

Enabling Smart, Inclusive, and Connected Communities: *An Opportunity Agenda and Roadmap Report*



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ENABLING SMART, INCLUSIVE, AND CONNECTED COMMUNITIES: *AN OPPORTUNITY AGENDA AND ROADMAP REPORT*

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FOREWORD: BECOMING A KEY STRATEGIC PARTNER IN SMART CITY AND COMMUNITY DEVELOPMENT

The role of public libraries in their communities has evolved over time. Once mainly repositories of knowledge sources and items typically dispensed through physical shelves and manual catalogues, public libraries have become anchor institutions with the unique ability to understand and support community needs, strengthen civic life, and facilitate engagement among community members to achieve shared goals.

Currently, public libraries offer programs and services to a variety of patrons, designed to meet their diverse needs and demands. They also provide a safe and neutral space within the community for patrons to participate in different activities, interact with each other and enjoy free and easy access to information and a variety of technologies.

All these features make public libraries a potential strategic partner in the development of smart cities and communities, which are cities/communities that¹:

- Promote a comprehensive view of the city/community, which materializes in different types of initiatives, from waste management to traffic control or water management.
- Adopt a double perspective, technological and human, which means that technology is key in their development (and, therefore, it is the tool par excellence) but that, at the same time, smart cities and communities have to be developed for, by, and with citizens. As a result, urban governance and participation processes as well as investments in human and social capital are inherent attributes of a smart city.
- Pursue a triple goal: to improve the efficiency of urban operations, to improve citizens' quality of life, and to promote the local economy, having as a common background environmental sustainability.

The idea that public libraries are necessary partners in urban development is not new. In the specific case of smart communities -- particularly after 2009 when the term "anchor institution" made its first appearance in United States law in the context of broadband policy -- public libraries have been widely identified as anchor institutions that could extend connectivity and the benefits of robust broadband, playing a key role in digital inclusion. In addition, libraries have embraced the digital era, becoming technological hubs: it is no surprise to find public computers and free Wi-Fi in libraries today; also e-books and online databases for research and an array of other online resources. Further, libraries are using social media platforms, such as Facebook and Twitter, to connect with patrons.

Yet, as parts of the digital, knowledge, and creative infrastructures of smart communities, public libraries can go beyond providing access to computers and to the Internet. Our research shows that, generally speaking, public libraries have the potential to contribute to smart communities by: 1) developing smart citizens; 2) enabling citizen participation; and 3) providing an innovation environment.

¹ For the rest of the document, the term "smart community" will be used and will be inclusive of both cities and communities.

First, given the emergence of proficiency in digital skills as an essential aspect of being a smart citizen, public libraries may, for example, provide training to help improve patrons' digital literacy and understanding of open data.

Second, public libraries may enable citizen engagement by providing opportunities to participate in the development of smart communities. It is not enough to have access to the technology and to know how to use it if there are no opportunities to meaningfully utilize the technology to engage in smart community initiatives. Public libraries are already considered trusted physical and virtual environments where -- among others -- civic and cultural engagement, lifelong learning, establishing feelings of identity and belonging to a community, and civic engagement can take place. Accordingly, they can also enable the participation of civil society in smart community initiatives.

Finally, public libraries may also create and support innovation spaces where entrepreneurs and small businesses can experiment with very diverse technologies and use them to conceptualize or develop new ideas and products. Further, in the context of smart communities, public libraries may serve as open spaces or techno-centric hubs for stakeholder engagement. They may become knowledge hubs and innovation environments where reliable sources of information are shared to understand, discuss and potentially solve community problems.

There is, therefore, a clear opportunity for public libraries to become a strategic and recognized partner in the development of smart communities, which surpasses digitalizing libraries or democratizing the benefits of digital connectivity. The traditional and important role of public libraries as trusted information intermediaries provides a powerful platform for public libraries to become key players in smart community initiatives, reinforcing their role as community anchors.

About the Opportunity Agenda and Roadmap Report

The **Opportunity Agenda and Roadmap Report** identifies areas of opportunity for public libraries to become strategic partners in the development of smarter, more inclusive, and more connected communities.

It is therefore addressed to public libraries, whether their goal is to begin exploring what becoming a key partner in the development of a smart community means, to start contributing to the development of their smart community, or to strengthen their already valued contribution to building a smart community.

The **Opportunity Agenda and Roadmap Report** does not intend to be a fit-all plan. Instead, it is a document to support public libraries' decisions about the role they want to play in building a smart(er) community. The **Opportunity Agenda and Roadmap Report** is the result of four years of research about the role of public libraries in the development of smart communities in the United States, conducted by the Center for Technology in Government at the University at Albany, State University of New York (CTG UAlbany). It is based on public libraries' collective experience and practices, which the research team has identified, collected and analyzed.

The **Opportunity Agenda and Roadmap Report** focuses on seven areas of opportunity: 1) infrastructure, 2) digital tools, 3) data, 4) participation and engagement of users, 5) public libraries as environments of innovation, 6) establishing partnerships, and 7) making an impact. This does not mean these are the only opportunities for public libraries who want to strengthen the role they play in making their communities smart(er). These are the ones that our research suggests as priority areas. In terms of structure, each of the areas includes three sections. The

first one presents the opportunity. The second one illustrates the opportunity by providing two specific examples of libraries that we have studied and that have embraced that opportunity. Finally, the area of opportunity closes with a series of practical recommendations that will get public libraries started in taking advantage of the opportunity.

We hope you enjoy reading this report. **It is time for public libraries to become an acknowledged and strategic partner in smart cities and communities!**

OPPORTUNITY #1: TAKING ADVANTAGE OF YOUR INFRASTRUCTURE

The infrastructure of public libraries has certainly evolved over time, considering the role that public libraries have played in the last few decades. In the past, public libraries focused on being in attractive and accessible locations and on having enough space for shelves of books as well as reading and work areas. Gradually, public libraries also prioritized the acquisition of technology and the availability of bigger spaces where connectivity and training played a key role. Further, public libraries started to use the online environment to make their collections virtual and more accessible to their patrons. Lately, public libraries are offering new programs and services that make them a key player in the development of smart cities/communities. This new strategy also entails changes in the library's building layout and physical infrastructure. Indeed, changing the role of the public library may result in a shift from solely space for collections, equipment, and associated physical infrastructure to a stronger focus on design for people, community outcomes, experience, and innovation, that require bigger, more open, and more polyvalent spaces. In addition, the emphasis on physical and digital inclusion that accompanies smart city initiatives encourages the use of mobile and digital infrastructures.

Examples from Public Libraries

Dokk1, Aarhus (Denmark): The board of directors of Dokk1 defines the public library as a covered urban public plaza, a space for people. Located in the waterfront of the Docklands in Aarhus, the library provides a welcoming and inclusive place and celebrates culture, inspires community interaction, and enables learning and creativity. Under the idea that the library is no longer a place where information can be found -- but instead a place for experiences --, the library has been built around multiple spaces (such as the IT Lab, several makerspaces, the Box, the Auditorium, and the Café), where several activities are organized: design thinking, start-up work, debates, reading circles, media interaction, performance and making. The building, with 36,000 m² of floor space, is said to be the largest public library in Scandinavia as well as a multi-functional building that contains the former central library, the municipal archives, the city administrative headquarters and additional office rental space. More information is available at: <https://dokk1.dk/english>





Skokie Public Library, Skokie, IL: The Skokie Public Library has been a pioneer in investing in changes to their physical and online infrastructures to better meet the needs of the community. In 2014, the library opened the BOOMBox, an interactive STEAM learning space for all ages. The BOOMBox program is set up like a museum exhibit, and the library rotates what is contained in the room for exploration. This space offers programs for all age levels, and allows different groups to learn together and from one another. More recently, in January 2020, the public library started a renovation project to modernize more than 85,000 sq. ft. with the goal of making it easier for people to find and use library materials, attend events, study, relax, connect with others, and interact with and get help from library staff. The enhancements included in the renovation project provide, among others, new adult and teen makerspace and digital media studios, and larger spaces for kids to engage in experiential learning and creative activities, better lighting that maximizes the effect of natural light throughout the building, larger rooms for adult and youth events, open spaces for exhibits, and a dedicated space for teens to hang out, study and be creative.

More information is available at:

<https://skokieliibrary.info/resources/boombox/> and <https://skokieliibrary.info/renovation/>.

Recommendations

- Choose a relevant and accessible location if you are going to open the doors of your public library for the first time. If you are currently under operation, make sure you advertise your location and provide the needed infrastructure (e.g., in terms of parking) to make it accessible to the members of the community.
- Invest in the equipment that you need (from computers and printers to software to 3D printers and additional digital fabrication equipment), and more importantly, maintain, repair, and update it regularly.
- Design the layout of your building taking into account your goals and resulting programs and services. If you do not have much room, consider investing in flexible and polyvalent spaces that can be easily used by different users and for different types of activities.
- Open 24/7 by using digital and mobile tools. These may include a website with a virtual catalog and online activities as well as social media, but also mobile facilities that may bring your programs and services to those residents that may not be able to visit the library building.

OPPORTUNITY #2: DIGITAL TOOLS TO ATTRACT AND RETAIN USERS

Smart community strategies have emerged in many communities as ways to improve government services, but also overall quality of life for residents. Public libraries play a critical role in helping individuals make sense of and leverage these smart community initiatives by offering programs and services that help residents contribute to a smarter community. No matter the programs and services you decide to offer as part of your journey to make a difference in the development of a smart community, those programs and services will only be successful if residents participate and take advantage of them.

Digital tools, such as distribution lists, social media, and having a website, have proved efficient to: 1) build awareness of the smartness-related programs and services that you already offer to specific users and to the community as a whole; 2) attract residents, mainly within the community, to engage in those programs and services; and 3) build residents' loyalty and, therefore, guarantee their sustained participation over time. In addition, through digital tools, you can also highlight the role the library and its staff are playing in the communities' larger smart community initiatives. This includes participation in the development of community-wide smart community plans or sitting on smart community advisory boards, committees, or other related groups. Finally, digital tools can be used to advertise public library partnerships with other community organizations focused on the design, development, or deployment of a particular smart community initiative.

Examples from Public Libraries

Chattanooga Public Library, Chattanooga,

TN: Chattanooga Public Library has a YouTube channel where it posts videos about the different activities they organize. As they state, it is a way to encourage lifelong learning by providing access to community programs as well as creative and informal learning opportunities for all ages. The channel features different categories of videos: Preschool Storytime, Toddler Time, Baby Bounce, MPRL (Make.Play.Read.Learn): Little Learners, MPRL: Elementary School, MPRL: Middle School, MPRL: High School, MPRL: Adults!, Makerspace Tutorials, and Recording Studio Tutorials. Using these videos and posting them on YouTube provides a low cost highly effective way not only to advertise programs and services related to smart city/community initiatives but also deliver these programs and services outside of the library. More information is available at:

<https://www.youtube.com/channel/UC8wQB1amgvxPX5JWJtywRQg>.



Ignacio Community Library, Ignacio, CO: The Ignacio Community Library used multiple digital tools to advertise its new Electric Vehicle Charging Station, an initiative related to an important smart city/community feature: sustainability. They posted information inviting the public to attend a grand opening event both in person and via Zoom using their website and an electronic newsletter. In addition, they utilized the video teleconferencing tool Zoom to allow anyone with an Internet connection and device to participate in the event virtually.



More information is available at:
<https://www.ignaciolibrary.org/mc-events/electric-vehicle-charging-station-grand-opening/>.

Recommendations

- Don't reinvent the wheel. Many public libraries are savvy social media users already. We recommend leveraging those existing tools and your skills at using them to highlight how your programs and services specifically contribute to smart community initiatives.
- Include popular smart community related hashtags when posting about your smart community related programs and services on Instagram, Twitter and Facebook. Some recent popular ones include: #smartcities, #smartcity, #smartcommunity, #smartcommunities, and #innovation.
- Use multiple digital tools to advertise the same event, program, or service. For example, include a news release on your website. Use that to create a Facebook post and then leverage Twitter to send a link to the Facebook post and engage with your patrons and other community partners.
- Use digital tools, such as YouTube videos, to also expand your capacity to deliver some library programs.

OPPORTUNITY #3: LEVERAGING DATA

Back in 2017, The Economist published a story titled “The world's most valuable resource is no longer oil, but data.” Since its publication, the topic has generated a great deal of discussions with people in favor of and people in disagreement with the statement. No matter what your position is, it seems clear that data is key for decision making at all levels and by different actors and that data access and sharing can generate positive social and economic benefits. In sum, data has potential for value creation. However, data may also result in challenges created by exponential growth in the volume and velocity of data, the variety of the types of data flowing in and their sources (e.g., websites, social media, individuals, sensors, etc.)

Public libraries are particularly well-positioned to work with data. They can do so by: 1) helping the communities that they serve engage in a range of data-based activities; 2) helping communities leverage data to better understand their communities, community needs, and develop solutions to community challenges; and 3) using data to demonstrate the contributions of their libraries, archives, etc., to the community(ies) that they serve. For example, public libraries can take a leading role in helping patrons navigate the overwhelming information available online, providing them with guidance to find relevant content in a world of data overload. They can also advocate, educate and train patrons for the critical consumption of data, taking privacy and security issues into account. Further, they can host open data portals, connect users with open data resources and act as a hub for civic digital activities intensive in the use of open data.

Examples from Public Libraries

Providence Public Library, Providence, RI:

Through its program Data Navigators 2.0, Providence Public Library teens learn how to organize and manipulate data to find trends and make predictions, and how to use Microsoft Excel and Tableau software to analyze data and create powerful visual stories. Data Navigators 2.0 guides youth through learning data analytics basics, including posing a question, collecting relevant data, cleaning the data using spreadsheet software, visualizing that data using Tableau, and analyzing data for insightful trends and correlations. The



course is currently available to Rhode Island Nurses Institute Middle College students during their school day and to all Rhode Island students after school, widening the opportunities to learn about data across the state. These after-school participants are in grades 9-12 and have the opportunity to earn high school credit through the Rhode Island Department of Education (RIDE) Advanced Coursework Network initiative. Participants also receive a stipend of \$100 for their completion of the program.

More information is available at: <https://civic-switchboard.gitbook.io/guide/case-studies/providence-public-library-providence-ri> and <https://www.provlib.org/education/teen-squad/data-navigators-2-0/>.

Chapel Hill, NC: The Chapel Hill Public Library hosts the city's open data collection at <http://chapelhill.opendata.org> with the stated objective of increasing government transparency by facilitating public access to local government information." Using the OpenDataSoft platform, Chapel Hill began placing data online in 2016 as a result of a partnership with Chapel Hill Police Department and its belonging to the Police Data Initiative. The portal started by publishing public safety related datasets on agency demographics, traffic stops, and bicycle and pedestrian crashes. Community satisfaction survey data was also included, regarding a variety of police department responsibilities and overall satisfaction. The library did not only host the portal. They also worked with the police department to make some aspects of the police datasets easier for the public to read and comprehend, resulting in names for datasets that both reflected reality and were understandable for the users. In addition to hosting data, the Chapel Hill Public Library hosted an Open Data Day in January 2017 in order to demonstrate the power of open data, introduce the portal and data to the community, and discuss ways to improve the product with the community. In 2019, they also organized a Civic Data Hackathon addressed to high school and university students, data science professionals, citizens, and Town of Chapel Hill staff to discuss solutions that could benefit the Town of Chapel Hill and the greater Chapel Hill community.

Recommendations

- Start by investing in data literacy in your public library. Train your staff to improve their abilities to access, interpret, critically assess, manage, handle and ethically use data.
- Conduct data audits, which will allow you to gain a bigger picture understanding of all of the datasets that are available in your library and, as a result, to identify redundancies and useless datasets that could be modified or discontinued; different datasets that could be analyzed together to give a better picture of a particular aspect of library service; and gaps in current data that can help you identify where you'd like to learn more.
- Manage data assets and understand digital curation techniques to ensure availability, access, and use of datasets in the community that you serve.
- Support local data collection that meets the community's needs.
- Data needs to reflect your impact, not your activity. Work strategically to leverage data to demonstrate value and impact instead of relying on the 'public good' argument.
- Expand your training programs to include topics around data and data literacy, such as the data lifecycle, privacy and security, data visualizations, data analytics, data-driven decision making, and data and civic engagement.
- Plan several activities around the open data movement. In addition to hosting and open data portal on your library website, you may consider, among other, creating educational resources, holding open data hackathons and contextualizing open data with other local information, such as historical resources.

OPPORTUNITY #4: THE POWER OF PARTICIPATION AND ENGAGEMENT

Smart community strategies have become a national priority with increased federal funding encouraging a community of data scientists, technologists and civic leaders to harness the growing data revolution, low-cost sensors and research partnerships to unlock new solutions that can benefit society. While acknowledging this broader community partnership, more often than not, these initiatives are industry- and government-driven with much less focus on identifying community demands that are all-inclusive and address that community's ability to benefit from and utilize smart community technologies and services. Truly successful smart community initiatives that provide benefits and value to a community's residents involve a combination of citizen participation and engagement. This involves citizens engaging with other key stakeholders such as government, industry and nonprofits, who are leading the smart community initiative to express and share their experiences and needs. This also involves citizens actively participating in the decision-making, implementation, and eventually use of the technological innovations.

Public libraries may play a leading role in reaching out to the community or specific community groups (e.g., immigrant groups, ethnic or issue-based groups, neighborhood associations) and facilitating citizen participation in the design, development, and implementation of smart community initiatives. Public libraries may also enable a more engaged community through activities where the library is proactive in stimulating interest in local issues, assisting the community in airing local concerns, or increasing the amount of information available on community issues including those related to investments in and deployment of smart community related technologies and other strategies.

Examples from Public Libraries

Schenectady Public Library, Schenectady, NY: At the end of 2019, the City of Schenectady partnered with the Schenectady Public Library to present the city's planned investment in and deployment of several different smart city initiatives. The city and library identified two library branches to be part of four city-organized open house events. Schenectady City Mayor Gary McCarthy decided to hold the forums after the City Council questioned the costs, transparency, security protocols and the overall scope of the effort, asking for more clarity. In a newspaper article about the open houses, Mayor McCarthy stated, "public engagement will play a critical role in this project as we evaluate new technologies and solutions to determine what options best serve the needs of the public as we build a smarter, safer, and more sustainable Schenectady for the 21st century."

More information about the City of Schenectady's smart city initiatives is available at: <https://www.cityofschenectady.com/505/Smart-City-Project> and <https://dailygazette.com/2019/11/15/city-announces-dates-for-smart-cities-public-forums/>

Ignacio Community Library, Ignacio, CO: The Ignacio Community Library actively pursues opportunities for Ignacio residents to engage with a variety of community stakeholders. For example, in the past, the community library has hosted forums with candidates running for county commissioner. In addition, the library has held or plans to hold interactive discussions with the Ignacio residents and various stakeholders on topics such as immigration, taxes, or education as well as using the library to bring together community members and the town board to discuss local issues such as rate hikes. Although these engagements have not focused specifically on smart city and community initiatives related to technological investments or innovations, but instead they have prioritized other aspects of smartness, the fact that the library has been successful in designing and facilitating such engagements demonstrates its capability to keep doing so in the future, expanding the types of initiatives that pursue citizen participation and engagement.

More information is available at:
<https://www.ignaciolibrary.org/>.

Recommendations

- Leverage your relationships and programs with government stakeholders such as local government agencies and local, state, and even federal elected officials to facilitate the engagement of citizens with government on issues related to smart community technologies and strategies.
- Bring smart community stakeholders together with citizens at the library so that citizens can learn about them and their work in the smart community, ask questions and share insights about the potential implementation of smart initiatives in their community. Smart community stakeholders may then use this feedback to design more successful and impactful smart community plans and programs.
- Gather input about residents' needs, expectations, perceptions, and opinions about participatory processes in the smart community. You can then share this information with other main smart community stakeholders.
- Prepare residents for civic participation by designing (training) programs that help them understand what a smart community means and the issues this type of initiatives entails. Empower residents to actively engage in finding effective ways to act on public challenges that are related to building a smart community.
- Help residents learn how to identify, evaluate and utilize information essential for making decisions about their community, particularly in terms of smart initiatives.
- Be clear and transparent about residents' engagement when you use your public library as a forum for discussion and participation. Be explicit about the goals of their participation and about the extent their proposals and input will be taken into account in smart community strategy planning and implementation.

OPPORTUNITY #5: BOOSTING INNOVATION IN THE COMMUNITY

In the context of smart communities, public libraries may serve as open innovation environments where reliable sources of knowledge are shared to understand, discuss and potentially solve community problems; where the collective creativity of expert groups is leveraged; and where social gathering, interactive learning, and creative production, including the development of entrepreneurship and civic innovation, take place. Public libraries may provide spaces that enable innovation and experimentation. These spaces show that civil society may play an active role in the innovation system and that citizens have the capacity to innovate and, therefore, to become co-creators in smart community initiatives. Further, through these spaces, public libraries may provide a physical and virtual collaboration platform where patrons are able to not only access the technology tools and the Internet speed they need for their projects, but also to test their innovative ideas and to engage -- onsite or remotely -- with others to further develop them. In doing so, public libraries offer a neutral and safe space that encourages the creation of networks of relationships among different members of the community to promote collaborative innovation. In addition, it becomes an open-to-all innovation environment in smart communities that may complement the more expert-oriented focus that living labs have.

Examples from Public Libraries

Chattanooga Public Library, Chattanooga, TN: The 4th Floor: In January 2014, an article in National Journal referred to the Chattanooga Public Library as the “library of the 21st century”. The designation was the result of its culture of experimentation and innovation, which started with the opening of the 4th Floor makerspace. With more than 12,000 sq. feet, the 4th Floor is home to 3D printers and a variety of fabrication technology tools deployed in ways that are always changing. It is currently being used for both library and partner-organized programming and as a co-working space. There are several examples about the 4th Floor uses, such as a father who made devices using a 3D printer to help his daughter who had mobility problems, a local business owner who made restroom signs using the vinyl plotter and another local entrepreneur who printed t-shirts for different community events. The Small Business Saturday Program is also organized in the 4th Floor to encourage and help business owners spread the word about their products and services and, therefore, expand their businesses.

More information is available at: <https://chattlibrary.org/4th-floor/>.

Chattanooga Public Library, Chattanooga, TN: The Studio: The Studio is a popular space for innovation. It provides library card holders access to a state of the art recording studio and educational facility with industry standard equipment and resources to help inspire, educate and



spark creativity. With a little less than 1,000 sq. feet, it consists of three live rooms: the vocal booth, the drum room, and the main control room. With a valid library card, patrons can reserve a 3-hour session to experience the art of recording, learn some music recording techniques, and work on their projects. The Studio also provides a low-latency audio visual streaming system (LoLa) which allows musicians from different places – to include those across great distances – to remotely play music

together with no time delay. Finally, The Studio also provides the opportunity for local people who are interested in music and recording to get together, practice, and collaborate both in person and remotely.

More information is available at: <https://chattlibrary.org/thestudio/>.

Recommendations

- Design or redesign the layout of your building taking into account the need of innovation spaces; big enough that they can accommodate several patrons and equipment.
- Carefully identify your equipment needs. For example, investing in digital fabrication tools and music equipment will be costly and you will need to prioritize and schedule these investments over time.
- Conduct surveys and interviews with your patrons to better understand their needs and, therefore, to better design programs of innovation that will be useful to them.
- Offer general innovation programs that show patrons and stakeholders the importance of innovation and co-creation and that talk about the notion of democratizing innovation, allowing everyone to be an innovator.
- Train your librarians and other employees on the tools available in the innovation spaces, so they can support patrons in using them. Volunteers may also help with these activities and will need training too.
- Invite stakeholders from the innovation ecosystem of your community to participate in the programs and services that you will offer in the innovation spaces of your public library.
- Partner with organizations that could help your users to take their innovation to the next level and potentially expand them or commercialize them.

OPPORTUNITY #6: ESTABLISHING PARTNERSHIPS FOR BETTER IMPLEMENTATION AND GREATER IMPACT

Smart community initiatives have been increasing in the last few years and, in many instances, they need community partners to be successful. This is due in large part to the fact that no single organization has the necessary mix of budget, community trust, resources, expertise and sufficient understanding of community needs and concerns to develop successful smart community initiatives on their own. The ability to establish partnerships with other community stakeholders is a critical capability for public libraries to fulfill their role as key contributors in the development of smart communities.

Collaboration and partnerships are important tools for public libraries that may help them design and offer new and better services to the community. But not only that, collaboration with stakeholders and community members strengthens the ability of public libraries to contribute to the development of a smart community by developing smart citizens, enabling citizen participation and providing spaces for innovation. Collaboration is particularly important given the challenges that arise from limited staff, scarce resources and the need to innovate. Thus, partners and stakeholders may influence the sustainability of programs and services and help public libraries to achieve their smart community related goals.

Public libraries may have different types of partners: among other, local, county and state governments; private companies and entrepreneurs; civil society organizations and nonprofits; foundations; other public libraries; and citizens' associations. Yet, partnering with local governments seems particularly important given that they are usually in charge of leading the smart community strategy. Partnering with local governments will help guarantee that the activities of public libraries are aligned with and contributing to such strategy.

Examples from Public Libraries

Chicago Public Library, Chicago, IL: In 2016, the Chicago Public Library partnered with the Chicago Tech Collaborative to develop the smart cities focused Array of Things project. The Array of Things (AoT) is an experimental smart city initiative initially deployed in the City of Chicago. The system includes sensors and software that can analyze data to help cities improve public services that impact such things as climate, air quality, traffic, and noise. The plan was to deploy the first sensor in the Pilsen neighborhood. Since the Chicago Tech Collaborative had been working with the Chicago Public Library on the Chicago Tech Plan, relationships were already in place to determine how the public library could facilitate this deployment. As a result, the Chicago Tech Collaborative in partnership with the Chicago Public Library used the neighborhood's Lozano Library branch to meet with community members about the AoT. The team held public meetings for neighborhood residents to inform the community about the project and to gather feedback on the associated privacy and governance policies that were related to the use of the sensors and the data that was going to be collected.

More information is available at: <https://arrayofthings.github.io/#>.

Ignacio Community Library, Ignacio, CO: The Sun Ute Community Center is a valued member of the Ignacio, Colorado community. Funded by the Southern Ute Indian Tribe, it is open to the residents of Ignacio and the surrounding community. Members of the Tribe can join for free and non-tribal members can join for what seems to be a reasonable monthly membership. In addition to physical fitness, the community center is also committed to improving the mental health of the Ignacio community. As an example of that, back in 2018, the Ignacio Community Library began partnering with the community center to try to address what all agree is a critical problem with suicide in the community and surrounding areas. This partnership grew out of conversations between the Ignacio Community Library director and the Sun Ute Community Center director when discussing some of the important issues that both the library patrons and community center members were facing. To this end, a designated Ignacio Community Library staff member began discussions with the Sun Ute Community Center director to begin working together on a joint program on mental health. The program was designed to include consistent messaging and activities each month at both the community center and the library highlighting different aspects of mental health as they relate to suicide. The library and community included the school district and the local home school programs in this mental health program to ensure consistency and maximize community exposure.

Recommendations

- Assign individual library staff to reach out to and work with a different community group or business in your community. These staff can start by meeting with representatives from their assigned community group (e.g. school district, chamber of commerce, a major private sector employer, community center, etc.) to learn about each other's existing programs and services and discuss what they think are the most pressing community needs.
- Set a modest goal of collaborating with at least one external partner a month to do a joint program.
- Seek out other community organizations to write grants with to fund joint programs or services.
- Have the library director or designated staff attend community meetings to learn about community needs, existing programs, and to educate residents and stakeholders on the library and what it can do for them.
- Recognize that collaboration can be costly in terms of time, frustrating due to the different pace at which organizations work, as well as different and sometimes divergent priorities and agendas. So, just get started, be patient, and look for shared interests and complementary capabilities that can address community needs.
- Offer library space for meetings and programs as well as library personnel to participate or facilitate discussions to help establish partnerships.

OPPORTUNITY #7: A FOCUS ON IMPACT: CONTRIBUTING TO THE GOALS OF THE SMART COMMUNITY

It is important that public libraries are aware of their real contribution to the development of a smart community. This does not mean to count only numbers of users, workshops, or e-books lent, to use a few examples. Understanding impact also involves knowing the contributions of the public library to the goals that a smart community aims to achieve. Indeed, smart community initiatives should not only be trendy concepts. Instead, they need to aim at making a difference and at generating impact in terms of improving citizens' quality of life (i.e., the degree to which an individual is healthy comfortable, and able to participate in or enjoy life events).

This can be achieved by:

- Improving the efficiency of community operations: Smart communities may create a positive impact in dealing with complex issues, such as public safety, health, mobility, and waste management, by meeting higher expectations of quality, cost and efficiency.
- Improving the local economy: Smart communities may contribute to economic development by, among other, creating jobs, promoting entrepreneurship and entrepreneurial activity and offering digital services to businesses.
- Increasing sustainability and better managing natural resources: As urbanization, industrialization, and consumption grow, environmental pressures multiply. Smart community initiatives should, therefore, also aim at improving sustainability and livability of the community by, for example, improving air quality and reducing greenhouse gas emissions and solid waste.

Three main issues have to be taken into account when measuring the impact of a public library: 1) The systematization of the assessment; 2) the use of different types of assessment methodologies and approaches; and 3) the successful report and use of the assessment results.

Examples from Public Libraries

Thomas Crane Public Library, Quincy, MA: The Thomas Crane Public Library (TCPL), in partnership with Saheli, a nonprofit organization that primarily serves South Asian women and families, provides digital training to diverse groups of community members. Participants in the training complete surveys either midway through the course or at the end, which results in important data about their impact. The results allow for improvements in the program. For example, after reviewing mid-course survey responses, the trainer added social media lessons to the training, which gave rise to the formation of online groups and, therefore, to greater outreach to the South Asian population. The trainer also learned that one participant started her own business using new connections she made through the class. Other improvements have been made to the program over time, including changing the time of the class, adding lab hours, and clarifying program expectations at the beginning of each class, which has supported program retention. Further, the survey also informed the TCPL's decision to continue their subscription to Lynda, an online training service that patrons can access through the library. TCPL uses Lynda's metrics to understand how often patrons use the service, but TCPL felt the investment in the subscription also needed to generate meaningful outcomes.

Using email addresses Lynda users provided when they registered for a Lynda account, TCPL sent users invitations to take an online survey. The results showed that patrons value the service and it helped them to develop their skills and knowledge across a range of topics.

More information is available at:

<http://www.ala.org/pla/initiatives/performance measurement/thomascranecasestudy>

Minneapolis Central Library, City of

Minneapolis, MN: The Minneapolis Central Library was completed on August 30, 2005. The building is an example of an infrastructure that contributes to a sustainable city, expanding the impact of its programs and services. Among other features, the building includes three green roofs. The green roof planting design concept emphasizes the influence of the Mississippi River on Minneapolis's street grid and building design and the positive impact of the building's green roof on the Mississippi River. The flow of the Mississippi River is emulated by waves created across plant palettes of varying and undulating heights as well as bloom times. Eighteen sedum species, which are traditionally used on European green roofs, were combined with 41 grasses and forbs that are native to Minnesota's bluff prairies – a habitat template similar, in many ways, to conditions found on extensive green roofs. This design concept was successfully implemented with careful species selection and placement. Excess storm water runoff from the roof deck is collected and stored in cisterns on-site, and used to irrigate the three green roof gardens. Assessment studies have shown that the three green roofs, which total 18,500 square feet, help the library stay cool inside. The roof serves as a huge sponge during the rainy season, when it filtrates and cleans storm water. The roof also provides a natural habitat right in the middle of downtown and reduces the dreaded heat island effect, keeping the local environment from overheating on a mid-summer day. Underfloor displacement cooling technology adds 20 percent running efficiency, and the entire building is 27

Recommendations

- Differentiate between outputs and outcomes. Outputs will help you describe the services you provide (e.g., number of makerspaces activities) while outcomes will help you understand the value of the programs and services you provide (e.g., impact on entrepreneurship in the community).
- Plan the assessment process when you design a program or service. Decide on what you are going to measure, how, and how often, going beyond the measurement of users or users' satisfaction.
- Collect comparable data from different programs and services at different stages, which will allow you to have a comprehensive understanding of your contribution to the smart community goals.
- Collect both quantitative and qualitative data. For monitoring purposes, design a good indicators system. Do not forget that indicators, in order to be useful, need to be relevant, objective, univocal, sensitive, precise, transparent and accessible. Organize your indicators according to, at least, three categories: resources/input, activity and participation. For better understanding the needs, expectations, and experiences of your patrons, regularly conduct interviews and focus groups with them.
- Communicate and use your results. Your assessments will allow you to rethink your contribution to the smart community development and goals. Analyze your assessment results so they can better inform your decision-making process in terms of existing programs and services, as well as next steps.

percent more energy-efficient than the required efficiency code, clearly contributing to a more sustainable city.

More information is available at: <https://www.greenroofs.com/projects/minneapolis-central-library/>.

IMPLEMENTING THE OPPORTUNITY AGENDA AND ROADMAP REPORT: THE PUBLIC LIBRARIES IN SMART CITIES AND COMMUNITIES TOOLBOX

The **Opportunity Agenda and Roadmap Report** identifies seven areas of opportunity, where public libraries can strengthen their role as strategic partners in the development of smart cities and communities. Although the report provides a few initial recommendations to get you started, you may want to know more about how to implement **The Opportunity Agenda and Roadmap Report**. In order to help you start taking advantage of these opportunities, the research team at CTG UAlbany has developed the **Public Libraries in Smart Cities and Communities Toolbox**, which you will find online at <https://www.smartcommunitytoolbox.ctg.albany.edu>.

The **Public Libraries in Smart Cities and Communities Toolbox** will provide more guidance to your public library in terms of how to advance its role as a community anchor in your smart city or community and will also provide you with numerous resources and ideas for, among other, new programs and services contextualized to community issues and interests, changes in organizational processes and uses of marketing tools. It will also provide additional examples of what public libraries are already doing as well as a virtual space for public libraries to connect and interact.

ABOUT THE CENTER FOR TECHNOLOGY IN GOVERNMENT AND THIS PROJECT

The Center for Technology in Government (CTG UAlbany) works with governments worldwide transforming public services through innovations in technology, policy and management. A research institute at the State University of New York (SUNY) at Albany, CTG UAlbany was established in 1993 to pursue new ways to use technology to address practical problems of information management and service delivery in government. CTG UAlbany collaborates with hundreds of domestic and international researchers on understanding and applying emerging technologies. CTG UAlbany also works with scores of local, state, federal and international government bodies as a trusted advisor and consultant through funded projects about management and policy decisions to govern the use of new technologies as tools for public service transformation.

More information is available at: <https://www.ctg.albany.edu/>.

The four-year research project “Enabling Smart, Inclusive, and Connected Communities: The Role of Public Libraries” is one of CTG UAlbany research projects conducted in partnership with the American Library Association (ALA)’s Center for the Future of Libraries. It aims to better understand how public libraries can advance their role as community anchors in smart city and community initiatives by contributing to the community’s understanding of and participation in such initiatives. Two research questions guide the study: 1) to what extent do public libraries, building on their expertise, knowledge, and background, contribute to communities’ understanding of and participation in smart city initiatives? and 2) what are the existing and potential benefits, costs, risks, challenges and unintended consequences for public libraries increasing their involvement in their communities’ smart city initiatives?

To address these two research questions, the following activities have been conducted: 1) a literature and current practices review; 2) an analysis of four case studies; and 3) a national survey. The project includes two main deliverables: the Opportunity Agenda and Roadmap Report and the Public Libraries in Smart Cities and Communities Toolbox, in addition to several dissemination activities of results. The research is supported by the expertise of an Advisory Board which has provided strategic advice for multiple stages and activities.

The intended outcomes for public libraries, local governments, and researchers include:

1. Increasing and sustaining relationships and collaborations between libraries and other organizations, such as city governments and community organizations.
2. Designing and developing two new and replicable resources to guide libraries willing to advance their role as community anchors in smart cities and to provide libraries with numerous resources and ideas for new programs and services contextualized to community issues/interests: the Opportunity Agenda and Roadmap Report and the Public Libraries in Smart Cities and Communities Toolbox.
3. Enhancing the relationships between researchers and practitioners by communicating research findings in different events and ways that will lead to improvements in library services.

More information is available at: <https://www.ctg.albany.edu/projects/imls2017/>.



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