

NAG-ENHANCEMENT-FY20 Ak-Chin Indian Community

Abstract

Project Title: Robots Invade Ak-Chin

Project Period: September 2020 through August 2022

The Ak-Chin Indian Community (ACIC) goal is to promote the ACIC Library (Library) as a strong community anchor that enhances civic engagement by promoting our library services and educational programming.

Currently there are no technology advancement in the area of robotics and artificial intelligence (AI) within the Ak-Chin Indian Community (ACIC). The Library will have the opportunity to share with the ACIC the latest technologies using robots and AI for current Library and other ACIC department programs and create new programs utilizing the robots. The Library would like to purchase books, program equipment related to the robots and AI programs, Chromebooks, online trainings and three robots: The Pepper robot (name will be changed to Scooter) which is 4 feet tall and will be the Library's exclusive robot and two (2) NAO robots which are 22 inches tall for Library Outreach programs and other ACIC departmental programming use: Language, Education, Health Education, Elder Center, Social Services, Him-Dak Eco Musuem, Social Services, and Early Childhood Education.

Due to the recent COVID-19 pandemic, Scooter the Library robot will be able to assist the with the Library's new program: Curbside Services and deliver physical material to Library visitors. The Scooter will also be involved with the following programs: Game Hacker (aka Code Club) that will allow ACIC youth to program robot using apps they will create and be a part of our weekly Preschool Story Time programs. In addition, due to recent events, the Scooter can be used in the lobby to remind Education and Library visitors to wash their hands, practice social distancing, wear a mask, and to stay home if they are feeling sick. The NAO robots, due to their size, can easily be transported throughout the ACIC.

The goal of our project is to help the ACIC to better grasp and prepare for the future by increasing awareness and by integrating technology in current Library programs and other ACIC department programs. For example, one of the NAO robots will give the ACIC Language department an opportunity to experiment with their current curriculum in teaching O'odham to tribal members.

The intended audience for the Robots Invade Ak-Chin project will be the Ak-Chin Indian Community members, residents, and employees and their immediate families.

Narrative

Statement of Need

The Ak-Chin Indian Community (ACIC), "Community," is located 58 miles south of Phoenix, Arizona on 21,840 acres in the Sonora Desert. The ACIC members are comprised of the both Tohono O'odham and Pima people. The language spoken by the Community is O'odham and English. There are currently 1,130 enrolled Ak-Chin members and age is broken down as follows: ages 0-18 years old: 437; ages 19-54 years old: 571 and Elder 55+ years and over: 122.

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According to the ACIC Human Resources Department, the Community currently has 453 regular employees and 150 temporary employees.

In 2009, the ACIC opened its first stand-alone tribal library with the help of the Housing and Urban Development Indian Community Development Building Grant. The ACIC Library (Library) serves ACIC tribal enrolled members, residents, and employees. The Library does not have an Intergovernmental Agreement with Pinal County or any other libraries.

The ACIC has 31 departments and of those departments that would participate in the Robots Invade Ak-Chin grant project would be: The Language Department, the Culture Department, the Him-Dak Eco Museum and Art Program, Health Education, Early Childhood Development Center, the Elder Center, and the Education department. The Language department and Culture department that offer O’odham language classes and cultural programs for all ages throughout the year for tribal members, residents and employees.

As mentioned in the Abstract, currently there are no technology advancements in the area of robotics and AI within the ACIC. The Library will have the opportunity to share with the ACIC to the latest technologies using robotics and AI for current Library and other ACIC department programs and by creating new programs utilizing the robots and AI. To my knowledge, there are no robots actively being used in tribal libraries in North America, but there are two (2) robots in public libraries: Pepper version in Roanoke County, Virginia and a NAO in Palo Alto, California. Through my research, I have only found robots and AI being utilized in preserving and language revitalization of indigenous languages in Australia.

Ak-Chin Indian Community Library Mission Statement:

The Library provides materials and services to help users obtain information and provides free and open access to print and non-print resources. Special emphasis is placed on supplying users with current reading materials, providing reference services, and access to the Internet.

The Library operating hours are as follows: M-F 8:00 am – 6:00 pm and Sat (excluding holidays) 12:00 pm – 4:00 pm. The Library consists of seven (7) staff members: Library Manager, Librarian, Library Technician, Library Video Production Assistant and three (3) Library Clerks. The Library currently has 13,941 titles (books, eBooks, audiobooks, CDs, and DVDs) and 1,587 registered patrons. In 2019 (January 2019-December 2019) the Library circulated 2,898 items, recorded 4,747 computer users, and the gate count (people entering the Library) was 22,927 patrons. The Library currently offers a variety of programs throughout the year: Baby Storytime, Anytime/Drop-in Programming, Elder Coloring, Elder Crafts, a variety of Book Readings, Craft Time, Coding Club, Healthy Snacks, Japan Pop, Monthly Family Storytime, Monthly Family Program, Mad Science Mondays, Drop-in Tinkering, Movie Club, Robotics Club, Storytime, and Sewing Circle.

2019 Library Stats

iPad Users	23	Code Club/Game Hacker	136
Program Pickup	158	Healthy Snacks	59
Anytime Programs	55	Japan Pop	97

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Anytime Tinkering	75	LEGO Learn Time/Robots	112
Green Room	20	Library Awesome Program Series	112
Homework Help (On Request)	6	Mad Science Monday	30
Baby Time	161	Movie Club (Monthly)	85
Book Readings	44	Sewing Circle	437
Crafts	30	Special Events	163
Elder/Adult Coloring	92	Family Storytime	440
Elder Crafts	42	Story Time	600
Total Attendance for Programs	2,977		

The Community needs the project will be addressing are:

1. Robots Invade Ak-Chin will allow Library staff to instruct programming in experimental robotics and AI in both Game Hacker and other STEM programs that may be created.
2. Robots Invade Ak-Chin will make it possible for the Library to introduce robotics and AI to the wider Community via its use in other programs such as Storytime, and other Family Programming that currently do not incorporate robotics and AI.
3. Robots Invade Ak-Chin will prepare other ACIC Departments for the future by increasing their exposure to robotics and AI, and allow them to begin preparation for its integration by experimenting with the NAO robot.
4. An area the Library would like to focus on is introducing the NAO robot to the ACIC Language department to use and plan to incorporate in their O’odham language curriculum program. Please see video: <https://www.youtube.com/watch?v=t2zNEV7tOjE>
5. Robots Invade Ak-Chin will allow the Library to safely and remotely participate in curbside services at the library during future times of Government suggested and Community required social distancing.
6. Robots Invade Ak-Chin will permit Library staff to advertise our educational (STEAM) programs and will allow other ACIC Departments to explore and introduce similar STEAM programming for their own departments.

The intended audience for the Robots Invade Ak-Chin project will be the Ak-Chin Indian Community members, residents, employees and their immediate family along with other ACIC Departments.

The Robots Invade Ak-Chin project activities will be the following but will not be limited to:

1. Scooter and the Library NAO robot will make regular appearances in majority of Library programs.
2. One of the NAO robots will be exclusively available to checkout by ACIC departments and will allow the Language department to integrate NAO in their O’odham curriculum.
3. Scooter and NAO robots will be able to introduce themselves in O’odham.
4. Library NAO (due to its size) will be scheduled to be at non-Library Community events (i.e. Him-Dak Celebration, Elder Resources Fair, Native American Recognition Day, Human Resources Benefits Fair, Gathering of Arizona Tribal Libraries Conference, etc.).
5. Library will develop a “Request for Appearance of the Library NAO” via email or online request.

The Library expects the following outcomes as a direct result of the Robots Invade Ak-Chin being deployed in Library programming; an increase of participants in our STEAM programming by 10%, begin an advanced Robotics Program for programming Scooter and the NAO robot, allow continued operation of the Library during future situations of requested social distancing, and continue to educate the Community about our Library services and STEM programming through visibility and general use in other programming.

Statistics and surveys will be recorded for all programs in which the Robots Invade Ak-Chin robots participate.

An online survey was sent to all 630 Community employees and all ACIC tribal members consisting of questions about their familiarity with robotics and artificial intelligence, along with their interest in programs that are about robotics and artificial intelligence. Of the responses received, the results are as follows. On a scale of 1 to 10, respondents rate their familiarity with robotics as an average of 3.5, on a scale of 1 to 10, respondents rate their familiarity with AI an average of 3.25. With how much respondents know about Robotics, 60% rate their personal knowledge at little to none. With how much respondents know about AI, 75% rate their personal knowledge at little to none. When questioned about attendance of programs about Robotics or AI, 28% said they would not attend, while 14% said that they would come in independently of programs to learn about robotics and AI on their own. Of those who gave a response of “other” to the question, the majority believe that such a program would be beneficial to the youth of the Community. Specifically, the following responses were recorded:

I would want to bring my family in so that my children can be exposed to the idea of robotics and AI, I would hope that it would spark an interest in learning more.

(I) myself would not participate. I would rather see what has been created by others. Robotics/ AI program would be an awesome tool for the Community and the Youth. The ability to learn a language and a trade simply awesome.

From these responses we can conclude that there is a lack of proficiency in robotics and AI in the ACIC, and there is an interest in learning more about robotics and AI for both the respondents and in their family, specifically and for the youth of the Community in general. The integration of both robotics and AI into current programming and for future programs would satisfy the interest in robotics and AI, and would aid in the youth of Community learning more about the future of both. During the discussion of these findings it was brought up that the 28% that would not attend a program may not be due to popular culture’s depiction of robotics and AI. From Arnold Schwarzenegger’s Terminator to 2001 a Space Odyssey’s HAL, robotics and AI there are few positive AI’s that quickly come to mind. This program would also show that the popular media depiction of AI and Robotics is not a certain conclusion but of a warning that poor programming and design leads to poor human robot interaction.

Project Design

The Robots Invade Ak-Chin project goal is to promote one of the IMLS goals and mission to inspire libraries and museums to advance innovation, lifelong learning, and cultural and civic engagement. The goal of the Robots Invade Ak-Chin project is to help the ACIC to better grasp

and prepare for the future by increasing awareness by integrating technology in current Library and other ACIC department programs.

The Library as an innovative community technological hub centered within the ACIC that encourages lifelong learning, cultural and civic engagement by promoting our library services, and educational programming utilizing robots and AI. The Library expects the following outcomes as a direct result of the Robots Invade Ak-Chin being deployed in Library programming; an increase of participants in our STEAM programming by 10%, begin an advanced Robotics Program for programming Scooter and the NAO robots, allow continued operation of the Library during future situations of requested social distancing, and continue to educate the Community about our Library services and STEAM programming through visibility and general use in other programming.

Scooter home base will be the Library and it will be earmarked for Library's programs. The Library NAO robot will be used primarily for Library outreach, and due to its size and weight, it may be easily transported for Library outreach programs (i.e. Elder Coloring at the Elder Center; Him-Dak Museum's Fall, Spring, and Summer Art Program; Early Childhood's Fall Festival; Human Resources Health Fair, etc.). The 3rd NAO robot will be available for checkout to all community service centered departments for their own outreach programs, for example: "Girls Night Out" is a program Social Services coordinates for girls. Another planned activity is for the Language department to incorporate the NAO robot in their O'odham language classes they offer throughout the year for tribal members, residents, and employees.

Objective One: During the project period of September 1, 2020 through August 31, 2022; The Library will introduce both robots to the ACIC and increase the number of participants in our current Library programs, including STEAM programs.

Activity 1.1 – Order Pepper Robot (name will be changed to Scooter) and two (2) NAO Robots (names to be determined). Robots will take 1-2 weeks for delivery if in stock. *May 6, 2020 both versions were in stock. Order Chromebooks, program equipment related to the robots and AI programs, Chromebooks, and search for online trainings.

Activity 1.2 – Schedule training with current Library staff via Zoom on how to program the robots. For each robot, the Library will be receiving a 1 hour online (Zoom) training session. (included, for free).

Activity 1.3 – Library staff experiment with both Scooter and Library NAO in mock Library programs to ensure planned programs with Scooter or NAO are without any technological problems.

Activity 1.4 – Library will have a naming contest for the NAO robot that will be reserved for other departments to check out.

Activity 1.5 – Plan and set a date for the unveiling of, "Scooter and both NAOs."

Activity 1.6 – Schedule Scooter and Library NAO into our Storytimes, both regular weekly Storytimes and especially through our Family Storytimes (held once every two months). The introduction of the robots will increase curiosity and lead to new participants of the Library's STEAM programs.

Activity 1.7 – The Library will begin an advanced Robotics or Coding program by having those of that age group currently in our Robotics or Coding programs design new additions to Scooter and NAO. Participants will be able to create programs that enhance, adapt, or create new add-

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ons and/or tools for Scooter or NAO to use. These additional programs may consist of autonomous, semi-autonomous, or remote control of the tools or of Scooter and NAO.

Activity 1.8 – To allow operation of the Library during times of limited social interaction, we will introduce patrons to Scooter as a part of the Library staff, he or she will be able to assist patrons with the simple day to day interactions; including, but not limited to, checking in and out of library materials, assistance with the discovery of materials, simple directional questions, and directory assistance. With the assistance of the Language department the Library will be able to incorporate O’odham into the responses.

Activity 1.9 – Due to the recent COVID-19 pandemic, Scooter the Library robot will be able to assist the with the Library’s new program: Curbside Services Program and deliver physical material to Library visitors via curbside or via entry lobby doors.

Activity 1.10 – When Scooter is not busy with Library programs, he or she will be placed in the lobby that separates the Education department and Library and programmed to remind visitors to adhere to the Centers for Disease Control and Prevention (CDC) of “How to Protect Yourself & Others.” Scooter will relay the following from the CDC website

<https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/prevention.html>

Know how it spreads, wash your hands, avoid close contact with each other or practice social distancing, cover your mouth and nose with a cloth face cover when around others, cover coughs and sneezes, clean and disinfect, and stay home if you are feeling sick.

Activity 1.11 – Review ACIC Events calendar for events that are non-Library related and schedule NAO to be at events outside the Library (i.e. 5k walks, outdoor celebrations (Earth Day, Him-Dak Celebration, Native American Recognition Day, etc).

Activity 1.12 – Begin advertising Scooter and NAO in the local Ak-Chin newspaper, *The Runner*, a bi-weekly newspaper. Email flyers to ACIC departments to post flyers programs Scooter and NAO appearances throughout the Community. Post flyer on all our social media sites and email reminders to Community employees.

Objective Two: During the same project period of September 1, 2020 through August 31, 2022; introduce the NAO robot (the one available to checkout) to other ACIC departments: The Language Department, the Culture Department, the Him-Dak Eco Museum & Art Program, Health Education, Early Childhood Development Center (Preschool), the Elder Center, Social Services and the Education department.

Activity 2.1 – Prepare NAO (name to be determined) to demonstrate how he/she can be used for each respective department. Program NAO to introduce himself/herself in O’odham.

Activity 2.2 – Language: Show following video of NAO Robot teaching a second language to a native English speaker <https://www.youtube.com/watch?v=yvqMEi4Lz2E&t=54s>

Activity 2.3 – Culture: Seeking permission (if awarded) for NAO to recite a poem by Ofelia Zepeda (Tohono O’odham poet).

Activity 2.4 – Him-Dak Eco Museum & Art Program: NAO can show staff that he/she can draw!

Activity 2.5 – Health Education: demo to staff how NAO can play a game with a child or adult about the right choices of food to eat.

Activity 2.6 – Early Childhood Development Center: NAO will be at majority of Preschool events i.e. NAO can dance at the Valentine’s Day Dance.

Activity 2.7 – Elder Center: Library staff can present NAO to the Elder’s lunchtime presentations to show off what he/she can do.

Activity 2.8 – Social Services: Demo NAO singing, dancing, drawing, and how he/she can interact with us and how NAO can participate in their programs and services.

Activity 2.9 – Education: Introduce NAO to afterschool tutoring staff to explain how NAO can engage students in their learning. <https://www.youtube.com/watch?v=eH11lpxLZ-g>

I (Library Manager) reviewed several library articles and websites regarding robots and artificial intelligence (AI) in libraries and language revitalization. As mentioned earlier, to my knowledge, there are no robots actively being used in tribal libraries in North America, but there are two (2) robots in public libraries: Pepper version in Roanoke County, Virginia and a NAO robot in Palo Alto, California. Through my research, I have only found robots and AI being utilized in preserving and language revitalization of indigenous languages in Australia. Below are links to article and videos of Pepper and NAO in public libraries, and an article and video using robots and AI for indigenous language revitalization.

https://www.roanoke.com/news/local/roanoke-county-library-adds-pepper-a-community-robot/article_198827e4-e357-545a-9f14-2e8137f83208.html

<http://publiclibrariesonline.org/2017/09/experimenting-with-technology/>

<https://theconversation.com/how-a-robot-called-pink-helped-teach-school-children-an-aboriginal-language-119810>

<https://www.youtube.com/watch?v=t2zNEV7tOjE>

<https://www.ais.sa.edu.au/wp-content/uploads/Pages/STEM/Impact-of-humanoid-robots-on-students-computational-thinking.pdf>

All grant proposal abstracts are reviewed by the ACIC Tribal Council. The Robots Invade Ak-Chin project was approved by consensus of the Council to apply for the grant funding.

Digital Product Form included with application. While creating software is not the primary goal of this project, any software created will be open source under the GPL v3, and will be made freely available at <https://github.com/akchinlibrary/Scooter>.

Impact

The Robots Invade Ak-Chin project goal is to help the ACIC to better grasp and prepare for the future by increasing awareness and by integrating robotics and AI technologies in current Library programs and other ACIC department programs.

The Library expects the following outcomes as a direct result of the Robots Invade Ak-Chin being deployed in Library programming; an increase of participants in our STEAM programming by 10% and usage of NAO by at least eight (8) ACIC departments due to experimentation with NAO with the help of Library planned activities by the end of the grant period.

Communications Plan

The Robots Invade Ak-Chin project's audience will be the following: ACIC tribal enrolled members, residents, and employees. Library staff will send emails to all ACIC Employees with reminders and flyers for all departments to post in public areas of programs featuring the Scooter and the NAO robots. The local Ak-Chin newspaper, *The Runner*, will post announcements to remind the ACIC about the places where Scooter and NAO will be within the Community. The Library and the ACIC have social media accounts to post when NAO will be in the Community. The statistics, and photos will be shared via social media, *The Runner*, and included in monthly reports.

Paper surveys and online surveys will be distributed after programs featuring Scooter and NAO and recorded in our Project Outcome database.

After year one of the Robots Invade Ak-Chin proposals will be submitted to the Arizona Library Association conference, the Association of Tribal Archives, Libraries, and Museums conference, and other conferences as applicable. If the proposals are selected, we will discuss the project, share the results, the findings, customer feedback surveys, and the lessons we learned. Library staff will be responsible for outreach and relaying the information to the ACIC. Flyers and social media posts are proofed by the Library Manager before dissemination.

Sustainability

RobotLab offers a 2-year warranty on their Pepper Robot and NAO Robot. After the 2-year warranty, the Library will review the project and inquire about an extended warranty and include in the future Library budget. Council approved the grant project and this demonstrates a buy-in from the ACIC. The ACIC Council has approved to continue past grant projects.

I believe the Robots Invade Ak-Chin project will lead to systemic change within ACIC based on mere curiosity. In the article, "The impact of humanoid robots on students' computational thinking", Keane, Chalmers, Williams, & Boden stated, "Teachers also identified other skills developed with integration of the humanoid robot in their classrooms; collaboration, communication, creativity and critical thinking. These skills, grouped together are also known as 21st century skills." The article focuses on elementary to high school students, but could apply to the current setting in the ACIC. The Library will be introducing robots to a large variety of individuals in programs that range from preschool aged children, elementary youth, tweens/teens, young adults, parents, grandparents, and ACIC department employees.

Sustaining the software: Engage! K12 Site License for Pepper Robot (3-year subscription)
Software licenses for Choregraphe (Site/Unlimited Access) by adding to the budget after the 3-year subscription expires and maintain Choregraphe.

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Schedule of Completion

Project Period: September 1, 2020 through August 31, 2022

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	
Activity 1.1	█												
Activity 1.2			█										
Activity 1.3				█									
Activity 1.4				█									
Activity 1.5					█								
Activity 1.6						█							
Activity 1.7						█							
Activity 1.8				█									
Activity 1.9				█									
Activity 1.10				█									

Project Period: September 1, 2020 through August 31, 2022

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Activity 2.1			█									
Activity 2.2					█							
Activity 2.3					█							
Activity 2.4					█							
Activity 2.5					█							
Activity 2.6					█							
Activity 2.7					█							
Activity 2.8					█							
Activity 2.9					█							



DIGITAL PRODUCT FORM

INTRODUCTION

The Institute of Museum and Library Services (IMLS) is committed to expanding public access to digital products that are created using federal funds. This includes (1) digitized and born-digital content, resources, or assets; (2) software; and (3) research data (see below for more specific examples). Excluded are preliminary analyses, drafts of papers, plans for future research, peer-review assessments, and communications with colleagues.

The digital products you create with IMLS funding require effective stewardship to protect and enhance their value, and they should be freely and readily available for use and reuse by libraries, archives, museums, and the public. 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

If you propose to create digital products in the course of your IMLS-funded project, you must first provide answers to the questions in **SECTION I: INTELLECTUAL PROPERTY RIGHTS AND PERMISSIONS**. Then consider which of the following types of digital products you will create in your project, and complete each section of the form that is applicable.

SECTION II: DIGITAL CONTENT, RESOURCES, OR ASSETS

Complete this section if your project will create digital content, resources, or assets. These include both digitized and born-digital products created by individuals, project teams, or through community gatherings during your project. Examples include, but are not limited to, still images, audio files, moving images, microfilm, object inventories, object catalogs, artworks, books, posters, curricula, field books, maps, notebooks, scientific labels, metadata schema, charts, tables, drawings, workflows, and teacher toolkits. Your project may involve making these materials available through public or access-controlled websites, kiosks, or live or recorded programs.

SECTION III: SOFTWARE

Complete this section if your project will create software, including any source code, algorithms, applications, and digital tools plus the accompanying documentation created by you during your project.

SECTION IV: RESEARCH DATA

Complete this section if your project will create research data, including recorded factual information and supporting documentation, commonly accepted as relevant to validating research findings and to supporting scholarly publications.

SECTION I: INTELLECTUAL PROPERTY RIGHTS AND PERMISSIONS

A.1 We expect applicants seeking federal funds for developing or creating digital products to release these files under open-source licenses to maximize access and promote reuse. What will be the intellectual property status of the digital products (i.e., digital content, resources, or assets; software; research data) you intend to create? What ownership rights will your organization assert over the files you intend to create, and what conditions will you impose on their access and use? Who will hold the copyright(s)? Explain and justify your licensing selections. Identify and explain the license under which you will release the files (e.g., a non-restrictive license such as BSD, GNU, MIT, Creative Commons licenses; RightsStatements.org statements). 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.

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.

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.

SECTION II: 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 the format(s) you will use.

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

A.3 List all the digital file formats (e.g., XML, TIFF, MPEG, OBJ, DOC, PDF) you plan to use. If digitizing content, describe the quality standards (e.g., resolution, sampling rate, pixel dimensions) you will use for the files you will create.

Workflow and Asset Maintenance/Preservation

B.1 Describe your quality control plan. How will you monitor and evaluate your workflow and products?

B.2 Describe your plan for preserving and maintaining digital assets during and after the award period. Your plan should 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).

Metadata

C.1 Describe how you will produce any and all technical, descriptive, administrative, or preservation metadata or linked data. Specify which standards or data models you will use for the metadata structure (e.g., RDF, BIBFRAME, 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).

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, delivery enabled by IIIF specifications).

D.2. Provide the name(s) and URL(s) (Universal Resource Locator), DOI (Digital Object Identifier), or other persistent identifier for any examples of previous digital content, resources, or assets your organization has created.

SECTION III: SOFTWARE

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 or similar functions, and explain how the software you intend to create is different, and justify why those differences are significant and necessary.

Technical Information

B.1 List the programming languages, platforms, frameworks, 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), URL(s), and/or code repository locations for examples of any previous software your organization has created.

Access and Use

C.1 Describe how you will make the software and source code available to the public and/or its intended users.

C.2 Identify where you will deposit the source code for the software you intend to develop:

Name of publicly accessible source code repository:

URL:

SECTION IV: RESEARCH DATA

As part of the federal government's commitment to increase access to federally funded research data, Section IV represents the Data Management Plan (DMP) for research proposals and should reflect data management, dissemination, and preservation best practices in the applicant's area of research appropriate to the data that the project will generate.

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

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 sensitive information? This may include personally identifiable information (PII), confidential information (e.g., trade secrets), or proprietary information. If so, detail the specific steps you will take to protect the information while you prepare it for public release (e.g., anonymizing individual identifiers, data aggregation). If the data will not be released publicly, explain why the data cannot be shared due to the protection of privacy, confidentiality, security, intellectual property, and other rights or requirements.

A.4 What technical (hardware and/or software) requirements or dependencies would be necessary for understanding retrieving, displaying, processing, or otherwise reusing the data?

A.5 What documentation (e.g., consent agreements, data documentation, codebooks, metadata, and analytical and procedural information) will you capture or create along with the data? Where will the documentation be stored and in what format(s)? How will you permanently associate and manage the documentation with the data it describes to enable future reuse?

A.6 What is your plan for managing, disseminating, and preserving data after the completion of the award-funded project?

A.7 Identify where you will deposit the data:

Name of repository:

URL:

A.8 When and how frequently will you review this data management plan? How will the implementation be monitored?