**Cloud-Based Accessibility for Individuals with Disability**

Tools for Creating Specifications of User Needs and Preferences for Online Interactions in Several Different Application Settings

Performance Work Statement

6/19/14

**Introduction**

**Overview**

The mission of the National Institute on Disability and Rehabilitation Research (NIDRR), the Office of Special Education and Rehabilitative Services (OSERS), the United States Department of Education (Department), is to generate and promote new knowledge to improve the abilities of people with disabilities to perform activities of their choice in the community and to expand society’s capacity to provide full opportunities and accommodations for its citizens with disabilities.

**Legislative Authority**

The authorization for this contract is contained in the Rehabilitation Act of 1973 as amended; section 202 (b) (2) is the most specific and relevant to this contract. International programs are authorized by Section 204 (b) (6).

**Background**

ED-OSE-12-D-0013 Task Order 1 laid the foundation for the design and implementation of tools to assist people in creating specifications of their needs and preferences for on-line interactions. As a next step, work is needed to develop and evaluate example tools that address the creation of such specifications for users in specific, concrete application settings.

Here, “application setting” means a situation in which a group of people must use on-line technology for a specified purpose, such as on-line educational assessment or acquiring basic on-line literacy. Supporting users in such a setting means enabling users who require different types of accommodations to create specifications of user needs and preferences to allow them to access and use the online technology available in the setting.

The focus of this work is creating software tools for identifying the preferences that would be needed for basic operations in selected application settings. This includes First Discovery tools, defined in the reports from Task Order 1, as tools used “to find out what the basic needs of a person are, needs that, if they are not met, would prevent the person from using the Information Communication Technology (ICT) at all.” In addition, the reports from Task Order 1 determined that it may be necessary to develop Explore tools, which are useful after a basic set of preferences have been established to “refine… current preferences, or to explore the use of different preferences for different tasks or environment.” Explore tools should be included to the extent, and only to the extent, necessary to create the basic preference set required for operations in the application settings, as established in a needs assessment for the application settings, as specified below.

Possible application settings to be explored were identified in related NIDRR sponsored research; others address broad needs in supporting elder citizens and in online education. The set of possible application settings is diverse and has potentially different preference specification needs.

Possible application settings include:

1. Accessible voting
2. Online educational assessment
3. Community-based technology support for older citizens
4. Open educational resources

**Scope of Work**

This Task Order is for one 12-month period. All deliverables shall be submitted to NIDRR’s Contracting Officer’s Representative (COR) electronically.

All reports must include a description of the results appropriate for a non-technical audience, AND a description appropriate for readers with knowledge of computer science and Web technology. These reports must be reviewed by the technical teams that produce the implementations.

1. OVERALL TASKS

1. Gather specific stakeholder input on Needs and Preferences Sets and First Discovery tools for specific application settings

### 2. Create First Discovery Tool(s) that address the needs identified in Task One

3. Evaluate First Discovery tool for specific application settings

1. SPECIFIC TASKS

1. Task One-- Stakeholder Workshops on creation of Needs and Preferences Sets for Online Accessibility for each of the specified application settings

1.1 The contractor shall plan one in-person stakeholder workshop, for the topic areas identified above. The contractor shall identify potential stakeholders for each topic area. These stakeholders will be reviewed and approved by the NIDRR COR. The contractor shall obtain NIDRR approval for the invitee list, identify a time and space for each workshop, and issue invitations to potential participants. The workshop shall be two-days and should include up to eight stakeholders representing the consumers in the application setting and up to eight members from the project team including technical team members who will later be designing and implementing the tools. The workshop shall occur in the 30 days following the establishment of the logistics (60 days after contract award). Specifically, NIDRR is seeking stakeholder representatives from the following groups (as appropriate to the particular workshop):

(1) National Institute of Standards and Technology (NIST) investigators working on accessible

voting;

(2) Investigators from the Dynamic Learning Maps project at the University of Kansas focused on accommodations in online educational assessment;

(3) Investigators at Older Adults Technology Services (<http://oats.org/>) offering support for older citizens in using IT in community settings

(4) Investigators working on the development of open educational resources.

At least one investigator not affiliated with the project team or their organizations must be included in each session, and there must be representation from the Project’s Technical Team.

In planning this workshop, the contractor shall contact representatives from each of the application settings, determine which individuals should be present, identify the most advantageous site of the workshop, and coordinate the logistics for holding the workshop (including the travel for the participants). In addition, the contractor shall be responsible for the honorarium for each of the eight consumer stakeholders (up to $500) for the workshop. The final list of invitees shall be approved by the NIDRR COR. The contractor shall also arrange to have the content of the workshop captured by a dedicated note taker. If the contractor wishes to record the sessions for transcription and later review, that is permitted but not required. The NIDRR COR must approve the attendee lists. In the event that a specific stakeholder organization listed declines to participate, a substitution may be recommended, subject to approval by the NIDRR COR.

1.2 Convene the workshop. The workshop will begin with a background briefing (about 2 hours) for the stakeholders on Global Public Inclusive Infrastructure (GPII) and on the concepts for preference creation tools developed in Task Order 1. One or more members of the project technical team must participate in this briefing (and in the ensuing discussion) to ensure that adequate technical detail is addressed. The contractor shall identify a facilitator for the workshop. The facilitator may be a member of the project technical team.

Following the background briefing, the facilitator will lead a discussion designed to identify user needs and preferences as well as specification of potential preference creation tools for the specified application setting. (Estimate 4 hours.) Matters to be addressed include:

1. What preferences must be supported in the application setting?
2. When and where would the preference tools be used? Is there a need for more than one tool for this application setting?
3. Should all of the preference creation tools in this application setting be designed for use by the end user independently, or should initial preference-setting tools to be designed to be used with staff support?
4. What user interface features and characteristics would preference tools need to have to serve this application setting?
5. Any opportunities in the application setting where preferences could be suggested on the basis of inference from user actions (e.g., in practice assessments) as opposed to being explicitly set in a Discovery Tool.
6. Any constraints on the allowable accommodations for the application (i.e., are there some accommodations that are either not permitted at all or that are only permitted in certain contexts - such as audio description being permissible for instruction but not for assessment).
7. Any technical constraints on the format/storage of the needs and preferences so as to work within the context of the application.
8. Contextual factors relevant to the applicability of a Discovery tool, for example, compatibility with specific security or privacy requirements; interoperability with existing tools and infrastructure.
9. Personas and scenarios that might influence the need for requirements (for example, personas that require the identified needs and preferences, and scenarios that show the identified user interface attributes and features at work).
10. Proposed evidence of effectiveness (for example, reduction in staff time, or support for a wider user population).
11. Any other input deemed necessary to develop a (set of) First Discovery tools to work in the application represented by the stakeholder.

The contractor shall prepare a report that analyzes the stakeholder input and discusses its implications on the development of a (set of) tools (First Discovery and, if essential, Explore tools) for each of the application settings. The report shall contain (1) a summary of the input from each workshop, including a discussion addressing the extent to which multiple tools are likely to be needed within each of the application settings (and why); (2) an analysis of the needs and preferences required in the different application settings and the extent to which they can be represented with a single preference framework; (3) a discussion addressing the extent to which a common core exists among the First Discovery and Explore tools appropriate for the application settings (e.g., will each application setting require its own First Discovery and Explore tools? Are there some aspects of the tools that are the same across all of the applications?); (5) a proposal for the tools(s) to be implemented in Task 2. Ideally the selection of tools to be implemented should provide a concrete demonstration of the generality of the approach in that the tools should cover multiple applications settings and be appropriate for users requiring different accommodations. If it is not possible to implement such a set of tools in the time allotted, the report should identify why this is the case; and (6) the notes and transcripts used to capture stakeholder input in each workshop. This raw data may be stored electronically, with an appendix providing a pointer to the hosting website.

Workshop participants must review and comment on the portion(s) of the report dealing with their application setting. Members of the project technical team must review and comment on the portion(s) of the report that describe and propose preference tools.

*Deliverables*

Subtask 1.1 The contractor shall provide the list of potential stakeholders for theworkshop as well as information on the logistics, e.g., time, place, agenda, of the workshop to NIDRR for review 60 days (2 months) from the start of the task order.

Subtask 1.2 A report on the workshop shall be submitted 120 days (4 months) from the start of the task order. The NIDRR COR will provide feedback regarding the report within two weeks of receipt of the report from the contractor. The response will include approval of the implementation proposal or provide specific feedback regarding changes to the implementation proposal.

2 Task Two--First Discovery Tools

2.1 The contractor shall determine which application setting(s) will be the focus of the development of First Discovery tools. These determinations will be reviewed and approved by the NIDRR COR. The number of tools will depend on the expected complexity, time requirements, availability of expertise, and funding. The tool or tools shall address the stakeholder input from Objective One as fully as possible.

The tool or tools should be operable as Web application(s) and shall produce needs and preferences sets in a format or formats recommended by the stakeholders during the workshops. The tool or tools should be freely available online (i.e., open source software) for examination by any interested parties. Code for the tool should also be freely available/open source for use and adaptation by other projects. Dependencies on other software should be limited to freely available software tools. Any software created for Objective Two shall be made publically available on a commonly used public repository such as GitHub.

Implementation work for this objective shall focus on the creation, not the use, of needs and preferences sets, except insofar as some work on use may be needed for the proper functioning of the First Discovery and (if essential) Explore Tool(s) themselves.

*Deliverables*

Subtask.2.1 Monthly briefings to the COR and NIDRR representatives on the creation of needs and preference sets and obtain NIDRR COR approval prior to embarking on the creation of Explore Tool(s).

Subtask 2.2 A report describing the architecture and implementation of the tool(s), and how well the tool(s) address the stakeholder input from Objective One, including any limitations (by the end of month 10 of task order performance).

3 Task Three—Evaluate First Discovery Tools for Specific Application Settings

Subtask 3.1 Convene a stakeholder workshop to evaluate the tool(s) developed in Objective Two. Stakeholders should include representatives from the application settings addressed by Objective Two above. Workshop participants must be able to operate the tool(s) proposed for their application setting (appropriate work settings and computers must be provided by the contractor for this unless such materials are available onsite). The NIDRR COR must approve the attendee list.

Participants shall be given a copy of the portion(s) of the Objective One report that describe the requirements identified for their application setting. Participants shall use the tool(s), working through the application scenarios as developed in Task One for their application setting(s), and otherwise examining the appropriateness of the tool(s) for their setting.

A member of the project technical team must participate, to observe and provide assistance.

The contractor shall record responses from the participants documenting the extent to which the tool(s) address the requirements for their application setting, and any deficiencies, limitations, and desired improvements. The workshop shall conclude with a group debriefing, in which all participants can share and discuss their evaluative feedback.

Subtask 3.2 The contractor shall prepare a report that describes the strengths and weaknesses of the tool(s), as assessed by participants, the feasibility of enhancing the tool(s), based on input from participants, and how evidence of effectiveness of the tool(s) could be gathered. The report shall include an appendix containing the raw input from the stakeholders during the workshop, possibly in electronic form, as described for the report for Objective One.

*Deliverables*

Subtask 3.1 A listing of workshop invitees, an agenda, and information on logistics, including time, place, and equipment for the evaluation workshop.

Subtask 3.2 A final report by the end of month 12 of the task order.

Compliance with IT Requirements

Internet Protocol version 6 (IPv6)- The Contractor shall provide COTS solutions that are IPv6 capable. An IPv6 capable system or product shall be capable of receiving, processing, transmitting and forwarding IPv6 packets and/or interfacing with other systems and protocols in a manner similar to that of IPv4. Specific criteria to be deemed IPv6 capable are: An IPv6 Capable system must meet the IPv6 base requirements defined by the USGv6 Profile and Testing program as found here “http://w3.antd.nist.gov/usgv6/testing.html”. Systems being developed, procured or acquired shall maintain interoperability with IPv4 systems/capabilities. Systems shall implement IPv4/IPv6dual-stack and shall also be built to determine which protocol layer to use depending on the destination host it is attempting to communicate with or establish a socket with. If either protocol is possible, systems shall employ IPv6. The contractor shall provide IPv6 technical support for system development, implementation and management System Development Standards: Information systems shall be developed in accordance with the ED Lifecycle Management Framework (LCM), ACS-OCIO 1-106.

A follow-on task order may be issued at a later date to include actual pilot deployments and their evaluation.

Deliverables Schedule

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| 1.1 | List of speakers and logistics for the workshop | 60 days after contract award |
| 1.2 | Report on the workshop | 120 days after contract award |
| 2.1 | Monthly briefings to NIDRR | On the 10th of each month |
| 2.2 | Objective Two Report | 10 months after contract award |
| 3.2 | Workshop attendees, agenda and logistics | 11 months after contract award |
| 3.3 | Final Report | 12 months after contract award |