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**Heather A. Katz, Ph.D.,** Senior Instructional Technologist and Researcher, has over 13 years experience in the field of education and instructional technology with a concentration in the application of cognitive sciences to electronic learning environments. Her current research endeavors involve data technical and training integration, content management, reusable object models, mLearning, and mobile technologies as they apply to enterprise strategies. Dr. Katz was the project lead and primary author of foundational research that was used to develop the U.S. Navy's Content Object Model.



**Stephen Worsham,** Senior Programmer, has over 20 years experience in the fields of computer programming and training with a concentration in the development of interoperable and open architecture development tools and data resolution systems. He has designed SCORM conformant proprietary software for the development of training courseware that delivers interoperable and open architecture source files. Mr. Worsham's current development endeavors include the design of interoperable system architectures that utilize web and data resolutions services to deliver both learning content and technical data objects to end users.



## Streaming mLearning Objects via Data Resolution and Web Services to Mobile Devices: Design Guidelines and System Architecture Model

Mobile technologies PDAs, cellular/smart phones, PC tablets, hand-held computers, wearable computer devices, etc. allow for connection to both internet-based learning/training resources, as well as other people. Users of mobile technology can manage the administration of their learning via personal journals and interaction with virtual learning environments. The ability to instantly download performance support resources and instantly publish ones behaviors/actions, observation, and data will empower users to become investigators and active learners that are responsible for their own knowledge acquisition and decision making. Further investigation that results in the design and implementation of guidelines is needed in order to successfully and effectively employ mobile technologies for education/training and performance support within blended learning environments, across various communities of practice, composed of learners having various skill levels. Moreover, existing technical specifications and standards such as wireless network technology, web services, Sharable Content Object Reference Model (SCORM) 2004, Content Object Repository Discovery and Registration Architecture (CORDRA), and S1000D (technical data publication standards) require investigation in their application to technically make available instruction and performance support resources via mobile technologies. Specifically, this paper will offer guidelines as well as a system architecture model that could potentially identify both SCORM conformant and technical publication objects via a content/data resolution server using web services to deliver objects for mLearning and performance support via mobile technology devices. Additionally, a prototype will be developed to demonstrate the capability to stream SCORM 2004 conformant objects from data repositories using web services to various mobile technology devices.