

Training with the Toolkit

Reuse or Remix

In many ways, the concepts powering the toolkit echo the oral and written traditions around technology support in general. All approaches have their roots somewhere else—and they will go somewhere new in the future as people adapt their actions to the real world and ongoing changes in technology.

Some core elements of the toolkit came from my work as a library technologist—starting with library tech work in the 1990s just as the web was exploding everywhere and libraries were scrambling to learn how to incorporate this new and powerful information tool into services for patrons. The challenge then, as it is now, is that the processes, culture, and details of information technology (IT) structures are not just different from library approaches but can sometimes seem at odds with them. Clearly, libraries need to harness technology to fulfill their missions, so this is a gap worthy of attention.

One cultural element that is identical in libraries and IT is the process of communication and iteration in problem-solving. When I started learning IT on the library job, there was little formal or comprehensive instruction to guide me. Most of what I learned was cobbled together from various buckets of information, including books on technology topics from the library shelves (some quite old); various online sources (including bulletin board systems and early software manuals); and often cryptic and disparate information describing the different yet vitally interconnected technologies, hardware, network components and topologies, operating systems, and software that made up all network stacks.

The glue for me was going beyond the static information and talking to anyone who knew more about this stuff than I did and applying their knowledge to whatever tech challenge I was facing through hands-on practice. Rarely could I simply copy what someone else did, but when I understood the concepts behind, for instance, how a network router manages internal data traffic and communicates with the outside world,

I could apply that knowledge to my situation and have a better chance of solving my problem.

This tried-and-true process of learning and iteration was not only a blueprint for my own work in library technology (and so many others in so many fields and walks of life), but also a key element of the toolkit. The project team designed the toolkit to be as flexible and adaptable as possible with the hope that it would be useful beyond the grant period.

Pre-toolkit Work

Two significant projects that contributed to the foundational elements of the toolkit were performed in my early consulting work.

Colorado Network Assessments

My first attempt to create a standardized approach to assessing real-world data network conditions in libraries and create recommendations for improvements came in 2013, when Sharon Morris of the Colorado State Library contacted me to perform eleven site visits to libraries in rural Colorado. The program was funded by the National Telecommunications and Information Administration's Broadening Technologies Opportunities (BTOP) program.

The site visits followed a standardized method I developed to assess the condition of the library's technology infrastructure and make recommendations for improvements:

- Each participating library was asked to complete an intake survey that helped me understand some basic things about the library's technology environment.
- Prior to each visit, I scheduled a phone call to schedule the site visit, set expectations for the site activities, and assign several easy tasks (including

internet speed tests) prior to the visit.

- The site visit was focused on staff interviews and assessment activities:
 - inspection, assessment, and detailed inventory of the library's internet connection and data area (including taking photographs)
 - on-site speed and quality tests of the library's internet connection
 - assessment of the library's Wi-Fi network (using Wi-Fi stumbler software)
 - a cursory inspection of basic network security
 - creation of a network map (hand-drawn)
 - discussions about the library's technology support
- After the visit, each library received a detailed individual report that included
 - key findings and recommendations for technological improvements
 - a detailed description of the library's technological environment
 - recommendations for broadband connectivity improvement options
 - a library network diagram (professionally drawn)
 - results of all tests (internet speed, quality, Wi-Fi, security, and others)
 - site photographs

This process and the deliverable blueprint provided a powerful foundation for what would be expanded upon and refined in the TGL program.

As well as guiding the creation and testing of a process to quickly assess tech conditions at a library, the effort yielded a key aspect of grant programs that carried through to the TGL pilot: the importance of aligning project outreach with the right participants.

Because Colorado Network Assessments was a first-of-its-kind grant program, participants essentially were allowed to self-select into it through an open application process. While ten of the eleven libraries I visited needed the visit (some quite urgently), I was surprised to discover that one small rural library had a sophisticated network design (enterprise-level hardware and software installed and maintained by a library board member who worked for an international tech company) and was clearly in good shape. The selection of this site for a visit was no fault of the library's (and the library staff were quite relieved to know that they were doing fine technologically), but it taught the program managers an important lesson for the future for making the best use of project resources when the relatively expensive and time-intensive process of site visits is involved.

You Can Do I.T. (Texas State Libraries and Archives Commission)

An opportunity to teach rural librarians in Texas the ins and outs of technology also contributed significantly to the toolkit approach. In some ways, it also gave the project team confidence that nontechnical staff were only a few simple moves away from taking control of their technological destiny.

In 2014, the Texas State Libraries and Archives Commission (TSLAC) posted a request for proposals for a training program with a seemingly audacious goal: teach lay people in libraries enough about hardware and software to address technology support gaps in the state. I had been a consultant for only a few years, and with a small office the arduous task of responding to a formal RFP was a little overwhelming. But the goal spoke to my values and mission as a consultant, and luckily, I was awarded the contract.

TSLAC E-rate coordinator Henry Stokes created the concept and identified the desired outcomes for the program (and the program logo, seen in figure 4.1), and the RFP was asking for a teacher who could create and deliver the curriculum to students gathered in central locations throughout Texas, with a focus on hands-on experiential learning. In the second year of training, Digital Inclusion Consultant Cindy Fisher supported the program by joining site visits for training and to provide feedback and inspiration for further curriculum development.

The first class, focused on network technologies, was indeed a success and spawned a second year and Texas tour focusing on the essential of hardware, software, and security. Table 4.1 shows the curriculum from both classes, and keen eyes will spot some parallels between the You Can Do I.T. curriculum and some content in the TGL toolkit.

Now anyone can access the resources created for the classes, offered as a free online curriculum on the TSLAC website.¹

As well as incorporating this field-tested content into the TGL toolkit, I have taken and adapted the You Can Do I.T. curriculum and provided live, hands-on interactive training for libraries in Arizona and Arkansas, with at least one more state planned for 2022. The Arkansas training was performed during COVID, requiring adapting the class for online delivery with substantial effort (with thanks to my Arkansas State Library partner, manager of E-rate services Amber Gregory, and the entire state library staff) and great success.

You can read more about the You Can Do I.T. program in the LITA Guide *Tech for All: Moving beyond the Digital Divide*.²

Table 4.1. Objectives for workshop series Networking and Hardware/Software

First Year of Training	Second Year of Training
Section I: Network Hardware, Cabling, and Internet Service Providers (ISPs) Workshop participants will be able to - define common terms used in computer networking - understand broadband options available and find ISPs serving their library, community, or both - demonstrate the ability to conduct speed checks to monitor broadband service in their library - identify hardware used or needed in a computer network - understand the functions and purpose of common network devices - understand modern cabling design and specifications and best practices to use when installing network cabling - understand the basic concepts of the TCP/IP protocol - understand simple IP address and subnet mask examples - understand the basic requirements for configuring TCP/IP network clients	Section I: Computer Hardware Workshop participants will be able to - recognize and explain the function of external parts of a standard desktop and laptop - recognize and explain the function of the various ports and cables - recognize and explain the function of the internal parts of a standard desktop and laptop - understand and evaluate computer specifications (chip types, memory, speed, storage, 32- vs. 64-bit) - define important hardware terms - demonstrate the ability to do basic maintenance (for instance cleaning, adding memory, replacing basic components) - find reliable sources for reviews and purchasing
Section II: Networking Configuration and Security Skills Workshop participants will be able to - understand the basics of wireless networking protocols and security - log in and configure typical wired and wireless routers - configure a router for internet access - connect computers to form a peer-to-peer wireless network - use networking utilities to analyze, diagnose, and document networks - demonstrate the ability to configure segmented public/staff library networks for security - understand drive mapping concepts and map a network drive - implement basic backups, security, and restoration procedures	Section II: Software and Security Workshop participants will be able to - understand the basics of BIOS security (settings, passwords) - describe the function of the operating system - understand the function of device drivers; install printers - demonstrate the ability to update operating system, drivers, etc. - understand the importance and proper use of antivirus, anti-malware, and other security software - evaluate public access computer systems such as time and printer management (Insight) and system restoration software (such as Deep Freeze, Clean Slate, Drive Vaccine, etc.) - implement basic backups, security, and restoration procedures

Start with the Best Partners

The GLB grant is using the common and powerful practice of train the trainer with a slight twist. While the training curriculum is important, gathering the right team might be equally as vital.

In the process of developing the toolkit, the project team discovered a curious situation: while most state library-level staff had a high degree of confidence in helping lead users through the toolkit questions, not all staff felt confident enough in their own knowledge and skills to make recommendations to the library to create its Broadband Improvement Plan (BIP). These staff members tended to be knowledgeable, highly skilled, and invested enough to help a library work through the TGL process but stopped themselves short when the time came to turn the assessment activities into long- and short-range plans. This situation led the project team to encourage interagency collaboration as a path to toolkit implementation success.

The model for collaboration came quite naturally and early in the project. The first site visits for the TGL grant were performed in Nebraska, bringing

together Holly Woldt of the Nebraska Library Commission (a state library organization) and Tom Rolfes of the Nebraska Information Technology Commission (a research and education network) for the very first time. As they logged hundreds of miles of dashboard time together visiting libraries for the TGL process, they found that not only do they have complementary skills, but they also have a shared dedication to help facilitate community transformation through schools and libraries.

Woldt says the toolkit process is like “gathering around the kitchen table, but at the library,”³ noting how it creates opportunities to gather people together around a topic of shared interest. In addition to convening conversations at the library level, Woldt and Rolfes also used the toolkit to help leverage their combined expertise and areas of influence to spark positive change in the state.

One of those ideas for positive change led to the Sparks project, a \$25,000 IMLS grant to create a fixed-base wireless connection between a local school district building and a public library in five rural Nebraska communities.⁴ The IMLS Sparks grant



Figure 4.1

The logo for the Texas State Library and Archives Commission's (TSLAC) You Can Do I.T. program, featuring "I.T. Heidi" artwork conceived and created by Henry Stokes.

(subtitled "Nebraska Schools and Libraries: Breaking the Ice and Igniting Internet Relationships") was designed to kindle partnerships between schools and libraries and, through internet sharing, to help narrow the homework gap (the barriers faced by students when working from home without reliable internet connectivity) for public K–12 students.⁵ In these communities, the libraries were able to tap into the higher bandwidth capabilities of the local schools. The experience with the Sparks grant led to further collaboration on connectivity improvements for libraries in the state.

While the partnership between Woldt and Rolfe resulted in significant impacts for users in Nebraska, perhaps even more importantly it demonstrated how powerful the right pairing of agencies and complementary skill sets can be in bringing the toolkit to users in the field. The TGL experienced the power of similar pairings in pilot visits to many states, notably Arizona, New Mexico, Pennsylvania, and others. In these cases, a representative from a state library

organization and a representative from a research and education (R&E) network (or a technical person from a state university) formed the team. In other cases, we gathered a state library rep, an R&E rep, and a tribal IT professional to work with a local library.

Train the Trainer

The GLB project team believes this formula (forming a team from complementary library and technical organizations to perform toolkit visits) is replicable. As of summer 2021, the curriculum is under development. The training design incorporates efforts to identify and gather the right partners before teaching best practices in administering the toolkit. Next steps are:

- Identifying potential partners in regions (including state and tribal boundaries). These partners are ideally at least two subject matter experts with complementary skills: a library expert, and a technology expert. The partners may come from state library organizations, state departments of education, tribal libraries, tribal government, research and education networks, schools, and other organizations.
- Bringing these partners together informally to explore possible collaboration.
- Delivering technology training curriculum and activities to the partners based on the toolkit and updated training materials.
- Providing advice and guidance to partners throughout the GLB grant period.

The project team plans a combination of remote and in-person training opportunities beginning in late 2021 and continuing throughout the grant period.

A Toolkit for All Libraries

Though the toolkit has been developed with the needs of rural libraries in mind, creative trainers will see opportunities for staff development in all types of libraries.

As demonstrated throughout this report, users have found great value in the TGL toolkit, and it has been embraced, used, and adopted by many libraries and organizations. But still, many library leaders keep technology at an arm's length.

Simply put, technology is increasingly integral to all library operations—even our lowest-tech libraries have some level of reliance on technology for simple operations, let alone the expectation of public access to computing devices, Wi-Fi, and the internet. At best, not understanding technology puts libraries at a disadvantage, and at worst makes them hostage to a

seemingly mysterious and unknowable body of knowledge and practical skills.

Happily, the toolkit has proven to be a catalyst for breaking boundaries and welcoming library staff of all technology skill levels as members in good standing of the technology club. This goes beyond simple skill-building. Harnessing technology allows the library to fully optimize this essential resource to serve patrons as it would any other, including the library budget, the library building, services such as outreach, and more.

Here are several examples of how the toolkit leads to transformational improvements for libraries.

“The More You Know” is a popular internet meme that plays on 1980s era public service programming for young people.⁶ While the meme is amusing, like all good humor it is based in truth. Knowledge is indeed power.⁷

This concept plays out in simple yet powerful ways.

One library I worked with reported a very inconsistent Wi-Fi signal at the front of the library and had received frequent patron complaints about the lack of reliable wireless service in that area of the building. The library director previously reported this issue to her tech support person, who felt that things were “working fine” every time he checked. (Intermittent issues are one of the biggest challenges for busy tech support people, who often need to reproduce a problem before they can solve it.)

After our site assessment, we spotted the likely culprit. The library building is rectangular, and the library’s single combination router/Wi-Fi access point was located at the back of the library, far away from the patron area in the front. Armed with new vocabulary and a basic understanding of how Wi-Fi works, the library director was able to communicate the issue more clearly to her tech support person and even offer suggestions on how to improve the signal (e.g., “Since our Wi-Fi service is running on the 2.4 GHz band, which limits its range, perhaps we need to move the access point to the center of the building or consider a different system that supports multiple Wi-Fi access points to get better signal coverage throughout the building”). The more you know indeed: the combination of knowledge and vocabulary helped the library director collaborate with her tech support person to improve Wi-Fi for patrons.

In another case, a library tech support person wanted to prevent the library’s Wi-Fi from “leaking outside” the building into a neighboring café, arguing that the café and its customers were unfairly benefiting from the library’s internet access. After discussing how Wi-Fi works, our conversation turned to the public benefit of a service like Wi-Fi that does not need to be constrained by physical space and indeed can be a way for the library to show how it is an “anchor

tenant” that plays a large role in the local community when it comes to meeting community internet access needs. After the discussion, the library director felt sharing the Wi-Fi with their neighbor was a benefit for all and could also serve as a way to market the library to new users by providing an innovative entry point to the library and its other services.

In another example, during a site visit to a library with poor connectivity, we learned that the city government (which the library was a part of) was bringing in a fiber optic connection to town hall, which was about one-half mile down the street. I thought this was good news, but the library quickly explained that it wasn’t a part of that project and did not expect to receive any connectivity. A quick inspection showed that the fiber route ran through the library’s back alley area, and it wouldn’t be too difficult to arrange for a stop at the library as part of the network plan. In this case, our conversations focused on strategies for advocacy (helping the library craft the language to show why it would benefit the entire community to include the library on the city fiber) as well as the technical knowledge (the techniques used to create a fiber access at the library as part of the data network design).

As its primary focus, the TGL project has demonstrated how rural and tribal libraries directly benefit by having a higher understanding of technology. In the GLB grant, a new target audience emerged: urban or semi-urban libraries that do not have the benefit of centralized or consistent technology support.

From the real-world examples above (as well as other examples throughout this report), it’s not a stretch to imagine how the toolkit could help libraries in more populated areas, including urban centers. Any library armed with the essential knowledge of basic technology functions and the vocabulary to describe problems or desires to technical and nontechnical people can tap into a world of opportunity to improve its technology support and advocate for better broadband and more powerful and equitable digital services for its community.

Library Organizations Using the Toolkit

The toolkit has been used throughout the US. The resources within the toolkit itself and the Creative Commons license present ample opportunities for adapting it to organizational needs. Projects at the state or consortial level include simple web page portals to the toolkit’s resources, statewide implementation of surveys, or research partnership with a university LIS program.

Although it’s difficult to track all uses and iterations of the toolkit materials, the project team has

identified the following uses of the toolkit in the wild:

ALASKA STATE LIBRARY

The Alaska State Library has published its own web resource on the toolkit and used it more recently as a basis to prepare libraries for possible technology funding opportunities.⁸

ARIZONA STATE LIBRARY

The toolkit was used as part of “You Can Do I.T.” hands-on technology training throughout Arizona (taught by Block), with additional digital inclusion content from Nicole Umayam, digital inclusion library consultant at the Arizona State Library, Archives, and Public Records.⁹

ARKANSAS STATE LIBRARY

In Arkansas, the state library incorporated the toolkit into its trainings. It made a connection between an upcoming E-rate cycle and using the toolkit to make librarians knowledgeable about the networking equipment they need that they can get with the next funding cycle. In June 2021 the toolkit was used as the basis for an assessment and buyer’s guide webinar to assist libraries in technology purchases under the American Rescue Plan Act.¹⁰

IDAHO COMMISSION FOR LIBRARIES

The Idaho Commission for Libraries is offering a Broadband Toolkit Improvement Program (BTIP), through which Idaho public libraries can receive \$500 to put toward the implementation of their action items determined through their Broadband Improvement Plan.¹¹

MASSACHUSETTS BOARD OF LIBRARY COMMISSIONERS

The Massachusetts Board of Library Commissioners conducted a public library internet bandwidth survey in February 2019. Of 370 libraries contacted, 214 provided information about their internet service providers, ran internet speed tests, and provided estimates of staff and patron perceptions with the library’s connectivity. Questions were based on the Toward Gigabit Libraries toolkit.¹²

MEASURING LIBRARY BROADBAND NETWORKS (MLBN)

Researchers at Simmons University, along with Internet2, Measurement Lab (MLAB), Code for Science and Society, and the Community Informatics Lab (CI Lab), examined how public libraries can utilize broadband

measurement tools and training materials to develop a better understanding of the relationship between library network infrastructure and digital services.¹³

MONTANA STATE LIBRARY

“In 2019, the Montana State Library contracted with Saddle Peak Technologies to collect data for the Internet2 Toward Gigabit Libraries Toolkit. The contractor visited Montana public libraries to gather information on broadband connectivity. A research team at the Simmons University School of Library and Information Science led by Dr. Colin Rhinesmith analyzed the data to help answer questions about libraries’ connectivity and related IT infrastructure in Montana.”¹⁴

NEBRASKA LIBRARY COMMISSION

The first TGL site visit in Nebraska modeled a key library-and-tech partnership model, teaming Holly Woldt from the Nebraska Library Commission and Tom Rolfes of the Nebraska Information Technology Commission. The collaboration produced more outreach and grant opportunities in Nebraska. The commission has hosted several webinars on the toolkit, and the toolkit is used as part of the E-rate application process in the state.¹⁵

NEW YORK STATE LIBRARY

The New York State Library is using the toolkit (spring/summer 2021) as a basis for a pilot project for remote network assessments.

OKLAHOMA (ONENET)

OneNet shared information about the toolkit on its website.¹⁶

PENNSYLVANIA/KINBER

In Pennsylvania, KINBER (the Keystone Initiative for Network Based Education and Research) used a Library Services and Technology Act (LSTA) grant to remix and tailor the toolkit for Pennsylvania libraries and in 2021 continues to provide training using toolkit materials.¹⁷

SOUTH DAKOTA STATE LIBRARY

The South Dakota State Library has published its own web resource on the toolkit. The toolkit has been used as a basis for technology education and advocacy training in the state, including hybrid live/remote sessions for fifty-plus library staff members throughout the state in early 2021.¹⁸

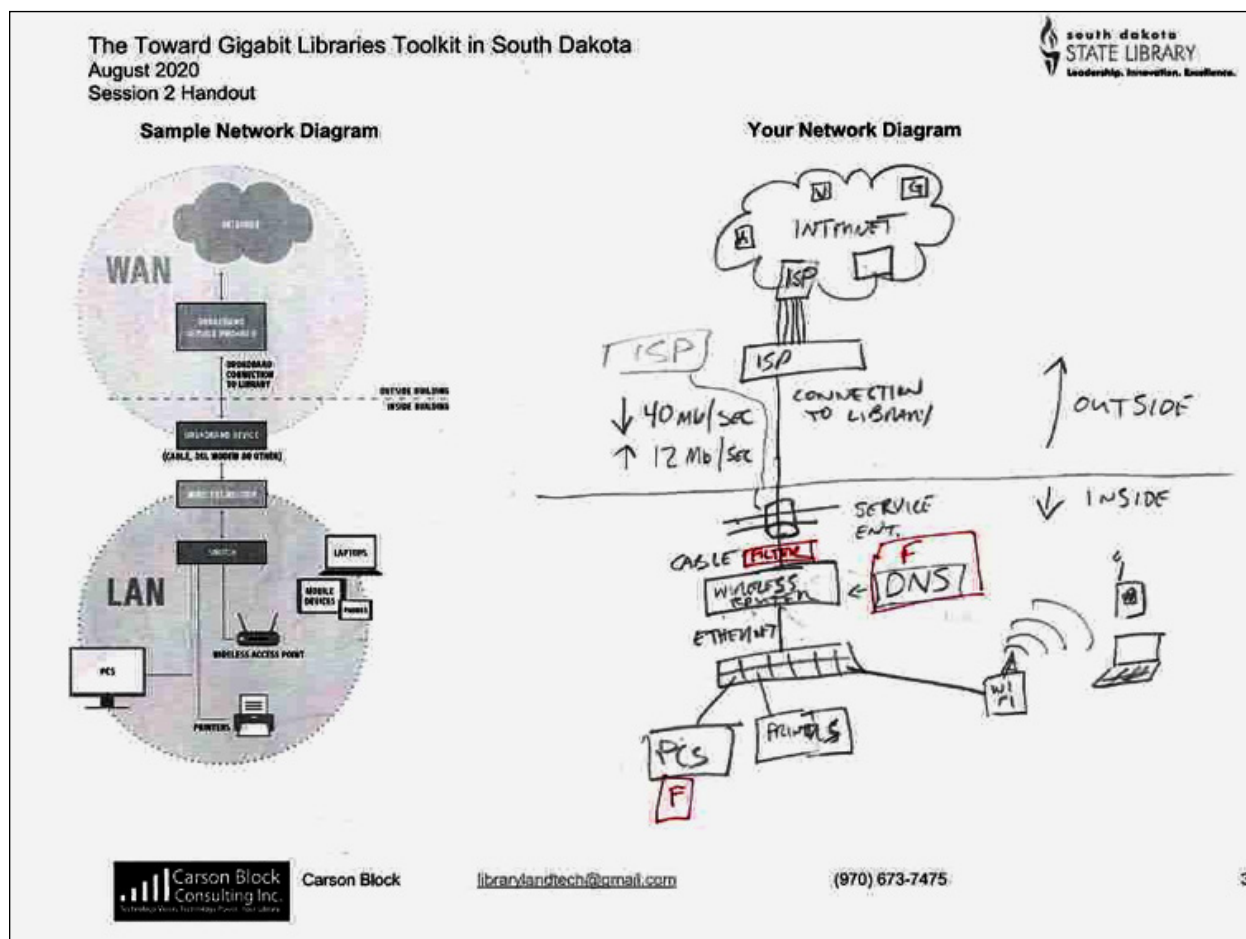


Figure 4.2

An example from a presentation to South Dakota libraries showing how the new network diagram handout can be used by libraries as a guide in drawing their own network diagrams.

TEXAS STATE LIBRARY AND ARCHIVES COMMISSION

Portions of the original toolkit were taken from Carson Block's work with the Texas State Library and Archives Commission "You Can Do I.T." hands-on technology training program for library staff. The "You Can Do I.T." core program objectives and logo were created by state E-rate coordinator Henry Stokes.¹⁹

WYOMING STATE LIBRARY

The Wyoming State Library shared information about the toolkit on its website.²⁰

Reuse and Remix to Drive Impact

When the toolkit is *reused*, the results are what you might expect: users simply distribute or work through the published project documents as they currently exist.

When elements of the toolkit are *remixed*, users

are encouraged to pluck applicable sections or elements of the toolkit to work into their own assessment, training, and advocacy work and to further adapt and improve the content.

The project team envisioned that this content flexibility would be especially useful for state library organizations, research and education networks, library consortia, and other organization that would like to customize the toolkit materials.

After the TGL grant ended, both Block and Stenberg provided unofficial support for the project, with Internet2 hosting the toolkit and other project resources on its website, and both answering questions from state agencies and others (including performing several webinars).

Block continued to promote the toolkit and, using the remix philosophy, developed more detailed worksheets for users.

The next version of the toolkit will include these new worksheets developed by Block, including an easier-to-use network diagram worksheet (seen in figure 4.2

with an example of a hand-drawn network diagram), a speed test log designed to capture more useful data, and a “rack diagram” example showing users how to sort out and document the specific equipment in their network closets.

Notes

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7. Readers are invited to do their own search: “knowledge is power meme.”
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9. For an example, see Arkansas State Library, “You Can Do I.T.! Arkansas,” <https://www.library.arkansas.gov/events/you-can-do-i-t-arkansas/>.
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