Investigation of Possible Uses of Blockchain Technology by Libraries-Information Centers to Support City-Community Goals (Proposal Number. LG-98-17-0209)

Abstract

The San José State University Research Foundation requests support from the Institute of Museum and Library Services (IMLS) National Leadership Grants program for a project focusing on the potential uses of blockchain technology that can extend library services to meet the needs of communities. The San José State University (SJSU) Research Foundation on behalf of the School of Information (iSchool) is the lead applicant with PIs, Sandra Hirsh and Susan Alman, and an advisory committee consisting of members associated with organizations that support libraries and information centers through education, research, programs, and services. These individuals have served as an advisory team to develop a project that will explore the ways blockchain technology can be used by libraries in partnership with community organizations. The Advisory Committee members are: Miguel Figueroa; Jason Griffey; Christinger Tomer; Brendan Howley; Amy Garmer; R. Ryan Hess; Nader Afzalan; Alessandro Voto.

Blockchain technology has the potential to enhance the role played by libraries within their communities, however, there are many questions yet to be answered about how specifically blockchain technology might be used and how much value it would add to library services and the communities they serve. The San José State University School of Information (iSchool) is poised to take a leadership role to investigate ways that blockchain technology can be used by libraries as a community anchor to partner with other organizations and to support city/community goals.

The year-long project will provide three opportunities for a national dialog among technical experts in libraries, blockchain technology, and urban planning and members of the information professions to discuss ways that blockchain technology can advance library services to support city/community goals.

1. **Develop a project website and blog** that will include information and resources about blockchain technology, potential uses of blockchain technology by libraries, and project updates along with a blog to foster open dialog. (Scheduled from November 2017 - September 2018.)
2. **National Forum** comprised of 20-30 technical experts in libraries, blockchain technology, and urban planning to identify and discuss key opportunities for libraries to serve as community anchors using blockchain technology. (Scheduled for March 2018.)
3. Host a **Library 2.018 conference** that will focus on Blockchain Technology as a Community Anchor. Registration in this open online conference is free to the profession and public. The June Library 2.018 conference will include sessions that review the blockchain recommendations made at the national forum and provide opportunities for input from conference participants. (Scheduled for June 2018.)

The resulting commentary from the blog, national forum, and conference will be evaluated and included in the project's final report. The report and the project findings will be available on the Project Website and disseminated at professional conference presentations beginning in summer 2018. The recommendations will serve as a guide for both large and small, urban and rural libraries to implement blockchain technology or consider other directions.

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Introduction: Blockchain Technology and Libraries

"Libraries demonstrate their value as community anchors by responding to issues and identifying trends that impact the community." [1] It is clear from the expanding literature that blockchain technology is a trend on the brink of revolutionizing the public and private sectors. There have been conferences, books, white papers, start-ups, and numerous back-channel discussions on ways blockchain technology can address seemingly endless processes, but librarians have not been evidenced in these mainstream discussions. However, the use of blockchain technology in libraries seems to be on the radar of many information professionals.

It is time to examine the possible ways that libraries can support city/community goals through the use of blockchains while the implementation of the technology is still in the infancy stage. The following statements provide support that blockchain technology is relevant to the communities served by libraries:

1. The Congressional Blockchain Caucus co-chairs, Jared Polis and David Schweikert, addressed the recent DC Blockchain Summit where they stated that blockchain "...could transcend partisan divides. The utopian aspect of people being in control of their own information has broad appeal to both the left and the right."[2]
2. *Urban or rural, public or private, large or small, libraries are living in a moment in which they are juxtaposed between their traditional role as a respected historical institution and their emerging role as a platform for progress. In an age where innovation occurs at the speed of thought, how can libraries embrace technology as well as employ it to build stronger communities?* [3]

This project focuses on the exploration of potential uses of blockchain technology[4, 5] that can extend library services to meet the needs of communities. The San José State University (SJSU) Research Foundation on behalf of School of Information (iSchool) is the lead applicant with an advisory committee consisting of members associated with organizations that support libraries and information centers through education, research, programs, and services. These individuals have served as an advisory team to develop a project that will explore the ways blockchain technology can be used by libraries in partnership with community organizations.

[1] Rosa, Kathy, Ed. "The State of America's Libraries 2015." A Report from the American Library Association.
[2] "*The Trump Administration is Buying into Blockchain Tech*" CoinDesk. March 17, 2017
[3] Excerpt from The Aspen Institute - Libraries in the Exponential Age: Moving from the Edge of Innovation to the Center of Community, 2016.
[4] The term "blockchain technology" refers variously to the BitCoin Blockchain, the Ethereum Blockchain, virtual currencies digital tokens, and/or smart contracts. In the main, however, the term refers to distributed digital ledgers, through which lists of transactions are replicated across a number of computers, rather than being stored on a central server. The common feature is a data store which: (1) contains records of transactions; (2) is replicated across a number of systems, typically configured as a peer-to-peer network; (3) uses cryptography and digital signatures to prove identity, authenticity and enforce read/write access rights; (4) can be written to and read by authorized participants, with readerspresumably constituting a wider audience; and (5) affords security mechanisms that ensure the integrity of the records contained therein.
[5] "*Programmable Blockchains in Context: Ethereum's Future*" Explanation of blockchains

Blockchain technology has the potential to enhance the role played by libraries within their communities, however, there are many questions yet to be answered about how specifically blockchain technology might be used and how much value it would add to library services and the communities they serve. The SJSU iSchool is poised to take a leadership role to investigate ways that blockchain technology can be used by libraries as a community anchor to partner with other organizations and to support city/community goals.

1. Statement of National Need

In the first few months of 2017 there have been several major conferences and projects that addressed the ways blockchain technology can be integrated into the public sectors.[6, 7] In a May 2017 Gartner, Inc. webinar, *Enterprise Blockchain: Current Pitfalls, Future Potential*, the following statement points to the uncertainty of how this technology can be harnessed.

> *Blockchain enthusiasm continues unabated across many organizations in multiple industry sectors. The potential is undeniable, but there is still much misunderstanding about this emerging technology. The result is significant misalignment between solution requirements and technology capabilities.*[8]

There are instances, however, of blockchain technology projects being developed in areas where libraries could also have a role. The recent *Smart Dubai* and *Illinois Blockchain Initiative* projects involving community and state governments provide models that warrant further exploration. *Smart Dubai* intends to achieve the goal of "becoming the world's first blockchain powered city by 2020" [9] by migrating diverse agencies such as "Dubai Tourism, the Dubai Health Authority and the Dubai Police." IBM and ConsenSys will collaborate on this initiative. The Illinois Department of Innovation and Technology (DoIT) formed a consortium of state and county agencies to explore the uses of blockchain and distributed ledgers.

> *The goal of the initiative is to determine if this groundbreaking technology can be leveraged to create more efficient, integrated and trusted state services, while providing a welcoming environment for the Blockchain community. Blockchain and distributed ledger technology has the potential to transform the delivery of public and private services, redefine the relationship between government and the citizen in terms of data sharing, transparency and trust, and make a leading contribution to the State's digital transformation.*[10]

[6] DC Blockchain Summit, Chamber of Digital Commerce, March 15-17, 2017. https://digitalchamber.org/events/dc-summit-2017.html
[7] Business of Blockchain Conference, MIT Media Lab, April 18, 2017. https://www.media.mit.edu/events/business-of-the-blockchain/
[8] *From Gartner, Inc. Website:*
[9] "Smart Dubai Office and 1776 Partner to Launch First Blockchain Challenge in Dubai." January 2017. http://www.smartdubai.ae/story0205b.php
[10] Blockchain in Illinois

Libraries and information centers need to take a proactive role in these early discussions in order to secure a seat at the table when community decisions are discussed and implemented. Including libraries in these collaborative projects could add new dimensions and roles for library/community partnerships. Librarians bring expertise in IT, community trust, and information organization and distribution, and blockchain technology has the potential to enhance the role played by libraries within their communities.

It has been proposed that blockchain technology be employed in a number of ways that are relevant to libraries and their users, including the establishment of access to resources and services until now beyond the scope of library services. There are, however, many questions yet to be answered about how specifically blockchain technology might be used and how much value it would add to library services.

2. Project Design

The year-long project will provide three opportunities for a national dialog among technical experts in libraries, blockchain technology, and urban planning and members of the information professions to discuss ways that blockchain technology can advance library services to support city/community goals.

1) **Develop a project website and blog** that will include information and resources about blockchain technology, potential uses of blockchain technology by libraries, and project updates along with a blog to foster open dialog. (Scheduled from November 2017 - September 2018.)
2) **National Forum** comprised of 20-30 technical experts in libraries, blockchain technology, and urban planning to identify and discuss key opportunities for libraries to serve as community anchors using blockchain technology. (Scheduled for March 2018.)
3) Host a **Library 2.018 conference** that will focus on Blockchain Technology as a Community Anchor. Registration in this collaborative open online conference is free to the profession and public. The June Library 2.018 conference will include sessions that review the blockchain recommendations made at the national forum and provide opportunities for input from conference participants. (Scheduled for June 2018.)

The resulting survey data and commentary from the blog, national forum, and conference will be evaluated and included in the project's final report. The report and the project findings will be available on the Project Website and disseminated at professional conference presentations beginning in summer 2018. The recommendations will serve as a guide for both large and small, urban and rural libraries to implement blockchain technology or consider other directions.

Scenarios: Libraries as Community Anchors Using Blockchain Technology

The IMLS Blockchain Grant Proposal's Advisory Committee, comprised of individuals representing industry leaders, blockchain innovators, and urban planners developed ideas for discussion in a national forum. The potential for blockchain technologies in information ecosystems such as libraries, museums, and archives is as-yet untapped but rich and varied. There are many potential projects for libraries and information brokers, and blockchain technology bears careful examination over the next several years. The ideas listed below will be developed into complete scenarios for a national discussion.

Potential Blockchain Projects for National Forum Discussion

- Building a distributed, permissionless metadata archive has perhaps the most disruptive potential. Because blockchains operate as a type of informational ledger that don't require a centralized gatekeeping organization, they could be utilized to build a truly distributed metadata system for libraries and related organizations. A blockchain OCLC, if you will. Such a system would be accessible to any who wished to be a part with no additional expenditures and thus would scale cleanly, while still maintaining quality of data through selective reading/output choice based on hash signing.

- Another potentially disruptive idea for information ecosystems is that of the Digital First Sale as a result of provable ownership and digital scarcity. A rights management system built on blockchain is obvious and at the center of many current blockchain projects. Of interest to libraries specifically is the potential for these to be a lever for digital first sale rights. Jason Griffey is in the process of researching such an argument with an internationally-regarded copyright expert, and will be working on a paper arguing for such over the summer 2017. While DRM of any sort is not desirable, if by using blockchain-driven DRM we trade for the ability to have recognized digital first sale rights, it may be a worthy bargain for libraries.

- Data-driven media co-creation and library social return on investment: mobile phone storytelling/compliance surveys as a community intelligence tool and mode of community coherence. Usecase: intensive local deployment of guaranteed annual income (GAI) on model of MINCOME, only successful North American GAI program. In partnership with MINCOME project lead, one of world's experts on political and administrative implications of GAI test program. Open adaptive smart contract tested hyperlocally via library partnership in pilot test underway in Hamilton, Ontario, Canada.

- Libraries and universities might use the blockchain for the Inter-Planetary File System (IPFS), a peer to peer protocol for a future Internet that uses bitTorrent, GIT and Blockchain. IPFS circumvents the gatekeeping of ISPs and large Internet companies. The system would need seeders on the Internet to keep copies of websites on their computers. A network of libraries/universities could serve to validate the credentials of a given copy of any website--similar to what miners do for BitCoin.

- A protocol for supporting community-based collections and borrowing could extend the traditional library collection beyond its walls into the community. Libraries could deploy a blockchain-based system layered with "smart contract" code to facilitate the indexing and sharing of community items (tools, cars, expertise) in a sharing network. The blockchain would govern who has borrowed items, who originally loaned them, etc. This could be a partnership with software developers and businesses.

- Peer-to-peer economies – Library facilitation of peer-to-peer sharing beyond just books through blockchain technology that helps members of the community authenticate the availability of different tools or services for a more efficient sharing economy.

- Examination of current and emerging expectations for ways public libraries contribute to city services.
    - Examination of civic innovations using blockchain technology and development of a rationale for why the library could be an ideal home for such initiatives. Libraries have strong community trust and citizens will connect the purpose of libraries to the goals of these new innovations.

- Library partnerships with museums, universities, and government agencies to share MARC records, authority control, and user-generated content.

- Blockchain could support "badging" for skills acquired through training. Libraries could authenticate the content of personal skills portfolios.[11, 12]

Project Schedule

The year-long project will provide three opportunities for a national dialog among technical experts in libraries, blockchain technology, and urban planning and members of the information professions to discuss ways that blockchain technology can advance library services to support city/community goals.

1. **Develop a project website and blog** that will include information and resources about blockchain technology, potential uses of blockchain technology by libraries, and project updates along with a blog to foster open dialog. (Scheduled from November 2017 - September 2018.)
2. **National Forum** will bring together 20-30 technical experts to discuss ways that blockchain technology can enhance library services. These individuals will be selected from among library leaders (e.g. LITA, PLA, ULC), blockchain innovators (e.g., Institute for the Future, MIT Media Lab, and Harvard Berkman Klein Center), and urban planners (e.g., American Planning Association--Technology Division) to explore the ways that blockchain technology can be used by libraries. The discussion will focus on the identification and discussion of key opportunities for large or small, urban or rural libraries to serve as community anchors using blockchain technology. (Scheduled for March 2018.)
3. Host a **Library 2.018 conference** that will focus on Blockchain Technology as a Community Anchor. Registration in this collaborative open online conference is free to the profession and public. The June Library 2.018 conference will include sessions that review the blockchain recommendations made at the national forum and provide opportunities for input from conference participants. (Scheduled for June 2018.)

The resulting commentary from the blog, national forum, and conference and the survey data will be evaluated and included in the project's final report. The report and the project findings will be available on the Project Website and disseminated at professional conference presentations beginning in summer 2018. The recommendations will serve as a guide for both large and small, urban and rural libraries to implement blockchain technology or consider other directions.

[11] *"Blockchain Revolution & Higher Education"* Educause Review March/April 2017
[12] Digital Credential Systems "*Credentials, Reputation, and the Blockchain*" Educause Review Monday, April 27, 2017

Project Timeline

Fall 2017 - Winter 2018	Spring 2018 - Summer 2018	Summer 2018 - Fall 2018
Develop project website and blog. Include information and resources about blockchain technology and project updates and blog to open discussion **Identify and contact** forum participants **Research and Develop scenarios** of potential blockchain uses in libraries **Create** forum agenda	**1-day National Forum** on-site in Silicon Valley (San Jose) Speakers (e.g. Jason Griffey and Alex Voto) Breakout sessions to review scenarios of libraries as community anchors using blockchain technology and make recommendations **Assessment** of Recommendations **Library 2.018 open online conference** on Blockchains Keynote Speaker(s) to Discuss Blockchain Presentation of Recommendations Crowd-sourced Presentations Open Forum Breakout Sessions to Discuss Recommendations Wrap-up **Survey follow--up** with participants **Compilation** of recommendations	**Assessment, Reporting & Dissemination of Recommendations** **Presentation of findings** at relevant venues

Project Activities

Website	National Forum	Library 2.018 Conference	Evaluation
Develop website to provide resources and blog for ongoing discussions about blockchain technology Disseminate forum and conference recommendations	Selection of Participants Scenario Development Travel Arrangements Forum Site Arrangements Survey of participants to review and revise recommendations	Identify opening and closing keynote speakers Call for presentations Identify open session moderators Online survey of conference participants	Analyze recommendations from expert forum participants and online survey responses from Library 2.018 conference participants Write final report that includes an overview of blockchain technology and recommendations for implementing blockchain in libraries or future directions. Disseminate findings through website and conference presentations

3. National Impact

The goal of this project is to gain a better understanding of blockchain technology and imagine its potential for small and large, urban and rural libraries and their communities. Technology experts representing libraries, blockchain development, and urban planning and information professionals will respond to the question of how libraries might be able to utilize blockchain technology to support city/community goals. The discussions held in the blog, national forum, and the Library 2.018 conference will focus on the ways and extent to which blockchain technology is appropriate in a library setting.

Based on an analysis of the commentary from the three discussion venues and the survey data, recommendations will be made about the ways in which libraries can use blockchain technology to support city/community goals. Possible recommendations may include the development of pilot projects or prototypes using blockchain technology to advance library services to support city/community goals. There may, however, be a recommendation that blockchain technology is not suited for widespread library use. This project will provide the means to have key experts and members of the profession engage in a meaningful and targeted dialog about the feasibility of moving ahead with blockchain technology. A

final report and the project findings will be available on the Project Website and disseminated at professional conference presentations beginning in summer 2018.

Project Resources: Personnel and Budget

Personnel

Sandra Hirsh, Ph.D. is the Principal Investigator of this project and will serve as Project Director.

Hirsh is professor and director of the School of Information at San José State University. Prior to joining the school as director, she worked in the Silicon Valley for more than a decade at major technology companies: Hewlett Packard, Microsoft, and LinkedIn. Hirsh's research and scholarship fall into three main areas: user/information-seeking behavior, especially in relation to technology use; education models; and, online experiences and communities. This work has been published in peer-reviewed journals and has appeared in international conference proceedings, and she also has edited a foundational library and information science textbook, *Information Services Today: An Introduction*. She has served in numerous leadership roles including as President of the Association for Information Science & Technology (ASIS&T), as committee chair and member in ALA, IFLA, ASIS&T, and SLA, and as advisory board and editorial board member for several organizations. She also has actively participated in her local community, serving for many years on the Palo Alto Library Advisory Commission and Library Bond Oversight Committee. She is the co-founder and has served as co-chair of the global virtual Library 2.0 conference series since 2011.

Susan W. Alman will serve as Co-PI of this project and will be responsible for project oversight, design, evaluation, reporting, and co-implementation.

Alman joined the San José State University School of Information as a part-time faculty member in 1999 and was appointed to the full-time faculty in 2012. Prior to this appointment Alman taught at the University of Pittsburgh's School of Information Sciences where she was Director of Distance Education and Outreach (1987-2012) and the University of Michigan (1985-87). In Fall 2014, she developed and led a MOOC, *The Emerging Future: Technology Issues and Trends*, that attracted over 1700 global participants. She is the organizer of the Library 2.015 Spring Summit, ***The Emerging Future: Technology and Learning***. Alman is an alumna of the Institute for Emerging Leadership in Online Learning.

Advisory Committee Members

Miguel Figueroa - Executive Director, ALA Center for the Future of Libraries
Jason Griffey - Fellow, Berkman Klein Center for Internet & Society at Harvard University
H. Ryan Hess - Palo Alto City Library, Library Services Manager, Digital Initiatives
Brendan Howley - Federation of Ontario Public Libraries, Project Lead OpenMediaDesk (OMD)
Amy Garner - The Aspen Institute, Director, Dialogue on Public Libraries
Christinger Tomer - Associate Professor, University of Pittsburgh, School of Computing and Information
Nader Afzalan - Chair, American Planning Association, Technology Division

Alessandro Voto - Consensys West, Regional Director

Budget

We request $100,000 to fund costs for: national forum; staff support to develop and maintain the Blockchain website, monitor the blog, organize the national forum and Library 2.018 conference, and write/distribute the final recommendations; Library 2.018 open online conference; and, conference travel.

National Forum	**Library 2.018 Open Online Conference**	**Staff Support**	**Conference Travel**
Travel for 30 Participants	Administrative	Develop and oversee website & blog	Travel to ALA and ASIS&T to present recommendations
Venue	Technical	Organize Forum	
Technical Equipment		Research & Develop Scenarios for National Forum and Blog Discussions	
		Compilation and Evaluation of Commentary and Survey Data	

Communication Plan

Although Planning Grants do not require a communication plan, this project will be promoted through the SJSU iSchool website and the Library 2.018 Conference. Library 2.018 Conferences are open and online and participants represent all types of libraries and information centers.

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Schedule of Completion
(10/1/17 – 09/30/18)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Planning												
Website												
Scenarios												
Forum												
Library 2.018												
Evaluation												
Dissemination												

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.

Not applicable.

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.

Not applicable.

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.

Not applicable.

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.

N/A

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.

N/A

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).

N/A

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).

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).

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).

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

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).

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).

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.

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.

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.

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.

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

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

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

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

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.

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

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

Name of publicly accessible source code repository:

URL:

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.

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?

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).

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.

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).

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?

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

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

Name of repository:

URL:

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