IEEE Actionable Data Book "ADBook" for Education
Industry Connections Activity Initiation Document (ICAID)
Version: 3.0, 15 Feb 2016
IC12-006-05 Approved by the IEEE-SASB 3 March 2016

Instructions

- Instructions on how to fill out this form are shown in red. It is recommended to leave the instructions in the final document and simply add the requested information where indicated.
- Shaded Text indicates a placeholder that should be replaced with information specific to this ICAID, and the shading removed.
- Completed forms, in Word format, or any questions should be sent to the IEEE Standards Association (IEEE-SA) Industry Connections Committee (ICCom) Administrator at the following address: industryconnections@ieee.org.
- The version number above, along with the date, may be used by the submitter to distinguish successive updates of this document. A separate, unique Industry Connections (IC) Activity Number will be assigned when the document is submitted to the ICCom Administrator.

1. Contact
Provide the name and contact information of the primary contact person for this IC activity. Affiliation is any entity that provides the person financial or other substantive support, for which the person may feel an obligation. If necessary, a second/alternate contact person's information may also be provided.

Name:　　　　　　　John B. Costa
Email Address:　　　jbcosta@repubit.com
Phone:　　　　　　　+1 321.262.3626
Employer:　　　　　RePub Interactive Technologies, LLC (RePubIT)
Affiliation:　　　　　IEEE Learning Technology Standards Committee

2. Participation and Voting Model
Specify whether this activity will be entity-based (participants are entities, which may have multiple representatives, one-entity-one-vote), or individual-based (participants represent themselves, one-person-one-vote).

"Individual-Based".

3. <u>Purpose</u>

3.1.   <u>Motivation and Goal</u>

Briefly explain the context and motivation for starting this IC activity, and the overall purpose or goal to be accomplished.

This exploratory project is looking at how the use of mobile tablets for delivering instruction will change educational publishing. Adoption of mobile devices for learning content delivery is happening worldwide. Mobile learning growth rate is 18.5% predicted to reach $12.5 billion by 2017. Current methods of packaging and delivery of content for these platforms does not utilize the rich media and collaborative affordances of these devices at all.

Future learning materials will use the computing power and sensors of tablet computers to interface with other systems, with cloud-based data, and with local devices (IoT) to produce more personalized and contextual instruction and practice. Activity members have developed demonstrable prototypes and presented on ADBook eLearning events in the US, Asia, and Australia during 2015. The most significant validation of the ADBook comes from the recent Broad Agency Announcement from the Advanced Distributed Learning Initiative seeking vendors to build a fully functional ADBook prototype to integrate with current Department of Defense Technology Learning Architecture applications.

We expect that several component standards will be required and that PARs will emerge later in 2016.

The ADBook Activity wishes to continue our work for an additional 2 years with the following goals in place:
1. Expand ADBook community support
    a. Leverage the momentum and validation of ADBook evidenced by the Department of Defense, <u>Advanced Distributed Learning (**ADL**) Initiative's Broad Agency Announcement</u> (**BAA**) Nov13th <u>Addendum</u>, soliciting vendors to develop a fully functional Actionable Data Book based on the IEEE ADB Activity recommended architecture
    b. Use conference events, speaking engagements, publication of articles, etc., to build industry visibility and enlist early adopters.
    c. Author IEEE approved reports based on elements outlined in the 90 page internal report assembled during 2015.
2. Secure involvement of eLearning and xAPI industry partners to formalize development of the architecture as a **Reference Model** for mobile eLearning.
3. Identify multiple segments (potentially 3-5) within the Reference Model, which can be moved forward as PARs for standard development under LTSC.
4. ADL BAA Addendum vendor select will join the ADBook Activity. ADBook Activity members will participate in functional requirements testing and evaluation throughout ADBook prototype development process Q2 2016 – Q4 2017.

The previous ICAID concluded Q4 2015 with 4 of the 5 deliverables achieved.
1. Successful demonstration of the Actionable Data Book model
    a. Demonstration at ADL xAPI Boot camp at the ADL Headquarters in Arlington, VA. https://www.youtube.com/watch?v=Y-1mk6F8DBY
2. Presentation at two eLearning industry conference workshop sessions
    a. Activity chair, John Costa also presented the ADBook ePub3 and HTML5 sample prototypes at the mLearnCon 2015 conference in Austin, TX, and at DevLearn 2015 in Las Vegas.
3. Authoring of a 90 page report on our findings, testing, and recommendations throughout the previous two years. Report Link
4. The Survey took the form of advanced industry research and documentation in support of the final report.

Additional Achievement in 2015
In December 2015, the ADL released a broad agency announcement requesting development of an advanced functional prototype of the IEEE-SA Industry Connections Actionable Data Book Activity. ADL approached IEEE to request cooperation of the ADBook Activity to support the vendor(s) awarded the contract in Q2 2016, thus involving the ADBook Activity in all stages of the fully funded prototype development effort. In doing so IEEE-SA ADBook will gain visibility in the US Military, Government, and corporate training and performance support markets. ADBook will advance its interoperability criterion, as the BAA requires that the ADBook prototype support integration with existing ADL prototype systems for content brokering, badging, competencies, user profiling and private learning data lockers.

3.2.   Related Work
Provide a brief comparison of this activity to existing, related efforts or standards of which you are aware (industry associations, consortia, standardization activities, etc.).

Baseline eBook technology

The established open content format for eBooks is ePub from the International Digital Publishing Forum (IDPF). This activity intends to use EPUP 3, the current version, as the basis for the actionable data book. The IDPF is beginning work an EPUB 3 profile known as EDUPUB to address the requirements eTextbooks and K-20 education sector stakeholders. This activity will use aspects of EDUPUB, now known as ePub for Education, as practicable.

The Readium foundation is developing an open source reader for EPUB 3 documents. This is the baseline "player" technology for an actionable data book. However, the actionable data book has engaged support from ePub3 reader developers beyond what Readium currently provides.

Operationally, the IEEE publishes many eBooks and also delivers online courses. Both technologies are relevant to this activity, which intends to coordinate with, leverage and inform internal IEEE work as practicable.

The ISO-IEC subcommittee dedicated to learning technology, SC36, is conducting a study group on eTextbooks with the intention of developing an international standard. The SC36 group has identified interactivity as a component of that standard. Participants in this

activity are also involved in the SC36 work, and expect to inform SC36 with findings on interactivity that result from developing the actionable data book.

Accessibility

Accessibility support is a necessary component of any adequate learning technology. In developing the actionable data book it shall be the policy of this activity to consider accessibility support from inception. The IDPF has defined baseline accessibility support in EPUB 3 and is expected to address learning-specific support in the EDUPUB profile. This activity shall align with the IDPF strategy for accessibility support

Higher Education Requirements

The IMS Global Learning Consortium (IMS) has developed several specifications related to assessments, accessibility, and learning analytics that are being considered by the IDPF for use in the EDUPUB (ePub for Education) profile. During its first year that work was identified as relevant by the activity and may be addressed in future technology demonstrations. We continue to monitor its progress however it has in recent years limited its support of key data and collaborative functions of the mobile learning platform that ADBook requires.

Data communication between content and cloud services

During its first year the activity experimented with the ADL Experience API (xAPI) to enable eBook content to communicate data with a cloud-based repository. It appears to be a viable, general solution. Greater collaboration with ADL on xAPI is anticipated in 2014 and discussions are is progress for standardizing xAPI in the IEEE LTSC.

IEEE Education Society

The IEEE Education Society has begun a standardization activity on "Networked Smart Learning for Online Laboratories" (P1876). The chair has been contacted regarding this activity and the work may become relevant as the both efforts move forward.

3.3.   **Previously Published Material**
Provide a list of any known previously published material intended for inclusion in the proposed deliverables of this activity.

The Digital Book in Higher Education: Beyond the Horseless Carriage. Edilson Arenas and Avron Barr. 30th ascilite Conference, Sydney, December 2013.

The IEEE Actionable Data Book: A Platform for Inclusive Education. Edilson Arenas, Tyde Richards, and Avron Barr. Proceedings of the IEEE Global Humanitarian Conference, San Jose, CA, October 2013.

The Importance of Software Standards in the Globalization of Educational Technology: The IEEE Actionable Data Book Project. Avron Barr, Tyde Richards, and Robby Robson. Proceedings of the Workshop on Learning Technology for the Developing World at the Artificial Intelligence in Education Conference, Memphis, July 2013.

3.4.   **Potential Markets Served**
Indicate the main beneficiaries of this work, and what the potential impact might be.

Primary beneficiaries of this work are intended to be:
- Platform providers smartphone and tablet devices, eBook readers
- Publishing organizations providing mobile interactive learning content to K12, higher education, and adult learning markets.
- Publishing companies in the K12, Higher Ed and vocational training markets interested in providing eBooks for STEM education
- Organizations interested in internally developing interactive eBooks for performance support applications
- Vendors of learning technology: learning management systems, authoring systems, learning analytics
- Non-profit organizations interested in field-oriented data collection in the public health or environmental science domains
- Government agencies interested in deploying eTextbooks on a state, national or regional level.

The potential impact is significant because the actionable data book application:

- Targets a hardware family of mobile devices that is becoming global available in both developed and developing countries
- Is relevant across all learning market segments – K12, higher education, vocational training – in the priority area of STEM education
- Taps into commercial and governmental interest in interactive eTextbooks
- Establishes a connection between interactive eBooks and cloud computing
- May be able to leverage the global reach of the IEEE as a diffusion vector.

4. <u>Estimated Timeframe</u>
Indicate approximately how long you expect this activity to operate to achieve its proposed results (e.g., time to completion of all deliverables).

Expected Completion Date: 12/2017

IC activities are chartered for two years at a time. Activities are eligible for extension upon request and review by ICCom and the IEEE-SA Standards Board. Should an extension be required, please notify the ICCom Administrator prior to the two-year mark.

5. <u>Proposed Deliverables</u>
Outline the anticipated deliverables and output from this IC activity, such as documents (e.g., white papers, reports), proposals for standards, conferences and workshops, databases, computer code, etc., and indicate the expected timeframe for each.

This activity anticipates the following deliverables:

1. A technical reference model of a networked, activity-based, actionable data book assuming EPUB 3, HTML5, and xAPI as initial implementation technologies
2. With development funded by the ADL BAA, ADBook demonstrable use cases are expected to include
   a. the ADL BAA prototype

      b. interactive white paper and standards documentation (for potential IEEE Publishing utilization)
      c. formative and summative assessment
      d. collaboration layer
      e. Learning Record Store experiential learning analytics data correlation and visualization
      f. interactive simulation integration
      g. online and offline data caching with data store and forward
      h. communication with cloud content broker for adaptive alternate content presentation
      i. online/offline operation
      j. mobile device operation

3. One or more sessions or workshops on the activity at an appropriate conference venue in the fall/winter of 2016.
4. Proposals for one or more IEEE standards by fall/winter 2016.

6. <u>Funding Requirements</u>

Outline any contracted services or other expenses that are currently anticipated, beyond the basic support services provided to all IC activities. Indicate how those funds are expected to be obtained (e.g., through participant fees, sponsorships, government or other grants, etc.). Activities needing substantial funding may require additional reviews and approvals beyond ICCom.

1. Marketing materials (Info graphic and promotional pieces) to solicit vendor participation.

2. Any assistance for travel and potential admission for 1-2 industry events related to eLearning, mobile training, and interactive e-books for education and training will be greatly appreciated.

7. <u>Management and Procedures</u>

7.1.   <u>IEEE Sponsoring Committee</u>

Indicate whether an IEEE sponsoring committee of some form (e.g., an IEEE Standards Sponsor) has agreed to oversee this activity and its procedures.

Has an IEEE sponsoring committee agreed to oversee this activity?: YES

If yes, indicate the sponsoring committee's name and its chair's contact information.

Sponsoring Committee Name: IEEE Learning Technology Standards Committee
Chair's Name: Avron Barr
Chair's Email Address: avron@aldo.com
Chair's Phone: +1.831.419.5829

7.2.   <u>Activity Management</u>

If no IEEE sponsoring committee has been identified in 7.1 above, indicate how this activity will manage itself on a day-to-day basis (e.g., executive committee, officers, etc).

N/A

7.3.   Procedures

Indicate what documented procedures will be used to guide the operations of this activity; either a) modified baseline *Industry Connections Activity Policies and Procedures*, or b) Sponsor or Working Group policies and procedures accepted by the IEEE-SA Standards Board. The chosen policies and procedures must be reviewed by ICCom

The ADBook activity will adopt the baseline Industry Connections Activity Policies and Procedures

8. Participants

8.1.   Stakeholder Communities

Indicate the stakeholder communities (the types of companies or other entities, or the different groups of individuals) that are expected to be interested in this IC activity, and will be invited to participate.

Members of the following stakeholder communities will be invited to participate in this activity:

- The ADL, AICC, IDPF, IEEE LTSC, IMS, EPUB, W3C, and SC36 communities
- IEEE entities with an interest in learning or relevant technologies including RAMLET.
- Communities of practice with an interest in using interactive eBooks for education including the Book Industry Study Group) and the Association of American Publishers.
- Platform providers: Smart phone, eBook reader, and
- Educational content publishers.
- ELearning authoring, analytics, and content distribution software vendors including: Adobe, Advantis, Articulate, IBM, Microsoft, Google, Saltbox, Rustici, Watershed, VisCa…

8.2.   Expected Number of Participants

Indicate the approximate number of entities (if entity-based) or individuals (if individual-based) expected to be actively involved in this activity.

Expand to 20 individuals participating on a regular basis. Currently the group has 12 members actively involved on a weekly basis.

8.3.   Initial Participants

Provide a list of the entities or individuals that will be participating from the outset. It is recommended there be at least three initial participants for an entity-based activity, or five initial participants (each with a different affiliation) for an individual-based activity.

Individual	Contact Information	Employer	Affiliation
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