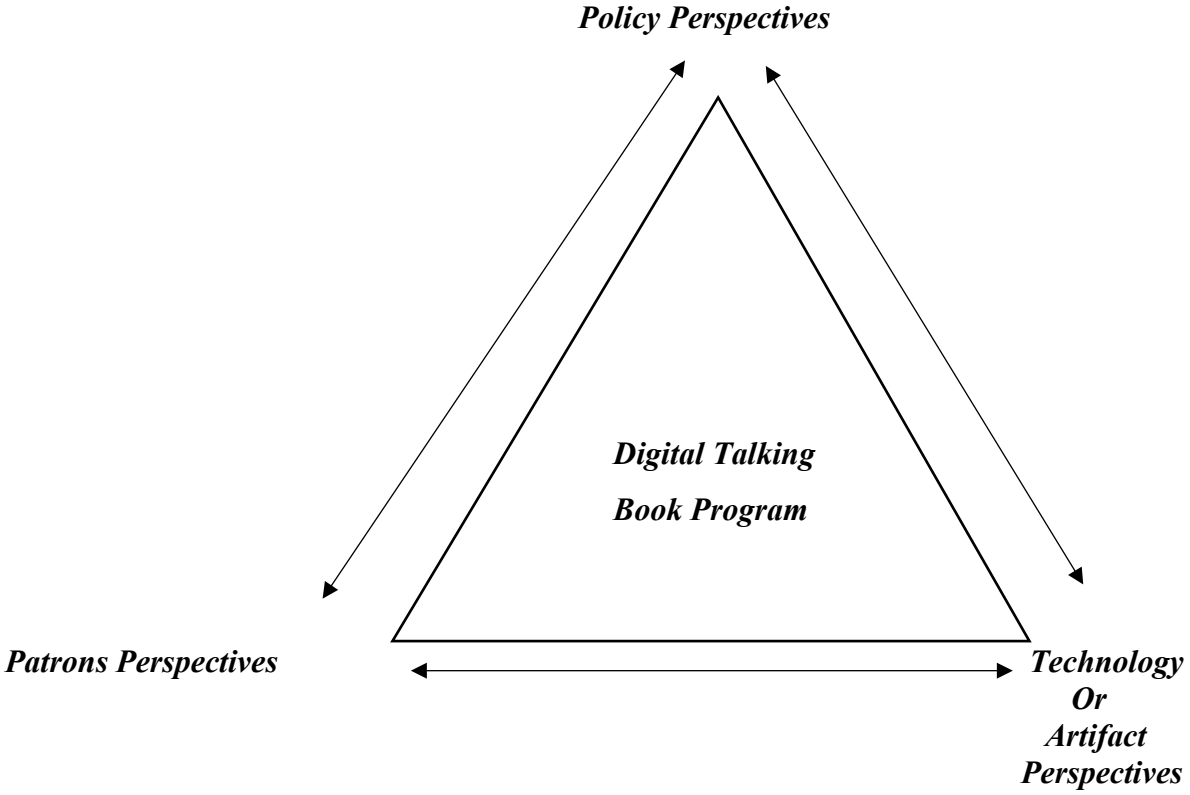

Figure 1.

Diagram of the Three Perspectives

1.5 Terms

The term users will now refer to patrons. Throughout this study, numerous terms have been defined where appropriate.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The first goal of this dissertation is to explore the factors that affect how people with print disabilities access information, specify print materials, and how NLS assists individuals with print-related disabilities in using printed materials. This study will explore just how social contexts can influence by what method people with print disabilities access printed materials. These factors include economic, human, legal, organizational, political, social, and technical factors. Librarians who are opting for using assistive and adaptive technologies for their print-disabled patrons should understand the complex multi-facet nature of this issue. Librarians' decisions to use assistive and adaptive technologies are being guided by their perceptions regarding their print-disabled patrons' information requirements and wants. These perceptions are further influenced by the kinds of disabilities their patrons have. Even though a considerable amount of assistive and adaptive technologies focused on people with visual impairments, these technologies need to be sufficiently versatile to allow their use by people with cognitive, physical, organic, reading, and writing disabilities. The print-disabled utilize these technologies, especially reading assistive technology to access printed information.

This dissertation will explore the means by, which social contexts have influenced the approaches used to help people with print disabilities access printed materials. These factors will be studied using the 3 perspectives: **Patrons' perspective, Policy perspective,** and **Technology/Artifact perspective**. The 6 Research Questions are based on the 3 perspectives. The 51 documents gathered from various sources will be used to answer the Questions. ***RQ1*** through ***RQ2*** will study the **Patrons' perspectives**. ***RQ1*** and ***RQ1 (a)*** will study patron and NLS Librarians' views about patrons' use of Adaptive/Assistive Technologies. ***RQ2*** will study if NLS is fulfilling its mission statement, and the Right to Read by using the Digital Talking Book Program and Digital Talking Book Player to serve NLS's patrons. ***RQ2(a)*** will study if NLS is fulfilling its mission statement and the Right to Read by using NLS's services and local NLS/LBPD libraries to serve NLS's patrons?

The second goal of this dissertation is to explore how the social context influences NLS's decisions about the planning, designing, and implementation of the Digital Talking Book Program and Digital Talking Book Player that are used by people with print disabilities to listen to digital audiobooks based on their reading interests. The various stakeholders were involved throughout the process, which include Patrons, NLS staff, NLS/BPH librarians, NLS/BPH library staff (including their volunteers), the United States Congress, the GAO, Advocacy groups for people with disabilities: American Council for The Blind, the Blinded Veterans Association (BVA) and the National Federation for the Blind, caregivers and families were another set of stakeholders. Tinally, the remaining stakeholders were Library Administering agencies on the local and state level and the Chief Officers of State Library Agencies (COSLA) (Keninger, 2015, p. 1; National Library Service for the Blind and Physically Handicapped, 2006, p. 7).

This topic will be explored under the **Technical/Artifact** perspective, which involves ***RQ3*** and ***RQ4***. The stakeholders' interaction and involvement in the process will be studied under ***RQ (3a) & (3b)***, ***(3a)*** will explore what features and options patrons' and NLS Librarians wanted to see in the new player. ***(3b.)*** will explore the influence of other stakeholders had on the planning process by examining the 51 documents to see what these stakeholders have written or said concerning this process. The stakeholders include Advocacy groups, Assistive Technology Companies, General Accountable Office, the Library of Congress, and the U.S. Congress. **RQ4** examines how the use of third-party assistive/adaptive technologies, the use of consumer devices (i.e., e-readers, smartphones, portable computers, and tablet computers); the use of broadband, and wireless Internet services affected the Digital Talking Book Program? **RQ (4a**) examines how have these technologies can impact the patrons' use of BARD.

The third objective of the dissertation is to broaden the scope of inquiry beyond what was discussed in the research paper and examine how the wider social perspectives influence NLS libraries and librarians' decisions regarding the availing of the print-disabled patrons' access to knowledge. This subject will be explored under the **Policy perspective** using ***RQ 5*** and ***RQ 6*** to study this perspective**.** ***RQ5*** will study how stakeholders argued for NLS needs to broaden its patron eligibility criteria and allow people with reading disabilities, such as dyslexia/ reading and writing difficulties to use the service. In what way will the inclusion of these new patrons affect NLS? The changes created by the ratification of the Marrakesh Treaty will have a profound impact on NLS as an organization, on NLS's technology, and NLS's services. ***RQ6*** will study if

stakeholders believe that NLS and its network libraries fulfil its mission statement and the right to read utilizing its current technology and services.

The fourth goal of this study is to apply the case study method to research how the technology developed and the social perspectives that surround the development process. Yin (2004) advocated using the case study approach as an appropriate and comprehensive research method that can be employed to investigate this process.

The fifth goal of this study is to examine 51 documents using NVIVO 10 qualitative software to answer the six Research Questions. This document examination was possible due to the use of Computer-Assisted Qualitative Software Programs (CAQDAS), these software programs are very powerful, which allowed researchers to store documents. I searched the documents based on queries using search terms from the codebook that I created and to generate queries based on using the six ***RQs***. The documents are coded based on these queries; the coded documents were reviewed as to their relevance in answering the six **RQs**.

The sixth goal of this dissertation is to employ social informatics as the theoretical foundation to assert the existence of a relationship between the development, design, and implementation processes related to information and communication technologies and the larger social context in which ICTs exists (Sawyer & Eschenfelder, 2002).

The final goal of this study is to fill the gaps in the research regarding NLS, because earlier studies, before the most recent studies by Bonnici et al. (2009), Bonnici et al. (2015), and have become outdated. There is a necessity for greater current research regarding NLS due to its considerable patron population and with changes that are being created by the new technologies NLS is planning to bring online within the next five years and the addition of new patrons who are print disabled based on reading disabilities who have never used the program. Due to the adoption of the Marrakesh Treaty, the forced changes to patron eligibility requirements and changes in the process to certify a patron's disability by a competent authority, by 2021, will need to studied.

2.2 History of the National Library Service for the Blind and Physically Handicapped

In 1897, the Library of Congress (LC) recognized the need to provide library services to people with visual impairments and LC opened a reading room for these patrons; the room contained 40 braille books, braille typewriters, and other equipment (Cylke et al., 2007, p. 798). In 1904, Congress authorized the free mailing of books for the blind, and in 1912, Congress

appropriated money for LC to hire a professional staff person to serve the visually impaired patrons. The collection grew to 2000 Braille books. In 1925, the reading room that was originally for people with visual impairments was designated as the Library of Congress's Service for the Blind that served 2,400 patrons across the country. The collection had expanded to 13,000 volumes, partially due to a 1913 law that required the American Printing House for the Blind (APH) to deposit a copy of every book for blind children produced by APH using federal funds in the Library of Congress (p. 798). Furthermore, the soldiers injured during World War I created a greater necessity for materials for blind adult readers. Impelled by this increased need, the American Library Association (ALA) requested the American Foundation for the Blind (AFB) to conduct a survey of the facilities in the United States and Canada for use by visually impaired persons. The survey, as completed in 1929, found 60 to 80 libraries that had sections for embossed books, another kind of books used by the visually impaired, which are expensive to produce and difficult to use. Subsequently, the survey discovered fewer than 10,000 active patrons and only 15 libraries that contained full-time dedicated staff (p. 799).

In 1930, AFB, APH, the Braille Institute in Los Angeles, and advocacy groups for persons with visual impairments lobbied the Congress to improve the situation:

> The federal government, they argued, should provide free books for blind people. Legislation sponsored by Representative Ruth Pratt of New York and Senator Reed Smoot of Utah established a coordinated, national library service for blind people and gave the Library of Congress its first funds for the purchase of books for the blind. President Hoover signed the Pratt-Smoot bill into law on March 3, 1931 (p. 799).

In 1932, the AFB began the development of "talking books", and the organization produced:

> A long-playing (33 1/3 rpm) unbreakable phonograph record and a machine on which it could be played. The average book required eight or nine 12-inch records, and the needle on the playback machine had to be changed with each side of a record (p. 799).

In 1935, the first 157 print books were selected for recording as audiobooks for visually impaired readers. The first book that was ordered to celebrate the bicentenary of George Washington's birth was Woodrow Wilson's biography of Washington; the other titles that were chosen were as follows: Chaucer's *Canterbury Tale*s, Carl Sandburg's *Abraham Lincoln: The Prairie Years*, Victor Hugo's *Les Misérables*, and Pearl Buck's *The Good Earth* (p. 799). Since the beginning of the program in the 1930s, free library service and equipment was a part of the program, and future audiobook record players and all successive playback machines have

remained free for use ever since. In the 1930s, LC appointed AFB as an agent to oversee the production and distribution of talking-book record players that were produced by the Works Progress Administration (WPA), which was a New Deal agency created to employ millions of out of work U.S. citizens, during the Great Depression.

> NLS services, originally limited to providing the written word to blind adults, expanded in 1952 to include books for children, in 1962 to provide music materials, and in 1966 to include service to people with other physical impairments that prevent the reading of standard print (Cylke et al., 2007, p. 800).

In 1969, the standard audio cassettes were first distributed to patrons, followed by playback machines, which were introduced in 1971. In June 1978, as a part of a major reorganization at the Library of Congress, the Division for the Blind and Physically Handicapped was restructured and renamed the Library of Congress' National Library Service for the Blind and Physically Handicapped (NLS), the name and abbreviation by which the agency is currently referred (National Library Service for the Blind and Physically Handicapped & The Library of Congress, 1984, p. 156).

In 1981, the first C-1 cassette players (i.e. CBMs) were deployed to patrons, and in 1996, Congress revised the copyright law by adding the Chafee Amendment, which "provides that groups producing specialized formats for the blind no longer have to gain permission from the copyright holder to begin production of nondramatic literary works" (Cylke et al., 2007, p. 800). However, due to the problems caused by the aging analog cassette technology, NLS, in the 1990s began the development of the Digital Talking Book Program (Cylke et al., 2007, p. 803). The agency helped in the development of the draft of the DTB standard (American National Standards Institutes (ANSI)/National Information Standards Organization (NISO) Z39.86–2002), which was adopted in 2002. Further, immediately after the standard was adopted, "NLS began developing a DTB title master collection. Because the development of a digital title master collection did not depend on the audio medium or the delivery method, NLS was able to begin the work even though neither had been selected," the agency began the production of digital audiobooks at their studios, obtaining the required material from contractors such as AFB and APH or acquiring commercially produced audiobooks (p. 803; National Library Service for the Blind and Physically Handicapped, 2006).

In 2003, NLS decided to proceed and implement the Digital Talking Book Program and build the Digital Talking Book Player around flash memory technology, replacing the 40-year old analog cassette books and cassettes book machines (National Library Service for the Blind and Physically Handicapped, 2003, 2012). In 2007, the production of the CBMs ended. The Digital Talking Book Program was introduced to NLS's patron population in 2009 and in April of the same year, NLS's BARD database was implemented that allowed patrons to download books onto a flash drive from a PC or Mac. In 2010, the production of new book titles recorded on analog cassettes and the production of books on cassettes was stopped (National Library Service for the Blind and Physically Handicapped, 2003, 2012). In 2013 and 2015, NLS created applications for smartphones that allow patrons to download books and magazines directly from the BARD database, onto Android phones via the Google Store and into iPhones through iTunes (Office of the Chief Financial Officer, 2017, p. 145). As of the fiscal year 2017–2018, NLS is currently planning "a new digital talking book delivery and playback system, including a new digital talking-book machine and infrastructures required for delivery through custom-duplicated cartridges (duplication on demand) or wireless networks" (Office of the Chief Financial Officer, 2017, p. 145). Duplication on Demand (DoD) is now being deployed with more than half of NLS's network libraries 42 out of 79 are now using some form of Duplication on Demand, NLS name for the system is *Gutenberg*, which is named after the inventor of the printing press (National Library Service for the Blind and Print Disabled, 2020b). The systems allow network libraries like Hawaii Library for the Blind and Print Disabled to mail to patrons a digital book cartridge (*See Picture 1, p.53)*, the cartridges can now contain more than 1 book. For example, if a patron wanted 15 books, they use to receive 15 single book cartridges. A patron receives their 15 books on 1 cartridge and even if that cartridge with the 15 books is lost, another cartridge can be duplicated with the same 15 books. For patrons and caregivers, this means they only need to keep track of a small number of cartridges and these cartridges are customized specifically for the patron.

Network Libraries that are now using DoD are no longer receiving single copies with 1 digital book on the cartridge, the books are being duplicated on to a single cartridge and mailed to patrons. "Since January 1, (2020) NLS has deployed Gutenberg to nine network libraries. David Perrotta, DoD project coordinator, noted that DoD has been particularly advantageous during the pandemic for several reasons. Multiple books per cartridge means that network

libraries can easily load up avid readers with extra books. And with fewer items to handle overall, libraries can get by with fewer people onsite" (National Library Service for the Blind and Print Disabled, 2020b). For a further explanation of Duplication on Demand (*See 5.9 p.157*). The agency plans to employ information gathered from NLS's 2017 in-house research "to complete specifications and develop research for the request proposal for next-generation talking book machine" (Library of Congress, 2018, p. 146).

2.3 Defining the Sociotechnical Process

Social informatics is a theoretical perspective that can be employed to study the entire development process of an ICT. In this case study, social informatics will be applied to investigate how different factors such as economic, ethical, legal, organizational, political, social, and technical impact and shape the development, and consequently, the implementation of the NLS's Digital Talking Book Program. This entire process can be described as a "Sociotechnical process". Russell and Williams (2002) defined this term as stated here:

> The character of processes, knowledge, and entities in, which social and technical elements are closely interwoven; the adjective is used to stress the pervasive technological mediation of social relationships, the inherently social nature of all technological entities, and indeed 'social' and 'technical' elements, institutions or spheres of activity (p. 128).

2.4 Sociotechnical Premise

Sawyer and Jarrahi (2014) maintain that sociotechnical is a premise that can be described as (1) the mutual constitution of people and technologies, (2) the contextual embeddedness of this mutuality, and (3) the importance of collective action (p. 5–1). The authors assert that sociotechnical research is based on the interdependent and closely associated relationship between the constituents of any technological objects or system, and the customs, rules of use, and participation of an entire range of stakeholders. This mutual constitution of both social and technical is the foundation of the term sociotechnical: mutual constitution directs scholars to consider an event without making *a prior* inferential judgment concerning the relative importance of the social or the technical (p. 5–2).

Mutual constitution implies (1) both people and technologies may possess some capability to act in a given circumstance, and (2) these actions are not independent of the events that surround them; the fundamental argument of the mutual constitution is the coevolution of things, which are technical and social. The focus on the interdependence of technology and

human organization is realized by attending to actions of social groups, pressures from contextual influences, and the complex process of development, adoption, adaptation of new ICTs into society (Sawyer & Jarrahi, 2014, p. 5–2).

> Why is this important? Barley (1988) argues a singular focus on the material aspects of technology leads researchers into inappropriate materialism. On the other hand, a focus on technology as a solely social production has led to an over-reliance on social orders as primary drivers, potentially leading to social determinism. In contrast, the sociotechnical perspective, and in particular the principle of mutual constitution, speaks directly to the complex and dynamic interactions among technical capacities, social histories, situated context, human choices, and actions rather than looking for a simplified casual agency (Barley, 1988; Sawyer & Jarrahi, 2014, p. 5–2).

The second component of the sociotechnical premise "is that all technologies are socially situated; any Information System (IS) or ICT is embedded into a social context that both adapts to, and helps to reshape, social worlds through the course of their design, development, deployment, and uses" (Sawyer & Jarrahi, 2014). The sociotechnical perspective is premised on the embedding of ICTs into the more complex environment of situated action, "A world that is tightly tied to the characteristics of where actions occur" (2014, p. 5–3).

The third component of the sociotechnical premise entails collective action, the pursuit of objectives by two or more concerned groups. This collective action undergirds the concept of the organization without implying positive or negative consequences, including shared pursuits or multiple groups who pursue different objectives that lead to the creation of conflict (Sawyer & Jarrahi, 2014, p. 5–3). The principal basis for collective action is the combined pursuit of one or more shared goals by two or more groups with a focus on the design, development, distribution, and use of a particular ICT, shaped both by forms and by the nature of the collective action. Collective action signifies that combined interests and multiple objectives are intertwined with both the context and the technological elements.

2.5 Social Shaping of Technology

This definition of sociotechnical is derived from the "Social Shaping of Technology", a theoretical standpoint that states that the social shaping of technology (SST) pattern concerns the designing and implementation of technology with a range of "social" and "economic" factors, as well as narrowly "technical" considerations (Williams & Edge, 1996, p. 865). Russell and Williams (2002) assert that the overall push of SST methods is to treat technologies as socially situated elements, in the following interconnected regards:

- Technologies are produced and used in particular social contexts, and the process of technological change is intrinsically social rather than being simply driven by a technical rationale.
- Technologies function in an immediate setting of knowledge, employ practices, skills, meanings, and values, problems, and purposes, and objects that they act on;
- Technologies in many applications are best considered to operate as sociotechnical *systems* or *configurations*.
- Technological change is always a part of a *sociotechnical*-transformation, and social arrangements are *co-produced* in the same process (2002, p. 48).

William and Edge (1996) further argue the following:

> SST studies show that technology does not develop according to an inner technical logic but is instead a social product, patterned by the conditions of its creation and use. Every stage in the generation and implementation of new technologies involves a set of choices between different technical options. Alongside narrowly "technical" considerations, a range of "social" factors affect which options are selected, thus influencing the content of technologies and their social implications (1996, p. 866).

The reasons due to which the perspectives of SST and social informatics were used by scholars studying technology's (e.g. computers) effect on society believed that researchers at the time maintained an extremely narrow focus on the view that technology changed society, without considering any other factors that occurred at the same that may have also steered these societal changes (Atkinson, 2008, p. 5). This theory was termed as

> **Technological determinism**, the view that technology and technological change are independent factors, impacting on society from the outside of that society— and that technology changes as a matter of course, following its path, and in doing so changes the society on which it impacts (2008, p. 5).

The author goes on to argue that "there is an element of truth contained within this… in that technological products do affect and can change our lives, but it is simplistic to imagine that other factors are not at play" (Atkinson, 2008, p. 5). Technological determinists argue that "This provides explanations for many changes that can be observed in society" (Goguen, 2004, p. 1). The opposite view regarding whether technology and technological change does or does not affect society is ***"social determinism"***, which is the theory that society is an autonomous force that changes technology. This provides explanations for many changes that can be observed in technology" (Goguen, 2004, p. 1). Beniger (1986), Chandler (1977), and Beilock and Dimitrova (2003), are researchers who studied technology and technological change, argue that social determinism presented a more comprehensive theory concerning the definition of how social

groups or society affected the development of technology and society's influence on technological change (Baek, 2007, p. 9; Beilock & Dimitrova, 2003; Beniger, 1986; Chandler, 1977). Beniger (1986) and Chandler (1977) argue that societal and organizational requirements for a well-organized management system guided the advance of communication technology during the industrial revolution. Further, Beilock and Dimitrova (2003) examined how pre-existing infrastructure and government policies have been found to increase the penetration of the Internet in a nation.

Other scholars believe that the SST and social informatics perspectives fall between these two contrasting views. Graham and Choi (2016) argue that SST provides investigators a theoretical structure to understand how different cultures employ new media technology in various ways to suit their needs, and "the social shaping of technology perspective draws attention to the agency (that) people (have) in determining how technology is used" (Graham and Choi, 2016, pp. 20–21). The reason why African-Americans were chosen for their study was their high cellphone use goes against conventional thinking about African-Americans and the "Digital Divide". The authors employ SST theory to examine the following question: If African-Americans are on the other side of the "Digital Divide", then why do they have high rates of cell phone use (Graham & Choi, 2016, p. 20)? The authors wanted to research this question by analyzing the data from *"The Mobile Access 2010." The Pew Internet and American Life Project* findings challenged researchers' and society's prevailing assumption that minorities are at a disadvantage when it comes to being able to afford and use ICTs. The researcher who authored the *Mobile Access 2010* study presented the following point:

> Continuing a trend, we first identified in 2009, minority Americans lead the way when it comes to mobile access—especially mobile access using handheld devices…minority Americans are significantly more likely to own a cell phone than their white counterparts (87% of blacks and Hispanics own a cell phone, compared with 80% of whites). Additionally, black and Latino cell phone owners take advantage of a much wider array of their phones' data functions compared to white cell phone owners (Graham & Choi, 2016, p. 20).

The authors argue that the circumstantial barriers that prevent African-Americans and Hispanics from acquiring ICTs, such as computers and mobile phones, have not changed significantly since the earliest research was conducted on the digital divide (Graham & Choi, 2016, p. 30). The thing that has changed is the way families use cell phones to communicate with their family members, especially by what means African-Americans families use cell

phones and smartphones to communicate and interact with their extended family. The authors' performed a secondary analysis of the *Mobile Access 2010* dataset and applied the following as independent variables: socioeconomic, family structure, and ethno-racial groups. They further used the following dependent variables: calling frequency, text messages, and Internet frequency to determine the reasons for African-Americans' high cell phone usage (Graham & Choi, 2016, pp. 22–24). Graham and Choi contend the following:

> African-Americans, controlling for other socioeconomic factors, exhibit higher rates of cell phone usage for communication controlling for other factors. For both phone calls and text messages phone activities that are primarily communicative, being African-American is associated with an increase in the frequency of these activities. Applying a social shaping approach, we argue that this effect is powered by the meanings that African-Americans attach to communicating with family. Attitudes and beliefs could not be directly measured. However, given what is known in the literature and the elimination of alternative explanations, the unique family culture of African- Americans appear to be the most viable answer (2016, p. 30).

2.5 (a) Patrons Perspectives

This study examines the **Patrons Perspectives** by exploring the type of people who use this technology. This dissertation discusses patrons' demographics and their perceptions regarding adaptive and assistive technology, their viewpoints on NLS's services and programs, their local LBPD services, by examining two major NLS patron surveys: *NLS Patron Survey Final Report* (2003) and *National Library Service for the Blind and Physically Handicapped: Talking Book and Braille Program Evaluation and Recommendations for Increased Patronage* (2013).

2.5 (b) Patrons Perspectives: Who is Eligible for this Service?

To be eligible to use this service, a patron or their family members or caregivers are required to file an "Application for Free Library Service" available at their local Braille and Talking Book Library. Alternatively, they can visit the National Library Service for the Blind and Print Disabled's website and print out or download the application form (National Library Service for the Blind and Physcially Handicapped, 2014a). The patron or their caregiver is required to get the application certified by a competent authority, who can be, "Doctors of Medicine; Doctors of Osteopathy; Ophthalmologists; Optometrists; Registered Nurses; Therapists; and Professional Staff of Hospitals, Institutions, and Public or Private Welfare Agencies (e.g., Social Workers, Case Workers, Counselors, Rehabilitation Teachers, and School Superintendents)" (National Library Service for the Blind and Physically Handicapped, 2014a).

This certifying authority would sign the application to indicate that the person is eligible to receive materials from the Braille and Talking Book libraries. Changes have been made to both the patron eligibility and the "certifying authority" due to the adoption of the Marrakesh Treaty and due to Bertoni's 2016 GAO Report (Bertoni, 2016), these changes will be examined and discussed under ***RQ5*** in Chapters: **4,** and **5**

The certifying authority determines that the patron has a disability that renders them eligible (National Library Service for the Blind and Physically Handicapped, 2014a). The certifying authority is required to employ the criteria listed below to authorize the patron to use the service:

The following persons are eligible for service:

- Blind persons whose visual acuity, as determined by a competent authority, comes to 20/200 or less in the better eye with correcting lenses, or whose widest diameter of visual field subtends an angular distance not exceeding 20 degrees.

Other physically handicapped persons are eligible according to the following criteria:

- Persons whose visual disability, with correction and regardless of the optical measurement, is certified by competent authority as preventing the reading of standard printed material.
- Persons certified by competent authority as unable to read or use standard printed material due to physical limitations.
- Persons certified by competent authority as having a reading disability due to organic dysfunction and of sufficient severity to prevent reading printed material in a normal fashion (National Library Service for the Blind and Physically Handicapped, 2014b)

When their local NLS/LBPD receives the patron's application, the library's staff reviews the application and contacts the patron or their caregiver to review the application once again for any possible incorrect information.

However, as of 2020, due to the adoption of the Marrakesh Treaty by the United States and the passing of the Marrakesh Treaty Implementation Act by Congress in 201, NLS is amending two regulations, **first**, as noted in **Chapter 1** NLS is expanding the patron eligibility requirement to include people with reading disabilities and **second,** NLS is dropping the need for medical certification for people with reading disabilities to apply to use the service (National Library Service for the Blind and Print Disabled, 2020a). The changes and implications by the

adoption of the Marrakesh Treaty will be discussed in **Chapter 1,** also discussed in **RQ6** in **Chapters 4 & 5** and **Chapter 6**.

The Reader Advisor or a library staff member can answer any queries patrons may have regarding their service. The staff member goes over the types of reading subjects or genres, authors, among other things that the patron wants to receive, confirm the type of Digital Talking Book Machine they want the library to send them. They also inform the patron about the time they will receive their first mailing of digital books and their Digital Talking Book Player. Once the library staff approves the patron's application, a Digital Talking Book Machine, Digital Talking Book Cartridges, and a "Welcome to the Library Packet" with information regarding contacting the library andmaterials regarding services that other agencies can provide for patrons.For example, information about NFB-News-line Service are sent to the patrons in the library packet. The "Welcome to Library Packet" is available in alternative formats, such as Braille, as a mp3 file, or on a Digital Talking Book Cartridge. All these materials are sent to the patron as "Free Matter for the Blind" via USPS.

The NLS libraries' mail cartridges are sent directly to the patron via the United States Postal Service "Free Matter for the Blind" postage rate. Patrons can communicate with their local NLS library in several ways:

- Patrons can call their local NLS Library.
- Patrons can email their local NLS Library.
- They can send correspondence via United States Postal Service to their local NLS Library as "Free Matter for the Blind and Handicapped".
- Patrons can visit their local NLS Library.

Patrons' family members and caregivers can visit the library on their behalf. Patrons usually contact their local NLS libraries personally or indirectly through caregivers, such as family members, home health aides, friends, or through a Recreation Director, if the patrons reside in a nursing home, hospice, or an assisted living facility. Many patrons utilize the services and programs that their local NL libraries provide.

2.5 (c) Patrons Perspectives: Patron Demographics

In 2003, the National Library Service for the Blind and Physically Handicapped contracted Abacus Technology Corporation and Katherine A. Nelson, Ph. D., to conduct a patron survey (National Library Service for the Blind and Physically Handicapped & Nelson, 2003, p. 1). NLS stated that the reasons for the patron survey were that during the process of conversion

to a Digital Talking Book format, the agency had to deal with decisions regarding hardware design, type of medium to use for both the hardware and the software, and a distribution system; they also needed to consider further practical matters such as price, durability, and obtainability of suitable technology. “The equipment and delivery systems, however, also must be well-suited to the people who will use them. To make good design decisions, NLS needs more information about its patrons’ abilities and preferences” (National Library Service for the Blind and Physically Handicapped & Nelson, 2003, p. 1).

Nelson applied a stratified random sampling method to identify patrons who belonged to five specified age groups (National Library Service for the Blind and Physically Handicapped & Nelson, 2003). Patrons in the age range from 18 to 39, 40 to 64, 65 to 84, 85 and older, and people whose years of birth were not recorded in the organizations’ mailing list, as well as 447 patrons, were given telephone interviews. The patron survey findings regarding the patrons’ backgrounds and their technological abilities are in this table:

Table 1.

Katherine A. Nelson, NLS Patron Survey Final Report. Abacus Technology Corporation (2003) December.

Education	Domicile of Patrons	Demographic profile	Age of the Population	Patrons Use of Technology	The Use of Adaptive Technologies	Problems patrons had in the in the Use of Technology
Eleven or fewer years of school to college graduate	NLS patrons were found to be less likely to live in a rural community or small town as against a suburb or city.	Despite this diversity, the general demographic profile of NLS patrons primarily comprised middle-aged and elderly people with late onset of serious vision loss with modest economic means	Patrons in the age ranges 18 to 39, 40 to 64, 65 to 84, 85 and older, and people whose years of birth were not recorded in the organizations' mailing list	The 2003 survey indicated that nearly all patrons used at least one high-technology device.	However, this population's use of high-tech adaptive devices, computers, and the Internet was less widespread but was still significant in 2003	The 2003 patron survey found that during that time, the problems involved in the use of computers and other high-tech devices included low income, difficulty in access by people with disabilities, and possibly, generational issues that suggested a lack of experience or only a transitory and unsatisfactory exposure to computers and what computers can do

Table 1. **(Continued)**

Katherine A. Nelson, NLS Patron Survey Final Report. Abacus Technology Corporation (2003) December.

Demographic Profile	Patrons Use of Technology	The Use of Adaptive Technologies
The survey found that older patrons comprise NLS's principal constituency; first, most subscribers were aged 65 or older. Second, older patrons, predominantly, those aged 85 or older, were the heaviest readers in the patron population	For instance, 88% to 75% of patrons who were over the age of 40 knew how to use remote control, 92% to 76.3% knew how to dial a phone, and 73.1% to 33.3% knew how to operate a CD player. Further, 47% to 18.3% knew how to swipe a debit card, while 35% to 9% knew how to use an ATM	The application of high-tech devices was found to be more common among younger patrons as compared to older ones; Nelson argued that with the introduction and use of the Digital Talking Book Player, the use of high-tech devices would increase over time.

This demographic information has influenced the development and design of both the Digital Talking Book Program and the Digital Talking Book Player (National Library Service for the Blind and Physically Handicapped, 2006).

2.5 (d) Patrons Perspectives: Patrons Perceptions of NLS Technologies and Services

In 2013, since the introduction of the Digital Talking Book Program, NLS wanted to study its patron population to determine if their patrons were satisfied with their services and technologies and the reasons due to which patrons left the program (National Library Service for the Blind and Physically Handicapped, 2013). Additionally, NLS wanted to increase the number of patrons using their service; further, the agency aimed to determine reasons due to which patrons choose to opt-out of their service. NLS contracted with ICF International to conduct a patron and demographic survey and the study was published in the report entitled *"National Library Service for the Blind and Physically Handicapped (NLS) Talking Book and Braille Program Evaluation and Recommendations for Increased Patronage: Final Report"*.

> The survey instrument and resulting report are designed to provide NLS with pertinent information to guide future NLS policies to increase satisfaction among current patrons and to develop strategies to recruit new patrons. To accomplish this, the survey examined current NLS patrons, former NLS patrons, and eligible non-patrons to provide

> information regarding the awareness about, usage of, and satisfaction with the NLS Talking Book and Braille Program (National Library Service for the Blind and Physically Handicapped, 2013, p. 3).

The survey was conducted online and over the telephone; a total of 2,517 individuals completed the survey:

> Sample patrons were selected using a stratified random sampling approach and their results are generalizable to the full NLS patron population. Former patrons and non-patrons were sampled using a convenience sample, providing results that are specific to the individuals in the sample. Their responses, however, are still useful in generating ideas for increasing patronage among these populations. The convenience sampling approach involved using print and electronic recruitment strategies, the most useful of which involved partnering with outside organizations to promote the survey among their members (National Library Service for the Blind and Physically Handicapped, 2013, p. 3).

These are some of the key findings of the study summarized in the table on the next page:

Table 2.

National Library Service for the Blind and Physically Handicapped (NLS) Talking Book and Braille Program Evaluation and Recommendations for Increased Patronage. (2013) Washington, D.C.: National Library Service for the Blind and Physically Handicapped.

Demographic Profile of Sample Patrons	Patrons Disabilities	Patrons Use of Technology
Compared to other respondent samples, a greater proportion of sample patrons exhibited the following characteristics: Older, less educated, Retired, Veterans, and Living alone	Non-patrons were less often blind/visually impaired: A smaller percentage of non-patrons reported blindness or visual impairment as their primary disability, a factor that may be important in marketing the program to them.	Use of tablets: Since the majority of the respondents reported using a tablet to access the Internet, ensuring that the Talking Book and Braille Program website and reading materials are accessible on such devices is crucial.
Former patrons and non-patrons spent less time reading in the previous week, which may be a reason for their not using the program or not taking the time to learn more about the program to determine their inclination to participate.	Limited mobility Highlighting access to reading materials without leaving the house (i.e., through mail or internet download) may be beneficial in gaining the patronage of the 38% of the non-patron population with limited mobility.	Social media Large percentages of non-patrons and former patrons reported using social media. For example, both groups use social media for communication and information

Table 2. (Continued)

National Library Service for the Blind and Physically Handicapped (NLS) Talking Book and Braille Program Evaluation and Recommendations for Increased Patronage. (2013) Washington, D.C.: National Library Service for the Blind and Physically Handicapped.

Problems Patrons had in the Use of Technology	NLS	BARD	Other Technologies and Services
Assistance with technology Nearly half of the former patrons reported that they did not require someone to assist them to use technology, a fact that may indicate that these individuals are tech-savvy and likely to be more interested in BARD than the traditional mail-order program. Conversely, nearly half of those former patrons who did require assistance with technology did not have such assistance available	Assistance for former patrons and non-patrons Non-patrons and former patrons may require greater guidance about using the Talking Book and Braille Program since they are less likely to have someone to assist them. For example, first time or former patrons who used CBMs may need assistance in using the Digital Talking Book Player	Many patrons do not use the Internet. Internet usage among sample patrons was found to be lower as compared to that among former patrons and non-patrons, a fact that is likely to have affected their interest in BARD and their ability to use alternate means to obtain the reading materials. The Talking Book and Braille Program may be particularly important for these individuals. Non-patron familiarity Most non-patrons had either never heard about the Talking Book and Braille Program or were unfamiliar with the way it operates. Lack of knowledge regarding using technology BARD and lack of computer skills were reported as the greatest obstacles in using BARD.	32% of former patrons stopped using the NLS program because they preferred another technology or service, and over half reported paying a monthly fee or fee per book downloaded to use these alternative services. The most commonly mentioned services include Audible, Bookshare, and iBooks. The most common technological gadgets were iPad/iPod, iPhone, and a Nook or Kindle. Both non-patrons and former patrons commonly reported obtaining their reading materials from online bookstores. If the materials they were interested in were made available in NLS, these individuals may be attracted to the Talking Book and Braille Program as a source of free reading materials, as opposed to paid online bookstores. Learning about NLS. The most common avenue for learning about the Talking Book and Braille Program was found to be educational or

			rehabilitation service providers, thus highlighting the need for these professionals to be familiar with the program.

NLS has implemented or is currently considering the implementation of the findings from this study. For example, NLS has created apps for smartphones, which allow its patrons to download books and magazines directly from BARD into Android phones and iPhones (National Library Service for the Blind and Physically Handicapped, 2012, p. 5). The study's findings reveal that NLS requires a greater community outreach to expand the size of its patronage (National Library Service for the Blind and Physically Handicapped, 2013, p. 58)

2.5 (e) Patrons Perspectives: Are Patrons Satisfied with the Digital Talking Book Player?

Participants in the 2013 patron survey were asked to rate their level of satisfaction with the Digital Talking Book Player on a scale of 1 to 5. Participants selected, were chosen from a random sample, rated the Digital Talking Book Player at 4.9, and non-sample patrons rated it at 4.7 (National Library Service for the Blind and Physically Handicapped, 2013, p. 44). The survey could not accommodate a sufficiently large and thus adequately representative sample size to report the reasons for their dissatisfaction with the player. However, sufficient responses were obtained from the non-sample patrons in response to the question of dissatisfaction, and the respondents provided a list of the reasons for their dissatisfaction with the player.

> The most commonly reported concern with the digital player among non-patrons was that the player is too large or heavy (63%). Non-patrons also reported that another technology is easier to use (36%), they cannot easily navigate to specific parts of the book or magazine (10%), and the equipment is not reliable (6%) (National Library Service for the Blind and Physically Handicapped, 2013, p. 45)

NLS librarians, in their responses to the 2014 Librarian survey, expressed this complaint regarding the player; as NLS is planning a future replacement for the device, NLS will have to consider these issues (Rose, 2018a, p. 473).

The findings of the 2013 patron survey indicate that on the national and local levels, NLS and the network libraries need to promote their services more to both younger and older patrons, because both groups now have access to several alternatives. However, NLS librarians assert in

their responses to the 2014 survey that social-economic factors will hinder many people with print disabilities from exploiting these alternatives (Rose, 2018a, p. 474).

2.6 Theories of Technological Politics

During the 1980s, as technology and technological change heralded by computers and other digital technologies gained momentum, researchers and scholars sought a theoretical perspective to describe this phenomenon. Winner (1980) argued that technological determinism did not take into account the various social factors, especially, political factors that could influence technological developments. Winner (1980) contended that social determinism concentrates excessively on how social factors and social groups influence technological change and technological innovation. In other words, he stated that they did not consider technical artifacts or politics. He believed that a theoretical framework should consider technological development and political and social factors: to explain the phenomenon.

Winner termed his stance as the **Theory of Technological Politics**. This framework argues that research, development, planning, manufacturing, and selling of technology can be a politically steered process. Winner, noting the importance of this approach, believes that "what matters is not the technology itself, but the social or economic system in which it is embedded" (Winner, 1980, p. 122). He argued that social, economic, and political forces shape technology and researchers in the field of science and technology are required to acknowledge these forces and social conditions when studying the development, distribution, and usage of science and technology. This viewpoint was employed extensively by scholars during the late 20th century to examine these issues. However, some scholars thought that the Social Shaping of Technology overestimates social forces' influence on technology and technological change. Other scholars argued that the Theory of Technological Politics did not adequately acknowledge how technology possesses agency and that researchers need to study this interaction between technological artifacts and users to observe how technology and its corresponding change affect the user, organization, and society.

2.6 (a) Theory of Technological Politics

In this Literature Review, I assert that the views proposed by the **Theory of Technological Politics** fall between those forwarded by technological determinists and social informatics. I also contend that social informatics lies between SST, with social determinism situated at the other end of the theoretical spectrum (see figure 2). In an essay titled "*Do*

Artifacts Have Politics", Winner asserts that technology, as it is used in modern society, has political attributes and that many of the devices, machines, structures, and systems can be accurately judged in the following three ways: (1) for their contributions to efficiency and productivity, (2) their effect on the environment, and (3) by what means these technologies represent the embodiment of particular forms of power and authority (Winner, 1980). "Since ideas of this kind are a persistent and troubling presence in discussions about the meaning of technology, they deserve explicit attention" (Winner, 1980, p. 121). The author discussed the writings of Mumford (1964), who claimed that two technologies have existed for centuries side by side: one technology is authoritarian is system-centered, powerful and yet unstable, and the other is democratic, human-centered, weak, yet durable (Mumford, 1964; Winner, 1980).

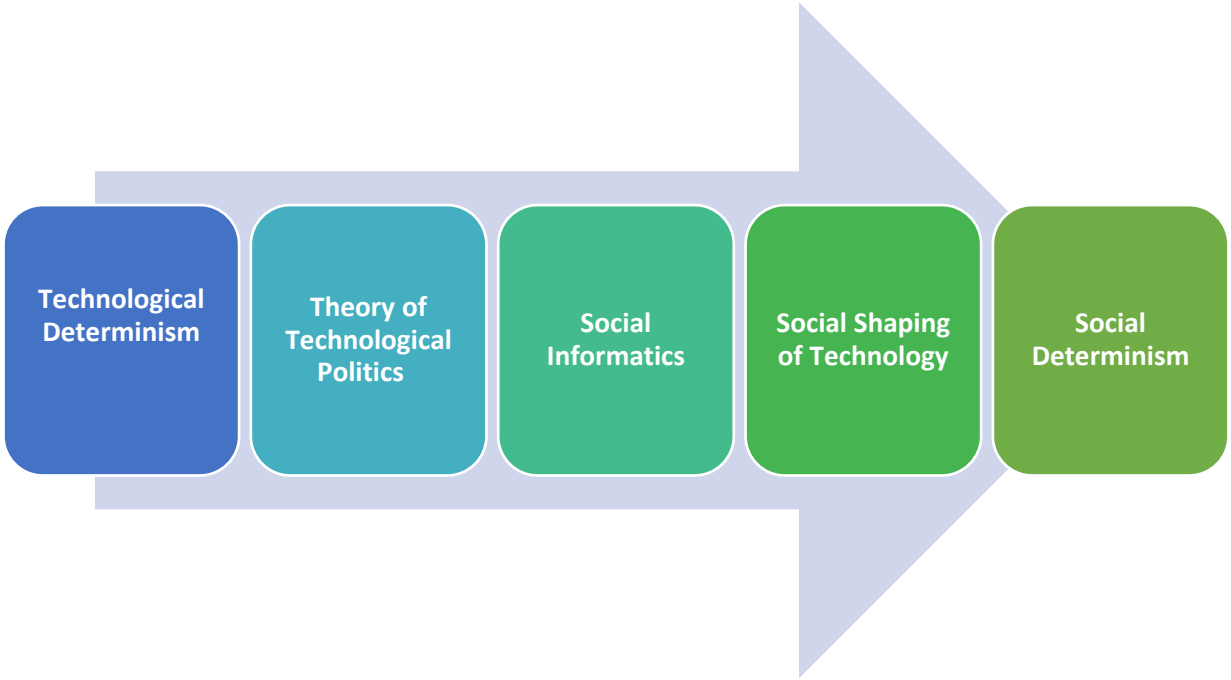

Figure 2.

Five Theoretical Frameworks Used by Scholars in the Examination of Science and Technology

Winner contends that "It serves as a needed correction to those who focus uncritically on such things as, 'The computer and its social impacts', but who fail to look behind technical things to notice the social circumstances of their development, deployment, and use" (Winner, 1980, p. 122). He discussed how technological systems are deeply interwoven with modern

politics and that artifacts entail politics. The author explains the two central points of his argument: (1) there are instances in which invention, design, or arrangement of a specific device becomes a way to settle an issue; (2) his second argument is as follows:

> Are cases of what can be called, '***inherently political technologies***', man-made systems that appear to require or to be strongly compatible with particular kinds of political relationships? Arguments about cases of this kind are much more troublesome and closer to the heart of the matter. By 'politics' I mean arrangements of power and authority in human associations as well as the activities that take place within those arrangements. For many purposes, 'technology' here is understood to mean all of the modern practical artifices, but to avoid confusion I prefer to speak of technolog*ies*, smaller or larger pieces or systems of hardware of a specific kind (Winner, 1980, p. 123).

His most famous and controversial example to support his argument is provided by Robert Moses' bridges, that is, bridges in New York with overpasses that discourage the traffic of buses on parkways (Winner, 1980, pp. 123–124). The designs allowed automobiles owned by the middle class to use the parkway to reach Jones Beach and prevented the parkway from being used by buses, thus stopping the poor from using Jones Beach. Winner contends that many of Moses's structures embody a systematic social inequality. The author employs this example to demonstrate by what method technology can be used to preserve a repressive status. Winner claims that technologies serve as means to create order in our world; devices contain the possibilities for many different ways to facilitate the organization of human activities (Winner, 1980, pp. 127–128). The selection of such technologies could be a conscious or unconscious decision, and technological innovations are similar to legislative acts that establish a framework for public order.

Winner contends that ***inherently political technologies*** are those technologies that require by their very nature to be political in a specific way (Winner, 1980, p. 128). He quotes Friedrich Engels, Karl Marx, and Plato to forward the argument that if society adopts technology, it is effectively adopting the social order to use that technology. Winner employs Engels' example of a thread factory to explain how the adoption of the factory system forces workers to submit to rigid discipline for the factory to produce its product. "Engels pulls no punches. The automatic machinery of a big factory," he writes, "is much more despotic than the small capitalists who employ workers ever have been" (Winner, 1980, p.129). Subsequently, Winner applies Engels' and Plato's example of a ship at sea that needs a captain who must be authoritarian for the ship to sail. Plato argued that "Because large sailing vessels by their very nature need to be steered with

a firm hand, sailors must yield to their captain's commands; no reasonable person believes that ships can be run democratically" (Winner, 1980, p.129). Further, Winner states that (1) the adoption of a given technical system requires the creation and maintenance of a particular set of social conditions as the operating environment of that system (Winner, 1980, p. 130). The example he offers, in this case, is nuclear power: if you accept nuclear power, you also accept highly specialized elite to operate nuclear power plants, and without this elite in the lead, it is not possible to have nuclear power. (2) "A given kind of technology is strongly *compatible with* but does not strictly require, social and political relationships of a particular stripe" (Winner, 1980, p. 130). Winner offers the example of solar energy in this case:

> Their case is, briefly, that solar energy is decentralizing in both a technical and political sense: technically speaking, it is vastly more reasonable to build solar systems in a disaggregated, widely distributed manner than in large-scale centralized plants; politically speaking, solar energy accommodates the attempts of individuals and local communities to manage their affairs effectively because they are dealing with systems that are more accessible, comprehensible, and controllable than huge centralized sources (Winner, 1980, p. 130).

If we examine social patterns that characterize technical systems, we can determine devices that are invariably associated with authority and power; the question is whether these technologies derive this association from an inevitable response to inherent characteristics of the objects, they are imposed by a ruling class, a governing body, or other institutions for their individual goals (Winner, 1980, p. 131) Winner asserts that social and economic forces shape the purposes, design, and application of technology that can lead to intended and unintended harms to specific groups or society as a whole. The Theory of Technological Politics advocates the belief that technologies are not neutral but are nurtured by groups to continue or alter social relationships.

From the 1980s to the 2000s, researchers felt that the theoretical framework of Technological Determinism did not adequately describe how both the development and the use of technology were influenced by society and how society was affected by the use of technology. Researchers who studied technology in the 2000s argued that scholars were orienting the field of technology-related research towards the social determinists' view, and their research was too focused on how an organization employs technology, and never described the technology being studied (Leonardi, 2012, p. 27).

2.6 (b) Theory of Technological Politics and their Relationship with the Digital Talking Book Program as a Technology/Artifact

In the examination of the Digital Talking Book Program as a Technology/Artifact from the perspective of the Theory of Technological Politics, the investigator would observe that the development process of a technology/artifact is a product of both political and technical processes. Assuming a layman's perspective, one could assert that the ultimate goal of the process was the development of a new Digital Talking Book around a digital medium that uses technology available in the consumer market. The technology had to be easy-to-use for NLS patrons. Additionally, NLS developed a distribution system that utilizes the current methods of sending digitally recorded materials to patrons and developed new methods for the same. The results of this process were the Digital Talking Book Program.

The researchers, who apply the Theory of Technological Politics to study technology, assert that the design and development of the program was a political process that included many stakeholders, who influenced how the program evolved. For instance, the Digital Long-term Planning Group was involved in the planning, development, and subsequent deployment of the Digital Talking Book Program and the Digital Talking Book Player to its patrons. This group consisted of many participants within and outside of NLS. The group's members included NLS staff, NLS/BPH librarians, NLS/BPH library staff, Chief Officers of State Library Agencies, and representatives of Consumer Advocacy groups (National Library Service for the Blind and Physically Handicapped, 2006). The final design and cost of the program were determined by NLS, with inputs from LC and Congress. The researchers who support the Theory of Technological Politics claim that even though the program was a technological achievement, it has to be navigated through internal and external politics to be successful. These researchers assert that even though designers, engineers, and others in the organization who contribute to the building of technology formed key parts of its success. Winner (1980) and other proponents of this view claim that the social processes both within and outside the organization influenced the technological artifact's success within the organization.

If Theory of Technological Politics scholars study the Digital Talking Book Program, the scholars would argue that the features of the Digital Talking Book Program were designed to make the technology more convenient to use by patrons, regardless of their experience in using digital devices. The design was based on the social contexts that Digital Talking Book Player

required to be designed around technology that could be adopted for this purpose. These contexts involved the NLS staff, NLS/LBPD librarians and staff, volunteers who repair NLS equipment, and patrons. The player needed to be manufactured at a reasonable cost and easy to maintain by NLS/BPH staff and volunteers. The device had to be sufficiently durable to allow shipping across the U. S. through the U.S. Postal System, and that patrons can use the machine with extremely little effort or assistance. In other words, the technology was shaped by the competing goals discussed above that interact with the needs of patrons, NLS/LBPD libraries, and staff for new technology, as the analog cassette technology was becoming obsolete and urgently required replacement.

These properties of the Digital Talking Book Player have remained unchanged since its introduction in 2009. However, other components of the program changed over time due to the emergence of new technology and patron demands for more ways to listen to digital recordings using devices other than the Digital Talking Book Player, for instance, the development of the BARD apps for Android and Apple devices.

2.6 (c) Technology/Artifacts Perspectives: The Design, Planning, Development, and Deployment of the Digital Talking Book Program

The librarians and staff who work for NLS are authorized by Congress to provide eligible patrons with library materials in accessible formats (Library of Congress, 2014, p. 113). The problem in this regard is that there has been limited research regarding NLS and even fewer studies regarding the technologies NLS employs to serve its patrons. Most of the literature published before 2009 has become dated, as NLS developed and implemented new technologies to serve its patrons since the time it introduced the Cassette Book Machines and Recorded Cassettes in the 1970s (Cookson & Rasmussen, 2001; Cylke et al., 2007; Epp, 2006).

Earlier studies discussed NLS's designing and planning of a Digital Talking Book Program and Digital Talking Book Player around some form of digital technology. The literature mentioned that NLS studied the shift from analog cassette technology to digital technology because analog cassette technology was becoming obsolete, and the manufacturing of the parts required to maintain analog cassettes had ceased. The internal research that NLS conducted during the 1980s and 1990s indicated NLS needed to start the transition to digital technology (National Library Service for the Blind and Physically Handicapped, 2003; 2006). NLS examined and then considered using three types of digital technology for a Digital Talking Book

Program and Digital Talking Book Player. In 2003, in a report entitled, *"Current Strategic Business Plan for the Implementation of Digital Systems,"* NLS discussed how the agency planned to implement its changeover from analog to digital technology (National Library Service for the Blind and Physically Handicapped, 2003).

NLS has investigated three types of digital media: (1) CD-ROM; (2) magnetic hard drive, and (3) flash memory. Based upon an evaluation of the relevant technological and economic characteristics of these three media types taken in tandem with the operational environment of the program, NLS concluded that at that time, a flash memory-based delivery system presented the best alternative, with one major proviso: the wholesale unit price of flash memory was expected to decline further before the implementation became economically feasible. NLS was confident that this economic threshold could be reached by FY 2008.

While CD-ROM and magnetic hard-drive technologies are both more advanced than flash memory, neither would support a book and machine system sufficiently reliably for the application in question; both books and machines would be likely to sustain damage during normal use and in transit via mail due to their inherent physical characteristics (the machines have precision parts built to fine tolerances and are extremely sensitive to shock, while the CDs are inherently delicate). These technological weaknesses would result in higher media and machine failure rates than with flash memory, leading to poorer service to patrons and increased workload for network libraries that would necessitate relatively higher book-replacement, machine-replacement, and machine-repair costs to NLS (National Library Service for the Blind and Physically Handicapped, 2003).

The NLS discussed in its 2006 update to the "*Current Strategic Business Plan for the Implementation of Digital Systems"* the results of a January 2004 patron survey that the agency conducted. The completed survey was published in the *"NLS Patron Survey Final Report*" (National Library Service for the Blind and Physically Handicapped & Nelson, 2003; National Library Service for the Blind and Physically Handicapped, 2006). The findings of this survey influenced the planning and implementation of the Digital Talking Book Program and the design of the Digital Talking Book Player. NLS asserted in the 2006 update that "The free national library program has always been user-driven. To make prudent design decisions about the digital system, NLS required more information about its patrons' abilities and preferences" (National Library Service for the Blind and Physically Handicapped, 2006). NLS commissioned the patron

survey to facilitate predictions regarding their patrons' preferences and abilities and to take the initiative to address any problems that they may have with digital books and digital playback machines to indicate potential barriers to this technology's acceptance. The agency wanted to "Design the new equipment so it will address users' reading needs" (National Library Service for the Blind and Physically Handicapped & Nelson, 2003, p. 1). "The results from this study … have been incorporated into subsequent planning studies for developing the digital-based system" (National Library Service for the Blind and Physically Handicapped, 2006).

The 2003 patron survey results regarding patrons' experiences with Cassette Talking Books and Cassette Talking Book Machines were as follows:

- The 2003 patron survey found that, across all age groups, NLS constituted the primary source of playback equipment at that time; similarly, their local Braille and Talking Book libraries served as their primary source for obtaining reading materials (2003, p. 2).
- Finally, Nelson asserted in her findings that handling the tapes and manipulating the controls are less likely to present a problem for the patrons than understanding certain aspects of the Cassette Talking Book Machine's operation. Although the vast majority of subscribers operate the Cassette Talking Book Machine themselves, half of the patrons received help to learn to use the device (2003, p. 2).

Based on these survey results, the NLS supplemented features in the Digital Talking Book Player to render the player more convenient to use by older or physically challenged patrons. For example, each button on the Digital Talking Book Player if hit twice will tell the patron the functions of that button and the purpose for which they can be used. The buttons' functions and the physical size of the Digital Talking Book Player were based on patron responses obtained from the survey. The Digital Talking Book Player is smaller in size than the Standard Cassette Book Machines (see Picture 1).

Picture 1.

Standard Cassette Book Machine and Standard Digital Talking Book Player (Demmitt, 2014)

In December 2003, NLS decided to proceed with the implementation of their Digital Talking Book Program, and to build their Digital Talking Book Player using flash memory technology (Cylke et al., 2007, pp. 803–804; National Library Service for the Blind and Physically Handicapped, 2003). On March 1, 2005, the National Library Service for the Blind and Physically Handicapped, Library of Congress contracted with Battelle Labs for the design and development of the Digital Talking Book Machine (National Library Service for the Blind and Physically Handicapped, 2005).

In 2006, the prototypes of the Digital Talking Book Machines were tested by the NLS; in 2007, the final prototypes were approved for production, and the Request for Proposals to manufacture the first 5000 machines was issued. Shinano Kenshi Co. Ltd (Japan) secured the contract, and the first production models were shipped to eight libraries in May 2009. They were beta tested until July 2009 (National Library Service for the Blind and Physically Handicapped, 2009).

In 2009, after five years of planning and development, NLS deployed the Digital Talking Book Player to its patrons across the country (National Library Service for the Blind and Physically Handicapped, 2012). In August 2009, the first production runs of the final versions of the Standard and Advanced Digital Machines were shipped to the Regional Libraries. In October 2009, the new Digital Talking Book Machines and Digital Talking Book Cartridges were distributed to patrons throughout the country, based on (1) whether a particular patron was a veteran, and (2) if the patron was centenarian; this prioritization was forwarded by NLS. NLS decided on these priorities because the statue that created NLS mandates that veterans and centenarians have service priority over other patrons (National Library Service for the Blind and Physically Handicapped, 2012). This distribution was completed in May 2010 and currently, the machines are being supplied to any patron that wants a player.

Picture 2.

Standard and Advanced Digital Talking Book Players and Digital Book Cartridges

Caption: Standard (left) and advanced (right) digital talking-book machines play cartridges (the blue containers below the players, are examples of digital book containers. In the Standard Player and the blue container beneath the Advanced Player is an example of white digital book cartridges) to provide high-quality sound and easy navigation for the blind and physically disabled readers (Vaughns, 2014)

The players depicted above present the Standard and Advanced models. The players are about 6 by 9 by 2 inches in size, in comparison to the cassette book machine (see picture 1), which is 9 by 11 by 3 inches or 108 cu.in. as against 300 cu.in. The weight of the Digital Talking Book Player (DTBP) is slightly over two pounds compared to C-1's (i.e., the CBM) seven pounds. The player's body was rendered a dark charcoal grey to allow a maximum visual contrast between the case's background and the buttons' colors. The white band along the front edge of the player constitutes a pullout handle, similar to the one on the CBM. An opening for the digital talking book cartridge is situated above the handle. The headphone jack is located on the right, with a bright green surrounding to render it easy to locate. A USB port is placed next to the jack for repair personnel's use for diagnostic information (the USB port can also be utilized to insert flash drives to play materials downloaded from BARD or third-party providers or to play mp3 music files). The backside of the machine, similar to CBM, contains a compartment to store the power cord. Four rubber feet are located on the bottom, the door to the battery compartment, and two inset bars to attach a carrying strap. It also contains plenty of room to accommodate identification labels.

The Advanced model (see picture 2) is precisely the same size as the standard one but comprises a second row of controls between the power, sleep, and volume controls, and the speaker. The advanced controls' functions are setting and retrieve bookmarks and navigating through the structured levels of a NISO book. The cartridge-shipping container is slightly longer and wider than a green cassette box but has only half the thickness.

The cartridge itself is the size of a cassette, but with a more complex shape (above, picture 2 presents examples of digital cartridges). The end of the cartridge with the round finger hole is slightly thicker than that of the cassette, with square sides, but is also beveled to allow the end of the cartridge to be pressed down on a flat surface in front of the player. The other end of the cartridge, with the USB connector, tilts up and can slide smoothly into the player. The end of the cartridge with the USB connector is also beveled, but with the bevels slanting toward the cartridge's center, to permit only one way to fit into the player (National Library Service for the Blind and Physically Handicapped, 2006).

NLS's Digital Talking Books was developed based on the Digital Accessible Information System (DAISY) standard, an international standard created by libraries for the blind from around the word (Lundh & Johnson, 2015, p. 55). The standard was based on the first DAISY format books, developed in 1994 by the Swedish Library of Talking Books and Braille (TPB; presently, the Swedish Agency for Accessible Media, MTM), a national library responsible for the production of accessible electronic media for print-disabled people in Sweden. The prototype was launched in 1996. The DAISY standard was further developed by the DAISY Consortium, formed in 1996 by government and non-profit talking book agencies from several countries,

including NLS (who is a full member), which used "Specifications for the Digital Talking Book," ANSI/NISO Z39.86-2002, based on the DAISY standard (National Library Service for the Blind and Physically Handicapped, 2003) Digital Talking Books, produced by NLS using the DAISY based ANSI/NISO Z39.86-2002 standard, possess the capability to combine human or artificial voice narration with digitized text (Lockerby, Breau, & Zuvela, 2006, p. 477). DAISY books allow the reader the ability to navigate around a recorded book through sections, chapters, and page phrases (Nasmith & Parkinson, 2008, p. 676). Lundh and Johnson, (2015) contend that the necessity for assistive reading technology, such as DAISY Talking Books is enormous; however, research in the area is scarce (Lundh & Johnson, 2015, p. 54).

2.6 (d) Technology/Artifacts Perspectives: Assistive/Adaptive Technologies

The types of assistive and adaptive technology that are currently available to people with disabilities, for example, computer-assistive technology, can scan the content displayed on the computer screen and convert it to speech or Braille (Dove, 2012, p. 24). Apple computers include assistive technology with all their products for zero cost; for example, iPhone, iPad, and Apple TV include screen magnification, and these products include a software package called *VoiceOver*, a screen-access technology for the visually impaired. Text to speech tools, such as screen readers and screen-enlarging software can read aloud printed and encoded text from websites or electronic documents (Kenney et al., 2016, p. 135). Screen readers and text to speech software can enlarge text or change screen contrast, highlight words using multiple colors for coding different ideas. These tools can be accessed as features of a computer's operating system (e.g. *VoiceOver* on iOS devices) or as free downloadable software (e.g. *NVDA*) or through purchase (e.g. *JAWS*, *Kurzweil*, and *Zoom Text*) (Kenney et al., 2016, p. 135). Optical character recognition scanning software allows the user to convert printed text to multiple formats, such as speech, large print, and audio, through an optical scanner or optical character recognition (OCR) software (Robitaille, 2010, p. 28). Specialized scanning systems present an exact image of a page, shown on a computer screen with a scanner, while OCR software operates at the same time to create the image displayed on the screen. Augmentative or alternative communication refers to various methods of communication used as an addition to speech, including voice-output communication devices and computers with a synthetic speech capability that can be used by individuals with limited speech ability (Dove, 2012, p. 24). A telecommunications device for the deaf (TDD) constitutes an electronic method for text

communication over a phone line, used by people with hearing or speech disabilities (Dove, 2012, p. 25). Speech to text technologies, such as that in *Dragon Naturally Speaking* voice recognition software which can be utilized to create documents, browse the Internet, among other things, use voice commands to tell the computer to perform these tasks (Kenney et al., 2016, p. 134). Assistive reading technology refers to technology that allows its users to listen to printed reading materials (Rose, 2018a, p. 471).

The social context can affect the adoption and use of assistive/adaptive technology by older adults. For example, if technology can benefit older adults by improving their lifestyle, reducing their social exclusion, older adults will adopt the technology. However, if the technology is difficult to use, or individuals do not want to use the technology or were compelled to use the technology, or it was made to appear like adaptive technology, there is a greater chance that older adults will reject it. Additionally, the type of assistive technology, such as screen readers, text-to-speech software, screen magnification technology, and commercial players, that is compatible with NLS Digital Talking Books can help people with disabilities to access the Internet, but the costs of acquiring these presents a hindrance to their use (Okonji, Lhussier, Bailey, & Cattan, 2015). The cost of this technology compels some people with print disabilities to turn toward platforms such as NLS, BookShare, and Learning Ally, academic, and public libraries because these institutions have the technology or are required by law to have these technologies available for their patrons with disabilities.

2.7 Policy and its Relationship with the Digital Talking Book Program

NLS's Digital Talking Book Program presents a good example of all the three perspectives' interacting. The development of the technology was driven by NLS's need to replace an outmoded technology, while meeting the patrons' needs, wants, and expectations. Based on NLS's patron survey, they wanted a player that was easy to use. However, the NLS management wanted a player and format that utilized "off the shelf technology" to maintain low costs, build a durable device that could be sent through the mail, and one that was easy to maintain by local NLS/LBPD libraries' staff and volunteers. I assert that all three perspectives drove the development of this technology, which was influenced by the stakeholders (NLS staff, NLS librarians, Advocacy Groups, the United States Congress, and Patrons). Policy played an important role in the development and implementation processes of the Digital Talking Book Program, and policy will serve as one of the determining factors that will influence NLS's plans

to replace the current Digital Talking Book Player and will serve as a guide for the future of the Digital Talking Book Program.

2.7 (a) What is Policy?

Colebatch (2009) explains that "We are governed", and this governance does not emerge out of nowhere; it is founded by many collective ideas, subjects, practices, and organizational forms (2009, p. 8). A policy implies a means to describe views concerning society's present and a probable future state; further, it also offers a justification of the rules and arrangements of organizations; the contributors involved in the government process attempt to have their concerns and activities expressed as "policy".

Colebatch further explains that the implication of policy is shaped around three themes:

(1) A policy suggests order. A policy implies system and consistency. The action is not arbitrary or capricious: it is governed by a known formula of universal application. In this way, a policy is seen to set limits on the behavior of officials; at the same, it frees them up to make choices.
(2) Policy implies authority. To speak of something as policy implies that has the endorsement of some authorized decision-maker. It is the authority, which legitimates the policy, and policy questions flow to and from authority figures.
(3) A policy suggests expertise. The policy is seen as seen a process of governing some particular problem areas, and this implies knowledge, both of the problem areas and of the things that might be done. (Colebatch, 2009, pp. 8–9)

These three themes do not always work together in harmony; in fact, Colebatch argues that the themes function against each other. The author believes that some shared assumptions must be formed concerning policy. The first of these assumptions entail the following: "It is assumed that governments choose policy objectives, a policy is what governments decide to do, and policy must therefore be public" (Colebatch, 2009, p. 10). A second assumption that follows the first is coherence, "all the bits of the action should fit together and form part of an organized whole, a single system; things should form part of a 'big picture".

The third assumption is the hierarchy:

> That governing is accomplished by the application of authority, with people at the top making decisions, giving instructions, and taking responsibility for them being carried out. This is an important part of the validation of action: that it is seen as flowing from the decisions of leaders with authority, and so acts of governing are explained by reference to visible choices of these leaders ('decisions')…Authority flows downwards, and action must be seen to flow the same way (Colebatch, 2009, p. 11).

The fourth assumption implies the power of expertise; the duty of the governing body concerns the supervision of the problematic areas of social practice, and this requires drawing on "specialist knowledge about these areas and their problems, and possible responses to these problems" (Colebatch, 2009, p.11). The formulation of policy entails more than merely governmental involvement; external agents have an important role to play in the process, particularly the impression they have regarding the aspects that are seen as difficult that attention in terms of the policy. Even if we hold on to the perception that merely governments are responsible for making policies, it does not enjoy the freedom to make policies in times and circumstances of their choosing; further, non-government entities are also an important component of the policy process (Colebatch, 2009, p. 13).

The fifth assumption is that policy is created by authorized leaders and is the product of these leaders' choices (Colebatch, 2009, pp. 13–14). The leader or a body, which forms a part of the process, is authorized to perform some action, chooses to do something, and describe their chosen course of action in a document. Further, the document discusses the choice, and that choice becomes policy. In other words, the document may be a proposal that reflects the concerns and practices of the structure that created the document; the document serves as an endorsement of the choice (2009, p. 15). As the document works its way through the body, not all members may agree with the choice, but the body must commit to executing the choice or decision. Colebatch stated that the activity required to execute the decision involves that all participants are aware of the developments, and the policy affects the organization and employs knowledge, expertise, and resources to implement the policy. The author states that tension exists between the decision and the structure when policymakers have to consider an alternative course of action, even though the policy process creates opportunities for choice and "the scope for choice is limited by the action already in place and the commitments, which it embodies" (2009, p. 16). He further contends that choice and structure are intricately linked to one another, and the decision is futile unless the policy decision shapes the act. Further, unless the activity can be linked to a policy statement, securing support for the action would be difficult. Colebatch states that the two work against each other, "making choices challenge the existing structure, and having this structure limits the opportunity for choice. So there is a structural tension between the two in the policy process, and as a consequence, a lot of ambiguity"(Colebatch, 2009, p. 17).

Colebatch explains that the term policy entails practitioners shaping the action and scholars who attempt to determine the rationale of the action (Colebatch, 2009, p. 19).

> The policy is a word, which frames the action rather simply describes it: it labels what we see so that we can make sense of it in a particular way. For a start, it describes the process of governing in a particular way, stressing order, intention, and outcome, and this makes the practice valid… In all of this, we are seeing how policy expresses relationships of power. The formal 'decision-making' in, which leaders enunciate and validate courses of action is an expression of their power. The interplay among participants to define the issue operates to recognize the legitimate participants and their right to influence the allocation of resources. And power is expressed in the shared understandings and values, which underlie the exercise of public authority (Colebatch, 2009, pp. 19, 20).

2.7 (b) Why is Policy Important?

Colebatch argues that the word policy can be applied to describe an organization's practice to complete its mission and duties by expressing its intentions to execute these duties through statements and by shaping their practice accordingly; scholars need to ask the question as to how the proposal to shape policy is translated into practice (Colebatch, 2009, p. 21). This compels researchers to examine the participants, the places in which the participants interact with one another, and the dialogues that are employed in providing the action form and stability. The author explains that the concept of policy mobilizes specific values, while policy expresses the values of instrumental rationality and legitimate authority; further, the policy presents the action in terms of the collective pursuit of known goals to ensure that the policy is stable and predictable (Colebatch, 2009, p. 21). For policy, some valid authority determines goals.

> In doing this, the concept of policy both explains and validates the action: it explains what people are doing, and it makes a concept in use, and understanding 'policy' means understanding the way in, which practitioners use it to shape the action (Colebatch, 2009, p. 21).

Policy is a concept applied in academics and used as a means to investigate the organized activity, chiefly, but not exclusively, concerning public authority. Policy leads us to inquire who is involved, the place of its implementation, how the act is framed, and "what is the significance in this process of the idea of authorized purpose: that is, to ask questions about policy as a process, and not simply an outcome" (Colebatch, 2009, p. 21).

2.7 (c) Why is Policy Important to Libraries?

The public library presents a good example of a policy in use because the daily administration of a public library entails several policy implications imposed by internal and

external sources. Libraries make decisions regarding circulation, acquisition, technology, budget, space, community programming, and building/maintenance. Public libraries in the United States are governed and managed by policies provided by their parent agency, city, county, state, and federal governments. Hafner (1993) further states that "they must attend to their relationships with clientele, staff, the board of trustees, town or city officials, and sometimes state legislators" (p. 1).

Public libraries developed into the institutions they are present because through the course of their history, political leaders, including the founding father of the nation, Thomas Jefferson, perceived public libraries as a means to promote democracy (Hafner & Sterling-Folker, 1993). Hafner and Sterling-Folker contend that the wealthy classes in the United States during the 18th and 19th century feared that an illiterate population was a danger to the capitalist, democratic system (Hafner & Sterling-Folker, 1993; Harris, 1973). Hafner and Sterling-Folker presented the following argument:

> They feared that the uneducated classes and newly arrived immigrants would fall victim to subversive ideas that threaten the foundations of the government. Unless these classes were educated and informed about their government, they would fall easy prey to false and foreign philosophies. The provision of public education and public libraries was believed as a means of securing America's democracy against such destructive possibilities (p. 17).

The authors propose that libraries allow the working classes access to the same information as the wealthy classes that facilitates the working classes in improving their economic, political, and social standing in society.

> The wealthy class believed that libraries were a way to instill democratic values and hence safeguard democracy. Access to information and ideas also strengthened the political system that depended upon its citizenry making wise and informed choices about their government (Hafner & Sterling-Folker, 1993, p. 18).

Hafner and Sterling-Folker suggest that the public library is the only entity in the United States society that creates knowledge, ideas, and disseminates information freely, accessible to all citizens. Kerslake and Kinnel (1997) and Aabo (2005) maintain that despite the fact this is the age of digital technology, public libraries' role of disseminating information to individuals and groups for participation in cultural activities is much the same as the 18th and 19th-century founders of public libraries envisioned. Kerslake and Kinnel (1997) and Aabo (2005) state that public libraries have a social impact on the communities they serve, such as fostering cultural enrichment. The authors believe that public libraries offer an educational impact, enabling

people to look for work, enjoy leisure time; further, they state that they have an economic impact as well; for example, safeguarding the survival of a range of cultural producers (encouraging the publication of local authors, books, and history, regional authors and histories, and so on) (Aabø, 2005; Kerslake & Kinnell, 1998, p. 163).

Public libraries are managed and organized by policies that originate from the library system, parent agency, or the organization that deals with its day-to-day operations. Additionally, public libraries are affected by policies from all three levels of government: local level: taxes and bonds to fund operations and purchases, policies regarding residents' access, usage and content on the Internet, policies concerning who can use the public meeting rooms, city, county, and state civil service employment policies; state level: state library privacy laws, Internet filtering laws, state government funding of libraries, federal level: American with Disabilities Act, Children's Internet Protection Act (CIPA), E-rate discounts on Internet access for libraries, Library Services, and Technology Act (LSTA) grants, and the Rehabilitation Act.

All three levels of policies can affect the day-to-day operations of libraries. Moreover, they affect what method the community can access information from libraries. For instance, in the last 30 years, the federal government installed some policies that emphasize that public libraries provide access to information so that patrons can access government services or use the library to stay informed about political issues that affect their communities, and further so that patrons can use the Internet to access this information.

2.7 (d) (1) How Does Policy Affect Access to Information?

Under the universal service provisions of the Telecommunication Act of 1996 (47 U.S.C. § 254(e)), the Federal Communications Communication (FCC) was authorized to create a program to ensure equitable access to the Internet by offering schools and libraries discounted rates (Kranich, 2001a, p. 91; Schement, 2001, p. 19). These provisions signify that schools and libraries would form the first step toward greater public access to the Internet. The program referred to as the Education Rate or E-rate extends more than $2 billion a year in concessions and grants to schools and libraries; the funds are derived from fees collected by the FCC from long-distance phone carriers. The goal of E-rate was to bridge the digital divide by providing access and connectivity to communities in need. The E-rate established the precedent that all schools, libraries, and rural hospitals should have access to the Internet. Further, these policies helped to encourage public libraries to provide their patrons with Internet access (Kranich,

2001a, p. 91; Schement, 2001, p. 19). In the 2000s, as patrons' use of the Internet in public libraries increased, increasing concerns were raised by the public, library trustees, library boards, town or city officials, state legislators, and the United States Congress as well (Kranich, 2001a, p. 92). This was the concern over children or minors' unrestricted access to the Internet in schools and public libraries that could have exposed them to adult or sexually explicit material. Due to these concerns, all three levels of government, especially the Congress, passed laws that mandated public library computers to install filtering software on all computers used by children to access the Internet. CIPA requires that all public libraries that receive E-rate, library services, and Technology Act funds, other federal funding must allow only a filtered access to the Internet (Kranich, 2001a, p. 92). In addition to this federal law, several states have passed laws (Arizona, Kentucky, Michigan, and South Dakota) that require public and school libraries to filter all computers used by children and minors so that these institutions receive state and local funding (Kretchmer, 2001, p. 99).

Public libraries must balance the goals of providing civic and government information to the community using the Internet, and at the same time, provide Internet access to patrons whose socio-economic status does not allow them unlimited access or allows limited access (Aabø, 2005, p. 209). Bertot (2009) contends the following:

> Public libraries were early adopters of Internet-based technologies and have provided public access to the Internet and computers since the early 1990s. The landscape of public access Internet and computing was substantially different in the 1990s as the World Wide Web was only in its initial development (Bertot, 2009, p. 81).

He further adds that public libraries experimented with public access to the Internet, incorporating this service into existing services and using any resources that were available to provide the public with Internet access, without taking into account the implications of public access technology on library management, facility, and staffing. Public libraries installed a variety of public access technologies for their patrons' use: public access computers, wireless access (Wi-Fi), integrated library systems, online databases, digital references, eBooks, downloaded audio and video, among other tools (Bertot, 2009, p. 83). Additionally, when libraries do not provide direct access to these resources and services, public libraries provide access points to services such as email, social networks, and online gaming. Patrons expect library technologies and services to be similar to ones they can access outside the library; otherwise, they will be discouraged from using the library (Bertot, 2009, p. 84). Patrons expect

library technologies to have a similar appearance and function as the services available in the marketplace. Further, they expect the same level of customization that Amazon, Facebook, iTunes, YouTube, Google, Instagram, and other Internet sites/services allow. Bertot states that for more than fifteen years, public access technology has become a complex issue that necessitates possessing adequate staff, funding, and resources to satisfy patrons' expectations and needs regarding networked technologies and services (Bertot, 2009, pp.90–91). This has placed a strain on public libraries, as they attempt to provide this service to their local communities (Bertot, 2009, p. 82). Bertot maintains that "given increased operating costs because of inflation, the continual need to innovate and upgrade technologies, staff technology skills requirements, and other factors discussed in this article, libraries may not be in a position to shoulder the burden of public access alone" (Bertot, 2009, p. 91). Public libraries should no longer bear the burden of being the sole provider of public access to the community. They need to reach out to their communities to find ways to expand public access (p. 91). Bertot believes that "the potential of such an approach can benefit a community through an integrated and broader access strategy, but also can relieve the pressure on the public library as the sole provider of public access" (p. 91). However, Kranich asserts that public libraries play an extremely crucial role in closing the "digital divide" (Kranich, 2001b, p. 87).

2.7 (d) (2) Digital Divide and Libraries

The term 'digital divide' for many researchers revolves around these two definitions:

> The gap in computer literacy and accessibility that divides American society along economic, racial, and ethnic lines (Heanue, 2001, p. 124).

> The differences in social, economic, and demographic factors between individuals who use computers and those who do not (Cresci & Jarosz, 2010, p. 4550).

In the disciplines of Communications, Disability Studies, and Library and Information Sciences, some scholars propose that the digital divide involves dealing with class, social, and economic inequities in access, ownership, and usage of ICTs (Stevenson, 2009, p. 1). To close or bridge the gap, the government and society need to work to improve the lives of people who might gain the maximum benefits from this technology.

Stevenson (2009) states that public libraries have benefited from the public, private, and non-profit funding of programs and technology that were employed to close the gap. However, he also believes that projects such as the Bill and Melinda Gates Foundation transformed the

discourse regarding the digital divide, changing it from an issue of class conflict to an administrative and technical issue (Stevenson, 2009, p. 1). The author suggests that public libraries could have employed alternative technologies and funding for public access technology. He proposed that instead of using Microsoft software or funds from the Gates Foundation, public libraries should have employed open-access software (Stevenson, 2009, p. 16). One of the main supporters of this view, Richard Stallman maintains that the digital divide is an indication of a larger social problem of proprietary software (copyright and patenting) and restrictive intellectual property law that restricts the flow of information.

Kinney (2010) and Bertot (2003) believe that the digital divide should be treated as a multifaceted concept that does not merely involve dealing with issues of access, but also analyzes problems related to communication, infrastructure, economic circumstances, information access, and literacy (Bertot, 2003; Kinney, 2010, p. 114). Kranich (who was also the president of the American Library Association in the early 2000s) stated that "long before policymakers began labeling gaps in electronic information the 'digital divide' libraries were providing communities equal ready, and equitable access to databases, computers, the Internet, free nets, adaptive technology, digital collections, and training" (Kranich, 2001b, p. 4).

The phrase, "If you build it, he (i.e., the people) will come," describes some of the policymakers' views of public libraries that provide public access to technology. However, merely providing technology and a place to use the technology may not be sufficient (Kinney, 2010; Robinson, 1989). Kinney states that social groups and patrons who can utilize these technologies and the initiatives that are aimed or designed to encourage their use, fail to reach these groups or these groups may not be taking advantage of the public access technologies (PATs) even when they are available due to a variety of reasons. For example, the reasons may be that certain socio-economic groups may not access them due to a lack of computer literacy, time limits placed on public library computer patrons, lack of resources to travel to a public library, and possible discomfort in using computers at the public library (Kinney, 2010, pp.120, 138–140). Additionally, lower-income library patrons are more likely to use libraries as their only means of using a computer with full capacities and Internet access. Even though many of these groups use other ICTs, such as smartphones to access the Internet, their usage of smartphones is limited due to phone, data plans capabilities, and other reasons. Further, cultural influences can play a role in users' cellphone usage (Graham & Choi, 2016). In other words,

some social-economic groups use cellphones/smartphones to access the Internet, but the same social groups may not have access to computers for Internet use.

Kinney proposes that there are differences in how public libraries provide Internet services to their patrons, because the urban/suburban libraries have broadband connections that rural libraries do not, and affluent cities/communities can spend a greater amount of fund money toward public access technologies than lower-income cities/communities (Kinney, 2010, pp. 118–120). Even within an urban system, the branches that have a greater number of prosperous patrons or those with more political power will have a larger number of computers than branches with less affluent users.

Kinney further stated the following:

> Even if libraries can provide greater equality of access to computers and the Internet, access alone is not enough to ensure technological equity. Public access to the Internet is not necessarily of the same quality as home access. Access does not ensure effective use, and the digital divide is a function of broader social conditions for which access to computers and the Internet is not a sufficient remedy (Kinney, 2010, p. 120).

However, Sigler et al. (2011) assert that library use increases during economic downturns and that public libraries played an important role in the difficult economic conditions during the 2008–2011 national economic downturn (Sigler et al., 2011, pp. 19–20). The United States public libraries could use the Internet to meet crucial patron and community needs despite the severe economic challenges facing public libraries. During the Great Recession, patrons utilized public libraries and library computers for job-seeking activities, social services, email access, and free entertainment; this increased the necessity and usage of the public library and the Internet. At the same, this drained library budgets, as the state and local government did not appropriate enough funds to public libraries to meet these increasing expenditures due to declining tax revenues and the financial uncertainties of the approaching years (Sigler et al., 2011, pp. 19–20).

Sigler et al. (2011) state that during this period, public libraries' role of providing Internet access expanded into providing direct access to e-government, including training, support, and most importantly, to serve as an e-government center for their communities (p. 31). They further contend the following:

> When libraries and government agencies actively collaborate to meet community needs, they can address problems more effectively and can even tackle problems that the libraries and government agencies cannot address individually… This prolonged economic downturn has demonstrated the continuing central role of libraries in their

> communities, of the important contributions of libraries and their public access technology to support the economic needs of community members, and the significant potential of library/government agency partnerships in addressing economy-related issues for communities (Sigler et al., 2011, p. 31).

They believe that as the economy's condition improves, public libraries will have to successfully reconcile needs and challenges about these services, which will likely be an issue for libraries well into the foreseeable future (Sigler et al., 2011, p. 32).

2.7 (d) (3) Disability Divide and Libraries

Dobransky and Hargittai (2006) argue that the "Disability Divide" is caused by social, economic, and technical factors, and these factors are the reasons due to which individuals with disabilities do not use computers and the Internet as frequently as users without any disability. Dobransky and Hargittaii analyzed the data from the Computer and Internet Use Supplement (CIUS) of the Current Population Survey (CPS) administered in October 2003 by the US Bureau of Labor Statistics and the Bureau of the Census (Dobransky & Hargittai, 2006, p. 319; National Telecommunications and Information Administration (NTIA), 2004). The CPS collects data on all members of a household by asking one member to report for all other household residents. The researchers analyzed for the age group 18 to adult, and their data set comprised 54,956 respondents. (Dobransky & Hargittai, 2006, p. 320). The survey asked questions regarding disabled and non-disabled members of households and those who used a computer and the Internet (Dobransky & Hargittai, 2006, p. 321).

The investigators discovered that a person's disability was not a barrier to their use of the Internet.

> …After controlling for people's socioeconomic background and other demographic characteristics, neither hearing impairment nor limited walking ability is a statistically significant predictor of Internet use.
> This is an important discovery, as it suggests that… when controlling for other factors in cases where the particular disability has little to do with using a computer there are few significant barriers to use. In contrast, disabilities that are more directly tied to using a computer visual impairment, difficulty typing continue to exhibit independent effects on use; these results imply that technological barriers are the likely culprit preventing people with certain disabilities from going online (Dobransky & Hargittai, 2006, p. 327).

The authors' further state that one of these technical barriers is the cost of adaptive technology: it is expensive for many people with disabilities who have low incomes (Dobransky & Hargittai, 2006, p. 316). When people with disabilities use the Internet, they are more likely to search for health information and information regarding government services and play online

games, compared to non-disabled users, who use the Internet to communicate, do online banking and shopping (Dobransky & Hargittai, 2006, p. 328). The authors claim that this is due to another technical barrier, that is, web sites that are not accessible to disabled computer users.

The social barriers that cause low Internet usage by people with disabilities are lack of education, training, or knowledge regarding computers, and available content on the Internet: Additionally, web accessibility may hinder access to this content (Dobransky & Hargittai, 2006, p. 330).

The authors concluded their study with the following assertion:

> Analyses of large representative data sets help provide generalizable findings in response to research questions. Such information can be useful for framing and focusing more in-depth studies of the phenomena under investigation. In this paper, we provide the context for more refined studies of ICT uses by people with disabilities. Results suggest that numerous factors pose barriers to ICT access for those with disabilities. Moreover, we find that it is misleading to collapse different types of disabilities into one category, as the likelihood of Internet use is not always related to disability status; future data collection efforts should try to disaggregate categories and studies should be mindful of the divergent situations faced by people living with different disabilities (Dobransky & Hargittai, 2006, p. 331).

Lazar and Briggs (2015) in a study in that was utilized to improve services for the visually impaired for the Baltimore County Public Library contend that public libraries in the past primarily purchased print materials for their patrons, and these print materials, such as books and magazines, were inherently inaccessible for people with print-related disabilities (Lazar & Briggs, 2015, p. 172). People with print disabilities were often referred to their local or state library for the blind and physically handicapped; however, over time, the nature of materials purchased at public libraries changed. A large percentage of materials acquired by public libraries are presently produced, distributed, and acquired in digital formats, such as e-books, subscription access to databases, CDs, and DVDs (Lazar & Briggs, 2015, p. 172). Lazar and Briggs believe that digital materials create an opportunity for public libraries to start providing services to patrons with print disabilities.

Further, Lewis (2013) believes that people with disabilities want to access information in the same manner as non-disabled library patrons. Lewis further argues that:

> Today, disabled individuals have higher expectations, and we live at a time when we can meet these expectations. Remarkable advances in technology have made it possible for individuals with disabilities to independently access the information they want and need. Individuals with disabilities have always wanted the same access to information that their family members and friends have at libraries. Now, because of adaptive technology, the

> Internet, and e-books, they know they can get more from our libraries. Individuals with disabilities are hungry for more information, and they deserve to get it (Lewis, 2013, p. 230).

The community with disabilities is one that desires equal access to information from both NLS libraries and their local public libraries. Lewis contends that with adaptive and other technologies, public libraries possess the capability to provide people with disabilities with quality library services (Lewis, 2013, pp. 230–231). The author further states that individuals with disabilities, at times, maybe unaware of the kinds of services their local libraries provide. She asserts that the staff at local public libraries are not trained as to providing library services to patrons with disabilities. Lewis also notices another problem with public libraries: the lack of awareness in the library staff regarding the process involved in referring patrons to their local NLS library or to other local agencies that can help individuals with disabilities. She observes that library staffs are not comfortable working with patrons with disabilities or depend on one librarian who has the training required to serve special populations, the only staff member with that kind of training (Lewis, 2013, p. 231).

Finally, Lewis maintains that providing library services to patrons with disabilities is not a stress-free task:

> Providing equal access to individuals with disabilities is not always easy. Many of my clients were bitter, discouraged, sick, tired, and crabby. But there have been incredible rewards: the clients who thought they could never enjoy a book once they lost their eyesight, the clients who thought they could never "see" art or "see" a play, and college students excited to receive electronic textbooks on time to complete course work (Lewis, 2013, p. 235).

People with disabilities simply want to be treated like everybody else in society and desire equal access to the same information as the non-disabled. People with disabilities wish to visit their public library to use adaptive technology and to access information in any format except print. Lewis (2013) states that these groups should be able to use both their public library and their local NLS Library.

Lazar and Briggs (2015) further offer the following argument:

> Public libraries in the United States are required to serve people with disabilities. Title II of the Americans with Disabilities Act of 1990 covers state and local government (which nearly all public libraries are a part of), and Title III of the Americans with Disabilities Act covers public accommodations, with libraries being specifically noted in the regulations. Some state-level laws also detail more stringent requirements for serving people with disabilities. However, in the past, there has been a parallel system in, which public libraries would serve people with most physical disabilities, and the Library of

> Congress National Library Service for the Blind and Physically Handicapped (LBPD) would serve people with print-related disabilities. So there is a long history of public libraries serving people with disabilities, but often the public library would serve people who needed physical access to the library (e.g., individuals in wheelchairs), and the LBPD would serve people who needed resources in an alternative format (Lazar & Briggs, 2015, p. 73; Lazar, Jaeger, & Bertot, 2011).

Copeland (2011) offers the counterargument that even though "The services of the NLS are of critical importance," public libraries have become dependent on NLS's services for their patrons with disabilities (2011, p.225).

> They have, in many instances, come to think of the NLS as the public library for those who are blind or who have physical challenges. In turn, this has led to ''separatist'' or ''segregationist'' tendencies. At least in terms of public library services, using a local public library has not been and is not always an accessible option for differently abled individuals (Copeland, 2011, p. 225).

Researchers in the fields of Communications and Library and Information Sciences fields have been studying how the ADA has affected public libraries' provision of services to special populations. One study focused on people with disabilities and their opinions regarding public libraries and library services (Burke, 2009). Copeland (2011) interviewed library patrons and probed the participants regarding their experiences using libraries throughout their life.

Burke (2009) conducted a study using the data obtained from the CPS, October 2002: School Enrollment/Library Use supplement, a federal survey conducted by the United States Census Bureau for the Bureau of Labor Statistics. The survey occasionally includes supplemental questionnaires such as the one that has been reexamined in this study (Burke, 2009, p. 46). "The October 2002 dataset contained information about 159,887 people who lived in 57,148 households. There was one reference person per household who answered questions for all people in the household… Library use questions were asked at a household level." (Burke, 2009, p. 46). The study examined a dataset comprising more than 5,137 households (9% of the households) in the United States reported a member identified with a physical, mental or emotional condition that impairs participation in activities of daily life (Burke, 2009, p. 46). People in households were surveyed concerning their opinions concerning barriers to public library use and the efforts made by public libraries to be useful to people with disabilities. The results of the study revealed that perceptions regarding accessibility, collections, and the presence of assistive or adaptive devices for people with disabilities were slightly more positive if someone in the household had been utilizing the public library in the previous year (Burke,

2009, p. 48). In other words, people with disabilities reported a more positive perception of libraries if someone in their household had used the public library earlier. However, the study suggested that even after the passage of the ADA, individuals with disabilities felt that their public libraries did not contain assistive/adaptive technology or materials in accessible formats (Burke, 2009, pp. 50–51).

The author further states that:

> Before marketing to the community, each public library would need to have a clear idea of what it has to offer its community in terms of accessibility, collections, and assistive or adaptive technology. Because previous studies showed that many libraries have inadequate availability of proper technology for people with disabilities, libraries that wish to serve people with disabilities should examine ways in which they can and should increase the availability of assistive devices. Rubin (2001) and Quezada (2003) suggest that libraries gather information about the prevalence of different types of disabilities in their communities to make good decisions on how to allocate funds for serving these communities (Burke, 2009, pp. 50–51; Quezada, 2003; Rubin, 2001).

Copeland (2011) conducted a qualitative study with differently abled patrons, a term the author applies for people with disabilities. The author believes that this term is most appropriate for referring to people with disabilities because terms such as disabled or people with disabilities have been created by society and serve to stereotype the differently-abled negatively. (Copeland, 2011, p. 226). In Copeland's study with differently-abled library patrons, the author conducted in-depth interviews with five people who held at least a master's degree in LIS; one participant had a Ph.D. in LIS, while another had a Ph.D. in history (2011, p. 228). The interviews were conducted face-to-face or via telephone; it contained open-ended questions, concentrating on knowing the participants' life histories, reconstructing their library accessibility- or non-accessibility-related experiences. The study attempted to learn about the respondents' experiences and emotions related to library accessibility or non-accessibility (Copeland, 2011, p. 229). The participants were asked to offer possible solutions to improve access and services for differently abled library patrons. All the participants' communications were recorded and transcribed, and a content analysis of the interview transcripts to locate themes, commonalities, and differences from the respondents' experiences were performed. The respondents were allowed to review their interview transcripts for accuracy (Copeland, 2011, p. 229).

The following themes emerged from the study's data: **(1)** the participants in the study expressed a deep love for both libraries and reading, despite challenges concerning

inaccessibility, **(2)** library services for differently abled populations are not always extensive and mainstreamed. Qualified patrons are often required to rely on the NLS, libraries in specialized schools, or other specialized, ‘‘segregated’’ libraries and library services for their informational, reading, and library programming needs. **(3)** While library accessibility has improved over the past several decades, further fundamental enhancements are still required, particularly concerning perceiving barriers to access through the perspective of the differently abled. **(4)** The availability of time, resources, and limited professional training of library and information science professionals act as barriers to accessibility. **(5)** Technology has opened many doors, but it has not deconstructed disability as a factor in library and information center services. Indeed, technology can construct disability. **(6)** Compassion cannot be mandated or legislated. Yet compassion is a hallmark of any service-based profession (Copeland, 2011, p. 230).

Copeland stated that all libraries, including public libraries, need to invite differently-abled library patrons to participate in the planning process of library services to serve them adequately (Copeland, 2011, p. 236). The study's participants offered the following suggestions to improve accessibility: Provide ramps and automatic door entrances or as a cost-effective alternative use automatic push-button device. These devices can be easily installed on both exterior and interior doors, including restroom doors. Widen stacks and spaces between furnishings for easier clearance and access; remove unnecessary barriers, such as book carts and shelving stools that may inhibit access throughout a space. Offer reference and circulation desks that allow librarians to see and assist seated patrons and that allow the seated patrons to access the desks. Whenever possible, staff all levels of the library to offer assistance to all patrons in need. Think of accessibility as an effort that benefits all library patrons and staff, differently able and typically able, alike. Use the principles of Universal Design and make small changes that benefit everyone. For example, automatic door entrances help those who are differently-able, a mother with small children, a librarian with a full book cart, a teen with a heavy book bag, and the elderly (Copeland, 2011, pp. 236–237).

Copeland advocates for further LIS research that involves differently abled library patrons, to help assess the accessibility or inaccessibility of library buildings and services (Copeland, 2011, p. 236).

Yi (2015) further proposes that public libraries need to consider accessibility or inaccessibility when they use their websites as a means to disseminate information to library patrons (p. 75). Yi contends that most public library websites are not accessible according to Section 508 of the Rehabilitation Act and that public libraries are not aware of the problem. Yi evaluated websites' accessibility based on Section 508 standards; "It requires any federally funded agencies to make electronic and information technology accessible to everyone" (p. 77). The author conducted web accessibility testing based on these standards on 20 public library websites administered by cities with a high percentage of people with disabilities and a considerable population of older adults; it was conducted for the following states: Alabama, Arizona, Florida, Hawaii, Kentucky Louisiana, Maryland, Michigan, Missouri Ohio, Pennsylvania, and Rhode Island (Yi, 2015, pp.77–78).

The study discovered that most of the public library websites that were examined did not comply with Section 508, while 20% of public library websites studied for accessibility by people with disabilities were found to comply with Section 508. Further, 13% of public library websites analyzed for accessibility by older adults were found to comply with Section 508 (Yi, 2015, p. 79). Yi argues that if the goal is to provide people with disabilities and older adults equal access to web resources and services as the rest of the public, compliance with Section 508 is essential. Yi argues that "compliance with Section 508 is fundamental to achieve such a goal. The public libraries in the study are placed in the communities with the highest percentage of people with disabilities or older adults who are the target population of Web accessibility" (Yi, 2015, p. 79).

Lazar and Briggs (2015) maintain that public libraries have a history of serving large populations, and as new technologies are acquired and used by public libraries, they need to create more opportunities to serve them. The authors, however, contend that people who are visually impaired or those with low vision have not been served by public libraries, while NLS will continue to be at the forefront of serving blind people and those with low vision. Lazar and Briggs argue that these new technologies and resources can create an opportunity to serve these patrons based on a starting point for these resources that do not require the addition of major costs to a library system (Lazar & Briggs, 2015, pp. 183–184).

2.7 (d) (4) Digital Inclusion and Libraries

Over the past 30 years, the federal government, state government, non-profit and philanthropic organizations have focused on making libraries, especially public libraries, the primary point of community's access to the Internet (Kinney, 2010, pp. 146–147). With the addition of broadband and mobile technologies, the public's expectations about public libraries remaining the central point for community access to the Internet for everyone in the community have also increased.

The policies that place public libraries are the primary point of the community's access to the Internet are also, intended to encourage low-income and the socially excluded groups to use public libraries for this purpose. However, Gehner (2010) asserts that not everyone welcomes this mission, even though there are American Library Association (ALA) policies, such as, ALA Policy 61, "Library Services for the Poor," that was adopted by the ALA in 1990 (Gehner, 2010, p. 40). He states that public library policies and library staff's attitudes can lead to the exclusion of not only patrons with low incomes, but also working-class patrons.

Kinney asserts that even though lower-income library patrons are more likely to use libraries as their sole means to access computers and the Internet, lower-income patrons are less likely to have library cards that allow one to use libraries and feel comfortable in libraries (Kinney, 2010, p. 122). Kinney contends that libraries helped to bridge the digital divide, but the gap continues to exist, and the target is to move towards new technologies and that, "Libraries help bridge some inequities more than others, and substantial disparities exist among library systems...'Access alone is not enough to remedy technological inequities. Public access is not of the same quality as home access; access does not ensure effective use; and broader social and economic issues hamper the ability of access to remedy social ills" (Kinney, 2010, p. 148).

2.8 Social Informatics and its Relationship to the Digital Talking Book Program

I assert that social informatics assumes a "middle of the road" approach and that the development of an ICT requires examination using this theoretical framework that takes into account various elements. Researchers in the field of social informatics would argue that many economic, ethical, organizational, political, social, and technical concerns and the variety of patrons' disabilities affected how the Digital Talking Book Player was planned, manufactured, implemented, and is used. Researchers argue that there is a mutual composition of social relations and technologies, which takes place due to technological artifacts becoming entangled

into our activities and our connections with other people (Bruce, 1996). Tuominen, Savolainen, and Talja (2005) argue that:

> The sociotechnical viewpoint can be highlighted by an example of a systems designer with a sociotechnical orientation. The systems designer does not simply plan the elements of technical artifacts while working in a design studio far away from the people who will use a specific system. Effective design of sociotechnical systems requires a set of "discovery processes" for understanding which features will be needed in the system (Tuominen, Savolainen, & Talja, 2005, pp. 338–339).

Sawyer (2005) explains that for more than 30 years, researchers have discovered five common findings that are derived from the inquiries in social informatics:

1) **Uses of ICT lead to multiple and sometimes paradoxical effects**. Anyone ICT effect is rarely isolatable to the desired task. Instead, the effects of using an ICT spread out to a much larger number of people through the socio-technical links that comprise context. An examination of this larger context often reveals multiple effects, rather than one all-encompassing outcome, and unexpected as well as planned events. (Sawyer, 2005, p. 11).

NLS/BPH libraries are discovering as more patrons' download using BARD; libraries are starting to notice that they will need to make changes in personnel and the areas in which their library staff works. A further focus is required in the areas of Reader Advisory, Technical Support, and Computer Support and less staffing in areas that focus on mailing materials to patrons (Rose, 2018a, p. 477). However, NLS librarians fear that as more resources are being used to improve the downloading of books from BARD, their patrons may fear being cut off from their local NLS/BPH library.

2) **Uses of ICT shape thought and action in ways that benefit some groups more than others**. People live and work together in powered relationships. Thus, the political, economic, and technical structures they construct include large-scale social structures of capital exchange, as well as the microstructures that shape human interaction. An examination of power often shows that a system's implementations can both reinforce the status quo and motivate resistance. That is, the design, development, and uses of ICTs help reshape access in *unequal* and often ill-considered ways (Sawyer, 2005, p. 11).

For example, Lundh and Johnson (2015) conducted a literature review on empirical research that studied the use of DAISY Books, and the authors reviewed 12 studies that fulfilled their criteria (pp. 56–57). The authors focused their study on the theory of affordances, a concept that is understood as the perceived possibilities that arise due to an encounter between an individual, an object, and an environment. Lundh and Johnson argue that "The usefulness of an

object, such as a talking book, is not a consistent factor. Instead, it depends on how people perceive the affordances of the object in a particular physical, social, and historical situation" (Lundh & Johnson, 2015, p. 56; Rose, 2018a, p. 471). The authors contend that a talking book cannot be considered useful *per se*; the book's usefulness does not depend exclusively on its design, user, or societal and institutional setting in which it is used, but rather, on the interaction between these three elements. The idea is to focus on the interaction between the user and the document in a specific context (Lundh & Johnson, 2015, p. 56).

Lundh and Johnson (2015) made the following observation in their literature review regarding studies on Digital Talking Books:

> However, to some extent, the affordances of talking books seem to depend on whether the users have visual impairments or dyslexia/reading and writing difficulties (other potential users are not covered in the previous studies analyzed). Some functionalities that were developed with visually impaired users in mind do not seem to offer any affordances to dyslectic users and vice versa. This raises important questions about further developments of the DAISY format, not least in light of the descriptions of the growing number of young users with dyslexia/reading and writing difficulties (2015, pp. 60–61).

In other words, the affordances of the Digital Talking Books in the DAISY format allow visually impaired persons to take advantage of this adaptive/assistive technology. However, these very features hamper the use of this technology by dyslexic individuals. NLS will be required to consider this issue further when it designs the replacement for the current models of the Digital Talking Book Player. NLS librarians, in their comments to the survey, were arguing that NLS has to open its services to people with dyslexia (Rose, 2014). They assert that this disability is more prevalent in students, and the librarians believe that Digital Talking Books could help people with dyslexia. The ratification of the Marrakesh Treaty and the passing of laws, which authorizes NLS to implement the treaty, NLS's implementation of the treaty has affected the patron eligibility standards, which now allow people with reading disabilities (including people with dyslexia) to apply for NLS services (Keninger, 2020). **RQ5** studies broadening of the patron eligibility standards from the various stakeholders' points of view.

3) **The differential effects of the design, implementation, and uses of ICTs often have moral and ethical consequences**. This finding is so often (re)discovered in studies across the entire spectrum of ICTs and across various levels of analysis that ignorance of this point borders on professional naiveté. Social informatics research, in its orientation towards critical scholarship, helps to raise the visibility

> of all participants and a wider range of effects than do other approaches to studying computerization (Sawyer, 2005, p. 11).

NLS and NLS/LBPD face these issues as the NLS wishes to expand the downloading of books via BARD and the possibility of mailing books directly to their patrons, instead of Digital Talking Books Cartridges being mailed by their local NLS/LBPD. The first concern in this regard is that many patrons of the program may not be able to use a computer due to their impairment or may not own a computer or may not be computer literate due to their socioeconomic status (Rose, 2018a, pp. 477–478). Conversely, however, the increasing number of 'Baby Boomers', who are aging and are facing various disabilities consequently, are computer literate and enjoy a higher socioeconomic status (their families have access to computers, smartphones, broadband, cellular phones, and Wi-Fi (Rose, 2018a, pp. 477–478). The NLS and NLS/LBPD libraries are being compelled to provide hi-tech services to these patrons and other patrons due to lower incomes may only be able to receive Digital Talking Books Cartridges via mail (Rose, 2018a, pp. 476–477).

4) **The design, implementation, and uses of ICTs have reciprocal relationships with the larger social context**. The larger context shapes both the ICTs and their uses. Moreover, these artifacts and their uses shape the emergent contexts. (Sawyer, 2005, p. 11).

I assert that this finding presents a prime example of how technology and the social context constitute reciprocal relationships. An example of this finding offered by the fact that society's perception of people with disabilities has evolved over the past 50 years, moving away from a medical model of disability towards a social inclusion model of disability, a shift in perspective that has influenced how people with disabilities employ adaptive or assistive technologies. Due to this change in perception, some advocates and researchers in the disability community have suggested the application of universal design of ICTs and proposed that over time, adaptive/assistive technologies must be done away with. The universal design concept is defined as "simply designing all products, buildings and exterior spaces to be usable by all people to the greatest extent possible" (Mace, Hardie, & Place, 1996, p. 2). For example, by the year 2020 in Norway, the universal accessibility of all ICTs distributed in the country will be required by law (Gasparini & Culén, 2012, p. 29).

These changes have influenced the Digital Talking Book Program. Gasparini & Culén (2012) "pointed out that many factors (socio-cultural, technical, economic, environmental, etc.)

influence adult adoption of assistive technology. We find that all those same factors influence the children" (Gasparini & Culén, 2012, p. 29). I propose that people with disabilities want to use adaptive technology, but they do not want to be stigmatized for this reason (especially in public). Consumer products such as iPad, iPhones, and Android Smartphones allow people with disabilities to access information without other people's knowledge (Gasparini & Culén, 2012). The author's argued that this issue was especially important for children who want to fit in with their peer group, and tablet computers allow these users the self-confidence and assurance to do so. Also, if children and young people use these devices as adaptive or assistive technologies in educational and social settings, it may prevent their peers from noticing the way these individuals utilize these devices(Gasparini & Culén, 2012, p. 33). "A very important point in favor of mobile assistive technologies is that it minimizes stigmatization for the ones using it"; further, these researchers believe that stigmatization is one of the main reasons due to why people with disabilities to reject adaptive and assistive technologies (Gasparini & Culén, 2012, p. 33). These reasons and the widespread use of consumer devices such as tablet computers, smartphones, by children and younger adults influenced NLS to add an Apple iOS application to iTunes to enable Apple patrons to download the BARD software for free, directly onto their Apple devices (Library of Congress, 2013). NLS, in 2015, added an Android application for Android smartphones and tablets computers that enables patrons to access BARD from these devices for downloading and listening to their NLS books (Library of Congress, 2013; 2015).

5) **The phenomenon of interest will vary by the level of analysis**. Because networks of influence operate across many different levels of analysis, relevant data on computerization typically span formal and informal workgroups; formal organizations; formal and informal social units like communities or professional occupation/associations; groups of organizations and/or industries; nations, cultural groups and whole societies (Sawyer, 2005, p. 11).

NLS presents a good example of how the LC, congressional committees, the GAO, advocacy groups, NGOs, professional associations (ALA, Association of Specialized and Cooperative Library Agencies (ASCLA), Special Library Association (SLA), local, state, and regional groups, for example, the Hawaiian Library Association (HLA) influence how NLS and the network libraries conduct their business. For example, ASCLA, under a contract from NLS and LC, drafted the standards that both regional and sub-regional libraries apply for the establishment and management of these libraries (American Library Association, 2011). These standards and guidelines were discussed earlier in this chapter, entitled, "*Revised Standards and*

Guidelines of Service for the Library of Congress, Network of Libraries for the Blind and Physically Handicapped," that were updated in 2010 to reflect the transition from an analog to a digital format. These standards set the benchmark for service and guide as the optimum practices for Network Libraries.

An example of this interaction with NLS is provided by the economic conditions of 2008–2009 that led to budget cuts at the state and local level, and the continuing budgetary problems that were caused by the recession. The Great Recession hit Michigan especially hard due to bankruptcies and layoffs in the automobile industry that forced some counties in Michigan to close their regional/sub-regional libraries. For example, the Wayne County Regional Library, which used to serve one of the largest and heavily populated counties in the state was closed. This regional library served all the communities in Wayne County, including Detroit. The Wayne County Regional Library oversaw the Detroit Subregional library, and the Detroit Public Library System managed the sub-regional. The Braille and Talking Book Library of Michigan took over the supervision of the Detroit Subregional Library, and the Braille and Talking Book Library now serve any patrons not served by the Detroit Subregional Library. In April 2016, a new Advisory and Outreach Centers (AOC), was opened at the Taylor Public Library in Taylor to serve all the Wayne County patrons that were being served by the Michigan Braille and Talking Book Library in Lansing, Michigan (Michigan Braille and Talking Book Library, 2016).

These closures influenced NLS to research alternatives to the current regional/sub-regional service model (Ducrest Associates, 2010, pp. 23–29). Due to the recession causing the closure of the regional/sub-regional libraries, NLS created Advisory and Outreach Centers, which serve as smaller and more economical versions of the sub-regional libraries (Ducrest Associates, 2010, p. 5; Network Service, 2011). The AOCs no longer provide daily circulation of audiobooks to their patrons, and the AOCs' staff focuses on Reader Advisory services, outreach, and the distribution of Digital Talking Book players (Network Service, 2011; Rose, 2018a, p. 478). The AOCs provide walk-in services to patrons who use the Digital Talking Books Player; the AOCs can download books from BARD for their patrons. The Regional Library provides daily book circulation to AOCs' patrons and oversees the maintenance and distribution of Digital Talking Book players for patrons in the AOCs' service area (Network Service 2011). The AOCs allow the regional libraries to maintain patron services and programs in the service area that the former sub-regional library served. ear collection of materials,

approximately 5,000 talking books (Rujan & Andrysiak, 2008, p.17). However, with NLS deploying DoD, NLS is moving from having a physical collection to a digital collection. AOCs use less space and the AOC can circulate digital cartridges via mail or patrons visiting the AOC. The AOC enables face to face service on a local level: patrons can drop off broken DBMs and pick replacement. The AOC can provide Outreach services to community via one on one training to use ATs, DBMs, BARD, how to apply for the service, Book Clubs and Author visits Outreach to schools, nursing homes, etc. Michigan has converted all of its subregional libraries to AOCs.

2.8 (a) Using Social Informatics to Analyze ICT Policy

Kling et al. (2005) state that social informatics forms a good theoretical foundation to examine ICT policy (Kling et al., 2005, p. 51). ICT policy analysts and researchers are concerned as to the extent to which government and public agencies should be involved in the encouragement, application, and distribution of ICTs in society.

Several public policy issues have been discussed in this proposal that falls within the ICT policy analyst's/researchers' purview, for example, the use of public libraries for Internet access by special populations and underrepresented groups, the use of public libraries to bridge the digital divide and the disability divide. Some of the issues include the utilization of ICTs as adoptive/assistive technologies by people with disabilities, whether ICTs should be developed using principles of Universal Design as against designing ICTs with accessibility features, and whether publishers and information vendors should render their electronic products (databases, eBooks, and websites among others) more accessible to individuals with disabilities.

Kling et al. (2005) assert that ICT policy analysts and researchers should examine these issues. Their central aim is to influence the opinions of policymakers to render these issues understandable, define them, and assess the alternative positions that can be assumed concerning these issues (Kling et al., 2005, p. 52; Thorngate, 2001, p. 85).

> Bauer (2001, p. 413) explains that ICT policy analysis is an activity fraught with complexity because these technologies do not interact with "established social and political processes" in stable or predictable ways. In fact, "more often than not, new technologies actually create many new problems, fall far short of their predicted abilities, or bring with them a myriad of unintended consequences" (Bauer, 2001, p. 413; Cranor & Greenstein, 2003; Kling et al., 2005, p. 51)

One problem with this situation concerns the evaluation of potential outcomes of competing policy alternatives which may become difficult for analysts and researchers that

supply a level of unpredictability to the process, amplified by the push for technological change (Kling et al., 2005, p. 52).

"Policy analysis is not a linear process. It is not a rational sequence of discrete steps that result in the formulation of policy alternatives" (Kling et al., 2005, p. 52). Research has discovered that policy is actually, "very untidy, with outcomes occurring as a result of very complicated political, social and institutional processes, which are rarely obvious," (Fitzduff, 2000, p. 3; Kling et al., 2005, p. 53). King et al. (2005) believe that most policy studies depend upon the analyst's or researcher's background; however, ICT policy analysis is based on assumptions regarding technology, opinions as to how ICTs are developed, how they are used in society. The assortment of social concerns that are likely to accumulate from the use of ICTs, all of which factor in determining the analyst's or researcher's perception of a specified technology problem (King et al., 2005).

> SI (Social Informatics) research can be used to challenge and transform these often taken for granted assumptions that policy analysts have about the nature of technology and its impacts on social and work life. For instance, a technologically deterministic approach to defining ICT policy would assume that social changes could be brought about simply through the introduction of the appropriate technologies in the appropriate places at the appropriate times. An approach steeped in SI might emphasize three themes, which were highlighted in earlier chapters, embeddedness, configurability, and duality of ICTs, providing a richer and more nuanced basis for analysis. (Kling et al., 2005, p. 53)
>
> The three key themes are:
>
> - **Embeddedness:** ICTs do not exist in social or technological isolation, their cultural and institutional contexts influence their development, implementation, use, and role in organizational and social change.
> - **Configuration:** ICTs are socio-technical networks that can be configured in ways that influence their uses and social consequences.
> - **Duality:** ICTs have both enabling and constraining effects on groups, organizations, and larger-scale social orders. (Kling et al., 2005, p. 54).

Kling et al. (2005) quotes Leslie Pal's definition of policy analysis as "the use of multiple methods of inquiry, in the context of argumentation and debate to create, critically assess, and communicate policy-relevant knowledge" (Abrams, 2002, p. 14; Kling et al., 2005, p. 53). The authors apply this definition as a starting point to forward the view that ICT policy analysts/researchers can benefit from social informatics and research in several ways. "SI is one of the appropriate methods of inquiry that should be used because of its focus on the

relationships among ICTs; the people who design, use, and manage them; and the contexts in which they are used" (Kling et al., 2005, p. 53). At the theoretical level, it provides researchers a set of reliable and tested conceptual frameworks that can be employed to distinguish, organize, and comprehend the social, cultural, and organizational forces that affect ICTs and their use in ways that encourage the creation of knowledge significant to policy. "It can provide them with a set of reliable analytic techniques to help identify and evaluate the social consequences of the implementation and uses of ICT-based systems" (Kling et al., 2005, p. 54). Social informatics can facilitate ICT policy analysts/researchers to assume a more critical view of the benefits and limitations that ICTs can offer in social and organizational environments. "Finally, SI can help them understand how the design, configuration, and implementation of ICTs is a socio-technical process, one that is charged with political, economic, social, and organizational implications" (Kling et al., 2005, p. 54).

Kling et al. (2005) assert that ICT policy analysts/researchers can apply social informatics to comprehend how and the reasons due to which the design, planning, deployment, and usage of ICTs "are not value-neutral. These are distinctly socio-technical processes that are heavily influenced by the approaches and orientations of stakeholders who have varying degrees of interest in ICTs' development, deployment, and use" (Kling et al., 2005, p. 55). Social informatics research has discovered that typically, there are positive and negative outcomes that emerge due to the application of ICTs in organizational and social environments. Once the ICTs are used, they facilitate or restrain social actions and social relationships and affect productivity and other organizational procedures (Kling et al., 2005, p.55).

> Analysts can use these findings to assess the extent to which different ICT policy decisions will if carried out, lead to advantages for some and disadvantages for others; some groups will gain in power, prestige, authority, and control of resources, while the relative status of other groups will be diminished (Kling et al., 2005, p.55).

2.9 Policy Perspectives: The Paradigm Shift in the Viewpoints of Disability as a Medical Condition to the Social Model of Disability

Heyer discusses in her book, *"Rights Enabled"* that the shift toward the social model of disability was a recognition of the fact that people with disabilities want the same treatment as the rest of society. The author argues that society must acknowledge that people with disabilities people have needs that are based on their disability (Heyer, 2015). People with disabilities ask for the fulfillment of these needs, and in asking for their needs to be fulfilled, they do not want

any special treatment. What they are asking for are reasonable accommodations under the ADA, the fulfillment of their needs, so that they can be included in the society (Heyer, 2015).

Heyer states that when the proponents for disability rights attempted to employ the same analogy that Civil Rights and Women Rights supporters employed to make their case for equal rights with the United States Congress, whose intention of reducing welfare rolls encouraged a shift in policy towards greater rights for individuals with disabilities (Heyer, 2015, pp. 16–20). As a result of this policy shift, the United States witnessed a change in the treatment toward people with disabilities and with the enactment of these laws that forced society to treat individuals with disabilities as equal citizens; first, through the enactment of *Section 504* of the Rehabilitation Act of 1973, and second, the passing of the Americans with Disabilities Act (ADA) in 1990. These laws helped change how the American Society treated the people with disabilities; for example, *Section 504* applies to any agency, educational institutions (K-12 and higher education), state or local governments, and private organizations that provide education, health care, housing, parks, and recreation, or social services that receive or distribute federal funding (Crow, 2008, p. 170).

The ADA when it was signed into law in 1990, the ADA was even more extensive, due to the manner the law was written to accomplish four board purposes in an attempt to eliminate discrimination against individuals with disabilities (Crow, 2008, p. 170). First, the ADA established a national mandate for the elimination of discrimination against individuals with disabilities; second, the ADA provided standards that can be employed to address discrimination against individuals with disabilities; third, the ADA authorizes the federal government to play a crucial that rose in the enforcement of standards established in the ADA on behalf of people with disabilities. Fourth, the ADA allows congressional authority, including the use of the 14th Amendment of the United States Constitution and the regulation of commerce to eliminate areas of discrimination-faced every day by people with disabilities (Crow, 2008, p. 170).

Heyer indicates that the ADA served as a model for the United Nations Convention on the Rights of Persons with Disabilities and other nations' anti-discrimination laws for individuals with disabilities, for example, Germany and Japan (Heyer, 2015, pp. 87–169). Heyer (2015) and Harpur and Suzor (2012) maintain that this shift in the disability rights paradigm influenced and enabled the passage of the ADA and the adoption of the United Nations Convention on the Rights of Persons with Disabilities (2015 pp. 2-3, 2012, p.169).

2.9 (a) Policy Perspectives: The Print Disabled Right to Information

NLS is authorized by Congress to serve people with print disabilities.

NLS functions under the Chafee Amendment to the copyright law 17 U.S.C. § 121 to produce books and magazines in specialized formats for eligible and registered patrons. NLS purchases print books and magazines and assign them to producers to narrate or transcribe into braille or a specialized talking-book format (National Library Service for the Blind and Physically Handicapped, 2012).

The problem with the materials that NLS produces or acquires is tha many people, including librarians at public and academic libraries, are not aware of this service (Rose, 2018a, p. 473). Many individuals in the disabled community may not want to exploit assistive and adaptive technology provided by NLS or any other organizations that serves the disabled (e.g., American Federation for the Blind, National Federation of the Blind, and American Printing House for the Blind) (Rose, 2018a, p. 473). They may prefer using their local public libraries for their information needs.

In the United States, public and academic libraries that are not specially designated as libraries for the blind and physically disabled are mandated by two federal statutes to provide access to information for persons with disabilities. The first statute, the Rehabilitation Act of 1973, and two sections of the Act, *Section 504* and *Section 508* mandate that libraries in the United States must provide persons with disabilities access to their libraries' programs, services, and technologies (Mates, 2012, p. 7). *Section 504,* "Forbids excluding individuals with disabilities from services or programs," and *Section 508*, "Requires federal agencies to make their electronic and information technology accessible to people with disabilities" (Mates, 2012 p. 12). For example, information providers and vendors who cater to libraries that receive federal funds have to ensure their products and services comply with *Section 508* (Blansett, 2008, p. 28, Rose, 2018a, p.470). In other words, any products or services sold by an information provider or vendor to a library must be made accessible to library patrons with disabilities, which means that all information services and products, such as databases, eBooks, websites, DVDs, CD ROMs, among other things, must be made accessible to library patrons with disabilities (Blansett, 2008, p. 28, Rose, 2018a, p. 470).

The ADA, amended in 2008 and reaffirmed in 2009, requires that a library must provide personnel, services, assistive technology, and adaptive technologies to help their patrons with disabilities access products, services, and technology (Mates, 2012, pp. 7–8). Many librarians

attempt to steer their patrons with disabilities toward their local NLS/LBPD libraries because they believe that their library is not equipped to deal with them, or they were instructed by their local public library to contact their local NLS/LBPD for questions or their information needs (Lewis, 2013, p. 231). Lewis, who was a librarian who worked for a Maryland NLS/LBPD library, was surprised when patrons contacted her at the NLS/LBPD library where she worked when their local public library could have answered their questions because patron's local public library staff was uncomfortable in answering such questions or providing information services to this community. However, the law obligates academic, private, and public libraries to provide access to patrons with disabilities to their library's collections, services, and technologies.

3.0 Summary of Literature Review

This Literature Review discussed the factors that affect the way in, which people with print disabilities have their information needs fulfilled by NLS. This chapter argues that social contexts can influence how NLS tries to meet these information needs.

One way NLS is trying to fulfill patron information needs is through the Digital Talking Book Program and Digital Talking Book Player. This Literature Review explores how social contexts can affect how this technology was developed and how economic, human, legal, organizational, political, social, and technical factors and stakeholders (patrons, Library of Congress, NLS staff, NLS/LBPD librarians, NLS/LBPD library staff, Congress, and advocacy groups for people with disabilities) influenced the course of development for these technologies.

Social informatics is a theoretical perspective that can be used to study how these factors affected the planning, development, and implementation of the Digital Talking Book Program and have affected the design, building, and then deployment of Digital Talking Book Player. In this chapter, the concept of a social-technical process is defined, and I argued and discussed how this concept is the best way to describe this process.

This chapter discusses four other theoretical frameworks: Technological Determinism, Theories of Technological Politics, Social Shaping of Technology, and Social Determinism, which can be used by scholars to study Science and Technology and examine the relationship between Science/Technology and society. These four theoretical viewpoints are used by scholars to investigate how technology and technological change impacts society and how society influences technology and technological change. However, I argue that social informatics is the best theoretical framework to use to study the planning, development, and deployment of the

NLS's Digital Talking Book Program and using the descriptive case study method to answer the research questions that are based around the three perspectives.

The social informatics theoretical perspective will be used to answer the six research questions, which are based on these three perspectives: **Patron's Perspectives**, **Policy Perspectives, and Technology/Artifact Perspectives.**

A. Research Questions that Examine the Patron's Perspectives

(1) What are the differences between the patrons' perceptions of and use of assistive/adaptive technologies and NLS librarians' perceptions of their patrons' use of assistive/adaptive technologies?

(1a) what are NLS Librarians' views on their use of these technologies by patrons?

(2) Is NLS fulfilling its mission statement, "That All May Read" and the Right to Read by using the Digital Talking Book Program and Digital Talking Book Player to serve NLS's patrons?

(2a) Is NLS fulfilling its mission statement and the Right to Read by using NLS's services and local NLS/BPD libraries to serve NLS's patrons?

B. Research Questions that will examine the Technology/Artifact Perspectives

(3) The Digital Talking Book Player has been in service for NLS since it was distributed to its patrons in 2009. NLS is planning to replace the current player.

(3a) what are the features and options that patrons and NLS Librarians would like to see in the new player?

(3b) The influence of other stakeholders had on the planning process (Advocacy groups, Assistive Technology Companies; General Accountable Office, Library of Congress, the U.S. Congress, etc.,).

(4) How has the use of third-party assistive/adaptive technologies, the use of consumer (devices (i.e., e-readers, smartphones, portable computers, and tablet computers); the use of broadband, and wireless Internet services have affected the Digital Talking Book Program?

(4a) How have technologies impacted the Patron's use of BARD?

C. Research Questions that will examine the Policy Perspective

(5) Stakeholders have argued that NLS needs to broaden its patron eligibility criteria and allow people with reading disabilities, such as dyslexia/ reading and writing difficulties to use the service: How will this inclusion affect NLS?

(6) Do stakeholders believe that NLS and its network libraries fulfil its mission statement and the right to read utilizing its current technology and services?

Policy plays an important part in the planning and deployment process of the Digital Talking Book Program and policy will guide the plans to update the program and will influence the planning process for a new Digital Talking Book Player. This chapter explains what policy is and why policy is important, especially to libraries. Public libraries are a good example of policies in practice and the day-to-day operations of a library, including patron services, budget, technology, community programming, are governed and managed by policies that are imposed by internal and external sources, such as their parent agency, city, county, state, and the federal government.

These policies affect how patrons can access information, including patron and public access to the Internet. As the Internet became available to the public, libraries, including public libraries experimented with providing patrons with access to the Internet (Bertot, 2009). However, the federal government during the 1990s implemented policies under the universal service provisions of the Telecommunication Act of 1996 (47 U.S.C. § 254(e)), the FCC was authorized by this law to create a program to ensure equitable access to the Internet by offering schools and libraries discounted rates (Kranich, 2001a, p. 91; Schement, 2001, p. 19). The E-rate program was created to increase access and connectivity to communities in need and that all school libraries and rural hospitals in the United States should have access to the Internet. The federal government and Congress wanted to use these policies as a way of closing the digital divide by having public libraries provide public access technologies, to the communities that they serve. However, Kranich, (2001b) and Bertot (2009) argue that public libraries have been providing public access technologies, since the beginning. Furthermore, Kinney (2010) and (Bertot 2003) argue that the digital divide is more than providing society access to the Internet, and the digital divide is now a multifaceted problem involving social-economic circumstances, infrastructure, information access, and literacy. Kinney (2010) contends that these factors and

the types of resources or lack of resources that public libraries use to provide public access technologies hinder many social groups from using computers and Internet.

Researchers such as Dobransky and Hargittai (2006) argue there is a disability divide, which is caused by social, economic, and technical factors, which impede individuals with disabilities in their use of computers and the Internet. These same factors also are hindering their use of public access technologies that public libraries provide to their patrons. However, Lazar and Briggs (2015) and Copeland (2011) argue that despite these problems, public libraries have a legal mandate and professional obligation to provide individuals with disabilities with library services including better physical access to library buildings. Lazar and Briggs (2015) and Copeland (2011) further argue that public libraries have to provide services to special populations, regardless of the services that NLS provides to differently able.

Kinney (2010) asserts over the past three decades, the federal government, state government, non-profit and philanthropic foundations, such as the Bill and Melinda Gates Foundation focused on making libraries, especially public libraries, the key point for community's access to the Internet (pp. 146–147). Gehner (2010) asserts that many public libraries do not welcome this mission, and public libraries through polices and library staff attitudes, lead to the exclusion of both low income and working-class patrons, even though the ALA has policies, which encourage libraries to provide library services to low-income patrons (p.40). Kinney (2010) contends that libraries have helped to bridge the digital divide, but as new technology is entering the marketplace, it is becoming increasingly difficult with the resources that the library has to close that gap.

Heyer (2015) discuses in *"Rights Enabled*" how the shift from the Disability as a Medical Condition toward the Social Model of Disability was a recognition of the fact that people with disabilities want to be treated the same as everyone else in society. People with disabilities argue that they have needs based on their disabilities and were asking to have these needs to be fulfilled and at the same time as these needs are being fulfilled, they did not want any special treatment; individuals with disabilities wanted reasonable accommodations for their needs to satisfy, which would allow them to fully participate in society (Heyer, 2015).

Supporters for disability rights employed the same analogy that Civil Rights and Women Rights supporters employed to make their case for equal rights with Congress, while at the same time Congress saw this shift in policy as a way to reduce the welfare rolls, by encouraging

individuals with disabilities to enter the workforce (Heyer 2015). The results of this policy, a series of laws were passed; first, the enactment of *Section 504* of the Rehabilitation Act of 1973, and second, the passing of the Americans with Disabilities Act (ADA) in 1990 forced society to treat people with disabilities as equal citizens (Crow, 2008). *Section 504* applies to any agency organization that receives or distributes federal funding; the ADA was even more far-reaching by trying to eliminate discrimination against people with disabilities in all parts of society; these laws changed the way society treated people with disabilities by trying to remove barriers that were preventing their full participation in American Society. The ADA served as a model for the United Nations Convention on the Rights of Persons with Disabilities (Heyer 2015).

> This shift in policy affected public libraries because under the Rehabilitation Act of 1973, and two sections of the Act, *Section 504* and *Section 508,* and under the ADA, libraries in the United States are required to provide persons with disabilities access to their libraries' programs, collections, services, and technologies (Mates, 2012, p. 7).

> Under these laws, people with print disabilities have a right to access print information in alternative formats and there is also an international human right to access information and the "Right to Read" (Shaver. 2015).

Cox, Rekas, and Shaver assert that this "Right to Read" was articulated by the Universal Declaration of Human Rights, reaffirmed repeatedly through various United Nation's treaties and conventions, such as the International Convent on Civil and Political Rights and the International Covenant on Economic, Social and Cultural Rights, UN Convention on the Rights of the Child, and the United Nations Convention on the Rights of Persons with Disabilities. (Cox, 2012; Rekas, 2013a; Rekas, 2013b; Shaver, 2015). Under both the International Covenant on Economic, Social and Cultural Rights and the United Nations Convention on the Rights of Persons with Disabilities, people with print disabilities have a right to have printed materials published or produced in alternative formats and these treaties and conventions obligate the state to provide printed materials in alternative formats for its citizens (Cox, 2012; Harpur & Suzor, 2014; Rekas, 2013a; Rekas, 2013b; Sganga, 2015).

The Marrakesh Treaty to Facilitate Access to Published Works for Persons Who Are Blind, Visually Impaired or Otherwise Print Disabled was ratified by the U.S. Senate on June 28, 2018, the U.S. Congress during 2018 and 2019 passed two pieces of legislation to implement the

treaty: Library of Congress Technical Corrections Act of 2019, the Marrakesh Treaty Implementation Act. The NLS implementation of the treaty has affected patron eligibility standards, which allow people with reading disabilities to apply for NLS services without a Doctor's certification (Keninger, 2020). The treaty and the two laws expand the criteria for people with disabilities who can use alternative formats by providing NLS and other "authorized entities" (Ex: Book Share and Learn Ally) to include people who have print disabilities; under section 121 of the Marrakesh Treaty Implementation Act. "The term "blind or other persons with disabilities" is now "eligible persons," which is then defined as someone who is blind, has a perceptual or reading disability, or has a physical disability affecting their ability to read" (Temple, 2018).

As a result of the U.S ratification of the Marrakesh Treaty, NLS in October 2019, has changed the name of the agency to **National Library Service for the Blind and Print Disabled.** This name change reflects how much impact this treaty has on NLS policy, procedures, regulations, NLS staff, and Network Libraries. These changes have been discussed in **Chapters 1** and will be examined and discussed in ***RQ5***, **Chapters 4**, **5**, and **6** (National Library Service for the Blind and Print Disabled, 2019e).

This dissertation examines how these three perspectives interact to create and influence policy using social informatics as a theoretical framework. Additionally, these interactions are influenced by stakeholders who were involved throughout the process of decision making. This inquiry will use the qualitative case study method to examine NLS and the Digital Talking Book Program. This thesis will apply the three perspectives to argue that the planning and deployment of NLS's Digital Talking Book Program is a social-technical process.

CHAPTER 3

METHODS

3.1 Introduction

The Digital Talking Books Program was developed between the 1990s and the 2000s to replace the Analog Cassette format, which had been developed during the 1960s to allow people with disabilities to access reading material. The Digital Talking Books Program was built around flash memory technology. The reasons for which the National Library Service for the Blind Physically Handicapped (NLS) supported their decision to employ this technology were based on these reasons: (1) at that time, the flash memory technology was considered "state of the art"; (2) the format was sufficiently durable to be mailed via the United States Postal Service.

This study is examining the design, development, and deployment of this technology as a social-technical process. It will further explore NLS's Digital Talking Book Program and Digital Talking Book Player's development and implementation processes based on three perspectives. The first is the **Patron's perspectives,** the second is the **Technology/Artifact perspectives** (Digital Talking Book Program, Digital Talking Book Player, and Adaptive/Assistive Technologies). The third is the **Policy perspectives** (stakeholders, laws, and regulations: on the local, state, and federal levels, Marrakesh Treaty, NLS's policies, congressional oversight, and GAO reports). This dissertation will examine how these three perspectives interact to create and influence policy using Social Informatics as a theoretical framework. Additionally, these interactions are influenced by stakeholders who were involved throughout the decision making process; these stakeholders include patrons, NLS librarians, NLS library staff, the United States Congress, and advocacy groups for people with disabilities. All these factors guided the planning and execution of the current Digital Talking Program and the player's design. These factors will impact plans for a new Digital Tanking Book program and future designs for a new Digital Talking Book Player. This inquiry utilizes the qualitative case study method by analyzing survey data, reports, and agency documents, among other sources of information, to examine NLS and the Digital Talking Book Program. This thesis will apply the three perspectives to argue that the planning and deployment of NLS's Digital Talking Book Program is a social-technical process.

This dissertation used the qualitative analysis software for data collection, document analysis, and coding. Documents that were needed for the case study were digitized and then imported into NVIVO 10. Some of the documents were already in the PDF format; the PDF documents were downloaded into NVIVO 10. I used the query and classification functions for NVIVO 10 to study the overall document set. A list of the 51 documents that were used for this case study is listed in a Bibliography in **APPENDIX B.**

3.2 Case Study Literature

> Case study research excels at bringing us to an understanding of a complex issue or object and can extend experience or add strength to what is already known through previous research. Case studies emphasize detailed contextual analysis of a limited number of events or conditions and their relationships. Researchers have used the case study research method for many years across a variety of disciplines (Soy, 1997, p. 1).

Yin (1981) proposes that case studies present an applicable research method for knowledge utilization when a topic covers an occurrence that seems to be inseparable from its context (1981, p. 99). The case study research method has been utilized for this study because it is excellent in providing researchers an understanding of a complex issue or object and entails numerous inquiries regarding decision-making behavior (Greenberg, Miller, Mohr, & Vladeck, 1977). Knowledge utilization possesses the following features:

- A series of decisions that are made over a sustained period, with no distinct beginning or endpoints (i.e., not sharply delineated from their temporal context).
- Outcomes whose direct and indirect implications are extremely complex for the application of single factor theories.
- A large number of suitable participants.
- Situations that are special in terms of agency, context, historical moment in time, and other key elements (Yin, 1981, p. 100).

Yin asserts that case studies are an appropriate strategy to answer the questions of how and why, "In short, the use of case studies allows one to examine the knowledge utilization process, and ultimately to recommend and design appropriate policy interventions" (1981, p. 100).

Further, Soy (1997) believes that researchers should apply six steps when they employ the case study method: the first step entails determining and defining the research questions:

> The researcher establishes the focus of the study by forming questions about the situation or problem to be studied and determining a purpose for the study. The research object of a case study is often a program, an entity, a person, or a group of people. Each object is likely to be intricately connected to political, social, historical, and personal issues, providing wide-ranging possibilities for questions and adding complexity to the case

> study. The researcher investigates the object of the case study in depth using a variety of data gathering methods to produce evidence that leads to an understanding of the case and answers the research questions.
> Case study research generally answers one or more questions, which begin with "how" or "why." The questions are targeted to a limited number of events or conditions and their inter-relationships. To assist in targeting and formulating the questions, researchers conduct a literature review. This review establishes what research has been previously conducted and leads to refined, insightful questions about the problem. Careful definition of the questions at the start pinpoints where to look for evidence and helps determine the methods of analysis to be used in the study. The literature review, the definition of the purpose of the case study, and the early determination of the potential audience for the final report guide how the study will be designed, conducted, and publicly reported (Soy, 1997, p. 1).

3.3 Why to Use this Method for the Dissertation?

Soy argues that "Case study research, with its applicability across many disciplines, is an appropriate methodology to use in library studies" (Soy, 1997, p. 1). GAO's *Case Study Evaluations* (1990), Yin (1981;1994), Stakes (2005), and Tight (2010) advocate the use of case studies to investigate a complex occurrence, evaluate a program, study a population, and examine the use of an object. "For a qualitative research community, case study concentrates on experiential knowledge of the case and close attention to the influence of its social, political, and other contexts" (Stakes, 2005, 443–444; Tight, 2010 p. 331; the United States General Accounting Office, 1990; Yin, 1981; 1994).

These researchers contend that the methodology's flexibility is derived from its applicability; the method is unique due to its ability to incorporate various types of evidence and present the human face of research by paying attention to context (Becker et al., 2012; Yin, 1994). This method allows researchers to collect and use qualitative and/or quantitative data. A case study methodology is a tool that allows the examination of an object, artifact, or technology and in what manner social, political, and other factors influence how they are designed and used by society, as well how it affects society.

3.4 Descriptive Case Study

This dissertation will constitute a descriptive case study; which aims to describe a process or situation through an evaluation (Fisher & Ziviani, 2004, p. 185).

> Descriptive case studies may be exploratory if relatively little research has been done in the area, or they may be illustrative of aspects thought to be representative or typical: Both exploratory and illustrative aspects may be included in a single case study, with the accent being on the typical.

> Catharine Hakim (1987) classified descriptive case studies as typical, or selective: (The typical was discussed above). The selective case study may focus on a particular issue or aspect of behavior with the objective of refining knowledge in a particular area, to provide a better understanding of causal processes. The selective case study may lead to questions about 'how' and 'why' issues or behavior conspired to produce the resulting outcomes: This leads into explanatory evaluation (Hakim, 1987; Schell, 1992, p. 5).

3.5 The Study's Methodology Will Examine the Digital Talking Program and NLS from Three Perspectives

This case study will scrutinize the Digital Talking Program and NLS from three perspectives. It will constitute a selective descriptive case study because it will focus on the way these three perspectives affected the process.

This study will employ qualitative data derived from the review of documents written by NLS Advisory Committees, a review of publications published by NLS, reports composed by NLS, studies conducted for NLS, congressional documents, and GAO reports. The author acquired these documents during his term of employment as a Reader Advisor for the Michigan Braille and Talking Book Library and as the Librarian IV, the Head of the Public Services Section, Hawaii State Public Library System's, Library for Blind and Print Disabled. Additionally, the author requested certain documents from the NLS Reference Section, a fellow NLS Librarian in Michigan, helped me located documents. I obtained documents from the websites of NLS, GAO, Library of Congress, and the United States Congress. The author also obtained print materials from the database searchers of Hein Online: Modern Link to Legal History, Google Scholar, LISA, Web of Science, ERIC, and the ProQuest Dissertations & Theses database.

Data will also be derived from an online survey conducted by the author that was sent to NLS librarians in 2014. Also, the data will be obtained from the following surveys conducted for NLS: *NLS Patron Survey Final Report* (2003) and *National Library Service for the Blind and Physically Handicapped: Talking Book and Braille Program Evaluation and Recommendations for Increased Patronage* (2013).

3.5 (a) Patrons Perspectives

This study will examine the two major NLS patron surveys mentioned above and a review of a GAO study entitled *Library Services for Those with Disabilities: Additional Steps Needed to Ease Access to Services and Modernize Technology* (Bertoni, 2016). Also, several

other documents including Library of Congress budget documents submitted to Congress, articles from Professional Library Journals, a Conference paper, the Data Set from a survey I conducted in 2014 for my paper, a Future Analysis of NLS document, Congressional documents, and Peer-Reviewed Publications. By examining these documents, this dissertation will obtain the patron's perspectives regarding adaptive and assistive technologies, the Digital Talking Book Program, NLS's services and programs, and patrons' views about their local NLS/LBPD services and programs.

3.5 (b) Technology/Artifacts Perspectives

This study will examine this perspective by using a document analysis of congressional publications, NLS publications, peer-reviewed paper, articles, and books chapters from professional publications to observe the way in, which the Digital Talking Book Program and Digital Talking Book Player have evolved before and after their introduction in 2009 and the plans NLS has for both the Digital Talking Book Program and the Digital Talking Book Player.

3.5 (c) Policy Perspectives

This dissertation will examine the policy perspectives using a document analysis of the publications and reports mentioned above. This dissertation will examine the way in, which the Library of Congress, U.S. Congress, the GAO, and other stakeholders influence NLS's mission to provide people with print disabilities with information in alternative formats.

3.6 Research Methodology

The Methodology applied the computer -assisted qualitative software program, NVIVO 10, to examine the 51 research to answer the six Research Questions. The NVIVO 10 program is a very powerful software package, which enabled me to store and examine documents, running search queries using terms obtained from my codebook and search queries using the six ***RQs***. **First,** I used MS Excel to create four tables: (1) Table of what I am looking for in these documents for coding, the table contained these worksheets: Themes, Terms, and Questions I Wanted to Answer from My Coding, (2) Table of Sources**,** (3) A Documents Activity Log, and (4) Codebook of search terms.

Second, I learned how to use the NVIVO 10 software and digitized some of the documents needed for my case study, which were imported into NVIVO 10. Some of the

documents were already PDFs and were downloaded directly into NVIVO 10. I used the NVIVO 10's query and classification functions to explore the overall document set.

Third, I created a preliminary coding structure for my qualitative case study and then I coded the 51 documents. I then met with my Dissertation Chair, Dr. Wayne Buente to review, my coding, the coding categories I used, and hierarchies that I structure the coding around to improve my data analysis. Dr. Buente provided guidance on how to improve my coding; after his invaluable feedback; I implemented his suggestions and refined the process that I was using to code the 51 documents. Based on Dr. Buente's feedback, I conducted a second round of coding of my documents based on the 3 Perspectives, the 6 Research Questions, the Terms and Concepts I found during coding, and terms from the codebook.

Fourth, Dr. Buente reviewed my second record of coding to integrate the first and second rounds of coding and the Research Questions into one data set, which would allow me to answer the **RQs**. During this process, when I started my dissertation research with six **RQs** that grew to 16 **RQ;** Dr. Buente recommended that I reduced the Research Questions to back to six **RQs**. I conducted a third and final round of coding, Dr. Buente advised that I place the coding under the title **"Final Research"** using the Matrix Coding Query function on NVIVO 10 to combine multiple forms of qualitative data. In so doing, it allows a researcher to compare data to see if there are any patterns in the data which are useful in answering the Research Questions (Jackson & Bazeley, 2019, p. 186). After running the Matrix Coding Queries, I analyzed the data and created hierarchies under **Final Research,** and then coded the References that came from the Matrix Coding Queries and used the References to answer the 6 **RQs.** The References used to answer the Research Questions can be found in **Chapters 4**. The chapter contains the summary and analysis of the six **RQs. Chapter 5** comprises a discussion of the key findings from the Research Questions. In **APPENDIX A Bibliography of Sources Cited and Used For Research Questions Answers 1 Through 6**. In **APPENDIX B List of the Fifty-One Documents Used in This Case Study.** In **APPENDIX C Answers to Research Questions 1 Through 6**, which came from the 3rd round of coding.

CHAPTER 4
SUMMARY AND ANALYSIS OF THE SIX RESEARCH QUESTIONS

(A) Summary and Analysis of Research Questions that have Examined the Patron's Perspectives

(1) What are the differences between the patrons' perceptions of and use of assistive/adaptive technologies and NLS librarians' perceptions of their patrons' use of assistive/adaptive technologies?

Librarians and patrons have similar views about assistive/adaptive technologies (ATs), they both agree that these factors, such as **accessibility, costs,** and **motivation** affect how patrons use these technologies. NLS libraries believe that their patrons were *Satisfied (40.00%), Somewhat Satisfied (37.14%), Very Satisfied (8.57%)*, with these technologies (See Figure 3 in Appendix) (Rose, 2018a, p. 473).

However, patrons are concerned with stigmatization in the use of assistive/adaptive technologies, especially young people, who want to look like their peers when they are using consumer technologies, such as, mobile devices, and at the same time, they want to use these devices as mobile assistive technologies or at minimum use the accessibility features of these ICTs.

"A very important point in favor of mobile assistive technologies is that it minimizes stigmatization for the ones using it. For example, for Mary, she could sit in the classroom with her headset on and listen to both to the text and the lecturer, without anyone thinking that this is strange or even noticing it. Thus the stigmatization problem is minimized at the same time allowing the user to attain more self-confidence in the academic arena." (Gasparini & Culén, 2012, p. 33). This stigmatization can determine whether or not patrons want to use ATs and if the devices are based on consumer mobile technologies, then the patron is more likely to feel comfortable in using this form of AT.

(1a) What are the NLS Librarians' views on their use of these technologies by patrons?

Librarians argue that several factors affect how people with disabilities use ATs. **One** factor is the lack of awareness about the technology, "Often, a lack of awareness by persons with disabilities that they can use computers is a limit. This factor is not helped by the fact that mainstream vendors of computer equipment know little about accessibility technology and often

give the wrong advice. Once the person does acquire knowledge that accessible technology is available, the cost of it, coupled with training in the use of the products, makes the learning curve very steep" (Mates, 2012, p. 12). A **second** factor is the patron's skill level, which is determined by the type of training that the patron receives, affects the patron's ability to use the technology. A **third** factor that librarians believe that effect patrons use of ATs is the lack of a computer or Internet access, "For example, staff in one library told us many of their NLS patrons have low incomes or are older with fixed incomes, and many, especially in more rural areas, lack the high-speed Internet connection needed for BARD" (Bertoni, 2016, p. 20). The lack of a computer or Internet access is hindering patrons' use of the technology to access other electronic information to satisfy their information needs.

A **fourth** factor that librarians believe that is hindering patrons' use of assistive/adaptive technologies is cost.

> NLS librarians believed that cost was deterring their patrons' use of assistive and adaptive technologies (Rose, 2018a, p. 472). When asked, "Do you feel the cost of these devices is hindering their use by patrons?" 96% of the respondents said **"Yes"** and 4% said **"No"**. What could explain this answer? Dobransky et al. (2006) argue that the cost of adaptive technology is a barrier to the increased use of computers and the Internet by people with disabilities. Adaptive technology can be expensive, and many disabled people who have a low income may not be able to purchase the technology (Dobransky & Hargittai, 2006, p. 317).

Librarians believe that these issues impact patrons' use of adaptive technologies.

(2) Is NLS fulfilling its mission statement, "That All May Read" and the Right to Read by using the Digital Talking Book Program and Digital Talking Book Player to serve NLS's patrons?

The answers to RQ2 maintain that NLS was fulfilling its mission statement, "That All May Read" and the Right to Read by using the Digital Talking Book Program to serve its patrons.

"Most patrons' preference for receiving materials through the mail and playing them on an NLS provided specialized audio device appears to be linked to their level of comfort with technology and their access to the Internet, according to interviews and survey data. NLS designed the digital cartridges and players that provide patrons with audiobooks and magazines to be easy to see and handle for those with visual and other disabilities" (Bertoni, 2016, pp. 18–

19). According to the 2013 NLS patron survey, two key findings indicate patrons' satisfaction with Digital Talking Book Program:

> **Key Finding: NLS as the Primary Method for Obtaining Reading Materials:**
>
> Two-thirds of the sample patrons reported that the Talking Book and Braille Program is how they obtain nearly all of their reading materials. Also, 31 percent reported they do not currently use or intend in the future to use, alternate means of obtaining reading materials. This reliance solely on NLS for obtaining reading materials may differ from the experience likely to be of interest to former patrons and non-patrons (National Library Service for the Blind and Physically Handicapped, 2013, p. 48).
>
> **Key Finding: Patrons Plan to Continue Using the Program**
>
> Patrons reported high satisfaction ratings with all aspects of the Talking Book and Braille Program, so it is not surprising that 98 percent plan to continue using the program. The survey also asked patrons about their intent to continue using the Talking Book and Braille Program. Nearly all patrons (98 percent of the sample patrons and 99 percent of the non-sample patrons) intend to continue using the Talking Book and Braille Program. (2013, p. 48).

In the survey, patrons were also provided a space to share any additional comments or suggestions regarding the Talking Book and Braille Program. These comments were analyzed to look for overarching themes. The most frequent theme was satisfaction with the program and/or gratitude for its existence. Other frequently reported themes suggested increasing the selection of materials available through the service, providing patrons with more information about what BARD is and how to use it, and creating more awareness about the program among those who do not use it (2013, p. 49).

The answers to RQ2 argue that NLS was <u>not</u> fulfilling its mission statement, "That All May Read" and the Right to Read by using The Digital Talking Book Program to serve its patrons.

(1) Patrons want a better selection of digital books because patrons were receiving fewer and fewer books by authors patrons want to listen too. **(2)** Patrons want faster production of new books, because patrons want to listen to new books at the same time as the print version has been published (Rose, 2014). **(3)** "They will expect free, immediate service that provides books and magazines at the same time their sighted peers have access… full-text, full-audio renditions of materials; more connectivity with related services (e.g. Bookshare and Learning Ally) through an NLS or network library portal; independent living services and technology training; and programming through network libraries" (Keninger, 2015, p. 2). **(4)** Problems with digital

magazine service: **(a)** they complain about having to return digital magazines and patrons were used to keeping magazines and forcing them to return the cartridges. If patrons do not return the magazine within the 30-day time limit, NLS suspends their magazine service. Denying patrons their magazine service is bad customer service. **(b)** The magazine on cartridge program is confusing due to different checkout limits depending on the frequency of the issues. "NLS should have designed the book and magazine cartridges to match their shipping containers. It would have been easy to explain the blue cartridges go in the blue container and red cartridges go into the red container" (Rose, 2014). **(c)** Talking Book Topics should be mailed out on a cartridge by itself on and should not have to be returned, which creates problems for patrons who want to retain it for a longer period, to use the audio catalog to order their book selections. **(5)** Patrons argue that the program needs a clear message about the program and greater visibility of the services. **(6)** Parents and Educators want an easier application process for students with learning disabilities to enroll in the program (Rose, 2014).

NLS has responded to these complaints:

(1) "NLS says it takes three to four months to produce an average 10-hour talking book from its print version (Dutky, 2016, p. 6; Rose, 2018a, pp. 476–477). NLS has taken steps to improve this process by agreeing with five major publishers: Hachette, Macmillan, Penguin Random House, Scholastic, and Audible, Inc. to convert unabridged commercial audiobooks to the Digital Talking Book format. NLS argues that the use of commercial audiobooks enables these books to be available on BARD much closer to the time that the print version is published, which allows patrons to read the book at the same time that the book is read by their friends. NLS maintains that it is more cost-effective and a time saver for the service to convert commercial audiobooks into Digital Talking Books, than for the service to record the books" (Dutky, 2016, p. 6; Rose, 2018a, pp. 476–477).

(2) NLS has expanded BARD and has promoted its use to patrons since all digital audiobooks that NLS produces and all commercial audiobooks purchased by NLS are loaded into BARD, which allows faster patrons access to the latest books that have been recorded at the same time as the print version is published.

(3) NLS, based on surveys, reports, and the 2016 GAO report, has increased their outreach to patrons and their families since these studies and reports were published. NLS has

initiated and then, "continued public education and outreach activities at a national level through the new web site, social media channels, partner organizations, and public service announcements. NLS has implemented a multimedia campaign utilizing radio, television, print, and web-based media outlets to expand awareness and use of NLS services by older Americans experiencing vision loss" (Library of Congress, 2019, p. 139). Finally, NLS has started a pilot program in Texas allowing students with Reading Disabilities, who under current NLS eligibility requirements **(at the start of the pilot program)** would be allowed **to** use the program after a medical certification of their reading disability. The pilot program allows students to apply to the program as long as an educator certifies the student's reading disability (National Library Service for the Blind and Print Disabled, 2020a). As of February 2021, NLS has its regulations to allow reading specialists, educators, librarians, and school psychologists provide certification (*See* **RQ6**).

The answers to RQ2 contend that NLS was fulfilling its mission statement, "That All May Read" and the Right to Read by using the Digital Talking Book Player.

"Most patrons' preference for receiving materials through the mail and playing them on an NLS provided specialized audio device appears to be linked to their level of comfort with technology and their access to the Internet, according to interviews and survey data. NLS designed the digital cartridges and players that provide patrons with audiobooks and magazines to be easy to see and handle for those with visual and other disabilities" (Bertoni, 2016, pp. 18–19).

> The program's mainly older patrons feel comfortable with NLS's specialized audio player because it is user friendly, according to the staff at all 8 network libraries we contacted. For example, librarians in one state said many patrons like NLS's player because it is durable and easy to use, and many especially those who lost their vision later in life do not feel as comfortable using commercially available audio devices (2016, pp. 18–19). At the same time, younger NLS patrons a minority of the customer base may prefer to use other devices, such as smartphones, to access NLS audio materials, according to the staff we spoke with at 6 of the 8 network libraries. Staff in one library said younger patrons tend to be more sophisticated in their use of technology, and prefer to use smaller, mainstream devices rather than the NLS player.

Both groups are satisfied with the machine, however, both groups want NLS to update and upgrade the player (Rose, 2018a, p. 473). However, NLS is planning to replace the current player by evaluating both commercially available players and is using information gathered from 2017 studies that were conducted to complete specifications to develop a request for the next-

generation talking book machine (Bertoni, 2016, pp. 18–19; Library of Congress, 2018, p. 144). NLS is planning in the winter 2022 to introduce pilot units of a new model of the Digital Talking Book Machine with online capabilities (National Library Service for the Blind and Printed Disabled, 2021)

The answers to RQ2 argue that NLS was <u>not</u> fulfilling its mission statement, "That All May Read" and the Right to Read by using the Digital Talking Book Player to serve its patrons.

When the Digital Talking Book Player was being planned, NLS in 2003 surveyed patrons to ask what patrons wanted in a new player. Based on patron's responses to the survey, the study's author contended that

> Even if NLS were to maximize the new device's accessibility, portability, and sound quality, however, some subscribers are likely to resist the digital machine, at least initially. Judging from the absence of a top-of-mind concern about the current machine, many subscribers do not perceive a need for the new technology. Another harbinger of resistance is generational differences in subscribers' exposure to and use of personal computers. For retirement-age subscribers, most of whom neither own nor use a computer, the digital device might be very intimidating. If we are right in thinking that the oldest subscribers' refusal to participate often indicates suspiciousness, resistance to the new equipment might be even more widespread than our findings suggest (Nelson, 2003, p. 50).

The 2013 NLS patron survey indicated that "Sample patrons provided an average satisfaction rating of 4.9 when asked about the digital player; non-sample patrons provided a satisfaction rating of 4.7. Respondents who were not satisfied with the digital player were asked why they were not satisfied with it and provided a list of potential reasons (National Library Service for the Blind and Physically Handicapped, 2013, pp. 44,45).

"There were too few sample patrons who were dissatisfied with the digital player to report reasons for dissatisfaction among sample patrons." Among non-sample patrons, the primary reason for dissatisfaction with the digital player among non-patrons was that the player is too large or heavy (63 percent). Non-patrons also reported that another technology is easier to use (36 percent), they cannot easily navigate to specific parts of the book or magazine (10 percent), and the equipment is not reliable (6 percent) (2013, p. 44,45).

In the 2016 survey of NLS Librarians, "The survey asked respondents questions about what single feature the librarians and their patrons liked and disliked about the Digital Talking

Book Player. Librarians commented that the top three features liked were the *Ease of Use, Audio Quality*, and the *Built-in User Guide*. The top three features disliked were the *Battery Recharging System*, the *Size of the Player*, and the *Weight and Portability of the Player* (Rose, 2018a, p.473).

(2a) Is NLS fulfilling its mission statement and the Right to Read by using NLS's services and local NLS/LBPD libraries to serve NLS's patrons?

The answers to RQ2a make a case that NLS was carrying out its mission statement and the Right to Read by utilizing NLS's services and local NLS/LBPD libraries to serve NLS's patrons.

NLS's conducted the 2003 patron survey to see what patrons felt about their Talking Book Service, which at the time NLS was using analog technology to serve patrons. The survey found, "Across age groups, NLS is the primary source of playback equipment, and the NLS machine is the one subscriber use most often. Similarly, their Talking Book Library is the primary source of reading material. In two respects, older subscribers make up NLS's principal constituency. First, the majority of subscribers are 65 or older. Second, they especially subscribers who are 85 or older are the heaviest readers" (Nelson, 2003, p. 2).

"Handling the tapes and manipulating the machine's controls are less likely to pose a problem than understanding certain aspects of machine operation. Although the vast majority of subscribers operate the machine to play tape themselves, half received help in learning how to use the machine" (2003, p. 2).

One of the 2013 patron survey's key findings was, "NLS as the primary method for obtaining reading materials [for patrons]. Two-thirds of the sample patrons reported that the Talking Book and Braille Program is how they obtain nearly all of their reading materials. Also, 31 percent reported they do not currently use or intend in the future to use, alternate means of obtaining reading materials. This reliance solely on NLS for obtaining reading materials may differ from the experience likely to be of interest to former patrons and non-patrons (National Library Service for the Blind and Physically Handicapped, 2013, p. 48).

The answers to RQ2a argue that NLS was <u>not</u> implementing its mission statement and the Right to Read by making use of NLS's services and local NLS/LBPD libraries to serve NLS's patrons.

In NLS's 2003 patron survey, when patrons were using analog cassettes and the Cassette Book Machine, patrons gave reasons why they canceled their service. "Very few subscribers (8%, not shown) have ever considered canceling their Talking Book service. Those who have are spread across all four age groups" (Nelson, 2003, p. 30)

> Subscribers' reasons for considering cancellation reflect their own needs and life circumstances more than dissatisfaction with the Talking Book program. The four most common reasons are that the subscriber hadn't been using the service, no longer needs the service, is too busy, and various other considerations having to do with the individual's specific circumstances. A few subscribers said they were not well enough to use the service. Altogether, respondent-based considerations make up almost two-thirds of the reasons subscribers provided for considering cancellation. The only other reasons that more than one or two people offered were that others "might need the service more than I" (n=7) and that the playback machine is difficult to use (n=6) (Nelson, 2003, p. 30).

In the NLS's 2013 patron survey, one of the survey's key findings explained why patrons stopped using the program, "Thirty-two percent of former patrons stopped using the NLS program because they prefer another technology or service, and over half pay a monthly fee or fee per book downloaded to use the service. The most commonly mentioned services include Audible, Bookshare, and iBooks. The most commonly used technologies were the iPad/iPod, an iPhone, and a Nook or Kindle" (2013, p. 52)

(B) Summary and Analysis of Research Questions that examined the Technology/Artifact Perspectives

(3) The Digital Talking Book Player has been in service for NLS since it was distributed to its patrons in 2009. NLS is planning to replace the current player.

(3a) What are the features and options that patrons and NLS Librarians would like to see in the new player?

In 2014, NLS Librarians and NLS formed a National Audio Equipment Advisory Committee, who tasks what changes to recommend to the NLS program, services, and equipment, especially the digital player. The committee recommends these changes to the Digital Talking Book Player: (1) Adding an SD or micro-SD card reader to the next generation player, as well as additional USB ports. (2) Creating Bluetooth remotes and breath switches that control all DTBM features for physically disabled patrons. (3) Creating a Bluetooth refreshable Braille display to be used as an accessory with the next generation player (Network Library Representatives, 2014).

On April 15–16, 2015, the National Library Service for the Blind and Physically Handicapped (NLS) and the Library of Congress, hosted a group of NLS stakeholders to discuss future trends and possibilities during NLS's first-ever *Futures Committee Meeting*. One of the questions that NLS asked the meeting's members to answer was, "**In five to ten years, what services do you expect from NLS? …**Talking-book machines will become easier to use, have better battery life, and include wireless connectivity…(Keninger, 2015, p. 4)

In the 2016 survey of NLS Librarians, "The participants were asked to consider what features or options that they and their patrons would like to add to the Digital Talking Book Player if NLS was to update or upgrade the player. Improving the *Player's Battery Life*, *Reducing the Size of the Player,* and *Adding the Capability of Either Direct Downloading from a Computer* or *Downloading via Wi-Fi* were the top three features requested " (Rose, 2016, p. 10).

(3b) What is the influence of other stakeholders had on the planning process (Advocacy groups, Assistive Technology Companies; General Accountable Office, Library of Congress, the U.S. Congress, etc.).

Advocacy Groups

Christopher Gray in his essay, *Digital Talking Books from the Consumers' Viewpoint,* argue that:

> The means of processing sound have also been improved over the years. First, digital processing of speech on cassettes was introduced to allow readers to speed up or slow down recorded speech with no change in the sound of the voice itself. Today, a test group receives weekly and monthly magazines from NLS sent digitally over the Internet that can then be played on a person's local computer. As a participant in this pilot project, feel it is important to share that the many issues and questions raised during this pilot have been surprising in their complexity, and truly are paving the way to a functional and durable program of magazine and book delivery in the future" (Auld, 2005, pp. 74–75)…
>
> As with these previous changes, the grave concern of a new sort is coming into focus as the Library of Congress endeavors to move toward the providing of recorded books in a digital format. Many feel the transition is too slow, and that our library system is being upstaged by other lesser services located elsewhere in the world. Others fear they are, or soon will be, less able to receive as many books as the blind already receives in other countries where digital books exist. Much more fear they will be unable to use the newer technology, and that the digital transition will deprive them of the ability to read at all. Though seemingly contradictory, all of these concerns have merit, and each must be meaningfully considered and taken into account during a transition period. In a library program, comprising roughly half a million patrons, this is only to be expected (Auld, 2005, p. 75)…

All of this is not to say that the American Council of the Blind has not taken issue or raised concerns regarding the transition to a digital medium or will not do so between now and 2008. We are concerned that ways be found to meet the needs of technically apt users along with the nontechnical. We are inclined to believe that the Library of Congress should consider a more aggressive offering of books to users who are willing, in the short term, to supply their own digital reading equipment. Some concerns have been raised already, and others certainly will be raised in the advisory structure that the Library of Congress has set up to guide this vital transition from plans on paper to the placing of digital material in readers' hands" (Auld, 2005, p. 75).

The basic point in all of this is to create, foster, and finally enhance the ability of people to read, who are otherwise not able to do so. In my view and the view of the American Council of the Blind, this is precisely what NLS is doing. Along with other organizations of and for the blind, and along with representatives from within the network of cooperating libraries that serve blind and physically handicapped readers, we have been asked and enabled to participate meaningfully in the planning process that will make digital talking books a reality in the United States" (Auld, 2005, p. 75).

We look forward to that day with optimism and anticipation. We must cooperate to secure the financing and national support necessary to create this new program. By doing so and by taking into account the needs of all readers, the blind and visually impaired of the upcoming decades will best be served. I conclude by inviting the broader community of librarians and other professionals in this field to join with us in making this a reality and working to ensure that all our population, disabled and non-disabled, have the greatest opportunity possible to enjoy life and literacy through the printed word, undoubtedly one of life's greatest gifts (Auld, 2005, p. 75).

Assistive Technology Companies

Bertoni argued in the GAO's report, *Library Services for those with Disabilities: Additional Steps Needed to Ease Access to Services and Modernize Technology. Report to Congressional Committees:*

As it considers moving forward with this effort, NLS is leaning toward designing its own next-generation, specialized player, but it has not fully assessed the costs and benefits of designing its own player versus using a commercially available player. NLS officials said that, in their experience, the existing commercially available players lack the durability needed for NLS's purposes, may not be suitable for users with physical disabilities and are expensive. Libraries for those with visual impairments in some other countries, meanwhile, have found that commercially available audio players can meet their users' needs. For example, the CNIB (Canadian National Institute for the Blind Library), which provides free reading materials to those with visual and other disabilities in Canada, does not provide its own specialized device to users but instead helps them acquire commercially available devices when they cannot afford to do so. CNIB officials said they chose this approach because it was less expensive than developing their own player, and also commented that it offers users a range of choices to meet their needs. Some libraries for the blind in Europe and Asia also purchase commercially available

> audio players for library users, according to two assistive technology companies we contacted. NLS officials told us they have not ruled out using a commercially-available device as their next-generation player, and while they have not yet analyzed this option, they plan to explore it further through requests for information and market research (Bertoni, 2016, p. 25).

General Accountable Office

As NLS was designing and developing the Digital Talking Book Program and the Digital Talking Book Player, the Chairman and Ranking Member of the House Committee on Appropriations asked GAO to review NLS planning and management of its Digital Talking Books development and acquisition project. GAO in its review of the NLS project criticized NLS's selection of Flash Memory technology for the program and complained in the report about NLS's decision-making and project management. GAO report stated:

> In summary, NLS analyzed various alternatives for the digital talking book program starting in 2000, but the analyses did not have the rigor recommended by library guidance and government and industry best practices to ensure that new assets are acquired through sound decision making. To its credit, NLS conducted market research and consulted with experts and stakeholders, including representatives from international organizations with similar programs, domestic groups representing people who are blind and physically disabled, and manufacturers. The agency identified and discussed numerous alternative technologies (including CD, flash memory, and miniature hard drives) and distribution mechanisms (such as Internet delivery via broadband channels and cable television channels). However, the agency's analysis of selected alternatives focused solely on the technology medium and the player and did not broadly consider the entire program and its underlying processes…(Government Accountability Office, 2007, p. 3).

Library of Congress

Introduction

"While this report identifies alternatives, these are not necessarily inclusive of all possibilities and it is doubtless that others exist. Some of the alternatives offered to deviate from how services to program users have been traditionally provided. However, while the pros and cons of these alternatives are cited where applicable, further analysis is required to determine the best recommendations for implementation" (Ducrest Associates, 2010, p. 1).

Section 5 - Major Assumptions for Long-Range Planning

"This section of the report presents the major assumptions about operations of the Books for the Blind Program that have been used for long-range planning in the past. These

assumptions will also continue to be generally used for future long-range planning since most of these will still hold although certain aspects of some may change as future operations evolve and such changes are noted" (Ducrest Associates, 2010, p. 18).

5.6 Assumption 6: NLS will continue to identify and adapt technologies to support a high-quality reading experience and may also extend these types of support to the network.

"NLS is developing and intends to implement, a functionality that will enable program users to request that a book be downloaded, wirelessly, directly to their players. This will likely have an enormous impact on the responsibilities of network libraries…" (Ducrest Associates, 2010, p. 20).

U.S. Congress

In 2015, the U.S. House of Representatives Appropriations asked the GAO to review NLS services:

> The Committee recognizes the importance of technology in ensuring that blind and physically handicapped United States residents and citizens are afforded access to reading material in a timely manner. In order to preserve the National Library Service for the Blind and Physically Handicapped today and ensure it is prepared to meet the needs of future generations, the Committee directs the Government Accountability Office (GAO) to review the services provided by the National Library. This review should include but is not limited to, a review of the NLS's user base, a comparison of services and playback equipment offered by the NLS to private sector services and technologies currently used by the blind and physically handicapped community, to include an evaluation of possible cost efficiencies in utilizing private sector technologies, availability of alternate distribution methods and other aspects of the NLS's services that the GAO deems relevant. The GAO is to prepare a report of its findings and report back to the Committee on Appropriations of the House and Senate no later than December 31, 2015 (House of Representatives, 2014, pp. 17–18).
>
> The GAO published the report in 2016 and is cited throughout this dissertation (Bertoni, 2016) (*See* ***Chapter 5***, pp. 121-122)

(4) How has the use of third-party assistive/adaptive technologies, the use of consumer devices (i.e., e-readers, smartphones, portable computers, and tablet computers); the use of broadband, and wireless Internet services affected the Digital Talking Book Program?

The increased use of third-party assistive/adaptive technologies, the use of consumer devices, the use of broadband, and wireless Internet services have affected the Digital Talking Book Program and have forced NLS to make changes to the program to meet the demands that these technologies have placed on the program.

In 2012, NLS submitted a report to the U.S. House Representatives entitled, *"That all may read,"* the report discussed NLS's technologies plans covering a five year to a ten year period. In the **Executive Summary** of the report NLS explained how it was going to meet the demands that these technologies were placing on the Digital Taking Book Program. NLS in its report argued that:

> As technology evolves, NLS continues to move forward with innovations in its programs to improve the reading and delivery experience for all patrons. One example is the development of applications for the iOS operating system used by Apple devices and for the Android operating system. These applications will be deployed during fiscal 2013 and will provide interfaces to search BARD, download content, store it on the mobile device, and read content using the same functionality as the current digital player. Ongoing research and exploration of cutting-edge concepts and developments will be required to keep NLS current in all aspects of its services (National Library Service for the Blind and Physically Handicapped, 2012, p. 5).

NLS in the report indicated that it was going to commission a survey to see if its services and technologies were meeting patron needs and find ways to increase the number of people using the service. The 2013 patron survey asked patrons what types of technologies they used to meet their reading and information needs. The survey authors made these suggestions in the **General Recommendations** section as to how NLS can increase its patronage and how it could use consumer technologies to meet these patrons' demands and increase the number of people using the program. In Recommendations numbers **#5** and **#6**:

> **5. Develop applications for various computerized devices such as smartphones and tablet computers that allow patrons to access BARD without regard to specific NLS-provided hardware:**
>
> The majority of the survey respondents reported using a tablet to access the internet, and several reported using smartphones. Several patrons reported using online outlets for obtaining their reading materials, and forty-seven percent of non-patrons reported using electronic texts to access reading materials (2013, p. 58). Of the 32 percent of former patrons who reported they stopped using the Talking Book and Braille Program because they prefer to use another technology or service 25 percent reported using Audible.com, 25 percent reported using Bookshare, 21 percent reported using an iPad or iPod, 15 reported using an iPhone, and 12 percent reported using iBooks. NLS should develop applications that would allow individuals to access reading materials from the Talking Book and Braille Program on existing devices such as iPhones. This makes the program more adaptable for readers who use a variety of devices for accessing their reading materials and may help attract non-patrons to the program because it would allow them to continue accessing reading materials on the devices they are already using. Developing such applications may also help to address the dissatisfaction some patrons reported with

the digital players and addresses the fact that 32 percent of former patrons stopped using the Talking Book and Braille Program because they preferred to use different technology or service (2013, pp. 58–59).

6. Consider developing partnerships with entities such as Apple, Amazon, and Barnes and Noble to Offer BARD and other digital solutions through them:

A number of the persons surveyed, regardless of patron type, use a variety of different technologies. Forty-seven percent of non-patrons obtain their reading materials from electronic texts and 22 percent of patrons reported they currently use e-readers or are likely to begin using them in the near future (2013, p. 60). Of the 32 percent of former patrons who stopped using the program because they prefer another technology or service, 12 percent indicated they use Nook or Kindle. NLS may consider partnerships with these two (as well as others) to be able to offer more of the contemporary best-sellers and other books that current and potential patrons may crave, in a way that is compliant with digital rights management but offers NLS patrons more than they can get from Amazon or Barnes and Noble on their own (2013, p. 60).

(4a) how have these technologies impacted the patrons' use of BARD?

In the same NLS 2012 report to the U.S. House of Representatives, the service argued in the section titled, **"Enhance the Reading Experience for All NLS Patrons by Leveraging Current and Future Technologies to Improve the Reading and Delivery Service."** In **Section J**, NLS discussed how patrons wanted to use Smartphones to access BARD and how NLS was making changes to BARD to allow patrons Smartphone access to BARD:

> NLS patrons have urged NLS to develop and deploy access to the BARD system using mobile devices such as smartphones. Therefore, NLS has developed specifications and contracted with vendors to develop applications for the iOS operating system used by Apple devices and for the Android operating system. These applications will be deployed during fiscal 2013 and will provide interfaces to search BARD, download content, store it on the mobile device, and read content using the same functionality as the digital player currently offers (National Library Service for the Blind and Physically Handicapped, 2012, p. 28).
>
> The apps being developed for Apple and Android-based smartphones will remove the complexity inherent in the current BARD download system. These devices come equipped with built-in accessibility features, including text enlargement, high-contrast settings, text-to-speech output, speech input, and support for refreshable braille devices. The set of gestures and commands required to activate and use these features are generally simpler to learn and use than the command structures required by a personal computer offers (National Library Service for the Blind and Physically Handicapped, 2012, p. 28).

Because these devices have accessibility features built into their operating systems, NLS patrons will not incur any additional expense above and beyond that encountered by mainstream patrons of the devices. With properly developed apps for these devices, NLS anticipates a significant increase in BARD usage, with smartphones and similar Web-enabled appliances to become fully integrated download, bookshelf, and reading systems (2012, p. 28).

It should be noted that the cost of these appliances, including ongoing data plans or Wi-Fi access, prices them out of reach for many consumers. A February 2012 Nielsen survey, *New U.S. Smartphone Growth by Age and Income*, shows a clear correlation between income and smartphone penetration in the general population (Nielson, 2012). For 70 percent of the disabled population who are unemployed, lower incomes are a major factor in this equation (2012, p. 28).

In the long term, broadband delivery of digital talking books directly to NLS talking book machines either pushed from network libraries or downloaded by the patron may revolutionize NLS's delivery system. This possibility is not imminent however and would require major infrastructure advances nationwide as well as within the NLS network and the NLS program itself.

NLS continues to research cutting-edge technologies to position itself to take advantage of new reading and delivery options as they become feasible and practical for the patron and within the fiscal and administrative constraints of the program (2012, p. 28).

In 2014, I surveyed NLS Librarians, and I asked the respondents this question**, "NLS said in its report to Congress last year that 15% of NLS patrons use BARD or download books. Please share your opinions about this statement"** (Rose, 2014).

The NLS Librarians text responses to the questions:

- I believe this figure to be accurate. Access to computers and the Internet are still an issue for a number of our patrons.
- I agree, maybe a little more now that people are becoming better with using the internet. As the computer-savvy population becomes older, the more will use BARD.
- Younger patrons are far keener on the mobile app than they are on the clunky digital book player, too.
- For our state, that figure would be too high; however, the large majority of our readers who sign up for BARD use BARD. That is, our strategy has been to assist readers to sign up and use BARD. I could imagine a divided strategy to sign up for BARD and then to cultivate its use later on, but that seems problematic to me.
- My sub-regional library's BARD-using patrons are probably a larger proportion of my overall patrons. I have many affluent and tech-savvy folks retiring to my city or my patrons have family members who are affluent and tech-savvy to help them with downloading materials.

- That figure is roughly accurate. Roughly 15-20% are registered for BARD use. On an ongoing monthly basis, the percentage of the total number of active patrons downloading books is more likely in the 5-10% range.
- BARD is growing in popularity as younger patrons register for the service. I do have patrons who do not use BARD because high-speed internet service is not available in their geographic area which is very rural. Most of my patrons use the mailed-out books and government-issued players due to fixed incomes.
- I believe that 15% that download are those who have a good source of income (employed or income from another source). Many of our patrons are unemployed or underemployed and cannot afford the technological items. There are transportation issues that preclude many from coming to a library to download. Also, some of our patrons (esp. some aged ones who had been heavy computer patrons when younger) have cognition issues that make the downloading process too difficult for them to handle (Rose, 2014).

Bertoni in his 2016 GAO's report to Congress made recommendations as to how NLS can take steps to make access easier for people with print disabilities to sign up for the program and recommendations on how NLS should modernize its technology. The report also discussed how BARD will be affected by the new audio player that will contain wireless capabilities that NLS is currently developing.

He argues that:

> NLS is in the preliminary stages of developing an audio player with wireless connectivity that could download the audio directly from BARD, an approach that it believes would improve services for patrons and potentially reduce overall costs to the federal government (Bertoni, 2016, pp. 24–25). NLS officials said patrons would benefit from a device capable of downloading audio materials directly from the Internet because they would receive content faster than receiving digital cartridges through the mail. As noted above, there are obstacles to the wider use of BARD among NLS's customer base, but an NLS-provided audio player with wireless connectivity could mitigate some of these issues. Specifically, such a device would eliminate the multi-step process now required to download BARD files to a computer and then transfer them onto NLS's audio player. The staff we spoke within 5 of the 8 network libraries commented that downloading audio files directly to an NLS player would be simpler than the current process. In addition, NLS is considering how it might address another obstacle lack of Internet access by providing not just the audio player but also the required Internet connectivity.[3] At the time of our review, the goal of providing patrons with a device capable of connecting directly to the Internet was included in NLS's draft strategic plan, and NLS officials said they were in the process of hiring a business analyst and project manager to more fully assess the business case for moving forward with this effort. LOC officials

[3] NLS has started to examine the costs of its current approach versus supporting wireless delivery for its patrons, and officials believe that wireless delivery may be less expensive than mail delivery through the Free Matter for the Blind and Other Physically Handicapped Persons program. NLS officials estimate that the majority of the cost of the Free Matter for the Blind program is associated with distribution of NLS materials (Bertoni, 2016, pp. 24–25).

told us they expect NLS to submit a proposal for this initiative to LOC's Information Technology Steering Committee during the fiscal year 2016 (Bertoni, 2016, pp. 24–25).

(C) Summary and Analysis of Research Questions that examined the Policy Perspective

(5) Stakeholders have argued that NLS needs to broaden its patron eligibility criteria and allow people with reading disabilities, such as dyslexia/ reading and writing difficulties to use the service: how will this inclusion affect NLS.

In the patron survey, '*National Library Service for the Blind and Physically Handicapped (NLS) Talking Book and Braille Program Evaluation and Recommendations for Increased Patronage*,' the survey authors discussed in these recommendations how NLS, by expanding its patron eligibility standards and allowing people with reading disabilities to use the service, will increase the numbers of patrons who do not use the program:

> **Recommendations with Regard to Non-Patrons**
>
> The majority of the non-patrons (87 percent) were interested in the Talking Book and Braille Program. Thirty-four percent had never heard of the Talking Book and Braille Program before the survey and an additional 34 percent had heard of it but were unfamiliar with it A key factor in gaining participation among non-patrons is simply increasing awareness about the program (National Library Service for the Blind and Physically Handicapped, 2013, p. 62). The following recommendations suggest methods for accomplishing this:
>
> **13. Re-brand the organization and program name to be more inclusive of those eligible individuals who are not blind or low vision.**
>
> Over 30 percent of the non-patrons qualified for the survey, and therefore program, based on a primary disability other than blindness or low vision. As it currently is represented, the program is geared primarily toward those with blindness or low vision (2013, p. 62). Individuals who qualify based on other disabilities or health conditions may assume they are not eligible for the program. Additionally, they may be unsure of their eligibility based on the somewhat vague eligibility criteria for those who do not qualify as a result of blindness or low vision. The criteria currently used by NLS are as follows: "unable to comfortably hold a book or turn a page or have a reading disability because of organic or physical dysfunction." Clarifying this definition, potentially through providing a list of example disabilities or physical conditions that would qualify a person for the program, maybe a necessary first step in making these individuals more aware of the program. One way to re-brand the organization and program to make it more inclusive of all eligible individuals is through targeted outreach to service providers and organizations that do not primarily serve the blind and low vision communities (2013, p. 62).

However, Lewis (2013) contends that "The NLS libraries are still critical because they are federally funded to provide a costly specialized service not possible for local libraries along with the highly specialized staff. However, today's technology can ensure that patrons with disabilities also can access information through their local libraries, either to supplement or to replace materials provided by NLS, other agencies, and specialized libraries" (2013, p. 230).

Bertoni in his GAO report to Congress made these recommendations as to how NLS can take steps to make access easier for people with reading disabilities to sign up for the program argued in this section, entitled, **"Eligibility Requirement May Limit Access of Potential Users with Reading Disabilities"**

> While NLS serves individuals with a range of disabilities, an eligibility requirement specific to individuals with reading disabilities may hinder this group of potentially eligible users from accessing services (Bertoni, 2016, p. 12) Specifically, the regulatory requirement that only doctors of medicine may certify a reading disability was cited as a barrier to services by staff with whom we spoke at 5 of the 8 network libraries, 2 organizations that provide similar services to NLS, and 2 organizations specializing in learning disabilities (See 36 C.F.R. § 701.6(b)(2)(ii))) (Government Printing Office, 2005). This eligibility requirement, which originated in 1974 and has remained largely unchanged since, creates additional steps and costs for applicants with reading disabilities in comparison to other groups, and may hinder some individuals' access to services. For example, officials we spoke with from a network library said that many of their potential users have little money and live in rural areas that are far from doctors, which limits their ability to get the necessary certification (Bertoni, 2016, p. 12).
>
> Furthermore, a medical diagnosis is not necessary to determine if an individual has a reading disability, according to several groups we interviewed and the policies of other organizations that support people with these disabilities. According to the staff we spoke with at two organizations specializing in learning disabilities, and 6 of the 8 network libraries, special education teachers and school staff are typically also knowledgeable about reading disabilities (Bertoni, 2016, p. 12). Recognizing this, certification of reading disabilities is conducted by non-medical personnel for other disability services. For example, under IDEA educational services are provided to eligible children with disabilities, including learning disabilities, which may affect the reading. However, IDEA does not require a doctor's certification of eligibility; this determination is instead made by the child's parents and a special education team generally comprised of the child's teacher and at least one other person qualified to conduct diagnostic examinations of children, such as a school psychologist or remedial reading teacher. Also, two private organizations that, similar to NLS, provide individuals with alternatives to standard print materials, use LOC regulations as guidance to determine the eligibility of individuals with disabilities except for reading disabilities. These organizations instead allow individuals who are deemed competent authorities for the other LOC eligibility categories by the organizations to certify for reading disabilities (Bertoni, 2016, p. 12).

Although the eligibility requirement for those with reading disabilities may be inconsistent with other federal policies and with some entities' current practices, and potentially hinder access to services, NLS does not plan any modifications (2016, p. 13). Network libraries have formally recommended to NLS that it re-visit the requirement that a doctor certifies the eligibility of those with reading disabilities. This is also consistent with our previous recommendations that agencies providing disability benefits and services should ensure they use up-to-date medical criteria, which reflect advances in medicine and technology and include consideration of non-medical evidence (Government Accountability Office, 2015). NLS officials said that changing the eligibility requirement for reading disabilities may lead to more users and increased costs. Two other organizations that provide similar services saw an increase in the number of users after they changed their certification requirements so non-medical personnel could certify eligibility. NLS has not estimated the potential demand for its services by those with reading disabilities, and so the actual effect on NLS services from revising the eligibility requirement is unknown (Bertoni, 2016, p. 13)

NLS argues in their response to Bertoni's recommendations, entitled **"NLS Certification of Persons with Reading Disabilities":**

NLS serves people with reading disabilities, as noted in the report. However, to comply with NLS's enacting legislation, which specifically states that the service is "for the use of the blind and for other physically handicapped residents of the United States," the regulation at 36 C.F.R. 701 .6 addresses reading disabilities in the context of organic dysfunction. NLS's informational material explains: "The following groups of individuals are not automatically eligible: those who have learning disabilities, dyslexia, attention deficit disorder, attention deficit- hyperactivity disorder, chronic fatigue syndrome, autism, functional illiteracy, or developmental disabilities, unless accompanied by a specific visual or physical disability." See http://www.loc.gov/ n ls/reference / guides/ read ingdisabilities.html. Per 36 C.F.R. 7016, a doctor of medicine must certify organic dysfunction (Bertoni, 2016, p. 37).

Since the 1970s, when 36 C.F.R. 701 .6 was promulgated, social and scientific thinking has changed regarding the causation and diagnosis of learning disabilities. The Library of Congress, therefore, agrees that it is sensible to reexamine and potentially revise the requirement that medical doctors must certify eligibility for N LS's program for those with a reading disability caused by organic dysfunction, to authorize other qualified persons to make such certification (2016, p. 37).

Currently, approximately six percent of NLS patrons are certified by medical professionals as having an organically based reading disability. NLS anticipates that broadening the types of people \who are deemed qualified to certify eligibility will lead to relaxed standards for what constitutes "organic dysfunction," and NLS has not officially predicted the increase to NLS readership that may result. However, it does seem clear that aside from NLS, stakeholders affected by this change would include current NLS patrons, people with reading disabilities, network libraries, and publishers (2016, p. 37).

> A preliminary survey of libraries in Europe serving individuals with print disabilities indicates that those who serve people with reading disabilities such as dyslexia report that from 30-65 percent of their patron base have reading disabilities. Bookshare and Learning Ally, which serve this population in the United States without requiring medical certification, report that 75-80 percent of their respective patrons are served based on reading disabilities. Such figures would indicate the potential to triple or quadruple the number of people served by NLS (2016, p. 37). Even if this number only doubled, NLS as it stands today would not have the equipment, books, or infrastructure capacities to accommodate the needs of the expanded readership. Additional resources would be required at the national, state, and local levels to accommodate such an influx (2016, p. 38).

Based on Bertoni's recommendations and the Marrakesh Treaty becoming law in May 2019, NLS, in September 2019, launched pilot projects in Texas and Pennsylvania which explored the impacts of easing access to the program for people with reading disabilities (Fernekes & Layman, 2019b).

> The Texas Talking Book Program (TTBP) was chosen for the pilot because Texas recently enacted a law requiring that schools refer students with reading disabilities to the TTBP. Its participation will help us understand how active engagement by the education community could impact enrollment in the program. The other pilot participants are our two network libraries in Pennsylvania: The Carnegie Library of Pittsburgh and the Free Library of Philadelphia. Pennsylvania, another state in the top five for population, doesn't have a law like the one in Texas, so NLS can compare and contrast the two states' experiences. Pilot participants will be instructed how to download books using the BARD Mobile app on a smart device; they will not be provided with a digital talking-book machine unless they request a hardship waiver (Fernekes & Layman, 2019b).

The pilot program started October 20, 2019, and was supposed to end September 20, 2020, but due to the COVID-19 crisis, which has closed the libraries in the pilot program, the pilot was ended early. However, NLS preliminary findings from the pilot indicated that the BARD infrastructure was able to handle the extra traffic handle created by the pilot participants (Fernekes & Layman, 2019b).

As a result of the Marrakesh Treaty and the statues to implement the treaty becoming law, NLS had the authority to expand patron eligibility requirement to include people with reading disabilities (*See* ***Chapters 1 and 5***). However, in order for people with reading and writing disabilities to apply for the program the process to certify their disabilities had to be changed, because the NLS regulation before the adaption of the treaty required a medical certification for people with reading and writing disabilities As of February 2021, NLS has changed the regulation to allow reading specialists, educators, librarians, and school psychologists to certify

people with reading and writing disabilities application, (National Library Service for the Blind and Printed Disabled, 2021)

(6)Do stakeholders believe that NLS and its network libraries fulfill its mission statement and the Right to Read utilizing its current technology and services?

The answers to RQ6 argue that stakeholders believe that NLS and its network libraries fulfill its mission statement and the Right to Read by utilizing the Digital Talking Book Player

John Taylor in his article discussed NLS's designing process for the Digital Talking Book Player and explained how the new player will impact NLS Network Libraries:

> In the future system, many aspects of machine operations will remain the same, including distribution of machines from manufacturers to network libraries; allocation of production based upon readership; storage, lending, and control of machines by network libraries; and management and procurement of repair parts by NLS. However, several aspects of machine operations will improve, thanks to better reliability: lower failure and repair rates, lower disposal rates, fewer repair costs, and relatively less reliance on volunteer repair (J. M. Taylor, 2004, p. 51).

The responses to RQ6 argue that stakeholders believe that NLS and its network libraries are <u>not</u> fulfilling its mission statement and the Right to Read by <u>not</u> utilizing other options to the Digital Talking Book Player

> Rujan & Andrysiak, in a study of Michigan's LBPDs, criticized the NLS player: The new NLS digital media player, which will become available over the next few years, will (Rujan & Andrysiak, 2008, p. 23). They provided at no cost to patrons. This will be an improvement over the current talking book machines in providing patrons access to digital audiobooks. This technology, which has not yet been sent to patrons, maybe already outdated when compared to private industry media readers designed for the blind in accessing other available online media sources not available through NLS. These private industry readers, however, come at a cost to patrons, unlike the NLS player (2008, p. 23).
>
> Currently, handheld devices (similar to MP3 players and the like) exist which can download over 10,000 titles through NLS. These devices can also access various media sources (some free, some for a fee) in addition to NLS. The Library of Congress is in the process of digitizing all new titles and a portion of the past collection which will be ultimately accessible via this technology (2008, p. 23).

The answers to RQ6 maintain that stakeholders believe that NLS and its network libraries are fulfilling its mission statement and the Right to Read by utilizing the Digital Talking Book Program to serve NLS patrons.

In the *2013 Patron Survey*, the authors in their **General Recommendations** section suggested ways, in which NLS can increase the numbers of patrons who do not use the program by adverting their patrons the ability to access reading materials without leaving their homes:

> **15. Highlight the ability to obtain reading materials without leaving the house.**
>
> Thirty-four percent of non-patrons reported a disability or condition that limits their mobility. For these individuals, obtaining reading materials from a public library may be difficult (National Library Service for the Blind and Physically Handicapped, 2013, p. 63). Online bookstores were the most frequently reported source for reading materials among non-patrons. The Talking Book and Braille Program minimize this difficulty by providing materials directly to the individuals, either through the mail or through the internet, without the cost of bookstores. Highlighting the fact that, with BARD, individuals can download materials like the way they are downloading their reading materials from online bookstores, without the costs, maybe effective for gaining their interest in the program (2013, p. 63).

The responses to RQ6 contend that stakeholders believe that NLS and its network libraries are <u>not</u> fulfilling its mission statement and the Right to Read by <u>not</u> exploring other technologies than the Digital Talking Book Program technology.

Jim Scheppke in his essay, *"The End of Talking Books?"* argued that NLS was taking too long in developing the program, his argument was, "For seventy-three years, a network of state libraries, public libraries, and other agencies have partnered with NLS to bring public library service to blind and print-disabled Americans. But today, participation in the program is falling because of the outmoded audiobook technology that no longer appeals to many potential patrons of the service" (Auld, 2005, p. 69).

"The United States is years behind the rest of the world in transitioning from antiquated cassette talking books to digital talking books. As a result, it is becoming harder and harder to sign up for new patrons to use the cassette talking books. "Don't you have books on CDs?" is the question my staff is asked again and again. The answer, sad to say, is that NLS will not provide us with digital talking books until 2008" (2005, p. 69).

Lazar and Briggs (2015) argued in their paper that public libraries need to take a more proactive role in providing library materials to people with print disabilities and public libraries should see this as a chance to serve these patrons, because in my work as Librarian who works for a Library for the Blind and Print Disabled (LBPD); patrons regardless of their disability, will go to their public library **first** before they are referred

to the local LBPD or **second before** they seek out their local LBPD. Lazar and Briggs contend that:

> In the past, public libraries acquired primarily print resources for the general public. These print resources, such as books and magazines, were inherently inaccessible for people with print-related disabilities (Lazar & Briggs, 2015, p. 172). Print-related disabilities include the inability to see print, process print, or physically handle print. People with print-related disabilities were often referred to as the State Library for the Blind and Physically Handicapped. However, over time, the nature of materials acquisitions at public libraries has changed. A large percentage of materials acquired by public libraries are now in digital formats, such as e-books, subscription access to article databases, and CDs and DVDs. These digital materials create an opportunity for public libraries to start providing services to people with print disabilities (2015, p. 172).

> However, public libraries now acquire much of their resources in digital format, including e-books and digital libraries available through the Internet (2015, p. 174). This offers an opportunity for the local public library branch to serve patrons who are blind or who have low vision. This is not meant to say that public libraries will ever replace LBPHs, as it is not likely that public libraries will ever have the full staff expertise on the topic or the specialized materials (e.g., materials in Braille or tactile format) that an LBPH will have (2015, p. 174). Furthermore, for some individuals with disabilities, transportation is a challenge, and the distribution system maintained by the LBPH is unlikely to be replicated at the local public library. However, since materials are being purchased in digital format, this should be viewed as an opportunity to require that the materials purchased are accessible, allowing a public library to have some materials to serve blind and low-vision patrons at the local branch and online (2015, p. 174). Up to this point, most public libraries have made no effort to serve blind patrons, instead referring them to the LBPH. This new opportunity should be viewed as complementary to the LBPH, not a replacement**.**

The strength of public libraries in serving patrons with print disabilities is providing patrons with materials in the large print or digital format. Also, providing these formats to patrons who did not want to use the NLS service for whatever reason or serve non-disabled patrons who want to use these formats.

The answers to RQ6 discuss how stakeholders believe that NLS is fulfilling its mission statement and the Right to Read.

Christopher Gray in his essay, *Digital Talking Books from the Consumers' Viewpoint,* argue that:

> In addition to my personal experiences and observations, I currently have the honor of serving as president of a consumer organization of blind people known as the American Council of the Blind. Through this organization, we are in direct contact with tens of thousands of blind Americans, the vast majority of whom are recipients of talking book services. This is one of the most-loved programs of service within the blind community

> and a frequent topic of conversation among our membership. The range of ability within our membership and throughout the Talking Book Program community is notable. Some of us buy audiobooks at the store or from audible.com, own MP3 players, and participate as readers far beyond the scope of the NLS Talking Book Program. Other members have real difficulty navigating the multitracked cassette tape or easily get lost or confused just moving back and forth within a cassette tape. Diabetics and those who have had strokes or other brain malfunctions, such as Parkinson's disease, often struggle with the task of inserting or removing a cassette from a machine (Auld, 2005, p. 75).

The responses to RQ6 contended that stakeholders do <u>not</u> believe that NLS is fulfilling its mission statement and the Right to Read.

Katherine Nelson, in her 2003 patron survey explained the patrons' response as to why they canceled their service as NLS was planning the Digital Talking Book Program, she argues in the section **"Canceling Service"**:

> There will need to be at least two different information campaigns, and possibly three (Nelson, 2003, p. 31). One information campaign needs to pique the interest of technologically savvy subscribers who are already interested in features like word spelling and navigational aids. Such features will not appeal, however, to subscribers who like their machine just the way it is (2003, p. 31). Information about important similarities between the old and new devices, such as ease of use or labeling, might appeal to this group; so might information about features that would be attractive to owners of any playback device (e.g., good sound quality, an auto-off function, or reductions in size or weight). This second type of information campaign might be more effective in counteracting indifference to the new equipment than in overcoming active resistance, especially among subscribers who are inclined to be suspicious or fearful of technology. These subscribers might need the most time to adjust to the idea of the new equipment; repeated preparation that begins well in advance of the equipment's actual release might soften resistance over time (Nelson, 2003, p. 31).

The answers to RQ6 argued that stakeholders believe that NLS is fulfilling its mission statement and the Right to Read using local NLS/LBPD services?

Lewis in her paper, "*Information Equality for Individuals with Disabilities"* discusses how LBPDs and their staffs should offer education, outreach efforts, and training to the community that they serve, because of their training:

> It is particularly effective if the training is taught by individuals with disabilities, either patrons or fellow staff members (Lewis, 2013, p. 237). In Maryland, LBPH staff members with disabilities offer training classes for local staff in adaptive technologies, accessible e-readers, accessible websites, and accessible textbooks. In addition to local staff getting used to working with staff members with disabilities, these sessions can

> point to difficulties faced by disabled staff and patrons. For example, at a recent training class that included LBPH staff, the software chosen for participant communication was not accessible to the blind trainers (2013, p. 237).
>
> The same community outreach and education training conducted by librarians at retirement communities, schools, and community agencies or organizations that is so important in showing the community what is available at our libraries is also critical for library staff. Speaking to small groups of patrons, often in informal settings, will help staff get to know the people they want to serve and increase their comfort level in doing so (2013, p. 237). Again, the goal should be that all staff members attain a level of comfort in dealing with diverse populations, so all are ready to help whoever walks into the library. Staff members should know the resources in their communities and keep in touch with experts in the field by following their websites and through social networking sites. They should attend events at associations and organizations in the community, such as an open house or a health fair (Lewis, 2013, p. 237).
>
> If a library has adaptive equipment, it should be in working order and staffs need to know how to use it. LBPH is a resource for training staff in this area (2013, p. 237). Individuals with disabilities should be included on the local library or trustee board and advisory committees. One Maryland library system created a diversity task force that includes services to individuals with disabilities. The task force is instrumental in developing inclusive programming and programming for seniors. This same system has an advisory committee made up of individuals with disabilities (Lewis, 2013, p. 237).

Bonnici, Maatta, Brodsky, & Steele, in their update to their 2009 paper, surveyed NLS Librarians in 2015. In the 2015 survey, the authors' asked NLS Librarians their views on NLS/BPH services:

> With reported decreases in registered clientele, active patrons, and perceptions of decreased support from administrators, the researchers were curious as to how perspectives of professionals serving in NLS/BPH facilities have changed over the past six years (Bonnici et al., 2015, p. 509). Nine questions were posed to garner professional librarians' perspectives on the NLS/BPH services. Questions addressed general strengths and weaknesses, concerns and desires of the services, the status of and confidence in the emerging digital Talking Book initiative as well as information about the impacts of facility closings. Responses to the major strength and major weaknesses of the service were collected in an open-ended format allowing for inductive analysis of responses to ensure a comprehensive view was provided. Four categories were extracted from the response regarding strengths: accessibility of materials (collection), quality of service, demand for service, and staff. The majority of the comments referred to the quality of the service reflecting the same opinion as to the 2008 study participants (2015, p. 509). Responses included references to digitization increasing the availability of materials in shorter delivery times. Also new this year were comments regarding the "free" service? Responses reveal there has been a major loss of confidence in the USA Postal Service (USPS) in delivering materials promptly. USPS Congressional Reports do not document

an overall trend of increased time to delivery for the years 2010-2014. However, the reports indicate the USPS is concerned with processes that ensure customer satisfaction with services, including delivery times (United States Postal Service, 2014). Opinions reported regarding the accessibility of the service and staff expertise have not differed since 2008. Although respondents in 2008 predicted a growing need for the service as the US population ages, data on clientele in the above section do not reflect positively on the prediction (2015, p. 509). Current data do not predict an increase in demand in the data reporting on the perceived strengths of the service. Rather, decreases in demand are reflected and correlated with the reported lack of both awareness and advocacy regarding NLS/BPH…

The responses to RQ6 argue that stakeholders believe that NLS is <u>not</u> fulfilling its mission statement and the Right to Read through the use of local NLS/LBPD services.

Bonnici et al. (2009) in their first survey of NLS Librarians in 2009:

> The survey queried for weaknesses in the NLS/BPH service with responses collected through an open-ended question. Four categories were extracted from the responses provided: service, technology, funding, and staff. Most of the responses contained information about the quality of the service related to timeliness of materials and the limited selection available compared to non-BPH materials provided to the general population through public libraries (2009, p. 519). Nearly the same amount of concern was expressed regarding equipment that lagged behind the information and communications technology market. Several responses specifically mentioned the prevalence of the use of the analog format to distribute Talking Books. Despite the rollout of the digital service, there is concern that the service will not be comprehensive enough to meet the demand. Several respondents expressed concern that the new digital players still appear cumbersome when compared to iPods and that this is not appealing to young patrons of the NLS/BPH service (2009, p. 519). Related to the lack of current technologies is the lack of funding for the service. Not only is this an impediment to updating the technology and services of the NLS/BPH, but it also restricts the flow of funds to employ staff to meet the level of current demand for services to special populations. Related to the question of perceived weakness is question 11, seeking input on the primary concern as it relates to services to the BPH population. Primary concerns reflect the four categories expressed for identified weaknesses. Specific concerns within the four categories included funding based on impending budget cuts to libraries at all governmental levels. Funding cuts will impact the delivery of service, outreach efforts, staffing, and updating of technologies for the provision of information in an accessible format for registered patrons (Bonnici et al., 2009, p. 519).
> To sum up, the professional perspective is that there is strong potential for technologies and the internet to break down the information access divide, as long as libraries commit to providing access to patrons through assistive technologies. There is a keen awareness among library professionals providing NLS/BPH access that sufficient funding for libraries to provide technology and promote a universal access philosophy is critical to success (Bonnici et al., 2009, p. 520).

The summary and discussion of the answers from the Research Questions and the key findings from the **RQs** can be found in **Chapter 5**.

CHAPTER 5

DISCUSSION

5.1 Introduction

In this chapter, I will discuss the answers for Research Questions 1 through 6 and discuss the key findings for each question.

(A) Discussion of the Answers to Research Questions that examined the Patron's Perspectives

5.2 Research Question 1 and 1(a)

(1) What are the differences between the patrons' perceptions of and use of assistive/adaptive technologies and NLS librarians' perceptions of their patrons' use of assistive/adaptive technologies?

The sources I used to answer **RQ1** in my research indicated that both Librarians and patrons have similar views about (ATs), which are centered on these factors: **accessibility, costs,** and **motivation**, which affect how patrons utilize these technologies. One, the accessibility factor depends upon how comfortable and confident are patrons in using ATs or adopting mainstream ICTs (i.e., consumer technology or mobile devices) as ATs. Gasparini et al. in their study of using tablets such as iPads as Assistive Technology for students with dyslexia make this point, "The author (Deibel) states*: By using the very digital media that is helping drive this information society, computing technologies may be a viable means of providing reading support and accommodation. For such technologies to be successful, though, they must be adopted into regular use. Unfortunately, studies have shown that 35–50% of all assistive devices are abandoned after purchase"* (Deibel, 2011, p. 2; Gasparini & Culén, 2012, p. 29). Two, patrons use ATs to access information via websites, and other electronic mediums, which may not be accessible using assistive/adaptive technology. Both groups agree that **motivation** and **cost** play a role in why patrons use or do not use ATs. Mates argues that if a person with a print disability is not employed they are more than likely not to have a computer and the financial resources to purchase one (2012, p. 12).

The major difference in the opinions with Librarians as to why patrons do not use adaptive technology is ***stigmatization***. Gasparini et al. argued that people with disabilities want to use adaptive technology but do not want to be stigmatized. This is particularly true for

children and young adults (Gasparini and Culén 2012, 28). In their study of how both groups used iPads in an education setting, the author's observed how students were conformable using their iPads around their peers, even though the participants were using accessibility features that Apple installed into the iPad (Gasparini and Culén 2012, 34). I would argue that ***stigmatization*** is one reason why people with print disabilities, reject using ATs like the Digital Talking Book Player because the AT does not look like consumer devices. This factor is also why NLS is developing a digital reader around smartphone technology and the digital reader looks like a regular smartphone to reduce some patron's anxiety in using the new reader (National Library Service for the Blind and Print Disabled, 2019b, 2021).

(1a) What are NLS Librarians' views on their use of these technologies by patrons?

In answering **RQ1 (a),** there are several factors that NLS Librarians contend that impact how individuals with disabilities use adaptive technology. Librarians would argue that **cost** is one of the most important factors, which is hindering patron's use of ATs. Mates (2012) and Dobransky et al. (2006) claim **cost** is the socioeconomic factor that prohibits people with impairments from owning a computer and using the Internet to meet their information needs and wants. **Costs** also affect people with disabilities by reducing their **motivation** for buying computers because some people with impairments are not employed. They cannot afford to buy ATs, and are less likely to use computers. These factors also influence individuals with disabilities access to training on how to use computers and the Internet. Mates (2012) in her book chapter explains how public libraries and librarians can meet these needs and fulfill their legal responsibilities under Federal and State laws to provide access, services, and technology so that people with disabilities can use computers and the Internet to access information to meet their information wants. Also, Mates (201) argues that by providing people with disabilities access, services, and technologies librarians are fulfilling their professional responsibilities.

5.3 Research Question 2

(2) Is NLS fulfilling its mission statement, "That All May Read" and the Right to Read by using the Digital Talking Book Program and Digital Talking Book Player to serve NLS's patrons?

The older patrons are comfortable using the Digital Talking Book Player because of its durability and ease of use. The *2003 Patron Survey* asked key questions that helped lay the foundation for the current players (Nelson, 2003). The survey gave NLS key information that helped NLS in its planning for both the Digital Talking Book Player and Digital Talking Book Program. In the *2013 Patron Survey,* sample patrons gave the digital talking book player an average satisfaction rating of 4.9 and non-sample patrons gave the digital talking book player an average satisfaction rating of 4.7 (National Library Service for the Blind and Physically Handicapped, 2013, pp. 44–45).

I would argue that survey data is indicating that there is a need for DBMs even though more patrons regardless of age are using smartphone technology to access BARD and more resources are available for patrons to buy Ats. For example, funding from Private Insurance, Medicare/Medicaid, Worker's Compensation, funding from state and federal agencies that serve people with disabilities: the State Department of Education in Hawaii Special Education Program, and the Department of Vocational Rehabilitation, and non-profit organizations that provide assistance and funding for ATs and computers: the Assistive Technology Centers of Hawaii all offer funding opportunities There still is a need for DBMs for patrons who do not have the resources to buy a smartphone and pay a monthly wireless bill or buy a computer and pay an Internet Service Provider for Broadband service or Internet access. NLS is planning to acquire a new Digital Talking Book Player to replace the aging DBMs and NLS wants to have DBMs available for future use to meet the continuing needs of people who require use of an NLS supplied device (Library of Congress, 2019, p. 138). NLS supplied equipment is necessary because many NLS patrons do not have resources, cognitive or physical abilities, or patrons are ill at ease using commercial devices.

The answers to RQ2 maintain that NLS is fulfilling its mission statement, "That All May Read" and the Right to Read by using the Digital Talking Book Player to serve its patrons.

In the research for my published paper and for this dissertation, one of the problems NLS faced when designing the Digital Talking Book Player during the 1990s and the 2000s was building a player for an older population, who was and is resistant to new technology and change. Even though the Analog Cassette technology was harder to use, this hesitancy to use new technology was and is based on each generation's exposure to digital technology. The more a generation is exposed to and uses new technologies the less resistant or hesitant people are to use new technology, especially older adults to technological change. For example, even today in 2020, in my work as an NLS Librarian, many of my patrons are still calling the digital cartridges, "cassettes". However, as many older patrons and their caregivers are becoming computer literate or as more patrons use smartphones, tablets, laptops, etc., older adults are more likely to use the Internet, and older patrons' resistance to new technology will decline over time.

However, Rose (2014) surveyed NLS Librarians about the Digital Talking Book Player and were asked what they and their patrons disliked about the Digital Talking Book Player. They identified the *Battery Recharging System*, the *Size of the Player*, and the *Weight and Portability of the Player* (Rose, 2016, p. 6). In the *2013 Patron Survey*, non-patrons in their survey responses were concerned about the player was too heavy or too large, another technology was easier to use, non-patrons had trouble navigating around a book or magazine, and the equipment was not reliable (2013, p. 44,45). NLS is pilot testing a digital book reader based on smartphone technology, and is similar to a smartphone reader that is being used by the United Kingdom's Royal Institute for Blind People. As discussed in **Chapter 4**, NLS is planning to have a new model of the Digital Talking Book Player ready by winter 2022 (National Library Service for the Blind and Printed Disabled, 2021). NLS was encouraged to follow this course of action due to findings by the various studies, reports, and patron surveys NLS has conducted over the years.

The answers to RQ2 maintain that NLS is fulfilling its mission statement, "That All May Read" and the Right to Read by using the Digital Talking Book Program to serve its patrons.

Overall, patrons who are satisfied with the program are comfortable with receiving their materials via mail. The *GAO 2016* study and the 2013 patron survey pointed out this finding. The 2013 patron study makes another key finding from the patron's responses to the survey that patrons want to continue to use the program due to their high satisfaction with the program and

are grateful for the program. One reason for this high satisfaction rating is due to the customer service performed by the Network Libraries. These Regional Libraries, Sub-regional Libraries, and Advocacy Outreach Centers provide library services to a very diverse and growing patron population.

The answers to RQ2 maintain that NLS is <u>not</u> fulfilling its mission statement and the Right to Read by using the Digital Talking Book Program to serve its patrons.

In researching the answer to **RQ2**, the two major patron surveys that NLS conducted in 2003 and 2013 were studied. The two surveys found that patrons wanted the program to be responsive to their needs andbe able to order and then listen to the audiobooks that held their interests (National Library Service for the Blind and Physically Handicapped, 2013; Nelson, 2003). Overall, the surveys found that between 2003 and 2013 patrons wanted their NLS service to be more like *Amazon*, *Bookshare*, and *Learning Ally*. Patrons desired faster production of books, which arrive at the same time as the print version is published andwider selections of authors and subjects. Also, they wanted more outreach about the NLS services and programs. In particular, patrons, their families, and advocacy groups wanted NLS to increase its publicizing about these programs and services.

The sources that were used to answer this question explained how NLS responded to patrons and their advocates' demands for these changes to the program. For example, NLS implementation of the Duplication on Demand service allows Network Libraries to customize the cartridges that are mailed to patrons based on their selections and interest.

5.4 Research Question (2a)

(2a) Is NLS fulfilling its mission statement and the Right to Read by using NLS's services and local NLS/LBPD libraries to serve NLS's patrons?

The answers to RQ2a make a case that NLS was carrying out its mission statement and the Right to Read by utilizing NLS's services and local NLS/LBPD libraries to serve NLS's patrons.

In the 2003 survey, patrons found that, regardless of the age group and the analog technology to serve their patrons, "Their Talking Book library is the primary source of reading material."A key finding of the 2013 survey was that patrons were not currently using or were not planning to use alternative means of obtaining reading materials" (2013, p. 48; Nelson, 2003, p. 2). These findings indicate that patrons feel that NLS services are meeting their reading needs

and local NLS/LBPD help patrons with their reading needs through the mailing of cartridges to their patrons, and by providing Reader Advisory services concerning the authors and topics that are of interest to them.

The answers to RQ2a make a case that NLS was <u>not</u> carrying out its mission statement and the Right to Read by utilizing NLS's services and local NLS/LBPD libraries to serve NLS's patrons.

Patrons in their responses to the 2003 survey said that they liked their service and only canceled their service based on their own needs or life considerations than their displeasure with their services.Many of these reasons were based on their health, their schedule, and lack of interest in the service (Nelson, 2003, p. 30). However, in the 2013 patron survey, the reason why patrons canceled their service was due to patrons using other technologies or services and were willing to pay a fee to use these services. By 2013, patrons now had more choices to select audiobooks from commercial audiobook providers. The most commonly mentioned audio services from the survey were *Audible*, *Bookshare*, and *iBooks*. The most commonly mentioned technologies from the survey that patrons used to play their audio books were the iPad/iPod, the iPhone, the Nook, and the Kindle (2013, p. 52).

I would argue that NLS is now faced by more competition for their patrons who want to listen to audiobooks using the latest devices, and many of these patrons now have the resources to acquire mobile devices. Because the prices have dropped low enough so that patrons can buy the devices, meet the expense of the monthly wireless bill and have enough money for the monthly subscription fees for the commercial audiobook services or pay a subscription fee for the non-profit audiobook services.

(B) Discussion of the Research Questions that Examined the Technology/Artifact Perspectives

5.5 Research Question (3a) and (3b)

(3a) What are the features and options that patrons and NLS Librarians would like to see in the new player?

As the Digital Talking Book Machine's technology matured in 2014 and 2015, NLS began to explore and plan for the updating of the DTBM. The stakeholders such as NLS Librarians, Network Staff, Network Libraries, Patrons, and Volunteers who repair the DTBMs, wanted these changes to the current machine.

However, NLS in its *2016 Budget Justification*, stated that "NLS will begin creating specifications and prototyping the next generation of NLS playback systems" (Library of Congress, 2016, p. 126). In other words, NLS decided to go ahead and design an all-new player, because NLS was being influenced by its stakeholders to update the player and at the same time it told Congress, that due to, "The obsolescence of some parts in the digital talking-book machine, which was designed in 2005, necessitates a design update. The design update was postponed in fiscal 2013 for reasons of funding and procurement lead time" (Library of Congress, 2015, p. 113). This is a prime example of how stakeholders can influence how technology is planned, developed, and then implemented.

(3b) the influence of other stakeholders had on the planning process (Advocacy groups, Assistive Technology Companies; General Accountable Office, Library of Congress, the U.S. Congress, etc.).

I used these five stakeholders as an example of how stakeholders had influenced the planning process of the Digital Taking Book Program:

Advocacy Groups

In 2005, Hampton Auld published five essays in an article for the *Public Libraries journal*, some of these essays in this article were critical of NLS's digital talking books planning process. In Christopher Gray's essay, he was at the time president of the American Council of the Blind, which is an advocacy group for the blind community, he argued that NLS needed to take the patrons, their families, and the blind community into account when NLS was transitioning from the analog format to the digital format. He discussed the concerns of his members that the planning process was taking too long to develop the technology and the lesser developed countries had already transitioned into the digital book format. Gray explained his position that, "We do not believe that a decrease in talking book readership stems from the slowness of transition by the Library of Congress to digital media. It is far more likely that the sheer degree of availability of reading material in bookstores and through catalogs creates an environment in which people losing their vision do not so quickly gravitate to the Talking Book Program" (Auld, 2005, p. 75). He advocated for stakeholders to support NLS during the transition process, "We look forward to that day with optimism and anticipation. We must cooperate to secure the financing and national support necessary to create this new program. By

doing so and by taking into account the needs of all readers, the blind and visually impaired of the upcoming decades will best be served" (Auld, 2005, p. 75).

Assistive Technology Companies

Bertoni in his 2016 GAO report argues for the need by NLS to considering acquiring commercially available devices. He interviewed two assistive technology companies to ask their views about using commercially available audio players to serve NLS patrons. This report and other comments from the disability community, persuaded NLS to consider buying and then modifying commercially audio players as a replacement for the current Digital Taking Book Players. The reason why stakeholders are pushing this as an alternative to NLS designed players is for the reason that stakeholders believe that commercially available audio players could be a cost-effective substitute, which could be quickly distributed to NLS patrons, stakeholders thought NLS would spend too much time to plan, build, and then deploy an NLS designed player.

General Accountable Office

One of the GAO's duties is to analyze government programs for Congress and to make recommendations for changes to improve those programs. GAO was asked to review NLS plans for designing and execution of its Digital Talking Book Program. GAO in its review was very critical of NLS plans and argued for NLS to look at other alternatives technologies, such as CD technology to serve its patrons, rather than use the Flash Memory technology it had chosen to use to serve its patrons (Government Accountability Office, 2007). NLS in its response to the GAO Report agreed and made changes to the program that GAO requested. However, NLS went ahead and decided to use Flash Memory technology because NLS argued that it was too far long in the planning process to change the technology. NLS argued that for over 10 years it had worked with the disabled community and worked with other stakeholders in developing the technology (Government Accountability Office, 2007, p. 10). This response shows how important stakeholders' input was to NLS during the planning process for the Digital Talking Book Program.

Library of Congress

LC in its role as NLS's parent agency hires consultants to help LC management conduct the long-range planning for NLS. In 2010, LC hired Ducrest Associates, to write a report that studied the future of NLS and how the Digital Talking Book Program could impact its future.

The report explored this subject by making assumptions for long-range planning and by looking at the alternative futures of the service using scenarios. LC and NLS used these types of reports to create a strategy for the development of a new technology to serve its patrons and conduct long-range planning that enabled NLS to get the most out of its current technology.

I would argue that many of the assumptions and scenarios in the Ducrest (2010) report in one form or another have currently happened. The report was a very helpful source because it gives the reader a clear picture of how digital technology is impacting the programs and services NLS uses to serve its patrons.

U.S. Congress

The U.S. Congress is one of the most important stakeholders. Congress provides funding to NLS and also conducts oversight of NLS by using the GAO. As part of its oversight duties, the U.S. House of Representatives Appropriations Committee was concerned about NLS and if NLS was able to serve its patrons with its current technologies. The House of Representatives Appropriations Committee asked the GAO to review NLS's currently technology, its plans for the technology and review the idea of whether or not NLS should use private-sector technology and alternative distribution methods to serve its patrons (House of Representatives, 2014, p. 18). GAO published the results of this review in the GAO report, "*Library Services for those with Disabilities: Additional Steps Needed to Ease Access to Services and Modernize Technology. Report to Congressional Committees. (2016).*

The GAO report is cited throughout this dissertation (Bertoni, 2016) and was one of the 51 documents used for this case study. The report suggested several changes to NLS's policies, procedures, programs, regulations, services, statutes, and technologies, which have been implemented by NLS and have been discussed throughout this dissertation.

5.6 Research Question 4 and 4a

(4) How has the use of third-party assistive/adaptive technologies, the use of consumer devices (i.e., e-readers, smartphones, portable computers, and tablet computers); the use of broadband, and wireless Internet services affected the Digital Talking Book Program?

NLS responded to the effects of these devices by **One** developing software called BARD Express, which allows BARD patrons to download books through Windows-based software directly onto a flash drive or cartridge using a USB cable. The flash drive can be played using the Digital Talking Book Player's USB port or with a cartridge inserted into the slot that is used

by cartridges supplied by NLS. **Two**, NLS is now emphasizing using BARD by developing "self-service" tools such as a virtual agent on the NLS website or via BARD Mobile that would interact with patrons and reduce the reader advisors workload (National Library Service for the Blind and Print Disabled, 2019b) **Three, "**NLS is testing a streaming service that would enable patrons to receive the data from files contained in an NLS book as they listen to it instead of having to download the entire book. Streaming would let patrons start listening to a book faster, and it would reduce the volume of traffic on NLS servers." The reason why NLS is developing these projects is the patrons' increased use of ATs, smartphones, and other ICTs that are used to meet information needs.

(4a) How have these technologies impacted the patrons' use of BARD?

Between 2012 and 2014, NLS developed and then released apps for *Amazon*, *Android*, and *Apple* devices. These apps allow patrons to download audiobooks and Braille files from BARD into their smartphones, and tablets through the BARD Mobile application (Library of Congress, 2014, p. 114). The BARD Mobile app has attracted younger patrons to use BARD because they could their smartphones to access BARD, the Internet, and smartphone apps, however, the same features that attracted young people to smartphones, and other mobile wireless devices also have attracted older adults to use these devices for the same reasons.

Because of the increased use of BARD, NLS has updated and increased the download capacity of BARD and is planning to move BARD from dedicated servers to cloud storage (Library of Congress, 2019, p. 114). Another reason for this increased capacity is NLS's plan to have the next generation of talking book players download via wireless connectivity (Bertoni, 2016, pp. 24–25).

(C) Discussion of the Research Questions that examined the Policy Perspective

5.7 Research Question 5

(5) *Stakeholders have argued that NLS needs to broaden its patron eligibility criteria and allow people with reading disabilities, such as dyslexia/ reading and writing difficulties to use the service: how will this inclusion affect NLS.*

The *2013 Patron Survey*, Lewis (2013), Rose (2014), Bertoni (2016), and Rose (2018a)surveys, peer review papers, and GAO reports demonstrate how stakeholders are making the case that NLS needs to expand its patron base to include people with reading disabilities, such as dyslexia to use the service. "A 2016 report by the Government Accountability Office

urged NLS to relax that requirement (Bertoni, 2016). Also, the 2018 Marrakesh Treaty Implementation Act expanded the definition of who can benefit from programs like NLS to include individuals who are "blind [or who have] a visual impairment or perceptual or reading disability [.]" Of course, many network libraries have expressed strong interest in loosening the certification requirement to increase access for individuals who would benefit from talking books." (Fernekes & Layman, 2019a)

"We want to relax the requirement that only a medical doctor can certify eligibility for people with reading disabilities, but we need data to help us project, and prepare for, the increase in enrollment that will bring—an increase that will impact both NLS and our network libraries," NLS Director Karen Keninger said. "We expect this pilot project to give us that data and let us test some of our assumptions." (Fernekes & Layman, 2019a)

The NLS in November 2019 responded to this interest in expanding its service to people with reading disabilities by conducting pilot projects in Texas and Pennsylvania to explore the impacts of easing access to the program for people with reading disabilities. The pilot program started October 20, 2019, and was supposed to end September 20, 2020, however, due to the COVID-19 crisis which closed the libraries in the pilot program. HAs a result, NLS stopped the pilot early due to the crisis. Nonetheless, the preliminary results of the pilot found that BARD could handle the increased traffic generated by the pilot and with the planned improvements to BARD will enable BARD to serve both new and current patrons. (Fernekes & Layman, 2019b).

The Marrakesh Treaty uses human rights and a legal framework to modify the copyright laws and intellectual property rights to create exceptions to these laws. Under terms of the treaty, "authorized entities" within the United States are allowed to exchange materials in alternative formats with countries that have ratified the treaty (Ayoubi, 2019; Vleugels, 2020, p. 1,4). Ayoubi argues that the treaty uses this legal framework to expand the "Right to Read" not just from a human rights standpoint under the United Nations Convention on the Rights of Persons with Disabilities Treaty. It extends these human rights to allow people with print disabilities equal access to print materials using the Marrakesh Treaty to facilitate that equal access (Ayoubi, 2019, pp. 434–437).

The ACB is a splinter group that broke away from the NFB during the 1960s, and both groups have conflicting views concerning advocacy for rights and services for the visually impaired ("The American Council of the Blind Unwilling to Cooperate," 2001). Exploring the

dispute between these two stakeholder groups and how this dispute affected their support for the treaty is an avenue for future research. It is beyond the scope of this dissertation. The ACB and the NFB supported the treaty, with NFB attending the Marrakesh Treaty negotiations (McMillion, 2018; Stephens, 2021).

5.8 Research Question 6

(6) Do stakeholders believe that NLS and its network libraries fulfill its mission statement and the Right to Read utilizing its current technology and services?

The answers to RQ6 argue that stakeholders believe that NLS and its network libraries fulfill its mission statement and the Right to Read by utilizing the Digital Talking Book Player.

These same stakeholders also agreed that the new player had several factors that were improvements over Analog Cassette Players, "Several aspects of machine operations will improve, thanks to better reliability: lower failure and repair rates, lower disposal rates, fewer repair costs, and relatively less reliance on volunteer repair" (J. M. Taylor, 2004, p. 51). In other words, the DBM was to be an easier machine to repair because the machine was based on digital technology, which at the time the DBM was first deployed, parts were available versus aging analog technology that was getting harder to repair due to parts no longer being manufactured or available.

The responses to RQ6 argue that stakeholders believe that NLS and its network libraries fulfill its mission statement and the Right to Read by <u>not</u> utilizing other options to the Digital Talking Book Player.

Advocacy groups for the disabled, scholars, NLS Librarians, consultants, etc. have argued about the problems concerning the Digital Talking Book Player. For example, authors who wrote a report concerning Michigan's LBPD and the services they provide to Michigan patrons, complained that the Digital Talking Book Player may have already been outdated even though at the time the report was written the DBMs were not deployed (Rujan & Andrysiak, 2008, p. 23).

The answers to RQ6 argue that stakeholders believe that NLS and its network libraries fulfill its mission statement and the Right to Read by utilizing the Digital Talking Book Program.

In the *2013 Patron Survey*, the authors in their **General Recommendations** section suggested that NLS can increase the numbers of patrons who do not use the program by

adverting their patrons the ability to access reading materials without leaving their homes and that patrons can obtain their reading materials via downloading books for free from BARD (National Library Service for the Blind and Physically Handicapped, 2013, p. 63).

The responses to RQ6 argue that stakeholders believe that NLS and its network libraries fulfill its mission statement and the Right to Read by <u>not</u> utilizing other options to the Digital Talking Book Program.

As the Digital Talking Book Program was heading toward its deployment in 2009, many advocates in the Disability Committee argued that the planning and deployment process was taking too long. Jim Scheppke in his essay, *"The End of Talking Books?",* "The United States is years behind the rest of the world in transitioning from antiquated cassette talking books to digital talking books. As a result, it is becoming harder and harder to sign up for new patrons to use the cassette talking books. "Don't you have books on CDs?" is the question my staff is asked again and again. The answer, sad to say, is that NLS will not provide us with digital talking books until 2008" (2005, p. 69). Other stakeholders argued that, as NLS is developing several new technologies (eBraille reader, smartphone player, streaming), it needs to compare "Off the Shelf" technology with technology developed by NLS to make sure that NLS is choosing technology that can be acquired cost-effectively.

The responses to RQ6 argue that stakeholders believe that NLS is fulfilling its mission statement and the Right to Read.

Christopher Gray in his essay, *Digital Talking Books from the Consumers' Viewpoint,* argue that "[I]n addition to my personal experiences and observations, I currently have the honor of serving as president of a consumer organization of blind people known as the American Council of the Blind. Through this organization, we are in direct contact with tens of thousands of blind Americans, the vast majority of whom are recipients of talking book services. This is one of the most-loved programs of service within the blind community, and a frequent topic of conversation among our membership" (Auld, 2005, p. 75).

The responses to RQ6 argue that stakeholders believe that NLS is <u>not</u> fulfilling its mission statement and the Right to Read.

Katherine Nelson, in her 2003 patron survey explained the patrons' response as to why they canceled their service as NLS was planning the Digital Talking Book Program, she argued that there was a need for two different information campaigns, **one** information campaign at

encouraging tech-savvy patrons and one that emphasize the features of the players that may be of interest to this group (Nelson, 2003, p. 31).

The responses to RQ6 argue that stakeholders believe that NLS is fulfilling its mission statement and the Right to Read by using local NLS/LBPD services.

Lewis in her paper, "*Information Equality for Individuals with Disabilities"* discusses how LBPDs and their staffs should offer education, outreach efforts, and training to the community that they serve, because, "[i]t is particularly effective if the training is taught by individuals with disabilities, either patrons or fellow staff members. In Maryland, LBPH staff members with disabilities offer training classes for local staff in adaptive technologies, accessible e-readers, accessible websites, and accessible textbooks. In addition to local staff getting used to working with staff members with disabilities, these sessions can point to difficulties faced by disabled staff and patrons" (Lewis, 2013, p. 237). In addition, she argues that staff should have an advisory council and that people with disabilities should serve on the council and be advocates for community outreach at retirement communities, schools, and community agencies or organizations that are so important in showing the community what services are available.

Bonnici, Maatta, Brodsky, & Steele, in their update to their 2009 paper, surveyed NLS Librarians in 2015. In the 2015 survey, the authors' asked NLS Librarians their views on NLS/BPH services. Responses to the major strength and major weaknesses of the service were collected into four categories: strengths: accessibility of materials (collection), quality of service, and demand for service and staff. The majority of the comments referred to the quality of the service reflecting the same opinion as the 2008 study participants (2015, p. 509). Responses included references to digitization for increasing the availability of materials in a shorter delivery period. Responses revealed that there has been a major loss of confidence in the U.S. Postal Service (USPS) in delivering materials promptly. NLS Librarians' views regarding the accessibility of the service and staff expertise had not differed since the 2008 survey. Although respondents in 2008 predicted a growing need for the service as the US population ages, data on clientele in the above section do not reflect positively on the prediction (2015, p. 509). Current data do not predict an increase in demand in the data reporting on the perceived strengths of the service. Rather, decreases in demand are reflected and correlated with the reported lack of both awareness and advocacy regarding NLS/LBPD.

The responses to RQ6 argue that stakeholders believe that NLS is <u>not</u> fulfilling its mission statement and the Right to Read by using local NLS/LBPD services.

Bonnici et al. (2009) argued in their survey of NLS Librarians, the weaknesses in the NLS/BPH service-based responses collected from the librarians were based around four categories: **service, technology, funding,** and **staff**. Responses concerning services dealt with the quality of the service related to timeliness of materials and the limited selection available compared to non-BPH materials provided to the general population through public libraries (2009, p. 519). Responses concerning technology was expressed regarding how equipment that was lagged behind the information and communications technology market. Several responses specifically mentioned the continuing use of the analog format to distribute Talking Books even though at the time the digital service was being rolled out to patrons and there was a concern that the service will not be comprehensive enough to meet the demand. Several librarians expressed concern that the new digital players still appear cumbersome when compared to iPods and that this is not appealing to young patrons of the NLS/BPH service (2009, p. 519). Librarians were worried about the lack of funding for the service, which is a hindrance to updating the technology and services of the NLS/BPH. It also was restricting the flow of funds to employ staff to meet the level of current demand for services to special populations. (Bonnici et al., 2009, p. 519).

Lazar and Briggs (2015) stated that public libraries are an ideal position to serve people with print disabilities because patrons are more likely to visit a public library before they visit an LBPD.

5.9 Other Findings Obtained through the Coding and Studying of the 51 Documents

One of the surprise findings of my research was NLS's implementation of Duplication on Demand (DOD) in 2018, many of the network libraries across the country including Hawaii State Public Library System Library for the Print Disabled are now using the system to serve patrons , which is a game-changer. Duplication on Demand is a system where digital books are downloaded from BARD onto a server that is located at the network library (Keninger, 2015, p. 5). The server then loads the digital books via a jukebox onto cartridges that can contain multiple books. Duplication on Demand enables a network library to mail fewer single digital cartridges to patrons, who due to their disabilities had trouble using and handling multiple single digital cartridges with only one book on each cartridge, patrons are now receiving one cartridge

with several books that were downloaded onto that cartridge. Digital Books that were duplicated on to cartridges that have been customized based on a patron's request or reading preferences (Keninger, 2015, p. 5).

NLS in both of its *"Current Strategic Business Plan for the Implementation of Digital Systems, December 2003 and September 2006"* wanted to develop and deploy the technology between 2013 and 2016.NLS originally planned to have a centralized facility that would download the titles from BARD onto servers and then duplicate the cartridges based on patrons request and then mail the cartridges to the patrons. However, NLS decided to decentralize the Duplication on Demand system and have the Network Libraries perform the task because they know what their patrons want and it is easier to mail cartridges directly to patrons from their local LBPD. (Ducrest Associates, 2010; Library of Congress, 2013, 2014).

CHAPTER 6

CONCLUSIONS, RECOMMENDATIONS, AND LIMITATIONS

6.1 Introduction

The Design, Development, and Deployment of National Library Service's Digital Talking Book Program is a Socio-Technical Process that was influenced by various stakeholders throughout the entire process: Patrons, the Library of Congress, NLS Staff, NLS Librarians, Network Libraries (including their Staffs and Volunteers), the United States Congress, the GAO, Advocacy groups for people with disabilities: Ex: American Council for The Blind, the Blinded Veterans Association (BVA) and the National Federation for the Blind, caregivers and families, finally Library Administering agencies on local and state level the Chief Officers of State Library Agencies (COSLA).

6.2 Using the Six Research Questions to Discuss the Goals of Dissertation

The first goal of this dissertation was to explore the factors that affected the way in which people with print disabilities access information, specify print materials, and how NLS assists individuals with print-related disabilities to access printed materials. This dissertation also explored how the social contexts have influenced the approaches used to help people with print disabilities access printed materials. These factors include economic, human rights, legal, organizational, political, social, and technical factors. These factors were examined using the 3 perspectives: **Patrons' perspective, Policy perspective,** and **Technology/Artifact perspective**. The 6 Research Questions were centered around the 3 perspectives.

RQs1 through **RQ2** studied the **Patrons' perspectives**, ***RQ1*** and ***RQ (1a)***. The research found that patrons and NLS Librarians have similar perceptions of ATs and similar perceptions concerning a patron's use of ATs. These similar views were **accessibility, costs** and **motivation**. All three factor**s** can affect how patrons use ATs to meet their information needs. However, the research has found that patrons have different opinions regarding assistive technologies. One of the main reasons why patrons refuse to use ATs is the fear of *stigmatization* through their use of ATs, especially young people who are worried about not looking like their peers when they are using technology (Gasparini & Culén, 2012). NLS Librarians argue that **costs** are the main factor that is hindering a patron's use of adaptive technology ((National Library Service for the Blind and Physically Handicapped, 2013; Rose, 2014, 2016).

This study found in the research to answer **RQ2** that patrons were satisfied with the Digital Talking Book Program, however their criticisms of the program between, *NLS Patron Survey Final Report* (2003) and *National Library Service for the Blind and Physically Handicapped (NLS) Talking Book and Braille Program Evaluation and Recommendations for Increased Patronage* (2013) determined that patrons wanted the program to be comparable to the non-profit programs, *Book Share* and *Learning Ally* and comparable to the commercial services, for example, *Amazon* and *Audible*. At the same time, they wanted faster book production that would allow patrons to listen to popular titles at the same time as their family members and friends were reading the printed versions. The main compliments that patrons had for the Digital Talking Book Program were (1) patrons receiving their materials through the mail and (2) patrons were happy that the program existed (National Library Service for the Blind and Physically Handicapped, 2013; Nelson, 2003).

This study found in answering **RQ2** that patrons were satisfied with the Digital Talking Book Player. However, as NLS was designing the player, the *NLS Patron Survey Final Report* (2003) indicated that NLS needed to take into consideration that older patron would be reluctant in using the new player because it was a new technology that they were not familiar with. NLS managed to overcome this problem with the help of NLS Librarians, Network Staff and Volunteers, and other stakeholders who worked with patrons and caregivers to familiarize older patrons with the new player (National Library Service for the Blind and Physically Handicapped, 2013; Nelson, 2003).

However, by the time NLS Librarians were surveyed in 2014 (Rose 2016), they were asked what they and their patrons disliked and liked about the player. The three top items that they disliked about the player were: *the Battery Recharging System, the Size of the Player, and the Weight and Portability of the Player.* The three top features they like about the player were: *Ease of Use, Audio Quality,* and *the Built-in User Guide*. Both Groups argued that the player needs to be updated (Rose, 2018a, p. 473). In the 2016 GAO report, the report noted that patrons preferred receiving materials through the mail and then using their NLS-provided player to listen to their books because they felt more comfortable using the Digital Talking Book Player than using commercially available devices (Bertoni, 2016, pp. 18–19).

In October 2018, Pamela Davenport, our NLS Consultant, during her Biannual visit to the Hawaii State Library Public Library System Library for the Print Disabled informed the LBPD

that NLS is in planning stages for a new DTBM. However she and others on the NLS staff, had not seen the prototype or if a prototype had been built. The new player will possibly be smaller than the current DTBMs, because of complaints that the current machines are too big, the new player will be voice-activated, and will have both Bluetooth and Wi-Fi capabilities (Rose, 2018b).

RQ (2a) examined *if NLS is fulfilling its mission statement and the Right to Read by using NLS's services and local NLS/LBPD libraries to serve NLS's patrons*. The answers to RQ2a argued that the program was the main source for patron reading, especially for older adults. This finding was confirmed in both the *2003 NLS Final Patron Survey* and 2013 Patron Survey.

The answers to RQ (2a) argued NLS was not fulfilling its mission statement and the Right to Read by using local NLS/LBPD libraries to serve NLS's patrons. One answer to ***RQ (2a)*** comes from the 2003 patron survey, which indicated that patrons were too busy, the service no longer met their needs, and that patrons were not well enough to use the service (Nelson, 2003, p. 30). A second answer to ***RQ (2a)*** came from the 2013 patron survey, which gave the reasons why patrons stopped using the service. For example, former patrons preferred using another technology or service and those who preferred using another technology or service did not mind paying a monthly fee or fee per downloaded book to use the service (National Library Service for the Blind and Physically Handicapped, 2013, p. 52). The former patrons mentioned using *Audible*, *Book Share*, and *iBook*, and the technology most commonly used were the Apple devices, the Kindle, and the Nook.

The second goal of this dissertation was to explore the manner in, which the social context influenced NLS's decisions concerning the planning, designing, and implementation of the Digital Talking Book Program and Digital Talking Book Player that are used by people with print disabilities to satisfy their information needs and wants. This topic is explored under the **Technical/Artifact** perspective, which revolves around ***RQ3*****,** and ***RQ4***. The research has shown that stakeholders were involved throughout the entire process and they helped to develop and refine the current Digital Talking Book Players. The stakeholders' interaction and involvement in the process were studied using ***RQ3 & (3a)*****,** ***RQ4 & RQ (4a)***.

RQ (3a) asked what features and options patrons' and NLS Librarians wanted to see in the new player. (1) Improving the Player's Battery Life, (2) Including Wireless Connectivity, (3)

Reducing the Size of the Player, and (4) Adding the Capability of Either Direct Downloading from a Computer or Downloading via Wi-Fi (Rose, 2018a, p. 474). An NLS advisory committee made of patrons, NLS Librarians, Network Libraries Staff, and Volunteers who repair the DBMs wanted these features added to the new player: (1) Adding an SD or micro-SD card reader to the next generation player, as well as additional USB ports. (2) Creating Bluetooth remotes and breath switches that control all DTBM features for physically disabled users. (3) Creating a Bluetooth refreshable Braille display to be used as an accessory with the next generation player (Network Library Representatives, 2014).

For ***RQ (3b),*** I used these five stakeholders as examples of how stakeholders had influenced the planning process of the Digital Taking Book Program: Advocacy groups, Assistive Technology Companies, General Accountable Office, Library of Congress, and the U.S. Congress.

RQ (3b) Advocacy group

I used Christopher Gray's essay that was published along with five other essays in Hampton Auld's 2005 article for *Public Libraries*, some essays in the article were critical of NLS's planning process for Digital Talking Books. Christopher Gray, who was at the time president of the American Council of the Blind, which is a major advocacy group for the blind community, argued that NLS needs to take patrons and the blind community into account when NLS was transitioning from the analog format to the digital format (Auld, 2005, p. 75). He discusses the concerns of his members that the process was too slow and lesser developed countries had already transitioned into the digital format. He advocated for the need for stakeholders to support NLS during the transition process (Auld, 2005, p. 75).

RQ (3b) Assistive Technology Companies

Bertoni in his 2016 GAO report argues that NLS needs to considering acquiring commercially-available devices to serve its patrons, he makes his point by explaining how Canada, Asia, and European libraries for the blind use commercial devices to serve their patrons and he used comments from the two Assistive Technology companies he interviewed to bolster his argument, "Some libraries for the blind in Europe and Asia also purchase commercially-available audio players for library users, according to two assistive technology companies we contacted" (Bertoni, 2016, p. 26). He and the assistive technology companies were arguing that

NLS needs to at least consider that alternative, because an NLS designed player may take a long time to develop than modifying a commercially available device.

My problem with this argument is that these same companies are going to bid to supply the devices to NLS. However, these same companies can provide the expertise to design or modify their equipment to satisfy NLS specifications for the new player.

RQ (3b) General Accountable Office

GAO is Congress's agency that analyses, audits, and investigates federal government agencies, federal polices, federal projects, and federal programs. GAO was asked by Congress to study the NLS Talking Book Program. GAO published their findings in a 2007 report, titled, *"Talking Books for the Blind,"* which analyzed NLS's selection of flash memory technology as the technical foundation for the Digital Talking Program and its design of the digital player. The GAO report criticized these choices and argued that NLS should have explored more options, such as CD technology as alternative technologies because CD and other technologies were available at the time (Government Accountability Office, 2007). The report showed how Congress is a major stakeholder that was concerned about how NLS was planning to serve its patrons using this technology. NLS asked Congress to appropriate public money to fund the program and it was Congress's duty to oversee the program and to make sure that NLS was making the right choices and decisions concerning the Digital Talking Book Program.

RQ (3b) Library of Congress

LC as NLS's parent organization needs to use current data to do long-range planning for the future and to see how technology, congressional funding, state and local funding, current and future economic conditions can affect NLS's technology plans and services. LC and NLS asked Ducrest Associates how the 2008-2010 Great Recession was going to affect both NLS and the Network Libraries. The report also examined NLS's technology and formats that were being used to serve its patrons and the Digital Talking Book program, which was starting to be deployed at the time and how the program was going to affect NLS and the Network Libraries. The report discussed how these new technologies, for example, Smartphones, Tablet Computers, and Duplication on Demand, would contribute to how Network Libraries served its patrons at that time and into the future. The report indicates how the Digital Taking Book Program, BARD, Smartphones, and Duplication on Demand will impact NLS based on various scenarios and assumptions (Ducrest Associates, 2010).

RQ (3b) U.S. Congress

In 2014, the U.S. House of Representatives, in an appropriations bill that was to fund NLS and LC operations, was concerned about how NLS technologies and services were going to meet the needs of its patrons in 2014 and into the future. The House of Representatives asked GAO to review NLS technology, services and its plans for the future. The GAO report published in 2016, I have cited this report throughout this dissertation as, *Library Services for those with Disabilities: Additional Steps Needed to Ease Access to Services and Modernize Technology. Report to Congressional Committees (2016)* or as (Bertoni, 2016). The GAP report influenced NLS to consider using commercially available devices for the new Digital Talking Book player and for the new eBraille reader, which is in the pilot project stage and is consider using Text to Speech for its magazines (NLS on the Move, September 26, 2019).

RQ4 studied how the use of third-party assistive/adaptive technologies, the use of consumer devices (i.e., e-readers, smartphones, portable computers, and tablet computers); the use of broadband, and wireless Internet services affected the Digital Talking Book Program. NLS responded to the effects of these devices by developing software for computers and phone applications for Amazon devices, Android and iOS smartphones that enables BARD users to download books using the Internet, using their Cellular Service or using Wi-Fi onto their devices. NLS wants to push the use of this technology further by developing a streaming service where patrons can download book files instead of the whole book. Streaming would let patrons start listening to a book faster, and it would reduce the number of patrons trying to access BARD to download books, thereby freeing up access to BARD (National Library Service for the Blind and Print Disabled, 2019b).

RQ (4a) studied how these technologies impacted the patrons' use of BARD. The introduction of these devices, along with mobile AT products from companies like *Human Ware* and *Zoomax*, has NLS emphasizing to Network Libraries that patrons who have their devices to access BARD should return their DTBMs, "there's a practical reason we're encouraging folks to sign up for BARD: the more people that use BARD Mobile, the longer we can stretch our supply of DTBMs until we roll out the next-generation talking-book machine" (National Library Service for the Blind and Print Disabled, 2019a). NLS added that they are planning improvements to BARD's infrastructure so it can accommodate the many new patrons that they predict as a result

of the ongoing outreach efforts and changes in the certification requirements for individuals with various reading disabilities to use the service.

The third objective of the dissertation is to broaden the scope of inquiry beyond what was discussed in my research paper and examine how the wider social perspectives have influenced NLS libraries and librarians' decisions regarding the print-disabled patron's access to knowledge. This subject was examined under the **Policy perspective** using ***RQ5*** and ***RQ6*** to study this perspective**.** ***RQ5*** studied how stakeholders argued to NLS to broaden its patron eligibility criteria and allow people with reading disabilities, such as dyslexia and other reading and writing difficulties to use the service. The inclusion of these new patrons is currently impacting NLS and will affect NLS well into the future. This change was created by the ratification of the Marrakesh Treaty and will have a profound impact on NLS as an organization, on NLS's technologies and NLS's services.

One of the sources that were used to answer ***RQ5*** was the 2016 General Accountability Office report. The findings of the GAO report argue that if NLS was going to increase its patronage, NLS needed to do more outreach by changing its eligibility criteria. However, over the past year this issue has changed due to the GAO Report and the Senate's approval of the Marrakesh Treaty. The two laws that were passed by Congress gave NLS the authority to implement the terms of the treaty, the passage of Marrakesh Treaty Implementation Act and the Library of Congress Technical Corrections Act of 2019.These changes affected NLS's eligibility criteria to allow people with reading disabilities to use NLS's services (Keninger, 2020).

NLS then undertook two steps to ease access for people with reading disabilities to apply and then use NLS services: First, NLS conducted the pilot program to test BARD to see if it can handle the increase in use by these new patrons. The participants were allowed to use BARD. The testing occurred in Pennsylvania and Texas by letting students with reading disabilities sign up and use BARD and, if needed, the student could use a DTBM but had to obtain a limited hardship waiver. "Under current regulations, people with dyslexia and other reading disabilities may enroll in the NLS program, but only if a medical doctor certifies that their disability is the result of "'organic dysfunction'" (Fernekes & Layman, 2019a). However, due to the pandemic, the pilot was stopped early but the results showed that BARD could handle increased usage by the pilot participants (Keninger, 2020).

Second, NLS is updating its regulations to reflect these statutory changes,

> As part of the Library of Congress Technical Corrections Act of 2019, our statutory authorization was modified to conform to the terms of eligibility specified in the Marrakesh Treaty and the Marrakesh Treaty Implementation Act. In furtherance of that effort, NLS will be updating its regulation to implement that statutory change. As you know, for years this regulation (found here: www.loc.gov/nls/about/organization/laws-regulations/36-cfr-701-10-title-36-code-federal-regulations/) has relied on the term "organic dysfunction" and the requirement that such reading disabled individuals obtain a medical doctor's certification. When the new regulation is implemented, that term and that requirement will no longer be operative. The new certification requirements in (b)(i) and (b)(ii) of the [attached] proposed language will, we believe, better serve blind and print disabled individuals (Keninger, 2020).

As of February 2021, the new certification requirements have gone into effect. The requirement that reading disabled individuals obtain a medical doctor's certification is no longer necessary and they can apply to services using an expanded list of professions that will certify the application (National Library of the Blind and Print Disabled, 2021).

This is the **third** surprise discovered in this study. NLS quickly implemented the terms of the Marrakesh Treaty and is making an overall change to both patron eligibility, by easing the requirements for patrons to be eligible and apply to use the service ,and certification, by eliminating the requirement for reading disabled individuals to obtain a medical doctor's approval. This is one major change that stakeholders wanted to make to the program when the treaty was first signed and introduced to the Senate in 2013.The treaty languished for five years due to publisher's objection that would loosened the copyright laws to allow the cross-border exchange of copyrighted materials without copyright restrictions. Disability and legal scholars supported the treaty or at most they wanted U.S. Copyright laws changed to allow the cross border exchange of books in alternative formats (Fitzpatrick, 2014; Sganga, 2015). T

My research shows that stakeholders pushed for the Marrakesh Treaty to be ratified in the Senate and then stakeholders, including the publishing community, made changes to the U.S, Copyright law through the Marrakesh Treaty Implementation Act, which tailored the copyright laws enough to overcome the publishing community objections to the cross-border exchanges of books and other materials. The laws broaden the criteria of people who can use materials in accessible format to all people who due to their disability cannot read. However, if the print disabled want to use materials in accessible formats, they will need to obtain the materials from organizations like NLS, Bookshare and Learning Ally. Because these organizations are under the

two laws and the treaty, the agencies, organizations, and groups that serve the print disabled are authorized to provide the print disabled materials in accessible formats (*See*, **Chapter 1**)

Stakeholders have accomplished a change that has took NLS over 40 years to make.

The answers to RQ6 argue that stakeholders believe that NLS and its network libraries were or were <u>not</u> fulfilling its mission statement and the Right to Read by utilizing current technologies and services.

RQ6 argues that stakeholders believe that NLS and its network libraries were fulfilling its mission statement and the Right to Read by utilizing the Digital Talking Book Player. The sources used to answer this question made the point that as the DBM became widely used by patrons and maintained by Network Libraries staff and volunteers, the machines would be more reliable for patrons, easier to repair by Network Libraries staff, and Network Libraries would have to use fewer volunteers to repair the machines (J. Taylor, 2004, p. 51).

RQ6 argues that stakeholders believe that NLS and its network libraries were ***not*** fulfilling its mission statement and the Right to Read by utilizing the Digital Talking Book Player Stakeholders argue that it took too long to be developed, planned, manufactured, and then deployed to patrons, especially when there were commercial technologies in the marketplace that other countries were using to serve their patrons. For example, Rujan & Andrysiak (2008) in their consulting report written for the Library of Michigan's Library for the Blind and Physically Handicapped argued that patrons could have been served using MP3 players and argued that DBM may be out of date before their distribution to patrons (Rujan & Andrysiak, 2008, p. 23).

The answers to RQ6 argue that stakeholders believe that NLS and its network libraries fulfill its mission statement and the Right to Read by utilizing the Digital Talking Book Program.

With the introduction of the BARD downloading systems, patrons can now download braille files and audiobooks that were customized based on a patron's requests or interests. Patrons can use BARD Express software to utilize their PC to download audiobooks onto a flash drive and play the audiobooks using the USB port. Patrons are now using the BARD apps to download braille files and audiobooks over the Internet or Wi-Fi onto their Amazon, Android, and iOS devices.

The responses to RQ6 argue that stakeholders believe that NLS is <u>not</u> fulfilling its mission statement and the Right to Read.

Stakeholders contend that NLS is running a very highly praised program by the blind community and this community still uses the program even though there are for a fee non-profit providers of audiobooks (*Book Share* or *Learning Ally*) or for-profit alternatives (*Audible* or *Overdrive*).

In another response to ***RQ6***, stakeholders argued that NLS is ***not*** fulfilling its mission statement and the Right to Read based on the 2016 GAO report. This report had a significant impact on the service. One of the important recommendations was that NLS needed to increase its public outreach. For example, during 2019 the service ran, a PSA campaign on Radio and TV increased the number of patrons applying for the program (Layman, 2018, p. 8). A second recommendation that the GAO report suggested was the need for NLS to obtain more data about their patrons. The report advocated for NLS to conduct more patron surveys. Based on these recommendations, NLS hired Gallop Inc., the polling firm, to conduct a patron survey of over 500 respondents in February 2019. The survey asked demographic questions such as the following: What types of technology are used? Does the patron use BARD?

"We learned a lot of really good stuff," said David Spett, NLS's data analyst. "For instance, our patrons are pretty evenly split between those who are very tech-savvy, not tech-savvy, and somewhere in between. A majority of our patrons have technology that would enable them to use BARD, a computer, or a smartphone or tablet with Internet access. But most of those people are not using BARD. We had previously believed that lack of technology or Internet access was the problem, but that seems to not necessarily be the case. A lot of people said they don't use BARD because they prefer mail delivery or aren't comfortable with newer technology" (Layman, 2020).

> Now NLS is planning two more surveys with Gallup to follow up on what we learned last year. The first survey will seek to determine patrons' satisfaction with various facets of NLS service, their technological preferences and capacities, and their willingness to use or barriers that keep them from using: BARD and the BARD Mobile app. The goal is to survey at least 2,250 patrons. At least 500 of those patrons will be active BARD users. In the second survey, Gallup will interview 200 former patrons or current patrons who have stopped using BARD, to gain insights into why they weren't satisfied with NLS or with BARD.

"Findings from these surveys will improve our understanding of the best way to modernize and improve our operations by providing detailed information on patron satisfaction, preferences, and capacities for a variety of topics, particularly newer technologies," Spett said.

"And by also surveying former patrons and former BARD users, we hope to learn how we can reduce attrition from the program."(Layman, 2020).

The answers to RQ6 argued that stakeholders believe that NLS is fulfilling its mission statement and the Right to Read by using local NLS/LBPD services.

Lazar and Briggs (2015) argue that public libraries should use this opportunity to serve people with print disabilities. Librarians can use their Local Library for the Blind and the Print Disabled as resources to assist public libraries for advice and training in how to serve people with print disabilities. Oftentimes, these patron's first visit requires public library assistance. Many patrons feel uncomfortable using their local Library for the Blind and Print Disabled.

Lewis (2013) advocates for the need for LBPDs to offer education, outreach efforts, and training to the community that they serve. "It is particularly effective if the training is taught by individuals with disabilities, either users or fellow staff members," this method of training can point problems to staff that people with disabilities face with using technology (2013, p. 237). The object of this education, outreach, and training is to help the staff become comfortable working with a diverse population. "Staff members should know the resources in their communities and keep in touch with experts in the field by following their websites and through social networking sites. They should attend events at associations and organizations in the community, such as an open house or a health fair" (Lewis, 2013, p. 237). "If a library has adaptive equipment, it should be in working order and staffs need to know how to use it. LBPH is a resource for training staff in this area" (2013, p. 237).

Bonnici et al. (2009) argued in their survey of NLS Librarians based on open-ended questions that there were four major strengths extracted from the qualitative responses: **accessibility of materials (collection)**, **quality of service, demand for service,** and **staff**. The majority of the comments referred to the quality of the service provided (pp. 518–519). Responses referred to the ease of use of the mail delivery system for homebound patrons and how free and tailored the service was for its patrons. Numerous replies focused on the accessibility of quality reading materials, including both classics as well as new books that were just printed. Service was similar to the access provided to registered patrons of public libraries. The remaining responses point out the growing need for the service as the United States population ages and the commitment of the staff and volunteers who provide the service of the

NLS/LBPD. NLS Librarians serving special needs populations place a high value on the accessibility of the service they provide (2009, p. 519).

Bonnici, Maatta, Brodsky, & Steele, in their update to their 2009 paper, surveyed NLS Librarians in 2015. In the 2015 survey, the authors' asked NLS Librarians their views on NLS/BPH services: Four categories were extracted from their response regarding strengths: **accessibility of materials (collection), quality of service, demand for service,** and **staff.** The majority of the comments referred to the quality of the service reflecting the same opinion as to the 2008 study participants (2015, p. 509). Responses included references to digitization increasing the availability of materials in a shorter delivery period. Also, there were comments regarding the "free" service? Responses reveal there has been a major loss of confidence in the United States Postal Service (USPS) in delivering materials promptly. Opinions reported the accessibility of the service and staff expertise have not differed since 2008. Although respondents in 2008 predicted a growing need for the service as the US population aged, the 2015 data on patrons did not reflect positively on their prediction (2015, p. 509). The data does show an increase in demand for the service with the data reporting on perceived strengths of the service. Rather, the data is showing that decreases in demand for the service are being reflected due to the lack of both awareness and advocacy regarding NLS/BPH.

The answers to RQ6 argued that stakeholders believe that NLS is <u>not</u> fulfilling its mission statement and the Right to Read by using local NLS/LBPD services?

Bonnici et al. (2009) argued in their survey of NLS Librarians based on open-ended questions that there were four major weaknesses from the responses: **service, technology, funding**, and **staff.** "Most of the responses contained information about the quality of the service related to timeliness of materials and the limited selection available compared to non-BPH materials provided to the general population through public libraries" (2009, p. 519). Respondents expressed concerns in regards to equipment that lagged behind the information and communications technology market. Several responses specifically mentioned the continued use of the analog format to distribute Talking Books, "Despite the rollout of the digital service, there is concern that the service will not be comprehensive enough to meet the demand". Several respondents expressed concern that the new digital players still appear cumbersome when compared to iPods. Thus, the look of the digital player is not appealing to young patrons of the NLS/BPH service (2009, p. 519). NLS Librarians, in their survey comments, argued, "Related to

the lack of current technologies is the lack of funding for the service. Not only is this an impediment to updating the technology and services of the NLS/BPH, but it also restricts the flow of funds to employ staff to meet the level of current demand for services to special populations." "Related to the question of perceived weakness is question 11, seeking input on the primary concern as it relates to services to the BPH population. Primary concerns reflect the four categories expressed for identified weaknesses. Specific concerns within the four categories included funding based on impending budget cuts to libraries at all governmental levels. Funding cuts will impact the delivery of service, outreach efforts, staffing, and updating of technologies for the provision of information in an accessible format for registered patrons" (Bonnici et al., 2009, p. 519).

The concerns raised in 2015 about the lack of confidence in the mail system is very prevalent today as in 2015, because of the pressure by USPS management to cut cost by reducing overtime and taking out of the high capacity mail sorting machines. Also, the mail system is handling increased mail due to the 2020 primaries ballots and the 2020 general election ballots being mailed to reduce voters exposure to the COVID-19 virus. In addition, problems caused by absentee employees who are sickened by the COVID-19 virus has caused staff shortages because there are not enough postal employees to cover for the sick employees (Jameel, McCarthy, Gillum, & Glickhouse, 2020), From a personal observation this has caused frustration among patrons and LBPD Librarians and their staff. At the Hawaii Library for Blind and Printed Disabled, we see the postal employees pick up and deliver the mail daily, however, many of our patrons and some of our patrons' caregivers do not understand that once the mail leaves our building it is USPS responsibility to deliver, "Free Matter for the Blind" mail to our patrons. With problems in mail deliveries and the closed LBPDs across the country due to the pandemic, this has given NLS the evidence it needs to continue to emphasize to Network Libraries the need for more patrons to use BARD as their primary means to receive their audiobooks and magazines (Keninger, 2020).

The fourth goal of this study was to apply the case study method to research how the technology was being developed and the social perspectives that surround the development process. Yin (2004) advocated this approach. The case study approach is the most suitable and comprehensive research method that can be employed to investigate this process.

The fifth goal of this study is to examine the 51 documents using NiVo 10 qualitative software to answer the six Research Questions. This document examination was possible due to the use of computer-assisted qualitative software programs. These programs are very powerful and allowed me to store and search the 51 documents based on queries using search terms from my codebook and the queries using the six ***RQs***. **Chapters 4** contains the summary and analysis of the six **RQs.** The discussion of answers from Research Questions and their key findings from the **RQs** can be found in **Chapter 5**.

The sixth goal of this dissertation is to employ social informatics as the theoretical foundation to assert the existence of a relationship between the development, design, and implementation processes related to information and communication technologies and the larger social context in which ICTs exists (Sawyer & Eschenfelder, 2002). Smutny (2020) contends that social informatics can provide a researcher with a theoretical base that can be useful in the study of sociotechnical systems. The author maintains that, "[c]onceptual anchoring, the thematic definition of research, and the creation of methodological aids for research in periods of expansion and coherence have enabled an unprecedented diversity of approaches to social informatics in the research of sociotechnical systems in various areas of the human activities… As examples of this; scholars have called for greater diversity in librarianship and information science (Brumfield, 2010; Rose, 2018a; Smutny, p.174 2020). The possibilities of useful approaches to social informatics in many areas only underlie the understanding of social informatics as not purely a discipline, but also as an ICT perspective applying practical research within the understanding of computer science in the United States. The use of social informatics approaches in various areas of social science was a typical phenomenon in the period of transformation after 2006 (Smutny, 2020).

This dissertation used social informatics to explore how a socio-technical system was developed, designed, and implemented by examining how stakeholders became involved with the process and influenced the outcome resulting in the success or failure of the technology. This success or failure is observed in the larger social context in which the technology or ICTs exists.

The final goal of this study is to fill the gaps in the research regarding NLS, because earlier studies, before the most recent studies by Bonnici et al. (2009) and Bonnici et al. (2015), have become outdated. There is a necessity for greater current research regarding NLS due to its considerable patron population and due to the infusion of new technologies into the organization.

Technological enhancements include the improvements to BARD and Bard Mobile, the new Braille eReader, the new Digital Book Reader based on Smartphone technology, smart speakers, voice interface using Google Assistant or Amazon Alexa, streaming of book chapters from BARD, and text to speech (Reading Technology Advisory Group (RTAG) Policy, Procedures, Member Roles and Responsibilities, 2020–2022 pg.3-4)). The addition of these new technologies will create change in how NLS, the Network Libraries, and NLS Librarians serve their patrons. Accordingly, these changes and impacts need to be studied.

With the broaden of NLS's eligibility requirement for people with disabilities to use the service and the changes to regulation that defines who is a "competent authority,"both changes were due to the US ratification of the Marrakesh Treaty. The passage of the Marrakesh Treaty Implementation Act will see an increasing number of new patrons using NLS technologies to access Braille, Digital Audio Books and Magazines (Operations Alert 20-39: Proposed New Regulations to Modify Certifying Authorities, June 16, 2020). The regulations have now come in effect as of February 2021, researchers will need to study how the inclusion of these patrons will affect both the Network Libraries and NLS as a whole. (National; Library for the Printed Disabled, 2021).

Finally, NLS acquiring foreign language materials in alternative format from countries who have signed the treaty, was one of the key factors that held up the treaty's ratification. To resolve this issue, the Marrakesh Treaty Implementation Act and the Library of Congress Technical Corrections Act of 2019 had a provision that strictly limited the use of materials that will be delivered through the cross border exchange of alternative formats by allowing only authorized entities located in a country to deliver to an eligible person located in their countries in an accessible format (The Library of Congress, 2010, p. 45314). The law authorizes NLS to be one of the authorized entities in the United States that will be allowed to exchange materials with organizations outside the U.S. that are permissible under the treaty terms to conduct these exchanges. NLS entered into a partnership with Accessible Book Consortium (ABC). The consortium has an online repository of hundreds of thousands of titles from around the world. NLS is conducting a pilot project with eight network libraries to download books using a new interface through ABC's Global Book Service. The pilot started in September 2020 and, after the test, NLS will assess the value and usefulness of the portal (National Library Service for the Blind and Print Disabled, 2020a). With projects like this occurring, there needs to be additional

research that examines these projects from a professional or peer-reviewed point of view by scholars who know the field and can provide a rigorous review of these new policies, programs, projects, and technologies to observe if NLS is meeting its patrons' needs.

6.3 Recommendations for Future Research

This study is expected to produce several outcomes. One of the outcomes of this case study is to provide the required research regarding how NLS and its technologies fulfill its patrons' needs since NLS has a large patron population and few researchers have studied this population. A second outcome is to provide research in an area where the literature is scarce. Third, the findings of this study may encourage other researchers to conduct further research in this area. For example, a future research project that I am planning to undertake is the review of all the patrons' studies that NLS has conducted since 2003. This will include the Gallop Inc. survey in 2019 and the Gallop patron surveys that are currently being conducted in 2020. By comparing these surveys, I can reveal how patrons' attitudes toward technology, NLS, and their local LBPD have changed over the past 17 years. Also, I want to explore if the patrons' demographics have shifted over the years. I am also planning in the future to update my research paper to ask NLS Librarians their opinions about the new technologies that NLS will be deploying over the next two to five years. My inquiry will determinewhat librarians think about the changes to the patron eligibility criteria, the dropping in 2021 of the medical certification for people with reading disabilities, and how they feel about the increase in the number of patrons as a result of these changes. Finally, this future work will fill a gap in the literature, besides the studies of Bonnici et al. (2009), Bonnici et al. (2015), and Rose (2018a). The earlier research published in this area before 2009 has become dated and further research is required to study both the NLS and people with disabilities.

6.4 Limitations

This study's validity is maintained by the quality of the research's qualitative data. Soy (1997) presented the following statement:

> Internal validity (especially important with explanatory or causal studies) demonstrates that certain conditions lead to other conditions and require the use of multiple pieces of evidence from multiple sources to uncover convergent lines of inquiry. The researcher strives to establish a chain of evidence forward and backward (p. 1)

The study's use of numerous sources from different agencies and organizations addresses the concern regarding interval validity because these sources examine NLS and its relationship

with its stakeholders from different viewpoints. Using these sources enabled a rigorous examination of NLS through the three perspectives. Since this was a qualitative case study, which studies a single case, this study analyzed the case using three perspectives, to demonstrate how all three perspectives interact with each other. this interaction reinforces each perspective's conceptual strengths and supports the study's external validity. The three perspectives can be employed to research other libraries or organizations dealing with people, technology, organizations, and policies (i.e., governmental, administrative, legal, legislative, and regulatory). However, due to the type of agency NLS is, the study's findings may apply only to NLS. This is a selective descriptive case study that aims to explore and explain how NLS developed its technology and further employs the three perspectives to analyze by what method the Digital Talking Book Program/Player was developed and the reasons for its development.

The internal validity was maintained through the study by Dr. Wayne Buente reviewing the coding to make sure that coding was accurately answering the Research Questions. When needed additional coding was conducted and the answers revealed from the final research coding were reviewed by Dr. Buente to determine if the sources used were truly answering the Research Questions.

APPENDIX A

BIBLIOGRAPHY OF SOURCES CITED AND USED FOR RESEARCH QUESTIONS ANSWERS 1 THROUGH 6

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APPENDIX B

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APPENDIX C

ANSWERS TO RESEARCH QUESTIONS 1 THROUGH 6 FROM THE 51 DOCUMENTS

(A) Answers to Research Questions that have to examine the Patron's Perspectives

1) What are the differences between the patrons' perceptions of and use of assistive/adaptive technologies and NLS librarians' perceptions of their patrons' use of assistive/adaptive technologies?

Tablet PCs–An Assistive Technology for Students with Reading Difficulties? (2012)

V. CONCLUSION

A very important point in favor of mobile assistive technologies is that it minimizes stigmatization for the ones using it. For example, for Mary, she could sit in the classroom with her headset on and listen to both to the text and the lecturer, without anyone thinking that this is strange or even noticing it. Thus the stigmatization problem is minimized at the same time allowing the user to attain more self-confidence in the academic arena. (Gasparini & Culén, 2012, p. 33).

Information Power to All Patrons (2012)

That's Not All, Folks

1. **Motivation.** Persons with disabilities are often not part of the workforce and are less likely to have had to use computers. Additionally, the cost of computer technology for those in a low-income bracket is prohibitive (Mates, 2012, p. 12).

U.S. House of Representatives in House Report 112-148 on the Legislative Branch Appropriations Bill, 2012 [H.R. 2551]. NLS: That All May Read, Report of the National Library Service for the Blind and Physically Handicapped. (2012)

1. Blind and Visually Impaired

People who lose their vision later in life account for the vast majority of NLS patrons. They are faced with the reality that the technology and skillsets required to use today's personal computer with limited or no vision, or with severe physical disabilities, are significantly different from those they used before the onset of disability. They are often faced with a reduction in income because of retirement job loss as a result of a disability. Yet, the technologies they need, such as screen readers or screen enlargement software, refreshable braille devices, and similar

adaptive equipment for the physically disabled add hundreds or thousands of dollars to the cost of computer systems (National Library Service for the Blind and Physically Handicapped, 2012, p. 6,7).

Is the Digital Talking Book Program meeting librarian and patron expectations? (2018)

Patrons' satisfaction with assistive and adaptive technologies

The survey asked NLS librarians if their patrons were satisfied with the assistive and adaptive technologies that were offered. The results showed that librarians believed that their patrons were Satisfied (40.00%), Somewhat Satisfied (37.14%), Very Satisfied (8.57%), Neutral (8.57%), and Somewhat Dissatisfied (5.71%) with these technologies (Figure 3) (Rose, 2018a, p. 473)

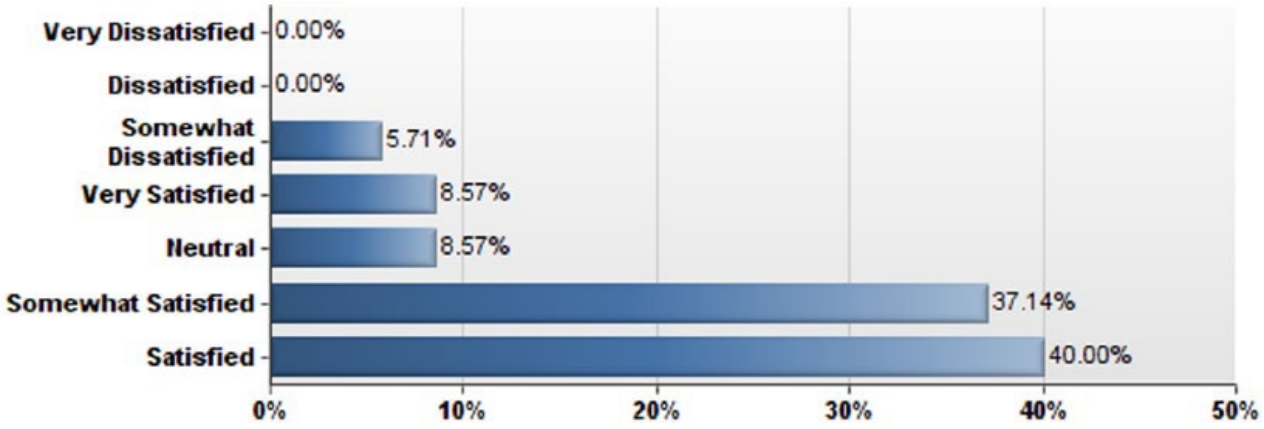

Figure 3.

Based on your and your staff's experiences and observations, are patrons satisfied with the assistive and adaptive technologies currently available? (Rose, 2018a pp. 473, 474)

(1a) What are NLS Librarians' views on their use of these technologies by patrons?

Information Power to All Patrons (2012)

That's Not All, Folks

2. Starting out and getting online. Often, a lack of awareness by persons with disabilities that they can use computers is a limit (Mates, 2012, p. 12). This factor is not helped by the fact that mainstream vendors of computer equipment know little about accessibility technology and often give the wrong advice. Once the person does acquire knowledge that

accessible technology is available, the cost of it, coupled with training in the use of the products, makes the learning curve very steep.

3. Making the Internet work for the user. A disconcerting fact is that many websites and applications are becoming less accessible rather than more. It is disappointing for a user with a disability to learn how to use a computer and then reach sites that are inaccessible because of poor design (Mates, 2012, p. 12).

4. Fully realizing the benefits and the dangers of the Internet. Some people who do become savvy Internet users may unintentionally restrict their access by setting up their screen readers to take short cuts, missing valuable information.

Libraries can inform the public, provide the technology, and train and educate the patron. As with most educational and intellectual pursuits, libraries can make a difference in the lives of people with disabilities and help them realize their fullest potential. (Mates, 2012, p. 12).

Library Services for those with Disabilities: Additional Steps Needed to Ease Access to Services and Modernize Technology. Report to Congressional Committees. (2016)

NLS Offers Materials in a Range of Formats, but Statutory and Other Limitations Impede Adoption of Potentially Cost-Saving Technologies

NLS Provides a Range of Reading Formats, but Most Users Choose to Receive Audio Materials Through the Mail

Furthermore, some patrons lack Internet access or do not feel comfortable downloading files from the Internet according to NLS's 2013 user survey, about 40 percent of those not using BARD cited lack of Internet access as a reason (Bertoni, 2016, p. 20). Staff at all 8 network libraries told us that many of their NLS patrons lack access either to the Internet or a computer. For example, staff in one library told us many of their NLS patrons have low incomes or are older with fixed incomes, and many, especially in more rural areas, lack the high-speed Internet connection needed for BARD (2016, p. 20). According to NLS's 2013 user survey, about 50 percent of sampled patrons who do not use BARD said they lacked the computer skills to do so. Similarly, staff in all 8 network libraries we contacted said the process of downloading files from BARD onto a computer and then transferring them to a cartridge that can be played on an audio device, is challenging for some patrons. For example, staff in one library said patrons have difficulty figuring out which folder to save downloaded files into on their computers.

Recognizing this, NLS officials told us they expect in summer 2016 to introduce a new software application known as Media Manager intended to simplify the process of downloading from BARD onto a computer by handling a number of the steps automatically (Bertoni, 2016, p. 20; National Library Service for the Blind and Physically Handicapped, 2013).

Is the Digital Talking Book Program meeting librarian and patron expectations? (2016)

Is the cost of assistive and adaptive technologies encouraging or hindering their use by patrons?

NLS librarians believed that cost was deterring their patrons' use of assistive and adaptive technologies (Rose, 2018a, p. 472). When asked, "Do you feel the cost of these devices is hindering their use by patrons?" 96% of the respondents said **"Yes"** and 4% said **"No"**. What could explain this answer? Dobransky et al. (2006) argue that the cost of adaptive technology is a barrier to the increased use of computers and the Internet by people with disabilities. Adaptive technology can be expensive, and many disabled people who have a low income may not be able to purchase the technology (Dobransky & Hargittai, 2006, p. 317). Librarians stated the reasons why they felt strongly that the cost of adaptive and assistive technologies is hindering their use by people with disabilities and why the cost of these devices is impeding the growth in the downloading of books from BARD. NLS librarians reported that the overall patron usage of BARD ranges from 12% to 24%. Librarians discussed in their responses the factors that are hindering their patrons' ability to use BARD: patrons' socio-economic status, physical, or cognition issues that impede their use of a computer (2016, p. 474).

(2) Is NLS fulfilling its mission statement, "That All May Read" and the Right to Read by using the Digital Talking Book Program and Digital Talking Book Player to serve NLS's patrons?

NLS Patron Survey: Final Report (2003)

5.0 DISCUSSION

This diversity, though all to the good, undoubtedly will make some design decisions harder to make than they would otherwise be (Nelson, 2003, p. 50). Emergent competition from other sources of playback devices and audiobooks complicates matters even further. Even in this competitive environment, however, subscribers continue to need and use the accessibility features their current NLS machine offers. Most subscribers, for example, use the large print or braille labels on cassettes and find raised symbols on keys very useful. The current machine also

is accessible in that most subscribers find it easy to use in general and its controls easy to operate. Its accessibility features and ease of use probably help to explain why subscribers who have machines from NLS and other sources rely primarily on their Talking Book machine. Presumably, subscribers will value ease of use in the digital equipment just as much as they value it now, in their current machine (Nelson, 2003, p. 50).

As important as accessibility and ease of use are, portability and quality of the listening experience matter as well. There is substantial demand for smaller and lighter players and better sound quality at normal speed. In these respects, subscribers value the same qualities that would be important to any owner of a commercial playback device (Nelson, 2003, p. 50).

Even if NLS were to maximize the new device's accessibility, portability, and sound quality, however, some subscribers are likely to resist the digital machine, at least initially. Judging from the absence of a top-of-mind concern about the current machine, many subscribers do not perceive a need for the new technology. Another harbinger of resistance is generational differences in subscribers' exposure to and use of personal computers. For retirement-age subscribers, most of whom neither own nor use a computer, the digital device might be very intimidating. If we are right in thinking that the oldest subscribers' refusal to participate often indicates suspiciousness, resistance to the new equipment might be even more widespread than our findings suggest (Nelson, 2003, p. 50).

U.S. House of Representatives in House Report 112-148 on the Legislative Branch Appropriations Bill, 2012 [H.R. 2551]. NLS: That All May Read, Report of the National Library Service for the Blind and Physically Handicapped. (2012)

Executive Summary

NLS works to ensure that all eligible individuals can access NLS-created materials regardless of their age, physical disabilities, economic circumstances, or technical expertise. The range of eligible individuals is vast, from a veteran who was blinded in Afghanistan and would like to download content on his smartphone, to an 80-year-old with macular degeneration who cannot afford a personal computer, to an individual who has been blind since childhood and can read braille in physical form but would not be able to learn to download content even if the technological means were made available to her. Because the range of Americans who cannot read standard print is so diverse, a mix of delivery options is essential (National Library Service for the Blind and Physically Handicapped, 2012, p. 3).

Congress has supported programs that meet the needs of the diverse segments of the NLS user population and continue to evolve, in particular, Digital Talking Books on flash cartridges, played on NLS-provided machines, which currently serve 85 percent of NLS patrons. NLS anticipates a demographically-driven increase in eligibility, based on the experience of late-onset vision loss of a growing population of people who are 60 or older (2012, p. 3).

NLS understands that the demographic of potential patrons are changing along with the U.S. population. Today, 63 percent of NLS patrons are 60 years or older, 26 percent are of working age and 6 percent are under 20. * Eighty-five percent of the NLS patron base continues to use traditional physical formats and specialized talking-book machines. NLS anticipates an increase in eligible patrons because of population and demographic factors; however, the majority of these individuals will be dealing with late-onset vision loss and may not have the skills or training required to effectively use current or near-future technologies to download their materials. Technology is advancing rapidly, but a significant portion of the eligible user population still lacks the financial resources or is otherwise unable to access the necessary hardware and software (2012, p. 4).

1. Blind and Visually Impaired.

Significant vision loss later in life requires substantial adjustments in many aspects of daily life, including reading, mobility, and accessing technology. Each of these factors significantly affects the use of NLS services. (2012, p. 5).

When reading can no longer be accomplished visually, accessible formats, including braille and audio, become critical. Most patrons who lose their vision later in life do not become proficient braille patrons but rely on audio formats, primarily human-narrated audio.

Thirty-two percent of patrons currently using NLS services are under the age of 60.6. Many of these individuals experienced vision loss early in life and have had more opportunities to learn the alternative skills of blindness. They are more likely to be able to read braille proficiently and to use computers and smartphones with assistive technology. However, according to data compiled by the National Health Interview Survey on Disability, 68 percent of legally blind Americans in this population group are unemployed. Thus economic factors impact the ability to own the technology and to pay ongoing costs for Internet access (2012, p. 6).

Technology is also changing: Internet appliances that provide access through speech-controlled interfaces such as Siri on the iPhone, touch screens with audio feedback, and other

built-in features will provide easier access for blind and severely visually impaired patrons as they become more commonplace and less expensive.

2. Physically Disabled.

Five-point eight percent of NLS patrons have disabilities that prevent them from holding or handling a book. These disabilities range from paper allergies to quadriplegia. NLS believes that this population is severely underrepresented among NLS patrons and plans to explore this issue in an upcoming survey. Due to the range of disabilities in this patron segment, generalizations about their abilities to use computers and Internet appliances are difficult to make (2012, p. 6).

Summary

Current NLS patrons range in age from 3 to 110 years (2012, p. 10). They come from all socioeconomic groups and live in every state and county in the United States and its territories. Some are very savvy technology patrons, while others never use technology at all. Some read braille, most do not. Six percent are under 20 years of age; 26 percent are working age, and 63 percent are age 60 or older. The largest age group is 80–89 at 22.4 percent. Most of the 63 percent who are over 60 have experienced vision loss later in life. Many experience additional disabilities as they age. Thirty percent of those who are working age are employed. Population trends predict an increase in eligible patrons over 60, congruent with the retirement of baby boomers. Active NLS patrons represent only a fraction of the eligible population. NLS programs and services must therefore meet the needs of children, working-age adults, and retired persons for information and leisure reading. At the same time, NLS needs to learn more about eligible non-patrons and determine how it may address their needs (2012, p. 10).

National Library Service for the Blind and Physically Handicapped (NLS) Talking Book and Braille Program Evaluation and Recommendations for Increased Patronage: FINAL REPORT (2013)

Section 6: Satisfaction with the Talking Book and Braille Program Patrons

Sample patrons provided an average satisfaction rating of 4.9 when asked about the digital player; non-sample patrons provided a satisfaction rating of 4.7. Respondents who were not satisfied with the digital player were asked why they were not satisfied with it and provided a

list of potential reasons. (National Library Service for the Blind and Physically Handicapped, 2013, p. 44,45).

There were too few sample patrons who were dissatisfied with the digital player to report reasons for dissatisfaction among sample patrons. Among non-sample patrons, the primary reasons for dissatisfaction are shown in Exhibit III-34 **(Figure 4).** The most commonly reported concern with the digital player among non-patrons was that the player is too large or heavy (63 percent). Non-patrons also reported that other technology is easier to use (36 percent), they cannot easily navigate to specific parts of the book or magazine (10 percent), and the equipment is not reliable (6 percent) (2013, p. 44,45).

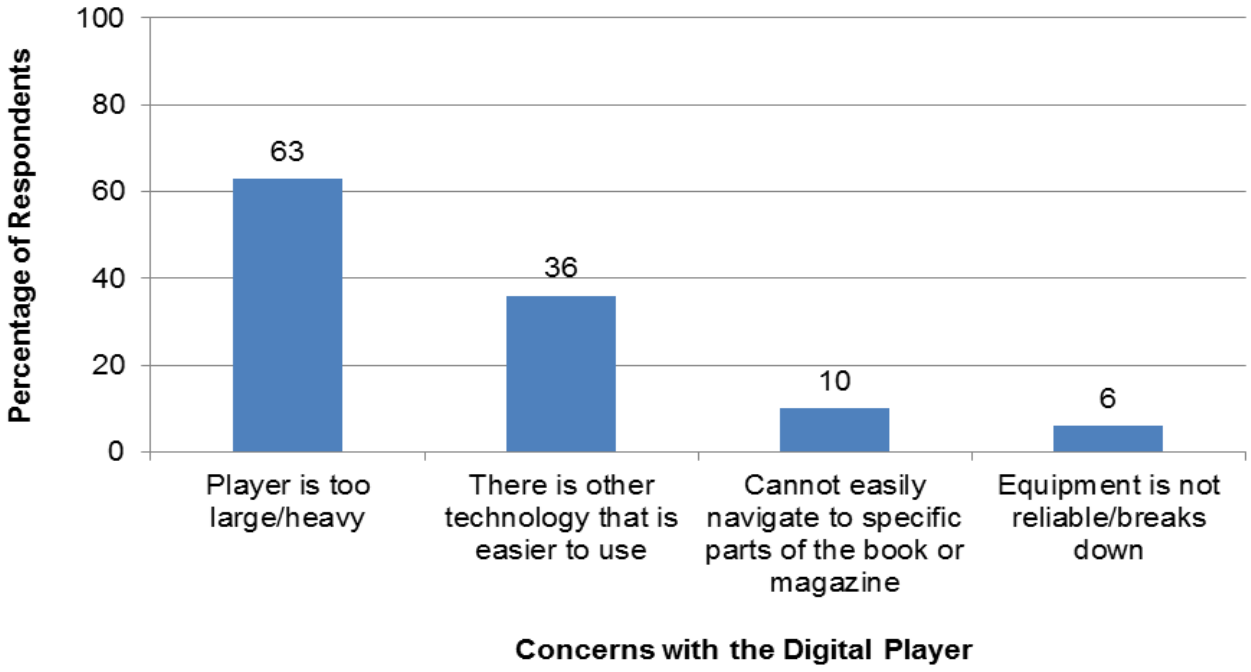

Figure 4.

*Exhibit III-34: Concerns with the Digital Player among Non-Sample Patrons**

**Concerns reported by less than 5 respondents are not reported (2013, p. 44)*

The majority of the survey respondents reported using a tablet to access the Internet, and several reported using smartphones. Several patrons reported using online outlets for obtaining their reading materials, and forty-seven percent of non-patrons reported using electronic texts to

access reading materials (National Library Service for the Blind and Physically Handicapped, 2013, p. 59,60). Of the 32 percent of former patrons who reported they stopped using the Talking Book and Braille Program because they prefer to use another technology or service, 25 percent reported using Audible.com, 25 percent reported using Bookshare, 21 percent reported using an iPad or iPod, 15 reported using an iPhone, and 12 percent reported using iBooks.

Survey of Librarians Serving the Disabled: Is the Digital Talking Book Program Meeting Librarians and Patrons Expectation (2014)

7. What changes would like to add to the Digital Talking Book Program?

(1) A better selection of digital books. Currently, we are receiving fewer and fewer books by authors our patrons want to listen too (Rose, 2014).
(2) A clear message about the program and greater visibility of the services.
(3) Faster production of new books so patrons don't have to wait long after sighted people can get the book.
(4) The fact that patrons have to return digital magazines and what happens if they don't do it is a problem. Patrons are used to keeping magazines and forcing them to return the cartridges or denying service is bad service. Talking Book Topics should be sent out on a cartridge by itself on and should not have to be returned, which is another service problem for our patrons (Rose, 2014).
(5) The magazine on the cartridge program is confusing. Different checkout limits are depending on the frequency of the issues. Patrons, new and old, still don't understand that they have to return magazine cartridges. NLS should have designed the book and magazine cartridges to match their shipping containers. It would have been easy to explain the blue cartridges go in the blue container and red cartridges go into the red container. NLS should have a consistent supply of cartridge and container labels for those libraries doing local duplication.
(6) Make it easier for students with learning disabilities to enroll in the program (Rose, 2014)

Futures Committee Meeting April 15–16, 2015 (2015)

In five to ten years, how will the needs of consumers using this program change?

Patrons will be older, more mobile, more tech-savvy, and represent a full spectrum of abilities and interests. They will continue to require training on using the NLS service from staff with "people skills" (Keninger, 2015, p. 2). They will expect free, immediate service that provides books and magazines at the same time their sighted peers have access… full-text, full-audio renditions of materials; more connectivity with related services (e.g., Bookshare and Learning Ally) through an NLS or network library portal; independent living services and technology training; and programming through network libraries. They will have ubiquitous

wireless connectivity and an explosion of mainstream reading options, although these options will continue to have significant accessibility issues. Text-to-speech will be common, voice recognition will be perfected, and devices will become less expensive (Keninger, 2015, p. 2).

In five to ten years, how will the needs of consumers using this program change?

They will want smaller, simpler, more sophisticated machines. (Keninger, 2015, p. 2)

In five to ten years, what services do you expect from NLS?

New technologies will facilitate direct download to talking-book machines, streaming, podcast services, and duplication on demand. Talking-book machines will become easier to use, have better battery life, and include wireless connectivity (Keninger, 2015, p. 2).

Duplication on Demand

The dilemma faced is twofold: NLS does not have the funding and network libraries do not have the space to put all those titles on cartridges and put those cartridges on network library shelves. And yet Futures participants strongly advocate that every patron should have access to every book in the NLS system, regardless of the patron's physical, technological, or financial circumstances. The short-term resolution seems to be duplication on demand, with wireless delivery directly to the patron's talking-book player being the long-term solution, which may be in the distant future (Keninger, 2015, p. 2).

Related Issues for Consideration

Discussion of a new talking-book machine included many suggestions for features, including text-to-speech, haptic (tactile) feedback, a braille eReader add-on, a simple but enhanced user interface allowing multiple profiles settings, a podcast aggregator, an in-box, and a smaller size (Keninger, 2015, p. 2).

Library Services for those with Disabilities: Additional Steps Needed to Ease Access to Services and Modernize Technology. Report to Congressional Committees. (2016)

NLS Offers Materials in a Range of Formats, but Statutory and Other Limitations Impede Adoption of Potentially Cost-Saving Technologies

NLS Provides a Range of Reading Formats, but Most Users Choose to Receive Audio Materials Through the Mail

Most users' preference for receiving materials through the mail and playing them on an NLS provided specialized audio device appears to be linked to their level of comfort with technology and their access to the Internet, according to interviews and survey data (Bertoni,

2016, pp. 18–19). NLS designed the digital cartridges and players that provide patrons with audiobooks and magazines to be easy to see and handle for those with visual and other disabilities.

The program's mainly older patrons feel comfortable with NLS's specialized audio player because it is user friendly, according to the staff at all 8 network libraries we contacted. For example, librarians in one state said many patrons like NLS's player because it is durable and easy to use, and many especially those who lost their vision later in life do not feel as comfortable using commercially available audio devices (2016, pp. 18–19). At the same time, younger NLS patrons a minority of the customer base may prefer to use other devices, such as smartphones, to access NLS audio materials, according to the staff we spoke with at 6 of the 8 network libraries. Staff in one library said younger patrons tend to be more sophisticated in their use of technology, and prefer to use smaller, mainstream devices rather than the NLS player (2016, pp. 18–19).

(2a) Is NLS fulfilling its mission statement and the Right to Read by using NLS's services and local NLS/LBPD libraries to serve NLS's patrons?

NLS Patron Survey: Final Report (2003)

Experiences with the Talking Book service and playback machine

Across age groups, NLS is the primary source of playback equipment, and the NLS machine is the one subscriber use most often. Similarly, their Talking Book library is the primary source of reading material. (Nelson, 2003, p. 2)

In two respects, older subscribers make up NLS's principal constituency. First, the majority of subscribers are 65 or older. Second, they especially subscribers who are 85 or older are the heaviest readers.

Handling the tapes and manipulating the machine's controls are less likely to pose a problem than understanding certain aspects of machine operation. Although the vast majority of subscribers operate the machine to play tape themselves, half received help in learning how to use the machine (2003, p. 2).

Canceling the service

Very few subscribers (8%, not shown) have ever considered canceling their Talking Book service. Those who consider canceling their service were spread across all four age groups. (Nelson, 2003, p. 30).

Subscribers' reasons for considering cancellation reflect their own needs and life circumstances more than dissatisfaction with the Talking Book program. The four most common reasons are that the subscriber hadn't been using the service, no longer needs the service, is too busy, and various other considerations having to do with the individual's specific circumstances. A few subscribers said they were not well enough to use the service. Altogether, respondent-based considerations make up almost two-thirds of the reasons subscribers provided for considering cancellation. The only other reasons that more than one or two people offered were that others "might need the service more than I" (n=7) and that the playback machine is difficult to use (n=6) (Nelson, 2003, p. 30).

Serving the Blind and Physically Handicapped in the United States of America. (2007)

Development of the DTB System

The development of the new digital talking-book (DTB) system has been constrained by the four core concepts that shape all planning at NLS (Cylke et al., 2007, p. 803). The core concepts are that the service must remain free for every eligible user: there must be a high degree of user involvement; access to NLS materials must be restricted to eligible patrons to protect copyrights; the focus must remain on the patrons' reading needs (2007, p. 803). Consideration of patrons' needs, for example, has prevented NLS from embracing technology such as CDs, which are considered to be too fragile to hold up under continued use. Development of an acceptable DTB system for NLS has also posed a series of technical challenges, including establishing a standard, designing a player, and creating a digital collection (2007, p. 803).

National Library Service for the Blind and Physically Handicapped (NLS) Talking Book and Braille Program Evaluation and Recommendations for Increased Patronage: FINAL REPORT (2013)

Section 6: Satisfaction with the Talking Book and Braille Program

Patrons

Key Finding: NLS as the Primary Method for Obtaining Reading Materials

Two-thirds of the sample patrons reported that the Talking Book and Braille Program is how they obtain nearly all of their reading materials. Also, 31 percent reported they do not currently use or intend in the future to use, alternate means of obtaining reading materials. This reliance solely on NLS for obtaining reading materials may differ from the experience likely to

be of interest to former patrons and non-patrons (National Library Service for the Blind and Physically Handicapped, 2013, p. 48).

Key Finding: Patrons Plan to Continue Using the Program

Patrons reported high satisfaction ratings with all aspects of the Talking Book and Braille Program, so it is not surprising that 98 percent plan to continue using the program (2013, p. 48).

The survey also asked patrons about their intent to continue using the Talking Book and Braille Program. Nearly all patrons (98 percent of the sample patrons and 99 percent of the non-sample patrons) intend to continue using the Talking Book and Braille Program. One percent of sample patrons and one percent of non-sample patrons are unsure about their plans to continue using the program, and less than one percent of each reported that they do not plan to continue using the program. Patrons who did not plan to continue using the program, or were unsure about continuing, were asked to provide one or more reasons for this. Sample patrons had varied reasons. Of the 1 percent of non-sample patrons who did not plan to continue or were unsure about their plans to continue, 29 percent indicated dissatisfaction with some aspect of the program, 29 percent reported they do not have time 29 percent reported there is another program that is easier to use, and 21 percent indicated a desire for NLS to develop an iPhone application (2013, p. 48).

Patrons were also provided a space to share any additional comments or suggestions regarding the Talking Book and Braille Program. These verbatim comments were analyzed to look for overarching themes. The most frequent theme was satisfaction with the program and/or gratitude for its existence. Other frequently reported themes suggested increasing the selection of materials available through the program, providing patrons with more information about what BARD is and how to use it, and creating more awareness about the program among those who do not use it (2013, p. 49).

Section 7: Interest in the Talking Book and Braille Program

Former Patrons

Key Finding: Former Patrons & BARD

Twenty-eight percent of former patrons stopped using the program before BARD was introduced. Letting these patrons know about BARD may help interest them in the program (2013, p. 50).

Key Finding: Other Technologies and Services

Thirty-two percent of former patrons stopped using the NLS program because they prefer another technology or service, and over half pay a monthly fee or fee per book downloaded to use the service. The most commonly mentioned services include Audible, Bookshare, and iBooks. The most common technologies were an iPad/iPod, an iPhone, and a Nook or Kindle (2013, p. 52).

General Recommendations

The following are general recommendations that apply to all respondent populations:

4. Increase awareness of the program among librarians as another way to inform potential users about the program.

Fifty-two percent of patrons reported they had used a public library before using the Talking Book and Braille Program. Librarians who know about the Talking Book and Braille Program could recommend the program to library patrons who may be eligible. Libraries could also post information about the program near the library's section for audiobooks so that those who are currently using public libraries for audiobooks could find out about the program without needing to speak to a librarian. (2013, p. 59).

Background

Public libraries in the United States are required to serve people with disabilities. Title II of the Americans with Disabilities Act of 1990 covers state and local government (which nearly all public libraries are a part of), and Title III of the Americans with Disabilities Act covers public accommodations, with libraries being specifically noted in the regulations (Lazar & Briggs, 2015, p. 173). Some state-level laws also detail more stringent requirements for serving people with disabilities. However, in the past, there has been a parallel system in which public libraries would serve people with most physical disabilities, and the Library of Congress National Library Service for the Blind and Physically Handicapped (LBPH) would serve people with print-related disabilities. So there is a long history of public libraries serving people with disabilities, but often the public library would serve people who needed physical access to the

library (e.g., individuals in wheelchairs), and the LBPH would serve people who needed resources in an alternative format (Lazar et al., 2011) (Lazar & Briggs, 2015, p. 173).

Each US state has a library affiliated with the National Library Service (NLS) that provides alternative formats of library materials for citizens in that state. For example, most state LBPHs offer reading material in large print, Braille, and digital formats. The reading material can be physically mailed to patrons, or, since the NLS recently updated from audio cartridges (similar to cassettes) to digital format, many books can be downloaded. Some states have an LBPH run out of a warehouse, which simply mails out materials. Other states have a library building that has reading material in alternative formats but also has activities and physical spaces similar to a public library, such as a children's area, a technology area, book club meetings, author signings, and poetry readings. Because of the nature of copyright law, copyrighted works generally cannot be transformed or reproduced into alternative formats without the permission of the authors and/or publishers. However, because of the Chafee Amendment (see http://www.loc.gov/nls/reference/factsheets/copyright.html) to copyright law in the United States, authorized entities (such as LBPHs) can reproduce materials in "specialized formats exclusively for use by blind or other persons with disabilities." This means that to receive reading materials reproduced in specialized formats from an LBPH, a formal process must take place to determine that the patron is indeed qualifies as having a print-related disability (Lazar & Briggs, 2015, pp. 173–174).

(B) Research Questions that will examine the Technology/Artifact Perspectives

(3) The Digital Talking Book Player has been in service for NLS since it was distributed to its patrons in 2009. NLS is planning to replace the current player.

(3a) What are the features and options that patrons and NLS Librarians would like to see in the new player?

Alternatives for Future Operations of the Books for the Blind Program Final Draft Report (2010)

Section 7 - Future Alternatives by Major Program Function and Planning Horizon

Summarized below are possible alternatives for future operations for the different major functions of the Books for the Blind Program that were described in Section 2 for current operations. As noted in Section 1, these are undoubtedly a subset of all the possible alternatives and others almost certainly exist (Ducrest Associates, 2010, p. 31).

7.2 DTBMs

Short term: A firm production plan is now in place for this period, during which all patrons will receive DTBMs. Current operations will continue at (Machine Lending Agency) MLAs and (Multi-State Center) MSCs, as will the mix of standard and advanced players. Volunteers will perform virtually all required repairs. During this period consideration could be given to possible future enhancements to the machine (Ducrest Associates, 2010, p. 32)

Medium-term: MLAs will accumulate and hold small buffer stocks of machines, and continue to distribute DTBMs to patrons. Consolidation of machine distribution at a smaller number of MLAs could begin, or existing operations may remain. Production of new units will continue at a maintenance level or be discontinued if, for instance, a large proportion of program patrons are using commercial machines. If production continues, the standard/advanced mix may or may not be changed. Volunteers will likely perform all repairs, but some commercial repair may be required. The machine will likely be upgraded to receive wireless broadband directly upon program user request and/or as "pushed" by network libraries to patrons (Ducrest Associates, 2010, p. 32).

Long term: It is doubtful that there would be further production of the DTBM at this time, but it is possible; it is equally likely that another NLS-machine may be in use, or commercial machines may replace a portion or all of the DTBM inventory or in entirety. DTBMs could be distributed by individual MLAs, from MLAs handling the consolidated workload, from a central distribution center (CDC), or MSCs. Repairs could be performed by volunteers and/or commercial repairers (2010, p. 32).

Library of Congress Fiscal 2013 Budget Justification: Submitted for use of the committees on appropriations. (2013).

Fiscal 2013 Priority Activities

The obsolescence of some parts in the digital talking book machine, designed in 2005, and the need to add direct-to-player DTB delivery functionality necessitates a design update. This design update, to begin in fiscal 2013, will involve electrical, mechanical, and software components. Options to be explored include the delivery of audiobooks directly from NLS to the player via the Internet rather than from network libraries via the postal service. These improvements will increase the efficiency and effectiveness of the program while enhancing services to patrons…(Library of Congress, 2013, p. 114).

2014 National Audio Equipment Advisory Committee Recommendations from Network Library Representatives (2014)

1. Add an SD or micro-SD card reader on next-generation player, as well as additional USB ports.
2. Bluetooth remotes and breath switches that control all DTBM features should be created for physically disabled patrons. Create a Bluetooth refreshable Braille display to be used as an accessory with the next generation player. (Network Library Representatives, 2014).

Futures Committee Meeting April 15–16, 2015

In five to ten years, what services do you expect from NLS?

…Talking-book machines will become easier to use, have better battery life, and include wireless connectivity…(Keninger, 2015, p. 4)

Library of Congress Fiscal 2015 Budget Justification: Submitted for use of the committees on appropriations. (2015).

Fiscal 2014 Priority Activities

…The design update of the digital talking book player, postponed in fiscal 2013 because of funding limitations, will commence. Work will continue on making program…(Library of Congress, 2015, p. 113).

Fiscal 2015 Priority Activities

…NLS will create specifications and begin prototyping the next generation of NLS playback systems…(Library of Congress, 2015, p. 114).

Library Services for those with Disabilities: Additional Steps Needed to Ease Access to Services and Modernize Technology. Report to Congressional Committees. (2016)

Appendix III: Accessible Data

Evaluation of Commercially Available Players

As noted in the report, only ten percent of NLS patrons are using commercial devices to read NLS materials. For the majority of NLS patrons, the NLS-provided player is preferred over commercial devices due to its simplicity of use and its durability. Also, the maintenance of NLS players overall has been low; and because the players are standardized, NLS can provide standardized training materials and comprehensive technical and maintenance support to libraries and volunteer repair groups throughout the United States and its territories (Bertoni, 2016, p. 39).

NLS also has made provisions for individuals who prefer to use other devices such as smartphones, tablets, and specialized third-party devices to access BARD and to play NLS talking books. NLS has created apps for both Android and iOS devices, to download and play

talking books. NLS has also cooperated with vendors who want to make their products capable of playing encrypted NLS books or to directly search BARD and download books. These efforts have guaranteed a wide range of choices for NLS patrons who prefer not to use the NLS-provided players. At the eligible patrons regardless of their physical, financial, or technological resources (Bertoni, 2016, p. 39).

As NLS begins the process of developing the next generation of talking book services, it will thoroughly study alternatives, including the pros and cons of designing an NLS-specific player versus using commercial players in the program. As NLS develops infrastructure to support the next generation of talking book services, NLS will ensure that the design adheres to applicable standards, which will ensure interoperability with a variety of devices. Thus, NLS will be positioned to implement whichever option that studies determine will bring the best value to both NLS and its patrons. Also, going forward, NLS fully intends to continue to support mainstream and specialized third-party devices to accommodate patron preferences (Bertoni, 2016, p. 40).

Is the Digital Talking Book Program meeting librarian and patron expectations? (2016)

Are NLS librarians and their patrons satisfied with the Digital Talking Book Player?

The survey results showed the NLS librarians were *Satisfied* (44.186%), *Very Satisfied* (37.209%), *Somewhat Satisfied* (13.953%), *Somewhat Dissatisfied* (2.326%), or *Neutral* (2.326%) regarding the Digital Talking Book Player (Figure 2). (Rose, 2018a, p. 473)

The survey asked respondents questions about what single feature the librarians and their patrons liked and disliked about the Digital Talking Book Player. Librarians commented that the top three features liked were the *Ease of Use, Audio Quality*, and the *Built-in User Guide*. The top three features disliked were the *Battery Recharging System*, the *Size of the Player*, and the *Weight and Portability of the Player.*

The participants were asked to consider what features or options that they and their patrons would like to add to the Digital Talking Book Player if NLS was to update or upgrade the player. Improving the *Player's Battery Life*, *Reducing the Size of the Player,* and *Adding the Capability of Either Direct Downloading from a Computer* or *Downloading via Wi-Fi* were the top three features requested. (Rose, 2018a, p. 474)

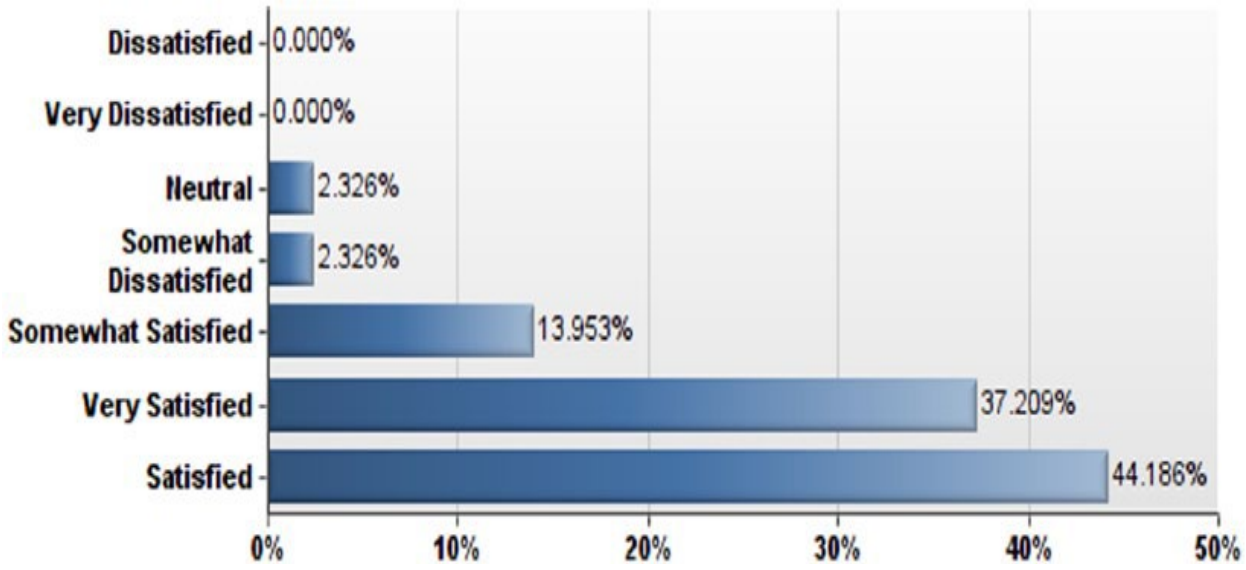

Figure 5. Figure 2.

Are you (NLS librarian) satisfied with the Digital Talking Book Player? (Rose, 2018a, p. 473)

Library of Congress, Fiscal 2017 Budget Justification, Submitted for use of the committees on appropriation. (2017)

Fiscal 2016 Priority Activities

Initiation of software development for a new generation of talking-book machines, which will support wireless delivery of materials (Office of the Chief Financial Officer, 2017, p. 146).

Fiscal 2017 Priority Activities

- Continue development of a new digital talking-book delivery and playback system, including a new digital talking-book machine (Office of the Chief Financial Officer, 2017, p. 146).

Library of Congress Fiscal 2018 Budget Justification: Submitted for use of the committees on appropriations. (2018).

Fiscal 2018 Priority Activities

- Use information gathered from 2017 studies to complete specifications and develop research for a request proposal for the next-generation talking book machine (Library of Congress, 2018, p. 144).

Library of Congress Fiscal 2020 Budget Justification: Submitted for use of the committees on appropriation. (2020).

Fiscal 2020 Priority Activities

Braille eReaders and Talking Book Machines: $2.375 million

NLS is requesting a total of $2.375 million in annual funding recurring for the next five years, 2020 through 2024 ($11,875 million total), to purchase braille eReaders and to supplement the digital talking book machine supply with either commercial off the shelf (COTS) or custom devices. NLS is requesting the flexibility within this five-year base funding request of $2.375 million per year to purchase both braille eReaders and digital talking book machines, and, if warranted, to reengineer and restart manufacturing of custom devices, as needed to meet stated goals (Library of Congress, 2019, p. 137).

The NLS shift to digital delivery and COTS devices will replace its current, legacy talking book system. However, as the program transitions to digital over the next five to ten years, the legacy talking book program will require some additional acquisition of physical media-based playback equipment to meet patrons' needs as current inventory declines. As it stands, in fiscal 2020, eReader procurement totaling $2.375 million is planned for fiscal 2020 through 2022 (Library of Congress, 2019, p. 137).

…It will need to supplement the current stock of talking book machines by adding 5,000 units annually at an expected average cost of $275 per unit. Therefore, NLS will transition the funding to procure $1.375 million worth of digital talking book machines and $1 million worth of eReader procurement during fiscal years 2022 through 2024 to meet this need and transition smoothly into the anticipated wireless paradigm. The requested funding of $2.375 million will non-recur in fiscal 2025 (Library of Congress, 2019, p. 138).

(3b) The influence of other stakeholders had on the planning process (Advocacy groups, Assistive Technology Companies; General Accountable Office, Library of Congress, the U.S. Congress, etc.).

Advocacy Groups

Digital Talking Books from the Consumers' Viewpoint

Christopher Gray

President, American Council of the Blind, San Francisco; cgray@acb.org

I was five years old when I received my first talking book from the Library of Congress. It came on several twelve-inch phonograph records, recorded at 33/3 RPM. I was too young to have learned to read the Braille labeling on the discs, but not so young that I could not enjoy the

A. A. Milne poetry and Beatrix Potter stories contained on those records. Through my childhood and adolescence, the Talking Book Program almost certainly had the most profound effect on my life of any single source of influence outside of my immediate family and upbringing. From Potter and Milne, I progressed through Beverly Cleary's Henry and Ramona, Oliver Butterworth's The Enormous Egg, Edward Eager's Half Magic, and later to Mark Twain, E. B. White, and Gordon Parks. Nowhere else could I have discovered the rich array of literary, educational, and recreational reading material that would lead me to a minor in English literature from the state university and lifelong involvement in literature with authors including William Vollmann, Wallace Stegner, Spalding Gray, Richard Yates, and so many more? (Auld, 2005, p. 74).

No less was my life shaped in the nonfiction arena, growing up with Bruce Catton's Civil War, William Manchester's *Presidents*, and the insightful historic genius of Barba Tuchman, who, incidentally, became a beneficiary of the Talking Book Program herself later in life. The fact that what I describe here might be similarly described, albeit with different authors and different books, through the voices of approximately 500,000 other American citizens, pays a most eloquent tribute to the NLS program, which is based on representative literary, historical, and recreational excellence presented by professional readers (Auld, 2005, p. 74)

During these years of reading, the Library of Congress: has progressed through many transitions in its service delivery system. From those original 33'3 records, readers transitioned to 10-inch, 1673 RPM disks, and still, later speeds decreased to 8"3 RPM. Later still, disks changed from hard to a flexible plastic media. Additionally, in the early to late 1970s, the program made greater use of cassettes to deliver books: more portably and at less cost. The physically handicapped who could not read standard printed material joined the ranks of blind readers, adding strength and stability to the program along with content and quality to the selection lists (Auld, 2005, p. 74)

The means of processing sound have also been improved over the years. First, digital processing of speech on cassettes was introduced to allow readers to speed up or slow down recorded speech with no change in the sound of the voice itself. Today, a test group receives weekly and monthly magazines from NLS sent digitally over the Internet that can then be played on a person's local computer. As a participant in this pilot project, feel it is important to share that the many issues and questions raised during this pilot have been surprising in their

complexity, and truly are paving the way to a functional and durable program of magazine and book delivery in the future (Auld, 2005, pp. 74–75).

These many transitions have come with attendant degrees of concern and fear by and for future recipients. The transition from phonograph discs to cassettes was roundly criticized by many as occurring too fast and as being unnecessary and ill-conceived. A small group of consumers expressed concern about the use of flexible discs, even though this newer technology represented a clear trade-off between durability and quality as balanced against faster and less expensive delivery of more books into the hands of more readers (Auld, 2005, p. 75).

As with these previous changes, the grave concern of a new sort is coming into focus as the Library of Congress endeavors to move toward the providing of recorded books in a digital format. Many feel the transition is too slow, and that our library system is being upstaged by other lesser services located else- Where in the world. Others fear they are, or soon will be, less able to receive as many books as the blind already receives in other countries where digital books exist. Many more people fear they will be unable to use the newer technology, and that the digital transition will deprive them of the ability to read at all. Though seemingly contradictory, all of these concerns have merit, and each must be meaningfully considered and taken into account during a transition period. In a library program, comprising roughly half a million patrons, this is only to be expected (Auld, 2005, p. 75).

In addition to my personal experiences and observations, I currently have the honor of serving as president of a consumer organization of blind people known as the American Council of the Blind. Through this organization, we are in direct contact with tens of thousands of blind Americans, the vast majority of whom are recipients of talking book services. This is one of the most-loved programs of service within the blind community and a frequent topic of conversation among our membership. The range of ability within our membership and throughout the Talking Book Program community is notable. Some of us buy audiobooks at the store or from audible.com, own MP3 players, and participate as readers far beyond the scope of the NLS Talking Book Program. Other members have real difficulty navigating the multitracked cassette tape or easily get lost or confused just moving back and forth within a cassette tape. Diabetics and those who have had strokes or other brain malfunctions, such as Parkinson's disease, often struggle with the task of inserting or removing a cassette from a machine (Auld, 2005, p. 75).

There's nothing novel about this. How many of us have been defeated trying to show an older relative how to run a VCR or DVD player? How many of us have had a particularly complex feature on one of these machines elude our mental grasp? LCDs can be hard for anybody to read; they're "impossible for blind patrons. Small buttons that were annoying at age twenty become difficult or impossible to use at eighty. It is - for reasons such as these that specialized equipment is needed for the Talking Book Program (Auld, 2005, p. 75).

Whatever solution is found in bringing digital talking books to the blind and physically handicapped must be a solution that can be applied across this broad range of user capacity. The community within the American Council of the Blind believes strongly in enabling all blind people, regardless of their particular ability in manual dexterity or their understanding of the more complex media of today. There is a consensus within the council that while waiting until 2008 is a frustration, and while we wish a transition could move more quickly, it is far better to organize and execute an orderly transition that truly works within the whole community of blind and physically handicapped readers than it is to rush toward a solution that will be outmoded before it arrives (Auld, 2005, p. 75).

We do not believe that a decrease in talking book readership stems from the slowness of transition by the Library of Congress to digital media. It is far more likely that the sheer degree of availability of reading material in bookstores and through catalogs creates an environment in which people losing their vision do not so quickly gravitate to the Talking Book Program (Auld, 2005, p. 75).

All of this is not to say that the American Council of the Blind has not taken issue or raised concerns regarding the transition to a digital medium or will not do so between now and 2008. We are concerned that ways be found to meet the needs of technically apt patrons along with the nontechnical. We are inclined to believe that the Library of Congress should consider a more aggressive offering of books to patrons who are willing, in the short term, to supply their own digital reading equipment. Some concerns have been raised already, and others certainly will be raised in the advisory structure that the Library of Congress has set up to guide this vital transition from plans on paper to the placing of digital material in readers' hands (Auld, 2005, p. 75).

The basic point in all of this is to create, foster, and finally enhance the ability of people to read, who are otherwise not able to do so. In my view and the view of the American Council

of the Blind, this is precisely what NLS is doing. Along with other organizations of and for the blind, and along with representatives from within the network of cooperating libraries that serve blind and physically handicapped readers, we have been asked and enabled to participate meaningfully in the planning process that will make digital talking books a reality in the United States. We look forward to that day with optimism and anticipation. We must cooperate to secure the financing and national support necessary to create this new program. By doing so and by taking into account the needs of all readers, the blind and visually impaired of the upcoming decades will best be served. I conclude by inviting the broader community of librarians and other professionals in this field to join with us in making this a reality and working to ensure that all our population, disabled and non-disabled, have the greatest opportunity possible to enjoy life and literacy through the printed word, undoubtedly one of life's greatest gifts (Auld, 2005, p. 75).

CONCLUSION

The world of the blind in America is separate and unequal. One of my all-time favorite books is of Such Small Differences by Joanne Greenberg, a book about a deaf-blind man and his struggles with loving and life. That book helped bridge my understanding but could never bring about total empathy and understanding. In preparing this column, I talked with some of the authors of these essays; these conversations led me to a somewhat deeper appreciation for diversity as well as the common elements of our humanity. I venture to say that most public librarians and public library trustees do not think often, if ever, about the blind members of their community. I hope that the essays in this column will result in heightened awareness, better communication, and better services (Auld, 2005, pp. 75–76).

Assistive Technology Companies

Contract agreement launches the next generation audiobook program for blind and physically handicapped readers (2005)

The National Library Service for the Blind and Physically Handicapped, Library of Congress (NLS) has contracted Battelle, a leading technology innovation firm, to design and develop a digital talking-book playback machine. The agreement is a milestone in the NLS project to convert its current analog audio system to a flash-memory digital format. (National Library Service for the Blind and Physically Handicapped, 2005)

To ensure product accessibility for NLS patrons, experts in disability and technology issues will serve as subcontractors on the project. They are HumanWare, formerly VisuAide, a leader in digital talking-book technology; National Federation of the Blind, the largest organization of blind persons in the United States with more than 50,000 members; and Trace Research and Development Center at the University of Wisconsin- Madison, which makes information technology and telecommunications systems accessible by people with disabilities (2005).

"We are excited to have brought this exceptional group of companies on board. We have great confidence in their capabilities and we know that the product they design will be a success for our patrons," says Frank Kurt Cylke, NLS director. "This is a major step in realizing our goal of having 60,000 playback units and several hundred thousand digital talking books ready for patron use by 2008" (2005).

Library Services for those with Disabilities: Additional Steps Needed to Ease Access to Services and Modernize Technology. Report to Congressional Committees. (2016)

As it considers moving forward with this effort, NLS is leaning toward designing its next-generation, specialized player, but it has not fully assessed the costs and benefits of designing its own player versus using a commercially available player. NLS officials said that, in their experience, the existing commercially-available players lack the durability needed for NLS's purposes, may not be suitable for patrons with physical disabilities and are expensive. Libraries for those with visual impairments in some other countries, meanwhile, have found that commercially available audio players can meet their patrons' needs. For example, the CNIB Library, which provides free reading materials to those with visual and other disabilities in Canada, does not provide its specialized devices to their patrons but instead helps them acquire commercially-available devices when they cannot afford to do so. CNIB officials said they chose this approach because it was less expensive than developing their own player, and also commented that it offers patrons a range of choices to meet their needs. Some libraries for the blind in Europe and Asia also purchase commercially-available audio players for library patrons, according to two assistive technology companies we contacted. NLS officials told us they have not ruled out using a commercially-available device as their next-generation player, and while they have not yet analyzed this option, they plan to explore it further through requests for information and market research.

General Accountable Office

GAO-07-871R Talking Books for the Blind

Subject: Talking Books for the Blind

In the 1990s, NLS recognized that analog audio cassette technology was becoming outdated and nearing the end of its useful life and initiated efforts to plan for a new, digitally based talking book system. NLS analyzed three alternatives for the system: CD, hard drive, and flash-based media, and chose to award a contract for the development of a digital talking book system based on flash memory media. The development phase is now nearing completion, and NLS is planning to award the manufacturing contract for the digital talking book system in August 2007...(Government Accountability Office, 2007, p. 1).

The Chairman and Ranking Member of the House Committee on Appropriations asked us to review NLS planning and management of its digital talking book development and acquisition project. Specifically, our objectives were to determine to what extent NLS (1) performed sufficient analyses to select technologies for the next generation of the talking book system and (2) effectively managed the development of the selected digital talking book technology and mode of distribution (Government Accountability Office, 2007, p. 2).

The digital talking book project is a significant system development and acquisition investment. NLS estimates the 5-year (2007–2011) cost of the program, including the player and media acquisition, to be about $174 million. Over this same time, NLS plans to continue the cassette-based talking book program, whose cost is estimated at $44 million. The 5-year cost of the combined digital talking book and cassette programs is about $218 million (Government Accountability Office, 2007, p. 2).

In summary, NLS analyzed various alternatives for the digital talking book program starting in 2000, but the analyses did not have the rigor recommended by library guidance and government and industry best practices5 to ensure that new assets are acquired through sound decision making (2007, p. 3). To its credit, NLS conducted market research and consulted with experts and stakeholders, including representatives from international organizations with similar programs, domestic groups representing people who are blind and physically disabled, and manufacturers. The agency identified and discussed numerous alternative technologies (including CD, flash memory, and miniature hard drives) and distribution mechanisms (such as Internet delivery via broadband channels and cable television channels) (2007, p. 3). However,

the agency's analysis of selected alternatives focused solely on the technology medium and the player and did not broadly consider the entire program and its underlying processes:

- NLS did not consider alternative ways to distribute players to the subscribers, such as, direct shipment from the manufacturer to the patron that could be less costly than the current process.
- NLS did not consider using commercial players designed specifically for people who are blind and physically disabled which include features such as tactile indicators and audio prompts and is compliant with the Daisy standard. For example, the agency had previously rejected commercial CD players based on its 2000 analysis, even though similar programs in other countries rely on such players to serve their subscribers… In addition, NLS did not consider using commercial services to distribute talking books to subscribers (2007, p. 4).
- NLS did not fully analyze the initial acquisition and life-cycle costs of each alternative nor did it update its 2000 analysis of the CD and flash alternatives as recommended by best practices. For example, the analysis stated that one-way mailing of CDs to subscribers an approach that could significantly reduce the $40 million that NLS spends annually on mailing costs would require highly automated equipment and technical staff to support it and concluded that few network libraries could provide such an environment. Because the analysis assumed that one-way mailing would continue to rely on network libraries for distribution (essentially mirroring the current distribution approach), NLS did not consider, for example, whether the use of commercial CD duplicating services or a centralized CD copying center that directly ships the media to the patron would be feasible (2007, p. 5).
- NLS did not provide documentation to support key technical conclusions, such as the advantages and disadvantages cited for each alternative. For example, its conclusion that repairs to CD and hard-drive-based players would be "relatively expensive for commercial repairers to perform" was not supported by technical studies or analysis.

Without a rigorous analysis of alternatives, NLS, the Congress, and the public will have limited assurance that the selected solution is the optimal one for delivering audio content to people who are blind and physically disabled, and NLS may be missing an opportunity to select a solution that costs less and serves its subscribers better (2007, pp. 5–6).

The weaknesses in NLS's approach existed, in part, because NLS was not required to adhere to the Library of Congress's system development guidance, which would have provided a structure for performing an alternatives analysis and managing the project (2007, p. 6). Furthermore, the library's Chief Information Officer does not have the authority to provide oversight of the project.

To ensure that the best solution is selected and effectively delivered to talking book subscribers, we recommend that you require the Director of NLS to take the following two actions:

- Develop and document analyses of alternatives, including technologies and distribution options, before continuing further work on the talking book modernization project. At a minimum, these analyses should (1) identify and consider alternatives for all aspects of the talking book program, (2) consider the use of commercial products and services, (3) fully analyze the initial acquisition and life-cycle costs of each alternative, (4) provide support for key technical conclusions, and (5) be consistent with library guidance.
- Strengthen NLS's capabilities for modernizing the talking book program by developing a concept of operations and project management and risk management plans consistent with the library's guidance and industry best practices (2007, p. 6).

We also recommend that you require the Chief Information Officer to oversee these efforts and ensure that they are accomplished in accordance with library guidance (2007, p. 7)

Agency Comments and Our Evaluation

- In written comments on a draft of this report, you concurred with our recommendations and described actions to address issues cited in the draft report, particularly in the areas of analyses of technologies and distribution options, NLS's capabilities for modernizing the talking book program, and oversight by the Chief Information Officer.
- You also noted that the digital talking book program has been in the planning stage for nearly a decade and that the blind community has high expectations for its implementation. You stated that the analyses and planned actions we recommended to strengthen NLS acquisition management can be carried out concurrently with the current acquisition schedule for the talking book system and the library's fiscal year 2008 funding request.
- We concur with the library's approach and agree that the necessary analyses and management actions to strengthen the digital talking book program could be performed concurrently with the tasks required for the initial delivery of the talking book system. These actions, if implemented as described, should ensure that NLS delivers a digital talking book solution that best serves the interests of both the program's patrons as well as taxpayers. Your written comments are reprinted in the enclosure (Government Accountability Office, 2007, p. 7).

Library of Congress

*Alternatives for Future Operations of the Books for the Blind Program Final Draft Report (*2010).

1.1 Report Objectives

This report presents the combined results of two separate studies that were conducted during 2010. The first was performed by Ducrest Associates under Order Number LCNLS10E0008 for the National Library Service for the Blind and Physically Handicapped (NLS), Library of Congress (LC), and the second was performed by the NLS Network Division. The objective of both studies was to develop an initial planning document for NLS that outlines how the Books for the Blind Program could evolve in the future taking into account the entire system, including those individuals being served and their needs, functional areas of program operations, major service providers and their roles, and current and future technologies and their potential impact (Ducrest Associates, 2010, p. 1).

NLS is planning for possible short- and long-range operations even as the transition to the new digital system consisting of digital audiobooks (DBs) and digital talking-book machines (DTBMs) is fully underway, and needs to initially identify and subsequently evaluate alternative ways in which the system could potentially evolve in the future. This report identifies alternatives that NLS may choose to implement to change how it provides support to its network of cooperating libraries and program patrons, and also suggests possible changes to the configuration and activities of the cooperating network of 113 libraries (Ducrest Associates, 2010, p. 1).

The aforementioned changes will be driven largely by advances in technology and how these advances can be used to make program patrons more independent and give them more control in how and where they access library services. At the same time, the agencies administering the network of libraries serving blind and physically handicapped individuals have lost funding because of the 2008 downturn in the economy, and many are looking for ways to reduce costs at both the state and local levels. Formulating a plan for future operations that considers both the advantages of the digital transition and the disadvantages of the economic downturn, and continues to provide equitable library service to program patrons, is necessary but challenging (Ducrest Associates, 2010, p. 1).

While this report identifies alternatives, these are not necessarily inclusive of all possibilities and it is doubtless that others exist. Some of the alternatives will deviate from how services to programs patrons have been traditionally provided. However, while the pros and

cons of these alternatives are cited where applicable, further analysis is required to determine the best recommendations for implementation (Ducrest Associates, 2010, p. 1).

Section 5 - Major Assumptions for Long-Range Planning

This section of the report presents the major assumptions about operations of the Books for the Blind Program that have been used for long-range planning in the past. These assumptions will also continue to be generally used for future long-range planning—since most of these will still hold—although certain aspects of some may change as future operations evolve and such changes are noted (Ducrest Associates, 2010, p. 18).

5.6 Assumption 6: NLS will continue to identify and adapt technologies to support a high-quality reading experience and may also extend these types of support to the network.

NLS is developing and intends to implement, a functionality that will enable a program patron to request that a book be downloaded, wirelessly, directly to their players. This will likely have an enormous impact on the responsibilities of network libraries…(Ducrest Associates, 2010, p. 20).

U.S. Congress

The Committee recognizes the importance of technology in ensuring that blind and physically handicapped United States residents and citizens are afforded access to reading material promptly. To preserve the National Library Service for the Blind and Physically Handicapped today and ensure it is prepared to meet the needs of future generations, the Committee directs the Government Accountability Office (GAO) to review the services provided by the National Library. This review should include but is not limited to, a review of the NLS's user base, a comparison of services and playback equipment offered by the NLS to private sector services and technologies currently used by the blind and physically handicapped community, to include an evaluation of possible cost efficiencies in utilizing private sector technologies, availability of alternate distribution methods and other aspects of the NLS's services that the GAO deems relevant. The GAO is to prepare a report of its findings and report back to the Committee on Appropriations of the House and Senate no later than December 31, 2015. (House of Representatives, 2014, pp. 18–19)

(4) How has the use of third-party assistive/adaptive technologies, the use of consumer devices (i.e., e-readers, smartphones, portable computers, and tablet computers); the use of

broadband, and wireless Internet services have affected the Digital Talking Book Program?

Alternatives for Future Operations of the Books for the Blind Program Final Draft Report (2010)

Current Program Operations Summary

2.4 Braille and Audio Reading Download (BARD): Digital Books and Magazines via Internet Download

The implementation of the BARD system has been a major success, with 19,000 digital audiobook titles and 46 magazine titles (in multiple issues) currently on the system, about 28,500 patrons (about 11 percent of program patrons who have been issued DTBMs), and about 155,000 books and 7,500 magazine downloads for October 1, 2010 (Ducrest Associates, 2010, p. 6). To date, institutions have not been able to use BARD, but the policy has been approved to allow institutions will be authorized to use the system shortly. Patrons continue to join BARD at the rate of about 2,000 per month, and it appears likely that 10 percent of patrons with DTBMs will be using BARD soon.

LC currently provides the data storage, data processing, and telecommunications infrastructure required for the NLS BARD system via a single-server website. This arrangement has adequate capacity given the projected number of patrons and associated activity (Ducrest Associates, 2010, p. 6).

The reconciliation of the library information systems with the Comprehensive Mailing List System (CMLS) for BARD updates of program-user authentication and authorization data, for which CMLS is the approving authority, is working but with some difficulty (Ducrest Associates, 2010, p. 6). Manual intervention is still required in facilitating information exchange between the systems. Transfer of BARD user circulation data to network library systems to update has-had histories is progressing well.

Network libraries are currently assuming the function of registering patrons for the BARD system. This began with 10 RLs and 11 SRLs and will be completed in several similar increments by March 2011. A BARD administration training module was posted to the network library website where it is now being used (2010, p. 6).

Section 3 - Technological Changes and Potential New Providers of Services

3.2 BARD Upgrades and Improvements

The current BARD system will have to be expanded in the future, with its server capacity delivered to several geographic locations (patrons in the Western states already apparently report slower response times from the system than do other patrons) (Ducrest Associates, 2010, p. 12).

With computer power becoming less expensive and web-site technology has advanced considerably, many websites now can interact with patrons, for example prompting them to "try this if you liked that," and delivering content "in the background." There is also the potential to make better use of Internet bandwidth for data transfer, possibly delivering content during underutilized periods; this consideration is particularly appropriate considering that, some program patrons may be receiving broadband Internet from an ISP that is subsidized by the federal government who, in providing that service in such a capability, could more easily facilitate such an arrangement (2010, p. 12).

The interface between library information systems and CMLS, which BARD relies upon indirectly for authentication and authorization of BARD patrons, is currently not seamless and requires manual intervention. A system in which a single "point of contact" is used for sign in and password… would be an improvement when, for instance, a program user moved from the domain of one network library to another there would be a single repository of information (Ducrest Associates, 2010, p. 12).

There is the further possibility of including local and special interest material on BARD that may not pass NLS QA standards and be made available as two classes of audio content (passed and not passed) on the system. This presents a logistical efficiency versus multiple network libraries developing their BARD-like systems for delivery of the same content.

Section 7 - Future Alternatives by Major Program Function and Planning Horizon

7.4 BARD

Short term: Current operations will continue with institutions joining individuals as BARD patrons, and with an increasing proportion of circulation from downloads as more patrons have broadband and DTBMs. Infrastructure may or may not have to be expanded during this period. Network libraries register patrons in the system and BARD is "branded" for network libraries rather than for NLS. Current levels of functionality are maintained during this period,

although plans for improvements could be developed. Current projections include the incorporation of Web-Braille into BARD in 2012 (Ducrest Associates, 2010, p. 33).

Medium-term: Capacity will likely have to be expanded to several servers and distributed geographically. All patrons will have DTBMs by the beginning of this period, and most will have broadband. Registration and branding by libraries will continue as in the short term. System functionality will likely be improved, with more sophisticated BARD-reader interactions (prompts, background communications, etc.), and the interfaces with both CMLS and library information systems will likely be improved. By the end of this period, a majority of audiobook circulation will likely be from BARD, much of it via wireless broadband. (2010, p. 33).

Long term: BARD will be the source of most audiobook circulation and a larger share of braille circulation. The system will continue to be branded for the network libraries. The various enhancements cited for the medium term will be in place. Patrons will be accessing the system via a variety of broadband methods and possibly using several types of playback machines. There will likely be developed a capability by which network libraries will "push" digital books via broadband Internet to patrons (2010, p. 33).

U.S. House of Representatives in House Report 112-148 on the Legislative Branch Appropriations Bill, 2012 [H.R. 2551]. NLS: That All May Read, Report of the National Library Service for the Blind and Physically Handicapped. (2012)

EXECUTIVE SUMMARY

As technology evolves, NLS continues to move forward with innovations in its programs to improve the reading and delivery experience for all patrons (National Library Service for the Blind and Physically Handicapped, 2012, p. 5). One example is the development of applications for the iOS operating system used by Apple devices and for the Android operating system. These applications will be deployed during fiscal 2013 and will provide interfaces to search BARD, download content, store it on the mobile device, and read content using the same functionality as the current digital player. Ongoing research and exploration of cutting-edge concepts and developments will be required to keep NLS current in all aspects of its services.

National Library Service for the Blind and Physically Handicapped (NLS) Talking Book and Braille Program Evaluation and Recommendations for Increased Patronage: FINAL REPORT. (2013).

IV. Recommendations

General Recommendations

General Recommendations The following are general recommendations that are applicable to all respondent populations:

1. Publicize the program, particularly BARD and other recent technological developments. This can be done efficiently by engaging organizations to which eligible individuals may belong.

Thirty-four percent of non-patrons had not heard of the Talking Book and Braille Program before completing the survey, and an additional 32 percent had heard of the program but did not know how it works. Similarly, 14 percent of current patrons were not aware of BARD. This leads to the recommendation that effort needs to be expended on disseminating information about the program more widely…(National Library Service for the Blind and Physically Handicapped, 2013, p. 58).

5. Develop applications for various computerized devices such as smartphones and tablet computers that allow patrons to access BARD without regard to specific NLS-provided hardware.

The majority of the survey respondents reported using a tablet to access the internet, and several reported using smartphones. Several patrons reported using online outlets for obtaining their reading materials, and forty-seven percent of non-patrons reported using electronic texts to access reading materials (2013, p. 58). Of the 32 percent of former patrons who reported they stopped using the Talking Book and Braille Program because they prefer to use another technology or service 25 percent reported using Audible.com, 25 percent reported using Bookshare, 21 percent reported using an iPad or iPod, 15 reported using an iPhone, and 12 percent reported using iBooks. NLS should develop applications that would allow individuals to access reading materials from the Talking Book and Braille Program on existing devices such as iPhones. This makes the program more adaptable for readers who use a variety of devices for accessing their reading materials and may help attract to non-patrons to the program because it would allow them to continue accessing reading materials on the devices they are already using. Developing such applications may also help to address the dissatisfaction some patrons reported with the digital players and addresses the fact that 32 percent of former patrons stopped using the

Talking Book and Braille Program because they preferred to use different technology or service (2013, pp. 58–59).

6. Consider developing partnerships with entities such as Apple, Amazon, and Barnes and Noble to Offer BARD and other digital solutions through them.

A number of the persons surveyed, regardless of patron type, use a variety of different technologies. Forty-seven percent of non-patrons obtain their reading materials from electronic texts and 22 percent of patrons reported they currently use e-readers or are likely to begin using them shortly (2013, p. 60). Of the 32 percent of former patrons who stopped using the program because they prefer another technology or service, 12 percent indicated they use Nook or Kindle. NLS may consider partnerships with these two (as well as others) to be able to offer more of the contemporary best-sellers and other books that current and potential patrons may crave, in a way that is compliant with digital rights management but offers NLS patrons more than they can get from Amazon or Barnes and Noble on their own (2013, p. 60).

Recommendations with Regard to Patrons

Patron satisfaction was generally high, with average satisfaction ratings for the various aspects of the Talking Book and Braille Program ranging from 4.2 to 4.9 on a 1 to 5 satisfaction scale in which 5 represented "very satisfied" (National Library Service for the Blind and Physically Handicapped, 2013, p. 60). However, there are a few areas in which satisfaction could be improved, particularly concerning BARD. Also, the findings suggest a need to increase awareness of the program particularly BARD among current patrons. Only 24 percent of patrons reported using BARD and 58 percent of those who do not use BARD reported not being aware of it. The following recommendations address these concerns:

8. Consider creating an online forum for Talking Book and Braille users to interact, share knowledge, and to assist one another in getting the most satisfying usage of the program.

Just as news of the survey spread quickly among NLS patrons (resulting in over 2,000 completed surveys from non-sample patrons), new developments could spread quickly across the network of Talking Book and Braille Program patrons (2013, p. 60). Besides, such a forum would allow those new to the program, or new to BARD, to reach out to those more familiar for guidance. Social media could play a distinctive role in hosting the online forum in several ways. Respondents reported a variety of assistive technologies used, and accessibility to NLS materials

may vary from one to the next. Allowing users to connect may be an effective and cost-efficient method of ensuring all patrons can properly use the equipment and read or listen to the materials (2013, p. 60).

9. Provide instructions or tutorials on using BARD and do so in an accessible format.

Of the patrons who are aware of BARD but do not use it, 52 percent reported not using it because they do not know-how. Creating simple instructions on using BARD and posting them to the website for BARD and NLS may be a simple way to increase the number of patrons using the program. Instead of traditional text-based instructions posted to the webpage, consider developing an instructional recording that individuals can listen to similar to how they would listen to the audiobooks provided by the program (2013, p. 60). The instructions contained in the web presentation should also be posted to the website in text form. Also, consider sending the instructions to individuals as they sign up for BARD. Developing a list of frequently asked questions to send with the recording, and to post to the webpage, is another efficient way to assist individuals in getting started with BARD.

Recommendations with Regard to Former Patrons

Several changes to the NLS Talking Book and Braille Program have been made since many of the former patrons left the program. For example, 28 percent stopped using the program before the introduction of BARD (National Library Service for the Blind and Physically Handicapped, 2013, p. 61). Providing information to these individuals on improvements that have been made and new features that have been added could be effective in regaining the interest and patronage of these former patrons. The following recommendations provide suggestions for how to do this and what information to provide:

12. Focus on the ability to use BARD as often, or as little, as desired, without waiting for the materials to come by mail.

Sixteen percent of former patrons indicated they did not spend any time reading during the previous week, which indicates that some former patrons may not be interested in the program simply because they do not read very often (2013, p. 62). This is supported by the fact that 10 percent of former patrons left the program because they no longer had time to read and 30 percent of those who stopped and re-started were drawn back to the program because they had time to read that they hadn't at the time they stopped using the program. Highlighting the ability

to download materials from BARD as often, or as little, as desired may be effective for regaining the patronage of these individuals. Also, the timeliness and convenience of downloading from BARD are helpful for individuals who may unexpectedly find they have some time to read but would not have time to wait for materials to be delivered through the mail. Instead of requesting materials through the mail and then waiting for them to arrive, BARD offers the flexibility to download materials when the person has the time (2013, p. 62).

Recommendations with Regard to Non-Patrons

15. Highlight the ability to obtain reading materials without leaving the house.

Thirty-four percent of non-patrons reported a disability or condition that limits their mobility. For these individuals, obtaining reading materials from a public library may be difficult (National Library Service for the Blind and Physically Handicapped, 2013, p. 63). Online bookstores were the most frequently reported source for reading materials among non-patrons. The Talking Book and Braille Program minimize this difficulty by providing materials directly to the individuals, either through the mail or through the internet, without the cost of bookstores. Highlighting the fact that, with BARD, individuals can download materials similar to the way they are downloading their reading materials from online bookstores, without the costs, maybe effective for gaining their interest in the program (2013, p. 63).

Library of Congress Fiscal 2014 Budget Justification: Submitted for use of the committees on appropriation. (2014)

Fiscal 2014 Priority Activities

Work will continue on making program offerings accessible through a variety of formats, including downloads through the BARD web site and newly developed accessibility on Apple or Android-based smartphones…(Library of Congress, 2014, p. 114).

(4a) how have these technologies impacted the patrons' use of BARD?

Alternatives for Future Operations of the Books for the Blind Program Final Draft Report (2010)

Major NLS Short Term Tasks

4.2 Assess the Impact of Broadband Access, BARD, DTBMs, and DB Mass-Duplication

An important question to be answered is how will BARD delivery of audiobooks as a program option, increasing availability of broadband Internet access to program patrons, and increasing availability of DTBMs to program patrons simultaneously affect the production requirements for DBs on cartridges in the years ahead (Ducrest Associates, 2010, p. 17). A related question is how much BARD capacity must grow, driven by increased DTBM and broadband availability to patrons and increased acceptance of BARD, to plan for the timing of such capacity expansion.

An evaluation should be performed that models various feasible scenarios for broadband access by program patrons, availability of DTBMs, acceptance level and use of BARD, and DB cartridge production. In such a model, the availability of DTBMs would likely be set to the NLS planned production quantities for the near future as a baseline, with various values within probable ranges used for the proportion of program patrons with broadband and acceptance/use level of BARD, with DB cartridge-production quantities as model outputs (2010, p. 17). Alternatively, DB cartridge-production quantities could be an input variable to the model, but the former is more likely. In any event, the objective would be to plan simultaneously for the likely expansion of BARD download activity and the likely contraction of DB cartridge-production quantities in future years.

5.10 Some Likely Changes in the Future

3) The implementation of BARD means that an ever-increasing percentage of program patrons will have the capability of self-service in that they can go on BARD, identify a book or magazine (in audio or braille), and download it (Ducrest Associates, 2010, p. 22). However, there will be for the foreseeable future patrons who do not and will not have the ability to take advantage of BARD. NLS is working on a modification of the digital player which, in 5 to 10 years, will assist these program patrons. Specifically, it is the possibility of wireless downloading of a book directly onto a specific user's playback machine. The implementation of this capability is related not only to the development of the functionality at NLS but the implementation of broadband capability throughout the United States. Once both these elements have been implemented, network libraries will no longer need to maintain physical collections of

recorded titles. This will mean secondary savings for libraries in terms of needed collection space, and first-hand savings in the lessening need for circulation and collection-maintenance staff (2010, p. 22). The savings, however, will be partially offset by the need for increased reader-advisory service and a need for staff with an understanding of computers and the Internet who can assist patrons with technical service issues. Finally, there will be a need for staff to promote the program within the regional libraries' service areas to ensure that all eligible individuals are aware of the program.

U.S. House of Representatives in House Report 112-148 on the Legislative Branch Appropriations Bill, 2012 [H.R. 2551]. NLS: That All May Read, Report of the National Library Service for the Blind and Physically Handicapped. (2012)

VI. PRIORITY 2: ENHANCE THE READING EXPERIENCE FOR ALL NLS PATRONS BY LEVERAGING CURRENT AND FUTURE TECHNOLOGIES TO IMPROVE THE READING AND DELIVERY SYSTEMS

J. Smartphone Access

NLS patrons have urged NLS to develop and deploy access to the BARD system using mobile devices such as smartphones. Therefore, NLS has developed specifications and contracted with vendors to develop applications for the iOS operating system used by Apple devices and for the Android operating system. These applications will be deployed during fiscal 2013 and will provide interfaces to search BARD, download content, store it on the mobile device, and read content using the same functionality as the digital player currently offers (National Library Service for the Blind and Physically Handicapped, 2012, p. 28).

The apps being developed for Apple and Android-based smartphones will remove the complexity inherent in the current BARD download system. These devices come equipped with built-in accessibility features, including text enlargement, high-contrast settings, text-to-speech output, speech input, and support for refreshable braille devices. The set of gestures and commands required to activate and use these features are generally simpler to learn and use than the command structures required by a personal computer offers (National Library Service for the Blind and Physically Handicapped, 2012, p. 28).

Because these devices have accessibility features built into their operating systems, NLS patrons will not incur any additional expense above and beyond that encountered by mainstream patrons of the devices.

With properly developed apps for these devices, NLS anticipates a significant increase in BARD usage, with smartphones and similar Web-enabled appliances to become fully integrated download, bookshelf, and reading systems (2012, p. 28).

It should be noted that the cost of these appliances, including ongoing data plans or Wi-Fi access, prices them out of reach for many consumers. A February 2012 Nielsen survey*, New U.S. Smartphone Growth by Age and Income*, shows a clear correlation between income and smartphone penetration in the general population (Nielson, 2012). For 70 percent of the disabled population who are unemployed, lower incomes are a major factor in this equation (2012, p. 28).

In the long term, broadband delivery of digital talking books directly to NLS talking book machines either pushed from network libraries or downloaded by the patron may revolutionize NLS's delivery system. This possibility is not imminent however and would require major infrastructure advances nationwide as well as within the NLS network and the NLS program itself.

NLS continues to research cutting-edge technologies to position itself to take advantage of new reading and delivery options as they become feasible and practical for the patron and within the fiscal and administrative constraints of the program (2012, p. 28).

Survey of Librarians Serving the Disabled: Is the Digital Talking Book Program Meeting Librarians and Patrons Expectation. (2014)

21. NLS said in its report to Congress last year that 15% of NLS patrons use BARD or download books. Please share your opinions about this statement.

Text Response

Accurate

I figured it to be more (Rose, 2014).

Very true

That sounds about right.

About 15% of our patrons use BARD

I agree with this statement

We are about 12%

That is pretty close to our numbers.

This is in line with state data.

I would agree that is correct. I am hopeful this number will continue to increase (Rose, 2014)

The younger patrons are using it. Others get someone to download for them.

That is a correct estimate. IL stats range from 12% to 16% per month.

Our download figures are consistently increasing.

We think 6% of our total patrons are active BARD patrons.

It is probably lower we still have access to high-speed internet issues.

Basically, I agree. Our percentage in Georgia continues to go up.

I believe this figure to be accurate. Access to computers and the Internet are still an issue for a number of our patrons.

I agree, maybe a little more now that people are becoming better with using the internet. As the computer-savvy population becomes older, the more will use BARD (Rose, 2014).

Seems about right, we had an increase of about 24 percent last fiscal year compared to the previous.

Agree, but the numbers should continue to trend upwards as more middle-aged and young people who have higher-level technical skills begin to utilize the program.

Younger patrons are far keener on the mobile app than they are on the clunky digital book player, too.

I think that is right some states have higher usage than other states. A lot depends on whether the patron can afford the cost of broadband or mobile devices.

Roughly 20% of our patrons have signed up for BARD, but not all are active patrons of BARD.

I think it is fairly accurate, maybe a bit on the high side. I think the problem is that we haven't seen continued growth in patrons (Rose, 2014).

As more tech-savvy patrons become part of the service, that number will continue to increase. I have been doing outreach for 17 years. Each year older people use computers. With the baby boomers, there will be a surge of tech patrons.

For our state, that figure would be too high; however, the large majority of our readers who sign up for BARD use BARD. That is, our strategy has been to assist readers to sign up and use BARD. I could imagine a divided strategy to sign up for BARD and then to cultivate its use later on, but that seems problematic to me (Rose, 2014).

My sub-regional library's BARD-using patrons are probably a larger proportion of my overall patrons. I have many affluent and tech-savvy folks retiring to my city or my patrons have family members who are affluent and tech-savvy to help them with downloading materials.

That figure is roughly accurate. Roughly 15-20% are registered for BARD use. On an ongoing monthly basis, the percentage of the total number of active patrons downloading books is more likely in the 5-10% range (Rose, 2014).

These are younger patrons who often learned to use the internet in school or who have worked with computers before losing vision. They are also people with caregivers who can download for them (Rose, 2014).

The statement seems accurate to me. While our library has 23% of patrons registered for BARD, only 14% have downloaded an audiobook in the past year.

Agree with this statement. The number will only continue to grow as assistive technology improves and patrons become more comfortable with using technology on their own or with assistance (Rose, 2014).

For our patrons, it would be a smaller percentage due to a large number of elderly we have on our service who do not own a computer nor know (or want to ask) someone who can assist. We do a large number of downloads on their behalf.

BARD is growing in popularity as younger patrons register for the service. I do have patrons who do not use BARD because high-speed internet service is not available in their geographic area which is very rural. Most of my patrons use the mailed out books and government-issued players due to fixed incomes (Rose, 2014).

I believe that 15% that download are those who have a good source of income (employed or income from another source). Many of our patrons are unemployed or underemployed and cannot afford the technological items. There are transportation issues that preclude many from coming to a library to download. Also, some of our patrons (esp. some aged ones who had been heavy computer patrons when younger) have cognition issues that make the downloading process too difficult for them to handle (Rose, 2014).

Futures Committee Meeting April 15–16, 2015 (2015)

Duplication on Demand

First, NLS is phasing out cassettes and in so doing, is digitizing its cassette collection. The result is that thousands of titles are available on BARD but will never be put on cartridges for distribution through copy allotment. Also, network libraries are submitting high-quality titles for posting on BARD. These, too, will never be processed through copy allotment or put on cartridges for distribution (Keninger, 2015, p. 2).

Library Services for those with Disabilities: Additional Steps Needed to Ease Access to Services and Modernize Technology. Report to Congressional Committees. (2016)

Audio Player with Wireless Connectivity

NLS is in the preliminary stages of developing an audio player with wireless connectivity where patrons could download the audio directly from BARD, an approach that it believes would improve services for patrons and potentially reduce overall costs to the federal government (Bertoni, 2016, pp. 24–25). NLS officials said patrons would benefit from a device capable of downloading audio materials directly from the Internet because they would receive content faster than receiving digital cartridges through the mail. As noted above, there are obstacles to the wider use of BARD among NLS's customer base, but an NLS-provided audio player with wireless connectivity could mitigate some of these issues. Specifically, such a device would eliminate the multi-step process now required to download BARD files to a computer and then transfer them onto NLS's audio player. The staff we spoke within 5 of the 8 network libraries commented that downloading audio files directly to an NLS player would be simpler than the current process (2016, pp. 24–25). Also, NLS is considering how it might address another obstacle lack of Internet access by providing not just the audio player but also the required Internet connectivity.[4] At the time of our review, the goal of providing patrons with a device capable of connecting directly to the Internet was included in NLS's draft strategic plan, and NLS officials said they were in the process of hiring a business analyst and project manager to more fully assess the business case for moving forward with this effort. LOC officials told us

[4] NLS has started to examine the costs of its current approach versus supporting wireless delivery for its patrons, and officials believe that wireless delivery may be less expensive than mail delivery through the Free Matter for the Blind and Other Physically Handicapped Persons program. NLS officials estimate that the majority of the cost of the Free Matter for the Blind program is associated with distribution of NLS materials (Bertoni, 2016, pp. 24–25).

they expect NLS to submit a proposal for this initiative to LOC's Information Technology Steering Committee during the fiscal year 2016 (Bertoni, 2016, pp. 24–25).

Library of Congress Fiscal 2020 Budget Justification: Submitted for use of the committees on appropriation. (2019)

Fiscal 2020 Priority Activities

With newly requested funding, NLS will address infrastructure needs necessary to grow the NLS patron base by replacing the current BARD website with a scalable, cloud-based infrastructure to increase the delivery of talking and braille resources (Library of Congress, 2019, p. 140).

(C.) Research Questions that will examine the Policy Perspective

(5) Stakeholders have argued that NLS needs to broaden its patron eligibility criteria and allow people with reading disabilities, such as dyslexia/ reading and writing difficulties to use the service: how will this inclusion affect NLS.

National Library Service for the Blind and Physically Handicapped (NLS) Talking Book and Braille Program Evaluation and Recommendations for Increased Patronage: FINAL REPORT (2013)

Recommendations with Regard to Non-Patrons

The majority of the non-patrons (87 percent) were interested in the Talking Book and Braille Program. Thirty-four percent had never heard of the Talking Book and Braille Program before the survey and an additional 34 percent had heard of it but were unfamiliar with it (National Library Service for the Blind and Physically Handicapped, 2013, p. 62). A key factor in gaining participation among non-patrons is simply increasing awareness about the program.

The following recommendations suggest methods for accomplishing this:

13. Re-brand the organization and program name to be more inclusive of those eligible individuals who are not blind or low vision.

Over 30 percent of the non-patrons qualified for the survey, and therefore program, based on a primary disability other than blindness or low vision. As it currently is represented, the program is geared primarily toward those with blindness or low vision (2013, p. 62). Individuals who qualify based on other disabilities or health conditions may assume they are not eligible for the program. Additionally, they may be unsure of their eligibility based on the somewhat vague eligibility criteria for those who do not qualify as a result of blindness or low vision. The criteria

currently used by NLS are as follows: "unable to comfortably hold a book or turn a page, or have a reading disability because of organic or physical dysfunction." Clarifying this definition, potentially through providing a list of example disabilities or physical conditions that would qualify a person for the program, maybe a necessary first step in making these individuals more aware of the program. One way to re-brand the organization and program to make it more inclusive of all eligible individuals is through targeted outreach to service providers and organizations that do not primarily serve the blind and low vision communities (2013, p. 62).

Information Equality for Individuals with Disabilities: Does It Exist? (2013)

Years before the ADA, the National Library Service for the Blind and Physically Handicapped ensured that at least one specialized library in each state would provide Braille and audiobooks, magazines, and other information to individuals who were blind or had low vision or who had physical or reading disabilities that prevented them from using standard print materials. In Maryland, LBPH is the NLS library (Lewis, 2013, p. 229).

But what about information for the vast numbers of individuals with disabilities who do not qualify for the NLS program? Where do they go for help in accessing the enormous amount of information that others take for granted for education, careers, or recreational needs? Are non-NLS libraries providing services and programs to individuals with disabilities? (2013, p. 230).

In the past many individuals with disabilities relied on alternative format collections for their information and their educational and leisure reading needs or else they relied on readers. However, the vast collections of public and academic libraries were virtually unavailable for their independent use. Cultural and educational library programs, such as book clubs or ones that focused on poetry, music, or art, generally were not inclusive or not ones in which they could take part in a meaningful way. Youth services, collections, and programming were not designed for inclusion. Youth programs often focused on visual materials or games requiring visual cues (2013, p. 230).

Today disabled individuals have higher expectations, and we live at a time when we can meet these expectations. Remarkable advances in technology have made it possible for individuals with disabilities to independently access the information they want and need. Individuals with disabilities have always wanted the same access to information that their family

members and friends have at libraries. Now, because of adaptive technology, the Internet, and e-books, they know they can get more from our libraries. Individuals with disabilities are hungry for more information, and they deserve to get it (2013, p. 230).

The NLS libraries are still critical because they are federally funded to provide a costly specialized service not possible for local libraries along with the highly specialized staff. However, today technology can ensure that patrons with disabilities also can access information through their local libraries, either to supplement or to replace materials provided by NLS, other agencies, and specialized libraries (2013, p. 230).

Survey of Librarians Serving the Disabled: Is the Digital Talking Book Program Meeting Librarians and Patrons Expectation (2014)

What changes would like to add to the Digital Talking Book Program?

Text Responses:

Make it easier for students with learning disabilities to enroll in the program. Various network librarians have been asking the Library of Congress to reexamine the certification requirements for reading disability since it is the only qualifying disability that calls for a medical doctor's signature or doctor of osteopathy's signature (Rose, 2014). The term "reading disability" is vague in that it encompasses more than dyslexia (now an outdated term). Also, at one time it was more common for families to have health insurance coverage and pedestrians, but today too many readers no longer have that luxury and cannot afford a doctor's visit for certification. We have worked with schools for decades and have been told repeatedly that school psychologists' diagnosis reading disability. I wish the Library of Congress could become more mainstream in its certification requirements for reading disability (Rose, 2014).

Clarify rules for usage by persons with reading disabilities. Clarify language that defines reading disability to language that matches current medical science. Allow Reading Coaches and School Psychologists to approve students for the program. EVEN if it means amending the current law. The language under which our program operates is uninterpretable and unreasonable given the way that reading disability is identified and remedied in public schools. Furthermore, the accessible media programs that serve K-!2 and postsecondary education rely strictly on the Chafee Amendment and use a more liberal means of determining eligibility. We should seek to develop consistency in our program with that of the Accessible Media programs so that resources are not unnecessarily duplicated (Rose, 2014).

Library Services for those with Disabilities: Additional Steps Needed to Ease Access to Services and Modernize Technology. Report to Congressional Committees. (2016)

Eligibility Requirement May Limit Access of Potential Users with Reading Disabilities.

While NLS serves individuals with a range of disabilities, an eligibility requirement specific to individuals with reading disabilities may hinder this group of potentially eligible patrons from accessing services (Bertoni, 2016, p. 12) Specifically, the regulatory requirement that only doctors of medicine may certify a reading disability was cited as a barrier to services by staff with whom we spoke at 5 of the 8 network libraries, 2 organizations that provide similar services to NLS, and 2 organizations specializing in learning disabilities (See 36 C.F.R. § 701.6(b)(2)(ii))) (Government Printing Office, 2005). This eligibility requirement, which originated in 1974 and has remained largely unchanged since, creates additional steps and costs for applicants with reading disabilities in comparison to other groups, and may hinder some individuals' access to services. For example, officials we spoke with from a network library said that many of their potential patrons have little money and live in rural areas that are far from doctors, which limits their ability to get the necessary certification (Bertoni, 2016, p. 12).

Furthermore, a medical diagnosis is not necessary to determine if an individual has a reading disability, according to several groups we interviewed and the policies of other organizations that support people with these disabilities. According to the staff we spoke with at two organizations specializing in learning disabilities, and 6 of the 8 network libraries, special education teachers and school staff are typically also knowledgeable about reading disabilities (Bertoni, 2016, p. 12). Recognizing this, certification of reading disabilities is conducted by non-medical personnel for other disability services. For example, under IDEA educational services are provided to eligible children with disabilities, including learning disabilities, which may affect their reading. However, IDEA does not require a doctor's certification of eligibility; this determination is instead made by the child's parents and a special education team generally comprised of the child's teacher and at least one other person qualified to conduct diagnostic examinations of children, such as a school psychologist or remedial reading teacher. Also, two private organizations that, similar to NLS, provide individuals with alternatives to standard print materials, use LOC regulations as guidance to determine the eligibility of individuals with disabilities except for reading disabilities. These organizations instead allow individuals who

are deemed competent authorities for the other LOC eligibility categories by the organizations to certify for reading disabilities (Bertoni, 2016, p. 12).

Although the eligibility requirement for those with reading disabilities may be inconsistent with other federal policies and with some entities' current practices, and potentially hinder access to services, NLS does not plan any modifications (2016, p. 13). Network libraries have formally recommended to NLS that it re-visit the requirement that a doctor certifies the eligibility of those with reading disabilities. This is also consistent with our previous recommendations that agencies providing disability benefits and services should ensure they use up-to-date medical criteria, which reflect advances in medicine and technology and include consideration of non- medical evidence (Government Accountability Office, 2015). NLS officials said that changing the eligibility requirement for reading disabilities may lead to more patrons and increased costs. Two other organizations that provide similar services saw an increase in the number of patrons after they changed their certification requirements so non-medical personnel could certify eligibility. NLS has not estimated the potential demand for its services by those with reading disabilities, and so the actual effect on NLS services from revising the eligibility requirement is unknown (Bertoni, 2016, p. 13).

Appendix III: Accessible Data

Certification of Persons with Reading Disabilities

NLS serves people with reading disabilities, as noted in the report. However, to comply with N LS's enacting legislation, which specifically states that the service is "for the use of the blind and other physically handicapped residents of the United States," the regulation at 36 C.F.R. 701 .6 addresses reading disabilities in the context of organic dysfunction. NLS's informational material explains: "The following groups of individuals are not automatically eligible: those who have learning disabilities, dyslexia, attention deficit disorder, attention deficit- hyperactivity disorder, chronic fatigue syndrome, autism, functional illiteracy, or developmental disabilities, unless accompanied by a specific visual or physical disability." See http://www.loc.gov/ n ls/reference / guides/ read ingdisabilities.html. Under 36 C.F.R. 7016, a doctor of medicine must certify organic dysfunction (Bertoni, 2016, p. 37).

Since the 1970s, when 36 C.F.R. 701 .6 was promulgated, social and scientific thinking has changed regarding the causation and diagnosis of learning disabilities. The Library, therefore, agrees that it is sensible to reexamine and potentially revise the requirement that

medical doctors must certify eligibility for N LS's program for those with a reading disability caused by organic dysfunction, to authorize other qualified persons to make such certification (2016, p. 37)

Currently, approximately six percent of NLS patrons are certified by medical professionals as having an organically-based reading disability. NLS anticipates that broadening the types of people \who are deemed qualified to certify eligibility will lead to relaxed standards for what constitutes "organic dysfunction," and NLS has not officially predicted the increase to NLS readership that may result. However, it does seem clear that aside from NLS, stakeholders affected by this change would include current NLS patrons, people with reading disabilities, network libraries, and publishers (2016, p. 37).

A preliminary survey of libraries in Europe serving individuals with print disabilities indicates that those who serve people with reading disabilities such as dyslexia report that from 30-65 percent of their patron base have reading disabilities. Bookshare and Learning Ally, which serve this population in the United States without requiring medical certification, report that 75-80 percent of their respective patrons are served based on reading disabilities. Such figures would indicate the potential to triple or quadruple the number of people served by NLS (2016, p. 37). Even if this number only doubled, NLS as it stands today would not have the equipment, books, or infrastructure capacities to accommodate the needs of the expanded readership. Additional resources would be required at the national, state, and local levels to accommodate such an influx (2016, p. 38).

(6)Do stakeholders believe that NLS and its network libraries fulfill its mission statement and the Right to Read utilizing its current technology and services?

The answers to RQ6 argue that stakeholders believe that NLS and its network libraries fulfill its mission statement and the Right to Read by utilizing the Digital Talking Book Player?

"*That All May Read) …Talking Books for the Blind and Physically Handicapped (2005)*

The End of Talking Books? (Jim Scheppke)

For seventy-three years, a network of state libraries, public libraries, and other agencies have partnered with NLS to bring public library services to blind and print-disabled Americans. But today, participation in the program is falling because of the outmoded audiobook technology that no longer appeals to many potential patrons of the service (Auld, 2005, p. 69).

The United States is years behind the rest of the world in transitioning from antiquated cassette talking books to digital talking books. As a result, it is becoming harder and harder to sign up for new patrons to use the cassette talking books. "Don't you have books on CDs?" is the question my staff is asked again and again. The answer, sad to say, is that NLS will not provide us with digital talking books until 2008 (2005, p. 69).

Alternatives for Future Operations of the Books for the Blind Program Final Draft Report (2010)

Section 7 - Future Alternatives by Major Program Function and Planning Horizon

Summarized below are possible alternatives for future operations for the different major functions of the Books for the Blind Program that were described in Section 2 for current operations. As noted in Section 1, these are undoubtedly a subset of all the possible alternatives and others almost certainly exist (Ducrest Associates, 2010, p. 31).

7.1 Program Content

Short term: NLS continues producing current program content but performs the evaluations suggested in Sections 4.1 and 4.3 to ascertain program user broadband Internet resources and use of alternative reading sources and public library plans, respectively. NLS will also monitor developments with commercial audiobook producers and will consider whether or not to seek legislative change regarding production copyright (Ducrest Associates, 2010, p. 31).

Medium-term: Depending upon the outcomes of the evaluations suggested in Sections 4.1 and 4.3, NLS (1) continues producing largely current program content, or (2) changes the conditions for some of the audiobook characteristics. It could be that commercial titles are used more extensively by NLS, or the current production mix may prevail. NLS will also monitor, via program user input, if program patrons are directly obtaining audiobooks from retailers and/or public libraries and at what cost; if NLS determines that all or most patrons are obtaining certain content from other sources, then it will likely not duplicate that content (Ducrest Associates, 2010, p. 31).

Long-term: The mix of program content provided by NLS is likely to vary somewhat from current operations, however, this degree is uncertain. Some content now being produced by NLS may be available at little or no cost from other sources (commercial sources and/or public libraries), but only time will tell. It is likely that synthesized speech may improve significantly by this time and that some materials produced by NLS may use this technology, and

it is also possible that more commercial works will become unabridged (Ducrest Associates, 2010, p. 31).

Improving Services for Patrons with Print Disabilities at Public Libraries (2015)

In the past, public libraries acquired primarily print resources for the general public. These print resources, such as books and magazines, were inherently inaccessible for people with print-related disabilities (Lazar & Briggs, 2015, p. 172). Print-related disabilities include the inability to see print, process print, or physically handle print. People with print-related disabilities were often referred to as the State Library for the Blind and Physically Handicapped. However, over time, the nature of materials acquisitions at public libraries has changed. A large percentage of materials acquired by public libraries are now in digital formats, such as e-books, subscription access to article databases, and CDs and DVDs. These digital materials create an opportunity for public libraries to start providing services to people with print disabilities (2015, p. 172).

However, public libraries now acquire much of their resources in digital format, including e-books and digital libraries available through the Internet (2015, p. 174). This offers an opportunity for the local public library branch to serve patrons who are blind or who have low vision. This is not meant to say that public libraries will ever replace LBPHs, as it is not likely that public libraries will ever have the full staff expertise on the topic or the specialized materials (e.g., materials in Braille or tactile format) that an LBPH will have (2015, p. 174). Furthermore, for some individuals with disabilities, transportation is a challenge, and the distribution system maintained by the LBPH is unlikely to be replicated at the local public library. However, since materials are being purchased in digital format, this should be viewed as an opportunity to require that the materials purchased are accessible, allowing a public library to have some materials to serve blind and low-vision patrons at the local branch and online (2015, p. 174). Up to this point, most public libraries have made no effort to serve blind patrons, instead referring them to the LBPH. This new opportunity should be viewed as complementary to the LBPH, not a replacement.

The answers to RQ6 argue that stakeholders believe that NLS and its network libraries were or were <u>not</u> fulfill its mission statement and the Right to Read by utilizing Digital Talking Book Player.

Serving Blind Readers in a Digital Age

In the future system, many aspects of machine operations will remain the same, including distribution of machines from manufacturers to network libraries; allocation of production based upon readership; storage, lending, and control of machines by network libraries; and management and procurement of repair parts by NLS. However, several aspects of machine operations will improve, thanks to better reliability: lower failure and repair rates, lower disposal rates, fewer repair costs, and relatively less reliance on volunteer repair (J. M. Taylor, 2004, p. 51).

Libraries for the Blind and Blind and Physically Handicapped Collaboration Study, Macomb County, Mideastern Talking Book Center, Oakland County LVPH: Final Report. (2008)

The new NLS digital media player, which will become available over the next few years, will (Rujan & Andrysiak, 2008, p. 23). The provided at no cost to patrons. This will be an improvement over the current talking book machines in providing patrons access to digital audiobooks. This technology, which has not yet been sent to patrons, maybe already outdated when compared to private industry media readers designed for the blind in accessing other available online media sources not available through NLS. These private industry readers, however, come at a cost to patrons, unlike the NLS player (2008, p. 23).

Currently, handheld devices (similar to MP3 players and the like) exist which can download over 10,000 titles through NLS. These devices can also access various media sources (some free, some for a fee) in addition to NLS. The Library of Congress is in the process of digitizing all new titles and a portion of the past collection which will be ultimately accessible via this technology (2008, p. 23).

The answers to RQ6 argue that stakeholders believe that NLS were or were <u>not</u> fulfill its mission statement and the Right to Read by utilizing current technologies and services.

NLS Patron Survey Final Report (2003)

Canceling the service

There will need to be at least two different information campaigns, and possibly three (Nelson, 2003, p. 31). One information campaign needs to pique the interest of technologically savvy subscribers who are already interested in features like word spelling and navigational aids. Such features will not appeal, however, to subscribers who like their machine just the way it is (2003, p. 31). Information about important similarities between the old and new devices, such as ease of use or labeling, might appeal to this group; so, might information about features that would be attractive to owners of any playback device (e.g., good sound quality, an auto-off function, or reductions in size or weight). This second type of information campaign might be more effective in counteracting indifference to the new equipment than in overcoming active resistance, especially among subscribers who are inclined to be suspicious or fearful of technology. These subscribers might need the most time to adjust to the idea of the new equipment; repeated preparation that begins well in advance of the equipment's actual release might soften resistance over time (Nelson, 2003, p. 31).

National Library Service for the Blind and Physically Handicapped (NLS) Talking Book and Braille Program Evaluation and Recommendations for Increased Patronage: FINAL REPORT (2013)

IV. Recommendations

The 2013 Patron and Demographic Survey were designed to provide NLS with pertinent information on awareness of, usage of, and satisfaction with the Talking Book and Braille Program to enable the organization to make important decisions that will help guide future NLS policies concerning retaining current patrons and recruiting new patrons (2013, p. 58). This section presents several general recommendations, followed by a series of recommendations to address each of the three populations examined. These recommendations build on the findings presented in Chapter III and are designed to 1) increase the usage by and satisfaction of current patrons, 2) regain the interest and patronage of former patrons, and 3) gain participation from non-patrons (2013, p. 58).

General Recommendations

The following are general recommendations that are applicable to all respondent populations:

2. Consider developing a social media presence for the NLS organization.

Large proportions of non-patrons and former patrons who completed the survey use social media (2013, p. 58). For example, 64 percent of non-patrons and 59 percent of former patrons use Facebook. Also, 16 percent of non-patrons learned about the survey through an organization's social media page. This may be an effective means of promoting the Talking Book and Braille Program, particularly BARD, within the highly connected blind community, as well as among those who qualify for the program based on criteria other than blindness or low vision (2013, p. 58). The sampling strategies for the non-patrons involved using the social media outlets of partner organizations, and several of the regional libraries, to recruit survey participants. While this was effective, developing social media pages dedicated to NLS would be a more sustainable approach and would allow for a more flexible distribution of information (National Library Service for the Blind and Physically Handicapped, 2013, p. 58).

LEGISLATIVE BRANCH APPROPRIATIONS BILL, 2016 (2014)

BOOKS FOR THE BLIND AND PHYSICALLY HANDICAPPED

The Committee recognizes the importance of technology in ensuring that blind and physically handicapped United States residents and citizens are afforded access to reading material promptly (House of Representatives, 2014, pp. 17–18). To preserve the National Library Service for the Blind and Physically Handicapped today and ensure it is prepared to meet the needs of future generations, the Committee directs the Government Accountability Office (GAO) to review the services provided by the National Library. This review should include but is not limited to, a review of the NLS's user base, a comparison of services and playback equipment offered by the NLS to private sector services and technologies currently used by the blind and physically handicapped community, to include an evaluation of possible cost efficiencies in utilizing private sector technologies, availability of alternate distribution methods and other aspects of the NLS's services that the GAO deems relevant (House of Representatives, 2014, pp. 17–18). The GAO is to prepare a report of its findings and report back to the

Committee on Appropriations of the House and Senate no later than December 31, 2015. The report was published as *Library Services for those with Disabilities: Additional Steps Needed to Ease Access to Services and Modernize Technology Report to Congressional Committees* (Bertoni, 2016).

The answers to RQ6 argue that stakeholders believe that NLS were or were <u>not</u> fulfill its mission statement and the Right to Read by utilizing local NLS/LBPD libraries.

US National Accessibility Survey: Librarians Serving Patrons With Disabilities. (2009)

NLS/BPH Services

Seven questions were posed to garner professional librarians' perspectives on the NLS/BPH services (Bonnici et al., 2009, pp. 518–519). Questions addressed general strengths and weaknesses, concerns, and desires of the services as well as confidence in the emerging digital Talking Book initiative. Responses to the major strength of the service were collected in an open-ended format allowing for inductive analysis of responses to assure that a comprehensive view was provided. Four categories were extracted from the response: accessibility of materials (collection), quality of service, demand for service, and staff. The majority of the comments referred to the quality of the service provided (2009, pp. 518–519).

Responses included references to the ease of use of the mail delivery system for homebound clients and the personalized, free nature of the service (2009, p. 519). Numerous responses indicated that the accessibility of quality reading materials, including classics as well as new releases, was similar to the access provided to registered patrons of public libraries. The remaining responses mentioned the growing need for the service as the US population ages, as well as the dedication of the staff and volunteers who provide the service of the NLS/BPH. In sum, library professionals serving special needs populations highly value the accessibility of the service they provide (2009, p. 519).

The survey queried for weaknesses in the NLS/BPH service with responses collected through an open-ended question. Four categories were extracted from the responses provided: service, technology, funding, and staff. Most of the responses contained information about the quality of the service related to timeliness of materials and the limited selection available compared to non-BPH materials provided to the general population through public libraries (2009, p. 519). Nearly the same amount of concern was expressed regarding equipment that lagged behind the information and communications technology market. Several responses

specifically mentioned the prevalence of the use of the analog format to distribute Talking Books. Despite the rollout of the digital service, there is concern that the service will not be comprehensive enough to meet the demand. Several respondents expressed concern that the new digital players still appear cumbersome when compared to iPods and that this is not appealing to young patrons of the NLS/BPH service (2009, p. 519). Related to the lack of current technologies is the lack of funding for the service. Not only is this an impediment to updating the technology and services of the NLS/BPH, but it also restricts the flow of funds to employ staff to meet the level of current demand for services to special populations. Related to the question of perceived weakness is question 11, seeking input on the primary concern as it relates to services to the BPH population. Primary concerns reflect the four categories expressed for identified weaknesses. Specific concerns within the four categories included funding based on impending budget cuts to libraries at all governmental levels. Funding cuts will impact the delivery of service, outreach efforts, staffing, and updating of technologies for the provision of information in an accessible format for registered patrons (Bonnici et al., 2009, p. 519).

The final question relating to service solicited responses on what the respondents would like to see most in the development of NLS/BPH services over the next decade. Again, the same categories surfaced as themes: technology and outreach. Access to updated technologies for the delivery of materials was the most frequently expressed desire for the coming decade (2009, p. 519). Included in the comments is the need for Described Video, which would provide access to currently released movies. In addition to materials, the ease or user-friendliness of player technologies was expressed by several respondents. Specific desires for increased services include the provision of materials beyond the English language format. Inclusion of NLS/BPH patrons in library programming, such as book discussions, through online, radio, and teleconference media to break the barrier of isolation would move service to a more equitable level (2009, p. 519). Internet access with assistive technology software provided to all registered patrons would expand outreach. Dovetailing the internet access issue is the need for the development of a national circulation system that would allow the sharing of bibliographic information and serve as the basis for an interlibrary loan program among NLS/BPH participating agencies (2009, p. 519)

To sum up, the professional perspective is that there is strong potential for technologies and the internet to break down the information access divide, as long as libraries commit to

providing access to patrons through assistive technologies (Bonnici et al., 2009, p. 520). There is a keen awareness among library professionals providing NLS/BPH access that sufficient funding for libraries to provide technology and promote a universal access philosophy is critical to success.

Information Equality for Individuals with Disabilities (2013)

It is particularly effective if the training is taught by individuals with disabilities, either patrons or fellow staff members (Lewis, 2013, p. 237). In Maryland, LBPH staff members with disabilities offer training classes for local staff in adaptive technologies, accessible e-readers, accessible websites, and accessible textbooks. In addition to local staff getting used to working with staff members with disabilities, these sessions can point to difficulties faced by disabled staff and patrons. For example, at a recent training class that included LBPH staff, the software chosen for participant communication was not accessible to the blind trainers (2013, p. 237).

The same community outreach and education training conducted by librarians at retirement communities, schools, and community agencies or organizations that is so important in showing the community what is available at our libraries is also critical for library staff. Speaking to small groups of patrons, often in informal settings, will help staff get to know the people they want to serve and increase their comfort level in doing so (2013, p. 237). Again, the goal should be that all staff members attain a level of comfort in dealing with diverse populations so all are ready to help whoever walks into the library. Staff members should know the resources in their communities and keep in touch with experts in the field by following their websites and through social networking sites. They should attend events at associations and organizations in the community, such as an open house or a health fair (Lewis, 2013, p. 237).

If a library has adaptive equipment, it should be in working order and staffs need to know how to use it. LBPH is a resource for training staff in this area (2013, p. 237). Individuals with disabilities should be included on the local library or trustee board and advisory committees. One Maryland library system created a diversity task force that includes service to individuals with disabilities. The task force is instrumental in developing inclusive programming and programming for seniors. This same system has an advisory committee made up of individuals with disabilities (Lewis, 2013, p. 237).

Second national accessibility survey: librarians, patrons, and disabilities

NLS/BPH Services

With reported decreases in registered clientele, active patrons, and perceptions of decreased support from administrators, the researchers were curious as to how perspectives of professionals serving in NLS/BPH facilities have changed over the past six years (Bonnici et al., 2015, p. 509). Nine questions were posed to garner professional librarians' perspectives on the NLS/BPH services. Questions addressed general strengths and weaknesses, concerns and desires of the services, the status of and confidence in the emerging digital Talking Book initiative as well as information about the impacts of facility closings. Responses to the major strength and major weaknesses of the service were collected in an open-ended format allowing for inductive analysis of responses to ensure a comprehensive view was provided. Four categories were extracted from the response regarding strengths: accessibility of materials (collection), quality of service, demand for service, and staff. The majority of the comments referred to the quality of the service reflecting the same opinion as to the 2008 study participants (2015, p. 509). Responses included references to the digitization of audio materials and increasing the availability of materials in shorter delivery times. Also new this year were comments regarding the "free" service? Responses reveal there has been a major loss of confidence in the USA Postal Service (USPS) in delivering materials promptly. USPS Congressional Reports do not document an overall trend of increased time to delivery for the years 2010-2014. However, the reports indicate the USPS is concerned with processes that ensure customer satisfaction with services, including delivery times (United States Postal Service 2014). Opinions reported regarding the accessibility of the service and staff expertise have not differed since 2008. Although respondents in 2008 predicted a growing need for the service as the US population ages, data on clientele in the above section do not reflect positively on the prediction (2015, p. 509). Current data do not predict an increase in demand in the data reporting on the perceived strengths of the service. Rather, decreases in demand are reflected and correlated with the reported lack of both awareness and advocacy regarding NLS/BPH.

Four categories were extracted from the responses provided about perceived weaknesses of the service: service, technology, funding, staff, and awareness of the service (2015, p. 509). Most of the responses contained information about a lack of awareness impacting demand for service. Respondents' comments revealed pleas for advocacy efforts at the national level to make patrons nationwide aware of the materials available for persons with different abilities. A

close second in comments addressing weakness related to the quality of the service negatively reflected in issues of timeliness of delivery of materials (2015, p. 509). A plethora of respondents voiced frustration with materials being delayed through the USPS. There is a decrease in reported concern regarding equipment that lagged behind the ICT market. The researchers postulate this may be due to a combination of events over the past six years, including the increase of the accessibility features of mainstream technologies such as websites (Maatta Smith, 2014) and e-readers (Maatta et al., 2014) as well as the deployment of the new media players distributed by the NLS. However, some challenges were expressed regarding decreases in budget impacting technology availability. Despite the rollout of the digital service, there is an ongoing concern that the service will not be comprehensive enough to meet the demand. Several respondents expressed frustration that the service still lacks in the use of wireless technology to facilitate access to materials by clients using the service. Respondents continue to associate the lack of current technologies to the lack of funding for the service (Bonnici et al., 2015, p. 509).

Respondents were queried again as to what they would like to see most in the development of NLS/BPH services over the next decade (2015, p. 510). The same categories as expressed in 2008 surfaced as themes: technology and outreach. Access to updated technologies for delivery of materials was the most frequently expressed desire for the coming decade, mainly reflected in the use of wireless technology for client access to materials as well as the integration of mainstream technologies such as tablet devices and smartphones as devices to access NLS/BPH materials (2015, p. 510). Included in the comments is the need for simple interfaces and usable, portable devices that are intuitive to the clientele, who predominantly represent the visually impaired category. Specific desires for increased services include expanding materials beyond popular reading materials to also include textbooks for children. This correlates with the increase in the report of registered patrons in the >0-10 years of age category. Reflecting the need for more technology-facilitated access is the expressed need for a knowledgeable staff capable of working with existing technologies while also being able to innovate out-of-the-box strategies for providing access to clients wishing to use mainstream technologies (Bonnici et al., 2015, p. 510).

APPENDIX D

THE 2014 SURVEY QUESTIONNAIRE

If you agree to participate, please answer YES to begin the survey. If you do not agree to participate, please answer NO and you will be exited from the survey

Yes (1)

No (2)

If No Is Selected, Then Skip to End of Survey

Questions about Digital Talking Book Players and Digital Talking Book Program

Are you satisfied with Digital Talking Book Program?

Very Dissatisfied (1)

Dissatisfied (2)

Somewhat Dissatisfied (3)

Neutral (4)

Somewhat Satisfied (5)

Satisfied (6)

Very Satisfied (7)

Are you satisfied with the Digital Talking Book Player?

Very Dissatisfied (1)

Dissatisfied (2)

Somewhat Dissatisfied (3)

Neutral (4)

Somewhat Satisfied (5)

Satisfied (6)

Very Satisfied (7)

What is the single major feature you like about the Digital Talking Book Players?

What is the single major feature you do not like about the Digital Talking Book Players?

If NLS was to update or upgrade the Digital Talking Book Players, what features or options you like to add.

What changes would like to add to the Digital Talking Book Program?

What age groups do you feel that likes or use the Digital Talking Book Player the most?

1 to 8 years (1)
9 to 14 years (2)
15 to 24 years (3)
25 to 34 years (4)
35 to 44 years (5)
45 to 54 years (6)
55 to 64 years (7)
65 to 74 years (8)
75 to 100+ years (9)

What age group do you feel that does not like or does not use the Digital Talking Book Player the least?

1 to 8 years (1)
9 to 14 years (2)
15 to 24 years (3)
25 to 34 years (4)
35 to 44 years (5)
45 to 54 years (6)
55 to 64 years (7)
65 to 74 years (8)
75 to 100+ years (9)

The following questions relate to patrons using your library's services.

How many patrons are registered with the library?

How many of your library patrons are currently active?

In order to a better understanding of the patrons that use your library, I would like to know more about your patron's background.

What do you estimate to be the age of your oldest patron?

What do you estimate to be the age of your youngest patron?

What state does your library serve?

Alabama (1)

Alaska (2)

Arizona (3)

Arkansas (4)

California (5)

Colorado (6)

Connecticut (7)

Delaware (8)

District of Columbia (9)

Florida (10)

Georgia (11)

Hawaii (12)

Idaho (13)

Illinois (14)

Indiana (15)

Iowa (16)

Kansas (17)

Kentucky (18)

Louisiana (19)

Maine (20)

Maryland (21)

Massachusetts (22)

Michigan (23)

Minnesota (24)

Mississippi (25)

Missouri (26)

Montana (27)

Nebraska (28)

Nevada (29)

New Hampshire (30)

New Jersey (31)
New Mexico (32)
New York (33)
North Carolina (34)
North Dakota (35)
Ohio (36)
Oklahoma (37)
Oregon (38)
Pennsylvania (39)
Puerto Rico (40)
Rhode Island (41)
South Carolina (42)
South Dakota (43)
Tennessee (44)
Texas (45)
Utah (46)
Vermont (47)
Virginia (48)
Washington (49)
West Virginia (50)
Wisconsin (51)
Wyoming (52)

Considering the total number of patrons that your library serves, what percent of your patrons live in: (The total for all combined communities should equal 100%. Respond using numeric characters without % sign)

_____ Rural communities (1)
_____ Suburban communities (2)
_____ Urban Communities (3)

The following questions will ask your opinions about your patrons' use of Assistive and Adaptive Technologies

Based on you and your staffs' experiences and observations are patrons satisfied with the current Assistive and Adaptive Technologies available?

Very Dissatisfied (1)

Dissatisfied (2)

Somewhat Dissatisfied (3)

Neutral (4)

Somewhat Satisfied (5)

Satisfied (6)

Very Satisfied (7)

If they are satisfied, please check the reasons why your patrons would buy these devices:

	Strongly Disagree (1)	Disagree (2)	Neither Agree nor Disagree (3)	Agree (4)	Strongly Agree (5)
Ease of use (1)					
Cost of the device (2)					
Availability for purchase (3)					
Availability to be played on the device (4)					
The vendor (5)					
Other (6)					

Do you feel the costs of these devices are hindering their use by patrons?

Yes (1)

No (2)

Do your patrons use any of these devices or technologies?

Fully Functional Screen Readers (Cobra, Jaws, NVDA, etc.) (1)

Additional Screen Readers (Dolphin Guide and Dolphin Guide Hands-Free, J-Say Pro, Thunder) (2)

Screen Readers and Assistive Technology Software for Mobile Devices (Braille Back, Google Talkback, Mobile Speak, and Siri) (3)

Screen Magnifiers with Screen Reading Capabilities (Magic, Super Nova, and Zoom Text) (4)

Voice Recognition Software (5)

Optical Character Recognition Scanning Software (6)

Reading Software for Educational Needs (7)

Reading Machines and Scanners (8)

Tablet Computers (Apple IPad, Amazon Kindle, etc.) (9)

Other (10) _____

Based on your observations and expertise what are the most popular subjects that are mailed to or downloaded by your patrons? Please list about three:

NLS said in its report to Congress last year that 15% of NLS patrons use BARD or download books. Please share your opinions about this statement.

NLS stated in its Fiscal 2013 and 2014 Budget Justifications to Congress that NLS wants to explore the delivery of audiobooks directly to the player via the Internet. Please share your perspective as to how this will affect the operations or services at your library.

The following questions will ask your opinions about your patrons how past and recent budget cuts have affected your library

Have federal, state, and local budget issues during the 2000s affected your library?

Was your library been forced to cut hours? (1)
Was your library been forced to cut or reduce services to patrons? (2)
Was your library forced to decrease outreach programs to patrons or the public? (3)
Was your library forced to cut spending? (4)
Was your library forced to cut staff or layoff staff? (5)
Was your library forced to cut staff hours? (6)
Other (7) _____

Alternatively, has your library's budget recovered?

Has your library restored or increased services to levels before the budget cuts? (1)
Has your library kept services at the same levels after the budget cuts? (2)
Has your library increase outreach with the public or patrons? (3)
Has your library increased spending? (4)
Has your library rehired laid off staff or hired new staff? (5)
Have your library hours increased? (6)
Have your library hours kept the same hours? (7)
Has your library increase staff? (8)
Other (9) _____

Does your library have done local recordings of books, etc. of local, regional, and state materials? If yes, answer the next questions.

Yes (1)
No (2)

Does your library have done local recordings programs have these features: Please choose as many chooses that apply to your program?

Is the studio located within the library? (1)
Do run the program with volunteers only? (2)
Do run the program with volunteers and staff? (3)
Does your library record books etc. for patrons? (4)
Does your program record materials using volunteer narrators? (5)
Does your program record materials using volunteer and staff narrators? (6)
Does your library record materials based on your collection development policy? (7)
Does your library record books in a foreign language? (8)
Does your library solicit funds to run and maintain the program? (9)
Are you planning to shut down or outsource the program? (10)
Other (11) _____

How many books does your library record in a year?

Does your library plan to convert older or books recorded in the analog format? Please explain your reasons for converting or not converting these books into the digital format.

If you want to discuss the features and the reasons why your library records local materials, please explain below:

APPENDIX E

THE IRB APPROVAL LETTER FOR THE 2014 SURVEY

A PDF copy of the IRB Approval Letter for the 2014 Survey can be found on a page after the Bibliography.

STATUTES

The Act to Promote the Education of the Blind 1879
Americans with Disabilities Act, Title II, 42 U.S.C. § 12131, et seq.
Americans with Disabilities Act, Title IV, 47 U.S.C. § 225
Assistive Technology Act of 1998, 20 U.S.C. § 1401 (1)
Chafee Amendment 17 U.S.C. § 121
Individuals with Disabilities Education and Improvement Act, 20 U.S.C. § 1400 (c) (5) (H)
Improving Access to Assistive Technology for Individuals with Disabilities Act, 20 U.S.C. § 1400 et seq.

Library of Congress Technical Corrections Act of 2019, Public Law No: 116-94.
Marrakesh Treaty to Facilitate Access to Published Works for Persons Who Are Blind, Visually Impaired or Otherwise Print Disabled

Marrakesh Treaty Implementation Act, Public Law 115–261, OCT. 9, 2018, 132 STAT. 3667, 17 U.S.C. § 121, et seq.

Pratt-Smoot Act, Public Law 89-522, 2 U.S.C. § 135a – 135b
Rehabilitation Act of 1973, Section 504, 29 U.S.C. § 794, et seq.
Rehabilitation Act of 1973, Section 508, 29 U.S.C. § 794d
The Tech Act of 1988 or the Technology-Related Assistance for Individuals with Disabilities Act of 1988, 29 USC § 3001 et seq.

Telecommunication Act of 1996, 47 U.S.C. § 254(e))

REGULATIONS

National Library Service for the Blind and Print Disabled (NLS) -Library of Congress Government Printing Office. 36 C.F.R. § 701.6(b)(2)(ii).

Amendments Regarding International Service, Loans of library materials for blind and other physically handicapped persons, 36 CFR, § 701.6, (h)

TREATIES

International Covenant on Economic, Social and Cultural Rights, open for signatures 16 December 1966, 993 UNTS 3 (brought into force on 3 January 1976)

The International National Convention on Civil and Political Rights

Universal Declaration of Human Rights, G.A. res. 217A (III), UN Doc A/810 71 (1948).

UN Convention on the Rights of the Child

United Nations Convention on the Rights of Persons with Disabilities, open for signature 30 March 2007, 993 UNTS 3 (into force on 3 May 2008)

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Office of Research Compliance
Human Studies Program

UNIVERSITY of HAWAI'I® MĀNOA

September 2, 2014

TO: Terence Lionel Rose
Principal Investigator
Communication & Infromation Sciences

FROM: Denise A. Lin-DeShetler, MPH, MA
Director

SUBJECT: CHS #22408- "Survey of Librarians Serving the Disabled: Is the Digital Talking Book Program Meeting Librarians and Patrons Expectations?"

This letter is your record of the Human Studies Program approval of this study as exempt.

On September 2, 2014, the University of Hawai'i (UH) Human Studies Program approved this study as exempt from federal regulations pertaining to the protection of human research participants. The authority for the exemption applicable to your study is documented in the Code of Federal Regulations at 45CFR 46.101(b)(Exempt Category 2).

Exempt studies are subject to the ethical principles articulated in The Belmont Report, found at http://www.hawaii.edu/irb/html/manual/appendices/A/belmont.html.

Exempt studies do not require regular continuing review by the Human Studies Program. However, if you propose to modify your study, you must receive approval from the Human Studies Program prior to implementing any changes. You can submit your proposed changes via email at uhirb@hawaii.edu. (The subject line should read: Exempt Study Modification,) The Human Studies Program may review the exempt status at that time and request an application for approval as non-exempt research.

In order to protect the confidentiality of research participants, we encourage you to destroy private information which can be linked to the identities of individuals as soon as it is reasonable to do so. Signed consent forms, as applicable to your study, should be maintained for at least the duration of your project.

This approval does not expire. However, please notify the Human Studies Program when your study is complete. Upon notification, we will close our files pertaining to your study.

If you have any questions relating to the protection of human research participants, please contact the Human Studies Program at 956-5007 or uhirb@hawaii.edu. We wish you success in carrying out your research project.

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