

ENABLING SMART, INCLUSIVE, AND CONNECTED COMMUNITIES: THE ROLE OF PUBLIC LIBRARIES

Technological innovation can help cities and their communities meet the current challenges of urban governance, tackle complex social problems, improve urban environments, become more competitive, and address sustainability concerns. Smart strategies have therefore emerged in many communities as a way to improve government services, but also overall quality of life for citizens. The majority of these strategies focus on how technology and data can save hard earned taxpayer money, vastly improve government decision making and current services, and enable new types of services only dreamed of before. Such smart 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 city technologies and services. Moreover, from our research and work with governments in this area, it is evident that community focused groups such as public libraries have been largely left out of the ongoing dialogue about smart cities.

Yet, as a very important element of the digital, knowledge and creative infrastructures of smart cities, public libraries could further play a critical role in involving the community and in addressing its needs, issues and interests. They could offer a new generation of library services that could be integrated with the city infrastructure and that could extend public libraries' role as community anchors and as information literacy hubs in smart cities. However, still, more knowledge and practical insights are needed on public libraries' strategies, programs, services and tools aimed at engaging communities in smart cities as well as on the benefits, challenges, risks, costs, and unintended consequences that public libraries could face by incorporating these into their role as community anchors. Further, research is also needed on how public libraries position themselves as community catalysts acting to spark innovation and positive change.

The proposed project "Enabling Smart, Inclusive, and Connected Communities: The Role of Public Libraries", submitted by the Center for Technology in Government at the University of Albany in partnership with the American Library Association (ALA)'s Center for the Future of Libraries, aims at better understanding how public libraries can advance their role as community anchors in smart city initiatives by contributing to the community's understanding of and participation in such initiatives. The primary audience of this research project includes public libraries, local governments, community groups, and researchers currently involved in or interested in information and technology to make their communities, smarter, more inclusive, and better connected. The project addresses two specific research questions:

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?
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?

This 36 month long project will use a multi-method research approach and include five specific activities: 1. Literature and Current Practices Review, 2. Case Studies, 3. National Survey, 4. Report and Toolkit Development, and 5. Dissemination of Results and Resources. 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, the Opportunity Agenda and Roadmap Report and the Smart Libraries Toolbox, to guide libraries willing to advance their role as community anchors and/or community catalysts in smart cities and to provide them with numerous resources and ideas for new programs and services contextualized to community issues/interests, and 3) enhancing the relationships between researchers and practitioners by communicating research findings in different events and ways that will lead to demonstrable improvements in library services.

ENABLING SMART, INCLUSIVE, AND CONNECTED COMMUNITIES: THE ROLE OF PUBLIC LIBRARIES

Introduction

“Enabling Smart, Inclusive, and Connected Communities: The Role of Public Libraries” is the name of the project submitted by the Center for Technology in Government at the University of Albany in partnership with the American Library Association (ALA)’s Center for the Future of Libraries. The project aims at understanding how public libraries could advance their role as community anchors in smart city initiatives, positioning themselves also as community catalysts for innovation and positive change. 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? The project, with a total budget of \$456,394, will produce: 1) an Opportunity Agenda and Roadmap Report and 2) a Smart Libraries Toolbox for diverse public libraries across the US.

In the following pages, we present our project narrative. In doing so we explicitly address the comments made by six reviewers to our pre-proposal.

Statement of National Need

Technological innovation can help cities and their communities meet the current challenges of urban governance, tackle complex social problems, improve urban environments, become more competitive, and address sustainability concerns. Smart strategies have therefore emerged in many communities as a way to improve government services, but also overall quality of life for citizens. The majority of these strategies focus on how technology and data can save hard earned taxpayer money, vastly improve government decision making and current services, and enable new types of services only dreamed of before. Take for instance the City of Schenectady, New York, which is piloting “smart” street lights that turn on, dim, and turn off based on time and activity, saving the city on future energy costs while also notifying the city of maintenance issues and needs. In addition, the “smart” lighting provides other opportunities to identify parking spaces, and measuring traffic patterns and counts (City of Schenectady, 2015). San Francisco is piloting “smart” parking with their *SFpark* application that provides citizens quickly find metered parking on streets (SFMTA, 2017). Another example is “smart” infrastructure where sensors proactively monitor public water and sewer systems for potential problems and maintenance needs. Ketchum, Idaho, is implementing a “smart” irrigation project that will replace existing systems in order to reduce water use and save the city more than 1 million gallons of water annually (Hickey, 2017). In addition, there are a growing number of “apps” that allow citizens to interact with their government such as New York City’s ‘DSNY Info App’ (allows users to set sanitation service reminders and weather related delays), Seattle’s ‘Find it Fix it’ app (users can report abandoned vehicles, graffiti and potholes), and Pittsburgh’s ‘Go Mobile PGH’ app (residents and visitors can pay for parking via their phone, allowing users to get parking expiration notices) (Snow, 2017).

Such smart 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 city technologies and services (Calzada, 2017; Anttiroiko, 2016; Almirall et al., 2014). Moreover, from our research and work with governments in this area, it is evident that community focused groups such as public libraries have been largely left out of the ongoing dialogue about smart cities (Burke et al., 2013).

The idea that public libraries are necessary partners in urban development has been circulating in the planning literature for decades (Goodman, 2015; Jerkov et al, 2015; Maurrasse & Bliss; 2006). In the specific case of smart cities, and particularly after 2009 in the United States, public libraries have widely been used as anchor institutions that could extend connectivity and the benefits of robust broadband (Goodman, 2015). In parallel, these libraries have also embraced the digital era, becoming technological hubs: it is no surprise to find public computers and free WiFi in libraries today; also e-books and online databases for research and an array of other online resources. Further, libraries are using Facebook and Twitter to connect with patrons.

Yet, as parts of the digital, knowledge and creative infrastructures of smart cities, public libraries could further play a critical role in involving the community and in addressing its needs, issues and interests. Some libraries are actually going beyond the adoption of technology or the role of city Internet hot spots and are engaging in smart initiatives. This is the case of the St. Paul library system in Minneapolis, which operates a mobile computer lab that goes out into neighborhoods to provide computer training and job search help in several languages (Keen, 2013). In Chicago, the public library is being modeled to help the city move forward as a leader in social innovation. New programs and services include YOUmedia, a digital learning program for teens that connects young adults to interactive media tools, mentors, and institutions throughout the city, and the Innovation Lab, which provides both youth and adults with introductions to 3D software, 3D printers, and laser cutting (Thornton, 2014).

These two examples show that it is more than digitalizing libraries (Mainka et al., 2013; Freeman, 2005) or democratizing the benefits of digital connectivity (Goodman, 2015). Moreover, as in the case of open government (Burke et al, 2013), the traditional and important role of public libraries as trusted information intermediaries provides a powerful platform for public libraries to be key facilitators in smart city initiatives. As a result, public libraries in smart cities may reinforce their role as community anchors and important third places (separate from the two usual social environments of home, “first place,” and the workplace, “second place”), that are key for civil society, democracy, civic and cultural engagement, lifelong learning, digital inclusion, and establishing feelings of a sense of place (Oldenburg, 1999).

Becoming part of the smart cities ecosystem may require a new generation of library services that will be integrated with the city infrastructure and that will extend the library’s role as community anchor and as an information literacy hub of a smart city, where new technologies will be experimented with and new concepts related to technology grasped (Jerkov et al., 2015). However, the role of libraries in smart cities has not been defined properly (Jerkov et al, 2015). An exception is a recent panel by Mainka et al. (2016), organized in the context of the Association for Information Science and Technology. Such panel presents several experiences of public libraries (e.g. Dokk1 in Aarhus, Denmark, and the Helsinki Public Library in Finland), that are conceptualized as open urban spaces where several stakeholders gather to co-create better services. The authors argue that in smart cities, public libraries are knowledge institutions in terms of place (building and spaces) and flows (use of technology). Additionally, Jerkov et al. (2015) propose a focus on information literacy in the new library services. The authors believe that this focus has the potential of making a strong contribution toward the development of a smart city. Timidly, the authors also argue new services will require librarians to play new roles: “librarians become facilitators of communication among users. Instead of being the ones who select the data stored in books for preservation and use, librarians become head hunters who select and encourage those users willing to share their knowledge with other users. In the smart library, librarians tap into specific knowledge in order to provide services to other users” (Jerkov et al., 2015: 28).

Although both studies recognize the need to make libraries an essential part of smart city initiatives, they only offer limited help in understanding specific public libraries’ strategies, programs, services and tools aimed at engaging communities in smart cities. Further, these works make evident the lack of studies providing an in-depth view on the benefits as well as the challenges, risks, costs, and unintended consequences that public libraries could face by incorporating these into their role as community anchors. We can therefore conclude that

more knowledge and practical insights are needed to further understand the role of public libraries as community anchors in smart city initiatives. Furthermore, research is also needed on how public libraries position themselves as community catalysts acting to spark innovation and positive change (Dowdall & Norton, 2016).

As a result of the gap in the literature described above, the proposed research project will address the following two research questions:

1. To what extent do public libraries, building on their expertise, knowledge, and background, contribute to the communities' understanding of and participation in smart city initiatives?
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?

Project Design

We propose a three year study. To ensure scientific rigor we will follow a **multi-method approach**. Multi-method research designs are recognized for their ability to provide more comprehensive explanations of complex phenomena than single method studies (Gil-Garcia & Pardo, 2006; Creswell, 2003). Mixed-method research allows deep understanding of variables, but also the generalization of relationships and models. The overall goal of this design is to build new understanding of how public libraries may retain and bolster their strong community role in the time of smart cities. The research design incorporates the following stages (see visual figure in document "Schedule of Completion"):

1. **Review of scientific literature, public documents, and good practices on libraries and smart cities (six months)**. During the first step, an environmental scan on theory and practice of libraries in smart cities will be conducted, involving three types of activities:
 - a. **Scientific literature** will be reviewed for any relevant recent findings that will contribute to a stronger theoretical framework as well as to informing the overall data collection and analysis.
 - b. Further, **public documents** will be analyzed in order to deepen our current knowledge about what public libraries are already doing to engage citizens in smart city initiatives throughout the United States. We aim at conducting an environmental scan that will give us a wider picture of the current role of libraries in the development of smart city initiatives and, therefore, the potential interests, capabilities, and resources of libraries for engaging in such projects.
 - c. Finally, and although our focus is on the United States, we will aim at identifying a few **good practices** at the international level whose analysis will be used to guide our next steps. Among other, we will use the following criteria to evaluate and select such practices: innovation, transferability, feasibility, positive impact, planning, evaluation system, citizenship involvement, relevance, adequacy, responsiveness, coverage, equity, and sustainability (Gascó, 2009).
2. **Case Studies (nine months)**. One of the most appropriate ways to address innovative and underexplored research questions is through a qualitative case study (Marshall & Rossman, 2011). Qualitative case studies are well suited to respond to 'what' (descriptive) and 'how' (explanatory) questions and allow for in-depth examination of those questions while leaving room for unexpected interesting findings that can form the basis for concrete hypotheses to be tested in future research (Yin, 2013). Four qualitative case-studies across the United States will be conducted according to four criteria: a) size of library, b) geographical diversity, c) current engagement in smart city initiatives, and d) research access.
 - a. **Size**: We aim at having representation of the different types of public libraries that can be found within the United States as a way to guarantee that the results of our research will benefit and will be useful for

a wide range of libraries across the country. Although there are few guideposts for determining what constitutes a small library, we follow Swan et al. (2013) and define small libraries as those with a legal service population of 25,000 or less.

- b. **Geographical diversity:** We have learned from past projects that context matters. This is particularly important in the case of smart cities (e.g. Gasco, 2016) and libraries (e.g. Delrieu & Gibsen, 2017; Buckland, 1999). Studying libraries as community anchors requires understanding the different dynamics of diverse communities and, therefore, considering context/location as a factor to examine. Our case studies will include libraries in different cities across the United States with the aim of also comparing how context may influence the role public libraries may play in smart city initiatives.
- c. **Current engagement in smart city initiatives:** Public libraries that are already engaged in smart initiatives (be they the result of their own activity, be they the result of an already established collaboration with the city government, or be they the result of a consolidated smart city strategy led by the local government that involves different partners in the city – including public libraries) are a good starting point to analyze how libraries are helping citizens make sense of and leverage smart city tools and services. The study of their practices, benefits, and challenges will deepen our understanding of how participation of public libraries in smart cities is currently taking place and what opportunities of improvement/development lie ahead.
- d. **Research access:** Access is an important variable in any case selection process. Without the right access it would be impossible to conduct a research project and produce useful results. Therefore, we have selected a set of libraries in cities where ALA or CTG already have an existing or emerging network of contacts who will grant research access.

Preliminary identification has already been done in partnership with the ALA's Center for the Future of Libraries and four libraries have been initially chosen¹:

- a. **Ignacio Community Library** (Colorado). This public library serves a population of 5,950 and is part of the “Small Libraries Create Smart Spaces” project, funded by a National Leadership Grant from the Institute of Museum and Library Services, led by OCLC in partnership with the Association for Rural and Small Libraries (see <https://www.webjunction.org/news/webjunction/libraries-chosen-smart-spaces.html>).
- b. **Saratoga Springs Public Library** (New York). Despite serving a legal population of around 27,000, it can still be considered a small library. In addition, the city has widely invested in smart initiatives, including making its public library a hub for anyone in need of access to technology. Further, the public library serves as a community hub, both physical and virtual (see <http://saratogasmartcity.com/connectedcommunity/>).
- c. **Chattanooga Public Library** (Tennessee). Chattanooga Public Library serves a population of around 173,000. According to the US Department of Education's National Center for Education Statistics (2016), Chattanooga can therefore be considered a medium or mid-size city. We thus consider its public library to be a medium-size library. The city was among the first group of cities to be named Smart Gigabit Communities (see <http://www.timesfreepress.com/news/business/aroundregion/story/2016/jun/14/chattanooga-among-15-cities-named-smart-gigabit-communities/371000/>). That had an impact on its public library which was transformed from “a tired, stagnating public library into a vibrant, active center for the production and consumption of knowledge and culture” (see <http://gigatown.co.nz/blog/the-public-library-in-the-gigabit-community-chattanooga-tn/>). The library is widely considered an innovation leader in the United States.

¹ This is an initial proposal. However, the environmental scan (activity 1) might result in the identification of public libraries that might be considered as more appropriate to include in our research. If that is so, our research design is flexible enough to allow for those changes.

- d. **Chicago Public Library** (Illinois). According to IESE (2016), Chicago is the seventh smartest city in the world. Therefore, it has been recognized internationally as a successful smart city. Among the more important partners of Smart Chicago, the smart city strategy, is the Chicago Public Library, which participates on a wide range of initiatives (see <http://www.smartchicagocollaborative.org/people/partners/chicago-public-library/>). Further, given several recent initiatives, the Chicago Public Library is leading innovation in the city and the profession.

Conducting the four qualitative studies will be carried out in three steps:

- a. **Develop and validate data gathering protocols** (three months). Interview protocols will be developed and meetings with libraries and municipalities will be held to confirm participation and begin scheduling interviews.
 - b. **Conduct interviews** (four months). Approximately, ten on-site interviews with representatives of the public library and the local government, with smart city advocates, and other community partners, such as users, will be conducted in each city (around 40 interviews in total). Conducting interviews on-site will contribute to more detailed understanding of the context of each city. Interviews will focus on three main topics: 1) current and potential programs/services in the context of smart cities, 2) citizens' reactions to these programs/services, and 3) benefits, costs, risks, challenges, and unintended consequences for public libraries. Interviews will be recorded (upon permission of each subject) and transcribed.
 - c. **Analyze the data** (two months). Given how little literature there is directly on the role of public libraries in smart cities, we will use a mixed inductive/deductive strategy to code the interview data: this will entail using the existing literature to code data that matched existing concepts on public libraries as community anchors in smart cities initiatives, while also remaining open to new codes (representing new concepts) emerging from the data, following a grounded theory approach (Glaser & Strauss, 2009). Interviews will be coded using a software called Nvivo.
- 3. National Survey (six months).** A national survey, aimed at gathering representative information from public libraries and city governments across the United States, will be conducted in partnership with ALA's Center for the Future of Libraries. The environmental scan and literature review and, more importantly, the findings of the in-depth studies will inform the survey design and administration. Thus, it will also collect information on programs and services, citizens' reactions, benefits, and challenges. Although we are aware of the concerns raised by the project "Measures Matter" led by IMLS and COSLA (<http://www.cosla.org/content.cfm/id/mtm>), particularly about the proliferation of surveys that result in a greater burden for local efforts, and uncertainty about the sustainability and long-term access to data, we believe that the nature and goal of our project, the very applied orientation and practical approach, and the focus on long-term sustainability and impact will result in timely and relevant data, which, according to the project's plan, will be available in the results' website for researchers and libraries to reuse. Such survey will be carried out in two steps:
- a. **Initial piloting and testing of the survey instrument** (three months). Initial piloting and testing of the survey instrument to make adjustments regarding vocabulary, question order, and scales, among others elements of the design, will involve key participants identified during the case studies as well as the members of the Advisory Board. The instrument will be revised and refined accordingly.
 - b. **Administering the survey to key actors in different cities across the United States** (three months). The survey will be sent to representatives of public libraries and city governments across the country. We will build a sampling frame using the network of initial key informants, ALA, and the network of local governments the Center for Technology in Government at University at Albany already works with. The survey will be conducted online and will remain open for two months. It will include two sections. The first will ask about respondents' personal and professional characteristics, including

current and past experiences and work histories. The second will reflect key issues identified in the case studies. Finally, survey results will be analyzed using factor analysis, logistic and OLS regression, and Structural Equation Modeling (SEM) techniques.

- 4. Opportunity Agenda and Roadmap Report and Smart Libraries Toolbox (nine months).** Based on our findings from the previous activities, we will produce a report that identifies the areas of opportunity and challenges for public libraries helping enable smarter, more inclusive, and more connected communities. This report will also provide a set of recommendations and next steps to help and prepare public libraries to engage in their communities' smart initiatives. In addition, the project will develop a toolbox aimed at helping public libraries understand and communicate the value they can provide as community anchors and, further, community catalysts in the context of smart cities. The toolbox will include, among other things, techniques, marketing tools, workshop/training ideas, and methodological guides (see the section on National Impact below for more information). Both the report and the toolbox will be made available to the four libraries and additional stakeholders of our case studies. A workshop will be organized with them to test the products and get the participants' feedback, which, in turn, will lead to an improved and refined version of both products. The workshop will start with a presentation of the two products by the research team and will include several small group exercises and plenary discussions. We will invite two representatives from each of the four cities, one from the public library and one from the city government, as well as the members of the Advisory Board (see below). The workshop will be facilitated by the research team and will be free for participants.
- 5. Dissemination (six months).** As each research step produces results, findings will be written in research papers to be presented at national and international conferences, such as the IEEE International Smart Cities Conference, the Hawaii International Conference on System Sciences (HICSS), and the IEEE International Conference on Research Challenges in Information Science. They will also be published in high-impact scientific journals in multiple disciplines, such as Government Information Quarterly, Social Science Computer Review, and the Journal of Information Science.

There will be specific dissemination activities once the final versions of the two final products, the Opportunity Agenda and Roadmap Report and the Smart Libraries Toolbox, is released. Dissemination will take place both online and offline. On one hand, the products will be emailed to all participating libraries in the case studies and the survey. Further, ALA will include the availability of the products through its communication channels, reaching a wider community of public libraries and library professionals. To guarantee that these products reach small and rural communities, we will rely on the network of the Association for Rural and Small Libraries (see below). The products will also be available on CTG's website and social media will be used for dissemination. The section of CTG's website containing the products will be complemented with additional pieces of information, such as videos on how to use the toolbox, news on the project and the experience of libraries using the products, and a forum to post questions and comments on the products. The research team will feed this section since the beginning of the project to raise awareness about it. However, the site will be fully developed during the last six months.

On the other hand, and in order to make sure dissemination reaches additional targets such as city governments, smart city-related organizations, other public agencies, and the academic community, but also in order to provide an additional opportunity for local governments and their public libraries to develop partnerships, a event on libraries in smart cities will be organized. Remote participation will be supported to maximize involvement of participants and enabling broad diffusion of project's results and increasing the potential for impact on practice. During the event, the project and the two products will be presented. Also, some of the libraries participating in the case studies will present their experiences. Further discussion on how public libraries can advance their role as community anchors will follow. Finally, the research team will also take part in practitioner-oriented conferences, both in the field of libraries and in smart cities, such as the Public Libraries Association (PLA) National Conference, the ALA Annual Conference, the

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Association for Small and Rural Libraries Conference, and the Smart City Expo World Congress in Barcelona (Spain). The latter is considered to be the most important smart city event in the world. Its popularity for both academics and practitioners has resulted in small editions all over the world: Puebla (Mexico), Casablanca (Morocco), Kyoto (Japan), Buenos Aires (Argentina), Montreal (Canada), Istanbul (Turkey), or Bogota (Colombia).

Regarding the **composition of the research team**, CTG has a successful record of funded research project management and a well-established organizational management structure, based on functional and highly efficient teams. For the proposed project, the management structure is designed to provide direction and control tailored to the specific needs. A two-member Senior Research team (SRT) will be formed for overall management, consisting of the PI, Dr. Mila Gasco, and one co-PI, Dr. J. Ramon Gil-Garcia. In addition, the research staff will include a Project Manager, Mr. Brian Burke, a Project Assistant, Mrs. Megan Sutherland, a Communications Manager, Ms. Kelsey Butz, and a Web Application Developer, Mr. Jim Costello. The Project Manager will have responsibility for administering the day-to-day operation of the research activities, financial and personnel management, record keeping and reporting to IMLS, Research Foundation (SUNY) and the University, and will report to the PI and the co-PI. The Project Manager will also act as professional staff to the SRT. Under the direction of the SRT, the Project Manager will develop detailed activity plans, organize and run regular project meetings, and prepare progress reports and systematic documentation of actions and decisions. These procedures are in place as part of regular CTG operations and have been refined over twenty years of successful funded research and strategic consulting projects. CTG formal processes are complemented by a high level of informal communication.

The core research team will also include a Subject Matter Expert, Mr. Miguel Figueroa, from the Center for the Future of Libraries at the American Library Association. The Center promotes futuring and innovation techniques to help librarians and library professionals shape their future as well as builds connections with experts and innovative thinkers to help libraries address emerging issues.

All members of the research team have wide experience in research but, also, in addressing practitioners' needs. Further, some of them have specific experience in research on libraries for they were part of the project "The Role of Public Libraries in Improving Local Open Government Ecosystems" funded by the 2013 Laura Bush 21st Century Librarian Program Grant (award number RE-00-13-0087-139) and whose final report can be found at https://www.ctg.albany.edu/publications/reports/enabling_open_gov_for_all/enabling_open_gov_for_all.pdf. Also, Mr. Figueroa's expertise will be key in addressing the needs of libraries and in the dissemination of the project's results.

In addition, the research team's work will be supported by the expertise of an **Advisory Board (AB)**, who will provide strategic advice for the multiple stages and activities of the project. It will be composed by leading academic and practitioners in the fields of public libraries and/or smart cities. The AB will represent different perspectives: the academy, the public sector, the libraries (including small and rural libraries), and the non-profit sector. The Advisory Board will advise and review the project at the request of the SRT, and will do so mainly through email. The main responsibilities of the AB include:

- Providing requirements and feedback to the project objectives.
- Helping ensure from the outset that the focus and design of the research addresses issues which matter to libraries and cities.
- Monitoring the main milestones of the project, updating their feedback, and providing the necessary inputs for guiding the project towards the achievement of main objectives.
- Promoting dissemination events and written outputs tailored to the needs of libraries and other stakeholders.
- Reinforcing the link between academic research and practice, guaranteeing the practical implications of the research results.
- Receiving regular updates on the progress of the study and providing feedback on emerging issues.

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- Providing a final feedback on results evaluation and expectations for future evolution.

The AB will meet face-to-face at the beginning and the end of the project. This second meeting will take place before releasing the final two products and at the same time than the final workshop with case studies' stakeholders. In addition, teleconferences with the Advisory Board will be organized every six months.

The following experts have already accepted to be part of the Advisory Board of our project:

- Mary Soucie, North Dakota State Librarian, member of the Board of Directors of the Association for Rural and Small Libraries. Mrs. Soucie's expertise on libraries, built over 20 years as a librarian, will be key for the development of the project. She has worked in public and school libraries at both the local and the state level and she has served as a trustee for both her local public library and an Illinois Regional Library System.
- Norman Jacknis, President of the New York Metropolitan Library Council, Senior Fellow at the Intelligent Community Forum, former CIO of Westchester County NY. Mr. Jacknis's interesting profile mixes different perspectives, that of libraries but also city governments and non-profits, that will be specifically valuable given this project's goals.
- Nigel Jacob, Founder and Co-Chair for the Mayor's Office of New Urban Mechanics in Boston, MA. Boston is known to be one of the smartest cities in the world. Further, Mr. Nigel has presented in the past for library audiences for ALA, showing a deep understanding of the needs of libraries.
- Dionne Baux, Director of Urban Programs, Main Street America. Mrs. Baux has extensive expertise engaging community stakeholders and identifying and implementing projects in conjunction with community based organizations and government institutions. She has been involved in smart city initiatives, particularly in the city of Chicago.
- John Bertot, Professor and Associate Provost for Faculty Affairs of the College of Information Studies at University of Maryland. Professor Bertot's research has focused, among other, on the ability of public libraries to understand access and dissemination issues from both a management and user perspective. In addition, he served as Chair of the ALA's Library Research Round Table, and currently serves on the ALA Committee on Research and Statistics and E-Government Services Subcommittee.

In terms of **available resources**, the infrastructure and mechanism for communication and coordination include CTG's managed LAN with workstations for all staff, e-mail, file server, applications software, and Internet access, as well as full phone and fax service. Effective protocols are in place for document management and secure storage of various electronic and paper files and other media. In addition, CTG has fully functional internal procedures and policies for financial and personnel management that are consistent with those of the SUNY Research Foundation, as well as experienced professional staff to support the research staff when necessary. Our financial needs are summarized below.

Total research project cost is \$456,394. The total salary and fringe benefits cost of \$266,834 for two faculty as PI and co-PI Researcher's, one Graduate Student, Project Manager, Project Assistant and Web Applications Developer to support all research activities of the project, and Communications Manager for outreach. Total contractor cost of \$48,840 for one independent contractor as a subject matter expert on the research team, stipends for Advisory Board members, live streaming of final workshop and venue and food costs for workshops and advisory board meetings. Total travel cost of \$44,118 for interviews at four site visits, two face to face Advisory Board meetings, refinement workshop for case study participants and conference travel support to disseminate findings and results to the American Library Association (ALA) and Smart Cities focused conferences. Total cost of supplies and materials of \$2,425 for workshop materials, electronic survey subscription, and software. University at Albany indirect of 26% on total direct cost of \$362,217 at \$94,177.

National Impact

As mentioned before, “Enabling Smart, Inclusive, and Connected Communities: The Role of Public Libraries” aims at advancing the role of libraries as community anchors in smart city initiatives that provide civic and cultural engagement, facilitate lifelong learning, promote digital inclusion, and support economic vitality through new programs and services. Although public libraries are already playing a significant role as providers of connectivity and as adopters of technology, a few successful examples are also showing that public libraries may become community catalysts and key facilitators in smart city initiatives. In this respect, smart cities require smart citizens (Gascó, 2016) and public libraries have the potential to become the platform that informs them and brings them together.

Our project will address this goal by 1) understanding and serving libraries interests and needs in advancing their role as community anchors in smart cities, and 2) examining the benefits but also costs, risks, challenges, and unintended consequences for public libraries of progressing towards this role. Further, the project will focus on 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 tools, the Opportunity Agenda and Roadmap Report and the Smart Libraries Toolbox, to guide libraries willing to advance their role as community anchors in smart cities and to provide them with numerous resources and ideas for new programs and services contextualized to community issues/interests, and 3) enhancing the relationships between researchers and practitioners by communicating research findings in different events and ways that will lead to demonstrable improvements in library services.

Our project will also pursue **broad national impact**. First, our proposed research will conduct an in-depth analysis of different types of libraries in different contexts that will inform a national survey. Both activities will ensure that the benefits of the research are not limited to the local community but advance national practice. In addition, having Mr. Miguel Figueroa, Director of the Center for the Future of Libraries at American Library Association, as a member of the research team will guarantee national coverage of dissemination of results and, therefore, national impact. Finally, the contribution of Mary Soucie, from the Association of Small and Rural Libraries, as part of the Advisory Board will also help reach small and rural public libraries, which make up the majority of public library systems in the United States (Swan et al., 2013).

As indicated above, our project will result in two specific practical products. First, the **Opportunity Agenda and Roadmap Report** will be a strategic document, providing specific advice. It will include two main sections. The first one will summarize our findings throughout the project, making evident the challenges but, also, the opportunities for public libraries to be proactive and deliberate in evolving the roles they may play in smart city initiatives (for an example of a CTG roadmap report, please, see “Enabling Open Government for All: A Road Map for Public Libraries” available at https://www.ctg.albany.edu/publications/reports/enabling_open_gov_for_all). The second section will include a set of recommendations for public libraries structured along the lines of relevant topics identified over this three-year project. Second, the **Smart Libraries Toolbox** will strive to be a source of knowledge and inspiration for public libraries interested in advancing their role in smart cities. It will consist of an online interactive guide containing several resources to support libraries that are willing to rethink their role in smart city initiatives. It will, at least, include six sections: 1) Getting Started, 2) New Programs and Services (resources on new services and activities that will develop the role of libraries as community anchors in smart cities, such as workshop/training topics, use of digital tools, and co-production processes), 3) Organizational Processes (resources on how to address the internal changes that might result as a consequence of the project; it will cover issues such as human resources management and reorganization of infrastructures and spaces, 5) Marketing and Outreach Tools, 4) Demonstrators (resources on new and existing innovative public libraries’ projects), and 6) Network and Additional Resources (a space for public libraries to interact, share experiences and resources and pose questions). In each of the sections, libraries will find several tools and resources, such as checklists, methodological guides, videos, and interactive fora (for an example of a toolbox that will inspire our

work, please, see http://toolbox.celsiuscity.eu/index.php/Main_Page). The toolbox will be accessed online through CTG and ALA's websites.

Our project aims at contributing to the **agency-level goal of Community** and, therefore to the **performance goal** of “strengthen libraries as essential partners in addressing the needs of their communities”. We plan to administer a very short survey (no more than five questions to ensure a high response rate) to the set of public libraries that will receive the Opportunity Agenda and Roadmap Report and the link to the Smart Libraries Toolbox. We will send the survey during the last four weeks. Yet, the changes we are envisioning as a result of our project are not minor and public libraries will need time to access the information in the products and to decide how to advance their role as community anchors in their cities' context. Therefore, we do not expect drastic changes at the beginning. Instead, we believe that the response rate and the reported innovations will increase as public libraries start reading and using the products. For that reason, and although the funding period will be over, the survey will remain open and public libraries approaching CTG or ALA to access the Opportunity Agenda and Roadmap Report and the Smart Libraries Toolbox will be asked to fill it. This final survey will include questions on meeting libraries' needs and interests, on libraries being better prepared to advance their role as community anchors, and on the perceived impact by libraries of the project's results. Results will be reported through CTG's website section on the project and through ALA's website.

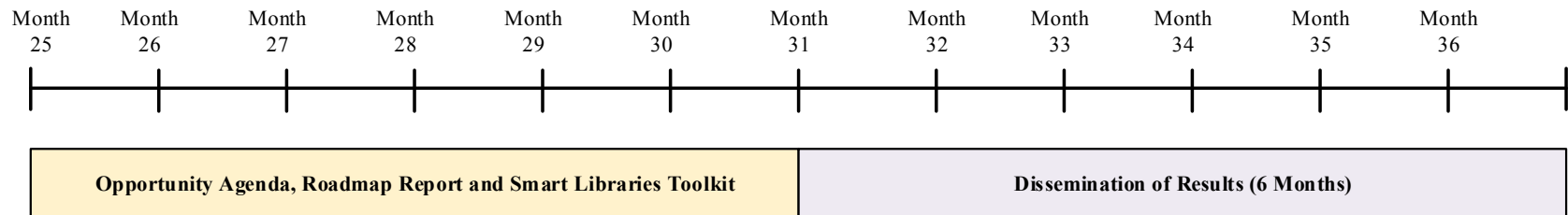
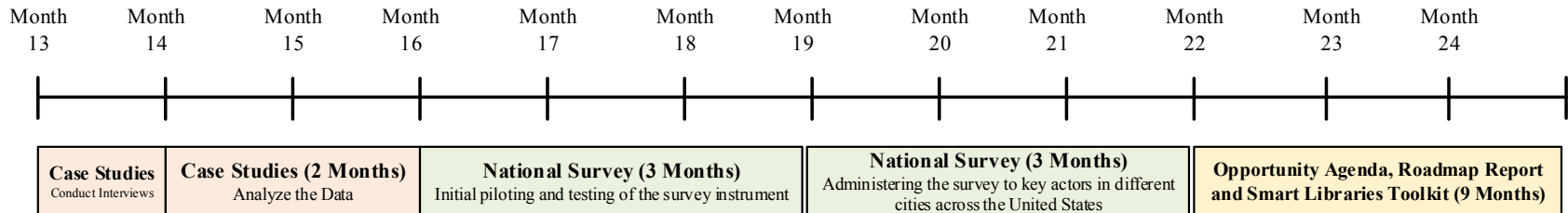
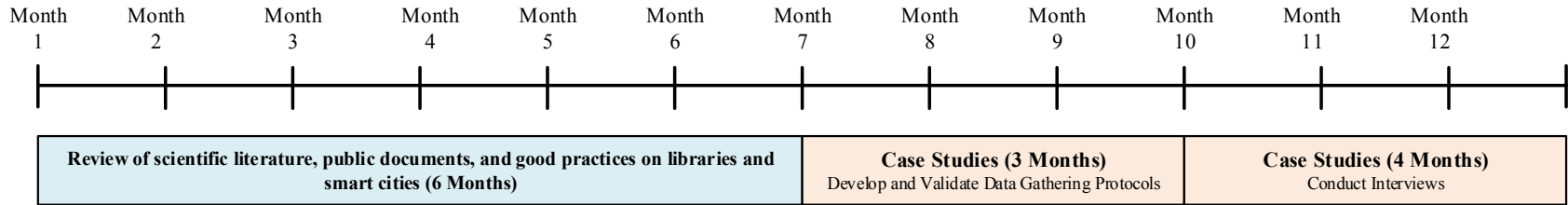
In order to have a more integral assessment, the results from the survey will be complemented with information about our ability to reach public libraries across the United States. Among other, we will measure number of libraries participating in the project, number of visits to the project's website (at CTG's website), number of times the final report is downloaded, and number of visitors accessing the toolbox.

In addition to this evaluation of impact at the end of the project, we believe it is key to also conduct qualitative formative evaluations throughout the project with the aim of improving the project's design and performance. As stated previously, the Advisory Board as well as the Subject Matter Expert will play a key role in this respect. Further, we will take advantage of our interactions with public libraries at different stages, for example during the initial piloting and testing of the survey instrument and the half-day workshop, to ask for feedback on our progress and intermediate results.

Finally, in terms of **sustainability**, we will follow two paths. First, we believe that having the project's products online will sustain its benefits beyond the funding period. Our goal in this respect is to grow a community of public libraries interested in becoming key partners in the development of smart city initiatives, showing the potential of the project for far-reaching impact across sizes (including rural ones) and complexity of libraries. Second, we expect the results of our project to influence the theoretical fields of smart cities and libraries and the areas where these two fields converge (such as information science, public administration, and computer science). Thus, to sustain the benefits of the project from an academic perspective, we will aim at expanding research on the role of libraries in smart city initiatives, for example, by means of international comparative research or by a study aimed at exploring the role of technology in supporting libraries contribution to smart city initiatives. We will also explore additional funding opportunities such as the ones offered by the National Science Foundation (for example, their program on Smart and Connected Communities) or foundations such as the Ford Foundation, which is particularly interested in the topic of civic engagement.

CTG IMLS NLG for Libraries Research Proposal: Schedule of Completion

ENABLING SMART, INCLUSIVE, AND CONNECTED COMMUNITIES: THE ROLE OF PUBLIC LIBRARIES



DIGITAL PRODUCT FORM

Introduction

The Institute of Museum and Library Services (IMLS) is committed to expanding public access to federally funded digital products (i.e., digital content, resources, assets, software, and datasets). The products you create with IMLS funding require careful stewardship to protect and enhance their value, and they should be freely and readily available for use and re-use by libraries, archives, museums, and the public. However, applying these principles to the development and management of digital products can be challenging. Because technology is dynamic and because we do not want to inhibit innovation, we do not want to prescribe set standards and practices that could become quickly outdated. Instead, we ask that you answer questions that address specific aspects of creating and managing digital products. Like all components of your IMLS application, your answers will be used by IMLS staff and by expert peer reviewers to evaluate your application, and they will be important in determining whether your project will be funded.

Instructions

You must provide answers to the questions in Part I. In addition, you must also complete at least one of the subsequent sections. If you intend to create or collect digital content, resources, or assets, complete Part II. If you intend to develop software, complete Part III. If you intend to create a dataset, complete Part IV.

PART I: Intellectual Property Rights and Permissions

A.1 What will be the intellectual property status of the digital products (content, resources, assets, software, or datasets) you intend to create? Who will hold the copyright(s)? How will you explain property rights and permissions to potential users (for example, by assigning a non-restrictive license such as BSD, GNU, MIT, or Creative Commons to the product)? Explain and justify your licensing selections.

The digital products we intend to create will be solely owned by The Research Foundation for the State University of New York (FOUNDATION). All copyrights for the digital products created will be solely owned/held by FOUNDATION. We do not anticipate creating any software through performing the project so the non-restrictive licenses mentioned would not be required. However we do intend to offer non-commercial, non-restrictive licenses for copyrights to the digital products created under the project. The Research Foundation for the State University of New York (SUNY) is a private, non-profit educational corporation that manages and administers sponsored research across the 64 institution SUNY system to ensure ethical conduct and financial transparency. The Research Foundation works with the academic and business leadership of campuses to support research and discovery at SUNY through efficient and skillful administration of sponsored projects and adept transfer and sharing of intellectual property for public benefit and economic growth. Based on this role we feel it is responsible and appropriate to license copyrights to the digital products through the Foundation as a way to benefit the public good and responsibly balance the interests of all interested parties.

A.2 What ownership rights will your organization assert over the new digital products and what conditions will you impose on access and use? Explain and justify any terms of access and conditions of use and detail how you will notify potential users about relevant terms or conditions.

The digital products we intend to create will be solely owned by owned by The Research Foundation for the State University of New York (FOUNDATION). We intend to offer non-commercial, non-restrictive licenses for copyrights to the digital products created under the project. All of our products will be publicly available via our website and available for download and use. All products will include a FOUNDATION copyright and statement. Here is an example of a past statement with access and use permissions: This report is funded by a 2013 Laura Bush 21st Century Librarian Program Grant: Award Number RE-00-13-0087-13 for the project titled The Role of Public Libraries in Improving Local Open Government Ecosystems. CTG grants permission to reprint this document provided this cover page is included. ©2014 The Research Foundation of State University of New York.

A.3 If you will create any products that may involve privacy concerns, require obtaining permissions or rights, or raise any cultural sensitivities, describe the issues and how you plan to address them.

We will not create any products that may involve privacy concerns, require obtaining permissions or rights, or raise any cultural sensitivities.

Part II: Projects Creating or Collecting Digital Content, Resources, or Assets

A. Creating or Collecting New Digital Content, Resources, or Assets

A.1 Describe the digital content, resources, or assets you will create or collect, the quantities of each type, and format you will use.

As described on page 9 of our narrative we plan to create two primary digital resources: Opportunity Agenda and Roadmap Report and the Smart Libraries Toolbox. The report will be published and made publicly available on the CTG website. The Toolbox will consist of an online interactive guide containing several resources to support libraries that are willing to rethink their role in smart city initiatives. It will, at least, include six sections: 1) Getting Started, 2) New Programs and Services (resources on new services and activities that will develop the role of libraries as community anchors in smart cities, such as workshop/training topics, use of digital tools, and co-production processes), 3) Organizational Processes (resources on how to address the internal changes that might result as a consequence of the project; it will cover issues such as human resources management and reorganization of infrastructures and spaces), 5) Marketing and Outreach Tools, 4) Demonstrators (resources on new and existing innovative public libraries' projects), and 6) Network and Additional Resources (a space for public libraries to interact, share experiences and resources and pose questions). In each of the sections, libraries will find several tools and resources, such as checklists, methodological guides, videos, and interactive fora. The toolbox will be accessed online through CTG websites. Users will be able to download and print the Report and components of the Toolbox as needed.

A.2 List the equipment, software, and supplies that you will use to create the content, resources, or assets, or the name of the service provider that will perform the work.

NA

A.3 List all the digital file formats (e.g., XML, TIFF, MPEG) you plan to use, along with the relevant information about the appropriate quality standards (e.g., resolution, sampling rate, or pixel dimensions).

Word and PDF. We anticipate posting any videos using YouTube.

B. Workflow and Asset Maintenance/Preservation

B.1 Describe your quality control plan (i.e., how you will monitor and evaluate your workflow and products).

NA

B.2 Describe your plan for preserving and maintaining digital assets during and after the award period of performance. Your plan may address storage systems, shared repositories, technical documentation, migration planning, and commitment of organizational funding for these purposes. Please note: You may charge the federal award before closeout for the costs of publication or sharing of research results if the costs are not incurred during the period of performance of the federal award (see 2 C.F.R. § 200.461).

CTG maintains all of its past digital products using both its website as well as secure server located at CTG. Please visit CTG at www.ctg.albany.edu and our Publications and Projects page for examples.

C. Metadata

C.1 Describe how you will produce any and all technical, descriptive, administrative, or preservation metadata. Specify which standards you will use for the metadata structure (e.g., MARC, Dublin Core, Encoded Archival Description, PBCore, PREMIS) and metadata content (e.g., thesauri).

NA

C.2 Explain your strategy for preserving and maintaining metadata created or collected during and after the award period of performance.

NA

C.3 Explain what metadata sharing and/or other strategies you will use to facilitate widespread discovery and use of the digital content, resources, or assets created during your project (e.g., an API [Application Programming Interface], contributions to a digital platform, or other ways you might enable batch queries and retrieval of metadata).

NA

D. Access and Use

D.1 Describe how you will make the digital content, resources, or assets available to the public. Include details such as the delivery strategy (e.g., openly available online, available to specified audiences) and underlying hardware/software platforms and infrastructure (e.g., specific digital repository software or leased services, accessibility via standard web browsers, requirements for special software tools in order to use the content).

Our products will be made openly available online via the CTG website at www.ctg.albany.edu.

D.2 Provide the name(s) and URL(s) (Uniform Resource Locator) for any examples of previous digital content, resources, or assets your organization has created.

www.ctg.albany.edu

Part III. Projects Developing Software

A. General Information

A.1 Describe the software you intend to create, including a summary of the major functions it will perform and the intended primary audience(s) it will serve.

We do not intend to create any software.

A.2 List other existing software that wholly or partially performs the same functions, and explain how the software you intend to create is different, and justify why those differences are significant and necessary.

NA

B. Technical Information

B.1 List the programming languages, platforms, software, or other applications you will use to create your software and explain why you chose them.

NA

B.2 Describe how the software you intend to create will extend or interoperate with relevant existing software.

NA

B.3 Describe any underlying additional software or system dependencies necessary to run the software you intend to create.

NA

B.4 Describe the processes you will use for development, documentation, and for maintaining and updating documentation for users of the software.

NA

B.5 Provide the name(s) and URL(s) for examples of any previous software your organization has created.

NA

C. Access and Use

C.1 We expect applicants seeking federal funds for software to develop and release these products under open-source licenses to maximize access and promote reuse. What ownership rights will your organization assert over the software you intend to create, and what conditions will you impose on its access and use? Identify and explain the license under which you will release source code for the software you develop (e.g., BSD, GNU, or MIT software licenses). Explain and justify any prohibitive terms or conditions of use or access and detail how you will notify potential users about relevant terms and conditions.

NA

C.2 Describe how you will make the software and source code available to the public and/or its intended users.

NA

C.3 Identify where you will deposit the source code for the software you intend to develop:

Name of publicly accessible source code repository: NA

URL: NA

Part IV: Projects Creating Datasets

A.1 Identify the type of data you plan to collect or generate, and the purpose or intended use to which you expect it to be put. Describe the method(s) you will use and the approximate dates or intervals at which you will collect or generate it.

We will collect two types of data. Interview data via audio recordings and notes and survey data through an online survey. Please see the Project Design section of our Project Narrative for purpose and intended use of the data. See Figure 1 on page 7 of the Project Narrative for approximate dates for data collection.

A.2 Does the proposed data collection or research activity require approval by any internal review panel or institutional review board (IRB)? If so, has the proposed research activity been approved? If not, what is your plan for securing approval?

The proposed data collection will require IRB review since it involves human subjects research. We will submit an IRB protocol submission application upon project approval.

A.3 Will you collect any personally identifiable information (PII), confidential information (e.g., trade secrets), or proprietary information? If so, detail the specific steps you will take to protect such information while you prepare the data files for public release (e.g., data anonymization, data suppression PII, or synthetic data).

We will collect PII in the form of name, job title, etc. in the case study interviews and maybe in the survey. All case study interview files (i.e. audio, transcripts, and notes) will be kept at CTG on our secure server and locked facility. The identification of specific individuals in our Report and Toolbox will only occur with prior approval from the individuals involved in the research.

A.4 If you will collect additional documentation, such as consent agreements, along with the data, describe plans for preserving the documentation and ensuring that its relationship to the collected data is maintained.

If the IRB determines we need to obtain written consent. We will store these files in a secure filing cabinet at CTG; clearly marked for this project.

A.5 What methods will you use to collect or generate the data? Provide details about any technical requirements or dependencies that would be necessary for understanding, retrieving, displaying, or processing the dataset(s).

Audio recorders, written notes, online survey tool such as SurveyMonkey.

A.6 What documentation (e.g., data documentation, codebooks) will you capture or create along with the dataset(s)? Where will the documentation be stored and in what format(s)? How will you permanently associate and manage the documentation with the dataset(s) it describes?

Tracking of interviews conducted and a code book will be developed for the case study portion of the project.

A.7 What is your plan for archiving, managing, and disseminating data after the completion of the award-funded project?

Audio files of interviews, interview notes, and interview transcripts will be stored at the Center for Technology in Government (CTG). Electronic files will be stored in CTG's secure network and hardcopies of notes and transcripts will be stored in locked drawers. We will keep the research data for at least three years. After three years we will work with the UAlbany Office for Pre-Award & Compliance Services to transfer appropriate research related files to the University Archives with the purpose of allowing broader access to the research data.

A.8 Identify where you will deposit the dataset(s):

Name of repository: I drive on CTG server

URL: NA

A.9 When and how frequently will you review this data management plan? How will the implementation be monitored?

Annually. Implementation will be monitored by the project PI.