IDEA (Innovation, Disruption, Equity, Access) Institute on Artificial Intelligence

1. Statement of Broad Need

Artificial Intelligence (AI) is a disruptive but transformative technology that can bring value to libraries, including but not limited to increasing library use, optimizing collection analysis, enhancing the user experience by producing high quality personalized services, and eliminating or reducing routine tasks. (Ex Libris, 2019). AI-based systems such as voice computing/technology (e.g. Amazon Alexa, Apple Siri, and Google Assistant) have become part of everyday use in homes, in the workplace, and on university campuses. Library and information professionals must keep abreast of advances in technologies, including AI and Machine Learning (ML) that will enable them to provide innovative and value-added services, access, collection development, metadata generation, privacy, intellectual freedom, play, and information literacy (Johnson, 2018). As stated by Coleman (2018, p.2): "The power [of AI] lies in the fact that machines can recognize patterns efficiently and routinely, at a scale and speed that humans cannot approach." Issues about inequality, discrimination, data privacy, and bias, combined with the costs and evolving nature of AI, influence the adoption of AI in academic, research, and other libraries (Ex Libris, 2018; Noble, 2018; Badia, 2019).

AI has been ranked as one of the top-three trends in the library and information field, and has been explored in-depth in *Library Technology Reports* (Griffey, 2019). Loida Garcia-Febo, ALA past President, urged librarians to "include AI in our professional agenda and in our national conversation." (Garcia-Febo, 2019). Library and information professionals should take the lead in embracing AI "not as users, but as active players to fight the risks of bias, misuse, and discrimination. Once they assume this leading role, [they] can be co-creators of "an intelligent information system that respects the sources, engages critical inquiry, fosters imagination, and supports human learning and knowledge creation" (Coleman in Ex Libris, 2018, p. 5). The ACRL *New Media Consortium Horizon Report* (2018) predicted that it would take 4-5 years for academic and research libraries to adopt AI. Yet, evidence suggests that while 80 percent of research librarians are exploring AI and machine learning, in reality only 5 percent of research libraries have leveraged AI technology (Ex Libris, 2019). AI adoption has been slow in libraries, suggesting there are not enough AI experts in the library and information field.

There is a need for educating the next generation of leaders in AI in libraries who are capable of increasing awareness, adoption, and application of AI solutions in library and information environments. In recent years, there have been continuing education offerings in AI at various professional conferences and workshops: a panel on AI impact in libraries at the 2019 ACRL conference,[1] a session on AI at the 2019 LITA Conference,[2] and Fantastic Futures 2019: The 2nd International Conference on AI for Libraries, Archives, and Museums at Stanford Libraries.[3] However, these sessions tend to be either too brief and narrow in focus, not covering the overall planning, design, and implementation process of AI in libraries, or narrowly targeting academic and research libraries, overlooking other library environments. Currently, only a handful of iSchools provide online courses in AI (e.g., University of California-Berkeley), or offer a multidisciplinary degree program in AI in collaboration with computer science, engineering, and cognitive psychology (e.g., University of Pittsburgh), presenting a pressing need to fill this education gap with the proposed continuing education program, the IDEA Institute on AI. Furthermore, Wood and Evans (2019) called upon "the deans of library schools [to] begin the discussion [of AI] by addressing curriculum adjustments" in order to sustain enrollment in the near future. The proposed project will address this need by:

1. **Developing an innovative, forward-looking continuing education program on AI in library and information environments.**

Library and information professionals will obtain a substantive understanding of AI knowledge and skills to plan, design, implement, and evaluate user-centered AI projects that are informed by a well-grounded agile User

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[1] https://libraryconnect.elsevier.com/articles/join-us-acrl-2019-sessions-ai-leading-liaisons-future-research-and-more
[2] http://www.ala.org/lita/lita-highlights-2019-ala-annual-conference
[3] https://library.stanford.edu/projects/fantastic-futures

Experience (UX) methodology (Fig. 1). This methodology is context-based, iterative, meaningful, useful, inclusive, and is empathetic to user emotions and needs. (Hartson & Pyla, 2019). Fellows will receive core and foundational training with a forward-looking focus, allowing them to build on their knowledge of AI issues and applications.

2. Developing AI leaders, who individually and as a collective, can innovate and create better awareness of AI as transformative technology.

Fellows will develop as leaders through lectures, discussions, hands-on activities, and the capstone showcase at the Institute. By networking with Institute instructors, local AI experts, and with one another, the Fellows will develop their own voice and skills in order to transfer knowledge broadly; and develop collaboration skills in order to leverage diverse perspectives and resources to create practical, in-context, authentic, and meaningful solutions. The Fellows will become part of a collective of future AI leaders during and beyond the Institute.

3. Contributing AI curriculum to fill a gap in AI education and training.

The curriculum consists of core and foundational knowledge of AI issues and applications. The curriculum will engage conceptual, technical, social, and applied dimensions in learning, including the ethical impact of AI. The publicly available curriculum will allow first, LIS schools to spark interest in and infuse AI in their programs, and second, libraries to utilize the curriculum to offer their own in-house AI training.
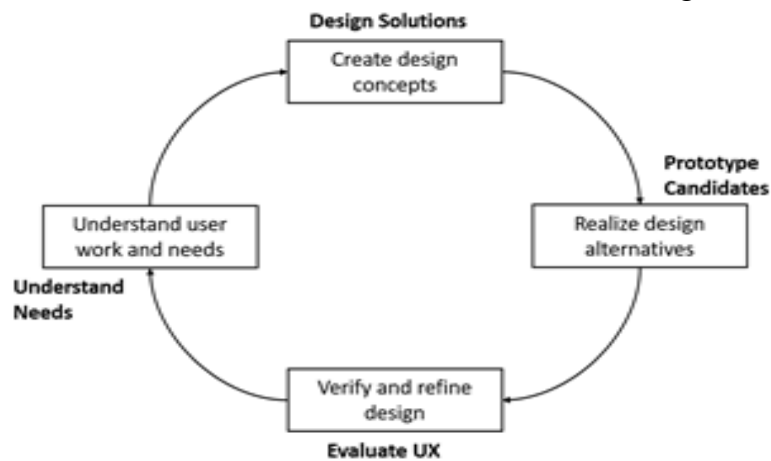
Fig. 1. Basic UX design lifecycle process. Adapted from Hartson & Pyla, 2019.

2. Project Design

IDEA (Innovation, Disruption, Enquiry, Access) Institute on AI is a one-week intensive, interactive, evidence-based and applications-oriented professional development program for library and information professionals, proposed for the Laura Bush 21st Century Librarian Program, Lifelong Learning Category. The Institute will create two cohorts of leaders (15 IMLS-funded and 5 self-funded Fellows per year; 40 total) with the knowledge and skills to innovate, apply, and evaluate AI in library and information environments. **In Year 1**, The Institute will be held at the College of Communication and Information at the University of Tennessee in Knoxville. **In Year 2,** the Institute will be held at the School of Information at the University of Texas at Austin. The PIs will collaborate with four experts in AI who will serve as members of the Advisory Board, as well as instructors with the Institute. The Association for Information Science and Technology (ASIS&T) will serve as a project partner not only in promoting, recruiting, communicating, and disseminating Institute findings, but also in continuing the IDEA Institute after the IMLS-funded Institute is completed. The Center for the Future of Libraries of the American Library Association (ALA) will support the promotion, recruitment, communication and dissemination of the Institute and its findings, especially through engaging ALA's network of diverse professional community members.

2.1. Goals and Objectives

The purpose of the proposed Institute is to build and enhance the knowledge and skills of current and future library and information professionals in AI through developing theoretical (conceptual) and practical experiences in a collaborative learning environment. This program also aims to build a collective community of

AI leaders in which Fellows will bring and share their work experience and professional practice, and engage with the PIs and AI experts to design, develop, evaluate, and implement AI solutions for their workplaces.

The goals of the IDEA Institute are as follows (see associates objectives in Table 2):

Goa1 1. Develop an innovative, forward-looking continuing education program on AI in library and information environments; **Goal 2.** Develop leaders of AI in library and information environments, who individually and as a collective can innovate and create better awareness of AI as "transformative" technology; and **Goal 3.** Contribute AI curriculum to fill a gap in AI education in LIS programs and library and information environments

Potential risks. The success of the project is grounded on the use of outcome-based planning, subject expertise, management experience, and formative evaluation. However, potential risks including: lower enrollment, unavailability of Institute Advisory Board members (instructors) for a full week, and challenges in the implementation of AI projects by the Fellows, may arise. These have been considered and support structures, flexibility and contingency plans are ready, should they be needed.

2.2. Project Activities (see attached Schedule of Completion)

Activity 1: Curriculum Development (Year 1: September 2020–February 2021; Year 2: September 2021–February 2022) The AI curriculum will be developed based on the combined expertise of the PIs and the four Institute instructors to include the core and foundational areas in AI, including Machine Learning (ML). The current draft of the Institute curriculum incorporates four aspects of learning about AI: **(a) Conceptual**, where the UX Lifecycle Methodology is used to guide the design of user-centered AI projects. To that end, Fellows will employ steps in this Methodology (Fig. 1, p. 2) as appropriate, which consists of four primary phases: understanding user work and needs; creating design concepts/solutions; realizing design alternatives and developing prototypes; and verifying, refining, and evaluating; **(b)Technical**, introducing voice-enabled digital technology, AI sensor systems, ML algorithms, and preparing data for ML; **(c) Social**, covering ethical and AI impact, including algorithmic bias; and **(d)Applied**, designing a variety of hands-on in-class activities in AI and ML in collaboration with the Institute's instructors.

Activity 2: Recruitment and Selection of IDEA Fellows (Year 1: October 2020–February 2021; Year 2: October 2021–February 2022): We will recruit two categories of IDEA Fellows: IMLS-funded Fellows (N=15) and self-funded Fellows (N=5) each year. Each IMLS-funded Fellow will have all their Institute expenses covered (program fee, housing, meals), except for transportation. The self-funded Fellows will pay their transportation, housing, and program fee (estimated at $1,000). Working lunch and selected dinner sessions will take place during the Institute to facilitate group learning and networking. The inclusion of five self-funded Fellows in the Program each year will provide an opportunity for participation, assess interest in the cost-model of the Institute, and yield important data points to determine sustainability of the Institute. We will focus on recruiting applicants who: (1) have a basic knowledge of programming languages (e.g., Python, Java, and/or equivalent); (2) hold full time positions in US institutions as library and information professionals; (3) are committed to participate in the Pre-Institute Onboarding Program for three months; (4) are able to participate in the 2021 IDEA Institute in Knoxville, Tennessee or the 2022 IDEA Institute in Austin, Texas for one week; and (5) have support to apply learning gained from the Institute to AI projects in their own workplace. Our **priority** is to recruit and create a cohort of Fellows who will represent diverse socio-demographic backgrounds, types of positions, types of libraries, and capacities of implementing AI in their workplace (see Diversity Section). **Applicants will be required to submit** a resume, a supervisor's recommendation and support letter; one letter of reference, evidence of programming language, and personal and vision statements. **Selections of the applications** will be made by the PIs and instructors.

Activity 3: Pre-Institute Onboarding (Year 1: April–June 2021; Year 2: April–June 2022). Twenty IDEA Fellows who have been selected through a competitive process will be expected to participate in a Pre-Institute Onboarding Program over three months prior to the Institute. Using shared documents (e.g., Google Drive), the PIs will facilitate the development of a learning community through online discussion and exchange of AI issues, based on readings on AI and ML. Fellows will spend about 10 hours on activities during the three-month onboarding period.

Activity 4: Hosting the 1st IDEA Institute at the University of Tennessee, Knoxville (July 2021): This is a week-long Institute in which 20 Fellows and four instructors will arrive on Saturday and depart the following Friday afternoon. The Institute will consist of lectures, hands-on exercises, lunch and learn, demos, discussions of AI applications, reflection on learning experiences, and a capstone showcase open to local library and information professionals and stakeholders. Five local AI experts will be invited to a networking session over dinner to connect with the Fellows. The draft of the Institute Program is shown in Table 1.

Table 1. Draft of the Institute Program

	Morning I	**Morning II**	**Lunch**	**Afternoon I**	**Afternoon II**	**Dinner**
Sunday	Program overview and Introduction	AI issues, opportunities, and challenges	Algorithmic bias	Designing AI project	Introduction to UX framework (I)	
Monday	Machine Learning and coding		Exchange of Fellows' AI project ideas	Digital Assistants/Voice Computing	AI-based sensors	
Tuesday	Applying UX framework (Phases II and III) for AI solution	Fellows work on their own project	Reflection on learning experience and discussion on areas of improvement	AI in technical services (e.g., linked data, semantics, metadata, etc.) and data management in AI		Networking with local AI experts
Wednesday	Harvesting, evaluating and training data sets for use in AI		AI impact, values, and ethical concerns	Evaluating AI solutions for libraries	Fellows work on their own project	
Thursday	Applying UX framework (Phase IV) Evaluation of AI solutions for libraries		Post-program questionnaire	Fellows work on their own project		Networking with local AI experts
Friday	Capstone showcase open to local library and information professionals		Farewell			

Activity 5: AI in Libraries Workshop at the ASIS&T Annual Conference (2021 and 2022) and AI in Libraries Session at ALA national conferences (2021 and 2022): Working with our partners and collaborators, all Fellows will be invited to present their AI applications at an ASIS&T workshop and at an ALA annual conference session.

Activity 6: Program Evaluation (Year 1: April–August 2021; Year 2: April–August 2022): The PIs will conduct formative and summative evaluations to ensure and assess the progress and success of this project using surveys and interviews. (SEE Section 2.4 Outcomes and Evaluation for details).

Activity 7: Project Communication (SEE 2.5 Communication Plan for details): Developing Project Website **(September 2020-February 2021);** Dissemination of Project Content and Results **(June 2020–August 2022)**

Activity 8: Hosting The 2nd IDEA Institute at the University of Texas at Austin (July 2022): The PIs will incorporate the evaluation results from the 1st Institute for delivery of the 2nd one. The 2nd cohort of 20 Fellows will be recruited and selected using the same procedure of Year 1. The 2nd Institute will be delivered and evaluated.

2.3. Project Resources (see Support Letters in Supporting Documents)

Project team: PI Dania Bilal, Ph.D. (Professor, School of Information Sciences, University of Tennessee, Knoxville) has expertise in human-computer interaction, User Experience, Web mining, and systems design and

implementation. She will co-lead all aspects of the project and be the Project Manager for Year 1, organizing and evaluating Year 1 of the IDEA Institute at the University of Tennessee. She will teach UX Methodology in Years 1 and 2. **Co-PI Clara M. Chu**, Ph.D. (Mortenson Distinguished Professor and Director, Mortenson Center for International Library Programs, University of Illinois at Urbana-Champaign) studies the information needs of and access by culturally diverse communities in a globalized and technological society, including emerging technologies to empower communities. As the current President of ASIS&T, she will serve as the liaison with ASIS&T and the ALA Center for the Future of Libraries. She will co-organize an ASIS&T Workshop on AI in Libraries and a session at the ALA Conference. She will lead the diversity plan. **Co-PI Soo Young Rieh**, Ph.D. (Professor and Associate Dean for Education, School of Information, University of Texas at Austin) conducts research on human information behavior and designing learning-centric search systems that support critical thinking and creativity. She will bring her experience of leading the IMLS-funded Library as Research Lab project (RE-95-17-0104-17) to this project. She will be the Project Manager for Year 2, organizing and evaluating Year 2 of the IDEA Institute at the University of Texas at Austin.

Advisory Board: Four experts in AI will serve in the dual roles of Board members as well as Institute instructors. They will co-select Fellows, co-develop the curriculum, and teach the topics with which they have expertise. **Catherine Nicole Coleman**, Digital Research Architect at Stanford Libraries. She leads the AI Initiative at Stanford Libraries and has expertise in implementing AI effectively into library services. She will teach in one or more of the following areas, as well as others that may arise: general AI issues and challenges, designing AI projects, evaluating AI solutions for libraries, AI impact, values, ethical concerns, and algorithmic bias. **Jason Griffey**, Director of Strategic Initiatives @ NISO, a librarian, technologist, consultant, and speaker. He is a current Affiliate at metaLAB at Harvard University. He has expertise in AI, machine learning (ML), and emerging library technologies. He will teach in one or more of the following areas, as well as others that may arise: Artificial Intelligence, Machine Learning, voice computing and AI assistants, and intellectual property. **Myung-Ja Han**, Professor and Head of Acquisitions & Cataloging Services, University of Illinois at Urbana-Champaign Library. She has expertise in linked data, metadata, information technology, semantic web, and data sets and AI. She will teach in one or more of the following areas, as well as others that may arise: Semantics, metadata, linked data, data management and AI, and AI in technical services; **Craig Boman,** Librarian and Product Analyst at OCLC. He has expertise in making software in the global library technology. He will teach one or more of the following areas: General AI issues and challenges, designing AI projects, evaluating AI solutions for libraries, machine learning and coding, as well evaluating, preparing, and training data sets for use in AI.

Partner and Supporting Organizations: The project will partner with the Association for Information Science and Technology (ASIS&T) to: (1) Promote the Institute and provide workshop space at the 2021 and 2022 ASIS&T Annual Meetings; (2) Host the Institute's post-grant website materials; and (3) Sustain the Institute, including offering the Institute in 2023. The Center for the Future of Libraries of the American Library Association (ALA) will support the Institute by (1) promoting the call for participants across the American Library Association's Offices, Divisions, Round Tables, and Affiliates; (2) providing opportunities for presentations and programs from the project at the ALA Annual Conference or Midwinter Meeting; and (3) disseminating reports and resources developed through this project across ALA's communication channels.

Graduate Student Research Assistants: Two GRAs (one at each university) will assist with developing and maintaining the project's website; research for curriculum development; delivery of the week-long Institute; data collection and analysis for program evaluation; and other tasks as assigned.

Facilities and Equipment: At the University of Tennessee, Scripps Theater, a large space that accommodates 50 people and Adam Brown Social Media Command Center, a space with six large monitors and four Mac mini computers, will be used. At the University of Texas at Austin, a computer classroom with 20 workstations and a large classroom with 44 seats will be used. The selection of software and hardware will take into account the following criteria: equity of access and applicability in the broadest range of library and information environments, including cost, ease of application, support and sustainability. For example, open software Microsoft Cognitive Development Toolkit and Keras Deep Learning Library, open sensor software and hardware (http://measurethefuture.net/), and AI assistants (Alexa, Google Assistant, and Siri, etc.).

Budget: The budget covers travel funds for fifteen IDEA Fellows, four instructors, the three PIs, as well as salaries and fringe benefits for one graduate research assistant (GRA) at the University of Tennessee and one GRA at the University of Texas at Austin for spring and summer semesters. It also covers AI hardware and software to be used during the Institute. The budget also includes networking dinners with local AI experts. The three PI's will be working on the project year-round while their efforts will be compensated at 23-31% of a summer month in Years 1 and 2. The PI's institution is contributing a modest cost share.

2.4. Outcomes and Evaluation

This project will benefit two kinds of communities: (1) The direct target community of the 40 Fellows who will develop into AI leaders, and (2) The impacted community, library and information environments at-large and the LIS education programs (see Broad Impact section). We will use a multi-method approach, collecting and analyzing evaluation data at multiple points of the Institute: during the Institute; within 2 weeks of completion of the Institute; and six months after the Institute. The IDEA Institute on AI will apply an outcome-based planning and evaluation model and will conduct two types of evaluation, formative and summative (Table 2), in order to understand the project's progress and outcomes.

The Fellows will share their interests and have a voice in their learning experience which is incorporated into the project design. The project design allows for external input, validation, and consensus building through input from the Advisory Board members who are AI experts working in various LIS sectors; validation from the Fellows' supervisors and observational showcase attendees; and consensus building from process observation at each PI/Advisory Board meeting and by Fellows at mid-Institute. The learning outcomes of the Fellows (Table 3) will be measured with respect to individual awareness, knowledge, and skills in AI in library and information environments. The instructors will be involved in the project design and provide input in co-designing the curriculum and addressing the interests of the Fellows (Table 2).

Table 2. Formative and Summative Evaluation

Objective	Measure	Method	Target/Data Source	Evaluation Type (F=Formative, S=Summative)		Time period
				F	**S**	
Goal 1. Develop an innovative, forward-looking continuing education program on AI in library and information environments.						
O1.1 A diversity of experts will develop and deliver an intensive, interactive, evidence-based and applications-oriented AI curriculum.	Curriculum development meetings	Process observation	PIs and Advisory Board	X		9/20-2/21 (Y1); 9/21-2/2022 (Y2)
	Curricular materials and pedagogy	Process observation	Fellows	X		Mid-Institute (Y1, Y2)
	Curricular materials and pedagogy	Post-Institute survey	Fellows	X	X	2 weeks pos-Institute (Y1, Y2)
O1.2 Fellows will share their AI interests to be used in designing the Institute.	Expressed interests	Application essay	Fellows	X		Sp 2021 (Y1); Sp 2022 (Y2)

Objective	Indicator	Method	Source			Timeline
O1.3 Fellows will have the capacity to problem solve by identifying, assessing and selecting AI commercial products or developing in-house AI solutions.	Application of UX methodology, knowledge of machine learning algorithms, critiques of AI library products,	Post-Institute survey	Fellows		X	2 weeks post Institute (Y1, Y2)
	AI application and sharing of AI knowledge	Supervisor Survey	Fellows' supervisors		X	1/22 (Y1), 1/23 (Y2)
	Capstone showcase presentation	Observation field notes	Showcase attendees		X	7/21 (Y1); 7/22 (Y2)
O1.4 Fellows will be capable of building on the core and foundational knowledge that they receive at the Institute.	Increased AI knowledge	Comparison of Pre- and Post-Institute and Survey			X	4-8/21 (Y1), 4-8/22 (Y2)
	Application of AI solution in the workplace	6-month post-Institute Survey			X	1/22 (Y1), 1/23 (Y2)
Goal 2. Develop AI leaders, who individually and as a collective, can innovate and create better awareness of AI as transformative technology.						
02.1 Fellows will have a voice in their learning experience.	Areas of Institute working well, areas needing improvement	Mid-Institute Process Observation	Fellows	X		7/21 (Y1); 7/22 (Y2)
O2.2 Fellows will become conversant in ethical issues in AI in library and information environments.	Active Participation in Lunch and Learn	Observation	Fellows	X		7/21 (Y1); 7/22 (Y2)
O2.3 Fellows will demonstrate their knowledge to develop an AI solution.	Dissemination of AI application and knowledge	ASIS&T Workshop, ALA conference participation, article publication, workplace presentation	Fellows		X	Post-Institute (Y1, Y2)
O2.4 The Institute will graduate a diverse group of AI leaders representing varied library and information environments.	Diversity of Fellows	Composition of Fellows	Fellows		X	Last day of Institute (Y1, Y2)

	Completion of Institute	Participation in capstone showcase	Fellows		X	Last day of Institute (Y1, Y2)
Goal 3. Contribute AI curriculum to fill a gap in AI education and training.						
O3.1 The curriculum consists of core and foundational knowledge of AI to develop AI education in LIS programs and training in libraries.	Core and foundational knowledge of AI in curriculum	Curriculum content and Institute activities	Project website		X	Project completion
O3.2 ASIS&T, the IDEA Institute's partner, will continue to host the curriculum beyond the IMLS-funded project.	Transition planning activities	Sustainability plan	PIs and ASIS&T		X	11/21 -8/22
O3.3 The IDEA Institute will continue to be offered by ASIS&T, which will engage additional LIS educators and professionals in the sustainability process.	Scheduled Institute for 2023	Call for participation	ASIS&T		X	Project completion
O3.4 The ten self-funded Fellows will demonstrate the need and evidence for the sustainability of the Institute.	Satisfaction with Institute and good value	Post-Institute Survey	Self-funded Fellows		X	2 weeks after Institute (Y1, Y2)

Table 3. Fellows Learning Outcomes

Learning Outcome	Project Objective (see Table 2 for corresponding evaluation)
(1) Develop understanding of AI technology as "disruptive" but "transformative" for augmenting and delivering services and improving workflows	O1.3 Fellows will have the capacity to problem solve by identifying, assessing and selecting AI commercial products or developing in-house AI solutions. O2.2 Fellows will become conversant in ethical issues in AI in library and information environments.
(2) Lead innovation through adopting AI applications in library practice using the UX Methodology as the conceptual framework	O1.3 Fellows will have the capacity to problem solve by identifying, assessing and selecting AI commercial products or developing in-house AI solutions.
(3) Evaluate AI products	O1.3 Fellows will have the capacity to problem solve by identifying, assessing, and selecting AI commercial products or developing in-house AI solutions.
(4) Develop AI applications in their library and information environments	O1.4 Fellows will be capable of building on the core and foundational knowledge that they receive at the Institute.
(5) Transfer and disseminate knowledge of AI in the workplace and broadly.	O2.3 Fellows will demonstrate their knowledge to develop an AI solution.

2.5. Communication Plan

The communication plan will promote and transmit the development, implementation, impact, and sustainability of the IDEA Institute using diverse channels and venues, engaging the project team, instructors, partner and supporting organizations, and stakeholders. This plan consists of a three-prong effort at the national level: (1) A dedicated website on a University of Tennessee-Knoxville School of Information Sciences server will be created, actively promoted, and updated regularly to share Institute, AI projects, curriculum, activities, accomplishments, and milestones. The project's website will acknowledge IMLS funding and other support, be available publicly and include social media features; (2) News about the Institute will be posted to appropriate library and information science listservs and social media; (3) Dissemination of Institute experiences and results will be presented by the PIs and/or Advisory Board at major LIS conferences including ALISE (Association for Library and Information Science Education) Conference, ASIS&T Annual Meeting, iConference, and ALA Annual Conference. The PIs will also publish their work in peer-reviewed journals, including JELIS (Journal for Education in Library and Information Science) and College and Research Libraries, among others; and (4) AI innovation and applications will be presented by the Fellows, who will be invited to present their AI projects and share their learning experiences at the ASIS&T workshop on AI in 2021 and 2022, and also present at ALA annual conferences. Fellows will also present their projects at the capstone showcase to local library and information communities and stakeholders at the end of the Institute.

2.6. Sustainability Plan

The project will be sustained in four ways. First, the Fellows will develop into leaders in AI in library and information environments who will be able to design, develop, and implement AI solutions in their work settings. Second, the dissemination of the Institute's curriculum will generate interest in the development of AI courses in LIS education programs and workplace learning that could lead to increasing the capacity of educating AI specialists in the library and information workforce. Third, the partnership with ASIS&T will contribute to sustaining the Institute. ASIS&T will host the Institute's post-grant website materials and identify a strategy to sustain this project, such as owning, branding, and further developing the Institute. It will continue to offer post-grant intensive training for library and information professionals on AI or other emerging technologies. Fourth, the synergies developed among the PIs and Advisory Board members will create a network of academics and practitioners who will be able to identify and address LIS education and training needs of the Fourth Industrial Revolution.

3. Diversity Plan

The IDEA Institute on AI is purposeful in its approach to equity, diversity and inclusion (EDI), and will adopt the following diversity statement:

> *The IDEA Institute on AI is committed to equity, diversity and inclusion in all aspects of the program in order to deepen the knowledge and skills of library and information professionals in using artificial intelligence (AI) to enhance information access, discovery and services for users, independent of race, ethnicity, gender identity, sexual orientation, socio-economic status, age, physical abilities, and other dimensions of potential inequity.*

The Diversity Statement will be observed in all aspects of the Institute, and has informed the development of its diversity plan, which addresses four areas, strengthening the project's outcomes:

(1) *Composition of PIs, GRAs, Advisory Board, and Fellows*. The PIs and Advisory Board members bring diverse backgrounds, including race, ethnicity, gender identity, age, subject matter expertise, institutional background, professional experience, and EDI leadership, among others.

(2) *Promotion, recruitment, selection, and retention of participants.* In order to ensure equity of participation and diversity in the composition of Institute Fellows, LIS associations working to develop and support library and information professionals of diverse backgrounds will be enlisted in the promotion and recruitment process. To expand the effort of recruiting Fellows with diverse backgrounds, we will reach out to LIS associations addressing diversity (e.g., ALISE Disabilities in Library and Information Science Special Interest Group, Association of Tribal Archives, Libraries, and Museums (ATALM)), HBCUs and Hispanic Serving Institutions and their networks. We will also collaborate with the Institute's partner and support organizations (ASIS&T and

ALA Center for the Future of Libraries, that includes ALA's Offices, Divisions, Round Tables, and diversity Affiliates). This project will make selection of diverse library and information professionals a high priority. Recognizing transportation cost as a potential barrier to participation, the Institute plans on identifying funding to make available travel grants per year. Retention of Fellows is addressed by creating a learning environment that understands and supports the needs of diverse learners.

(3) *Subject content*. The curriculum will address issues of EDI in the application of AI in library and information environments, including the examination of AI applications for bias-free algorithms, accessibility, EDI and ethics of AI, among others. Moreover, the resources developed by the Institute will be accessible beyond the time of the Institute to support equity in developing a diverse workforce of library and information professionals.

(4) *Pedagogy*. The Institute will create a collective and supportive, rather than competitive, learning environment, whereby praxis takes place, with an instructor being a learner and vice versa, different modes of learning are engaged, and support is provided so no one falls behind. By engaging Fellows of diverse backgrounds, we ensure that we do not have an echo chamber, and are able to broaden our approaches and discussions. Through our pre-program on-boarding and formative evaluation processes, we will identify opportunities and challenges that the Institute will use to enhance the content and learning experience.

4. Broad Impact

The Institute on AI will have an impact on **Lifelong Learning**, an IMLS Laura Bush 21st Century Librarian Program Project Category, by providing Fellows much needed continuous education in AI to stay at the forefront of technological developments and to lead innovation. The Institute will have a national impact as it will spark future innovation, collaboration, and dissemination of AI in library and information environments. Success in recruiting a diverse, intellectually robust cohort that is engaged in real-world learning experiences and building valuable professional networking among the cohort and with instructors will continue after the grant-period. In addition, Fellows will learn what it means to be change agents to lead the adoption of disruptive, transformative technology, while being strategic and agile.

The broad impacts of the Institute on AI are as follows:

1. *Building greater AI knowledge, skills, and abilities in the library and information professions.* Library and information professionals will begin to meet user needs in the changing digital landscape to continue to stay relevant and create new opportunities for the communities they serve.

2. *Taking an emerging technology from concept to real-world application.* By creating a cohort of emerging leaders of AI in library and information environments, Fellows will create awareness of AI, and continue to innovate and push the boundaries of intelligent applications.

3. *Providing a sustainable model through strategic partnership and collaboration.* ASIS&T will advance continuing education capacity in AI in library and information environments on an international scale via training library and information professionals in AI and other emerging technologies. 4.

4. *Creating a footprint/model.* This project will create a footprint/model for future efforts in LIS education and training in AI, which is not yet commonplace. The materials will be broadly available through the project website under the Creative Commons BY-NC-SA license (https://creativecommons.org/licenses/by-nc-sa/4.0) in the public domain, as well as through the University of Tennessee's institutional repository TRACE. The Institute and its curriculum can be adapted, to be used as a whole or in part, across different library and information professional development programs and LIS curricula.

5. *Disseminating project outcomes.* IDEA Fellows, PIs, and Advisory Board members will share project outcomes and experiences at LIS national conferences and workshops, and at local capstone showcases. They will also disseminate project outcomes and evaluation results via scholarly and professional publications.

The proposed IDEA Institute on AI proposed will produce a tested, cost-effective, sustainable continuing education model that will impact the capacity of the workforce in library and information science in the Fourth Industrial Revolution.

IDEA (Innovation, Disruption, Enquiry, Access) Institute on Artificial Intelligence

IDEA YEAR 1 (2020-2021)

Activities	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG
Curriculum development	■	■	■	■	■	■						
Development of project website	■	■	■	■	■	■						
Evaluation planning		■	■	■	■	■	■					
Recruiting and selecting 1st cohort of Institute Fellows		■	■	■	■	■						
Pre-Institute onboarding								■	■	■		
AI in Libraries Session at ALA National Conference										■		
1st IDEA Institute at University of Tennessee in Knoxville											■	
Program evaluation of 1st Institute								■	■	■	■	■
Dissemination of Project Content and Results										■	■	■

University of Tennessee — 2

IDEA YEAR 2 (2021-2022)

Activities	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG
ASIS&T Workshop in Salt Lake City, Utah		■										
Curriculum revision as needed	■	■	■	■	■	■						
Recruiting and selecting 2nd cohort of Institute Fellows		■	■	■	■	■						
Follow-up evaluation of 1st Institute cohort (Jan-Feb)		░	░	░	■	■						
Revision of 2nd Institute evaluation program based on 1st Institute evaluation results		░	░				■	■	■	■		
Pre-Institute onboarding								■	■	■		
AI in Libraries Session at ALA National Conference										■		
2nd IDEA Institute at University of Texas at Austin											■	
Program evaluation of 2nd Institute								■	■	■	■	■
Developing sustainability plan with ASIS&T		░	■	■	■	■	■	■	■	■	■	
Transitioning the Institute to ASIS&T		░	░	░	░	░	░	░	░	░	░	■
Dissemination of Project Content and Results	■	■	■	■	■	■	■	■	■	■	■	■

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?