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ADL and Mobile Learning

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11 August 2010

Report Documentation Page

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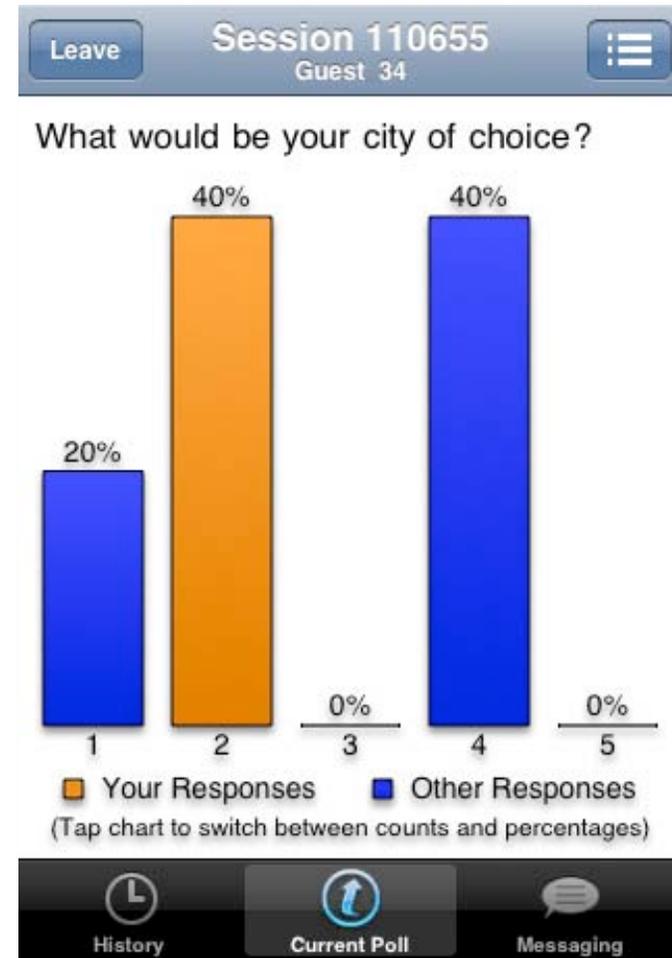
The appearance of commercial products does not constitute endorsement by the Advanced Distributed Learning initiative or the Department of Defense, of the commercial product.



ResponseWare

- iPhone
- BlackBerry
- Mobile browser to <http://rwpoll.com>

turningtechnologies.com



Vision

To be the source of information and support for DoD mobile learning initiatives.



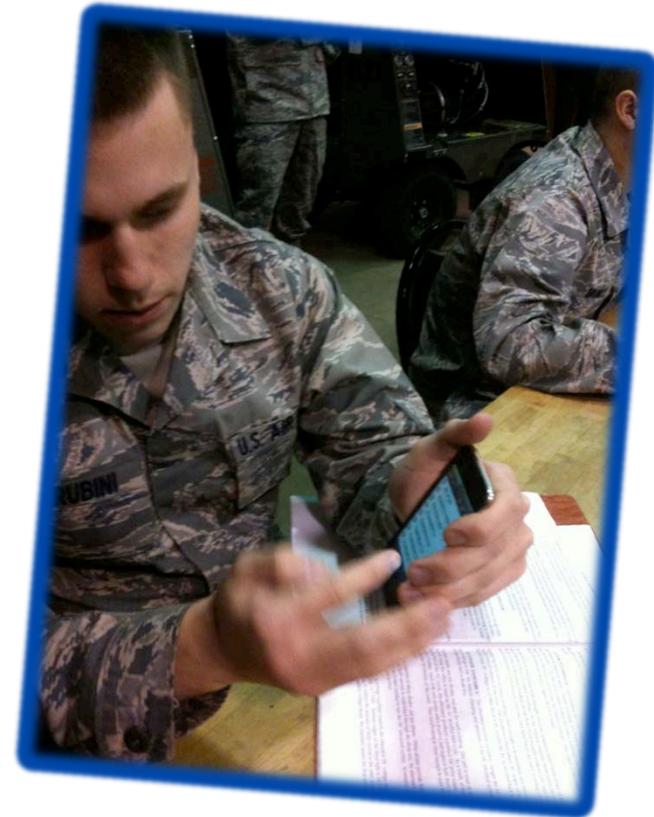
Knowledge

- Tracking
- Collecting, sharing
- Presentations
- Use cases



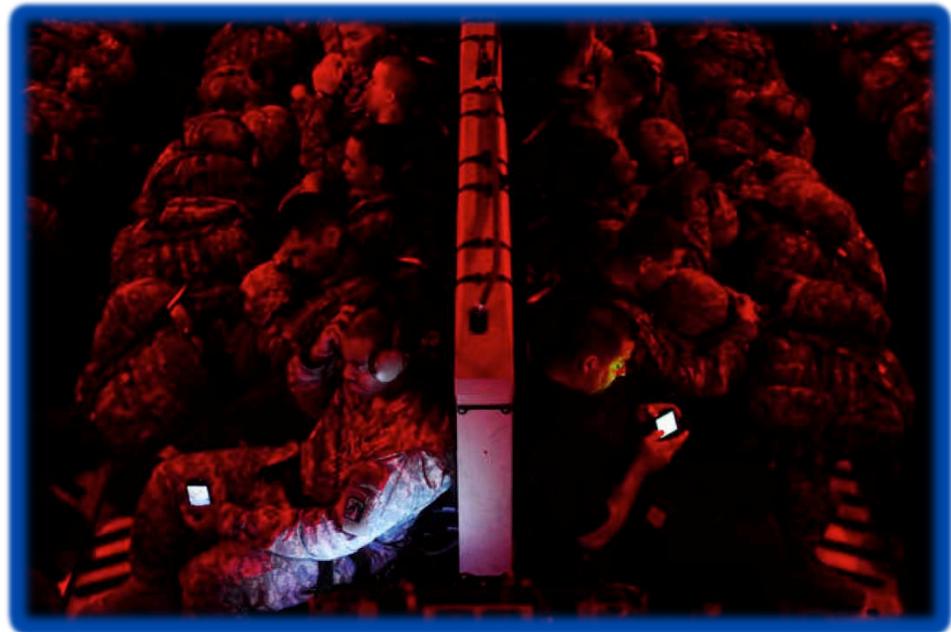
Deliverables

- Developing samples
- Tools identified
- Workshops, webinars
- White papers
- Annual S&T Workshop



Research

- Collecting, sharing best practices
- BAAs



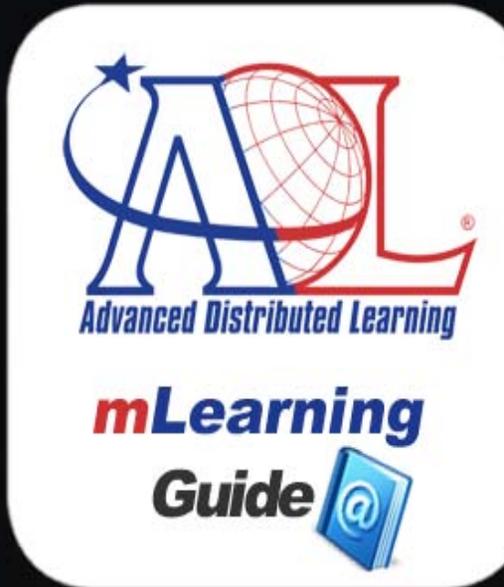


<http://emerginged.com/adlmobile>

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Mobile Learning



The Basics

Getting Ready

Devices

Development

Resources

Advanced

About ADL

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Back

Mobile Learning

Mobile Learning Basics

Welcome to Mobile Learning Basics. The menu items below will help you get started with mobile learning.

Definitions >

Glossary >

Capabilities >

Industry Statistics >

Quotes >

5 Five Moments >

<http://mlearn.adlnet.gov>



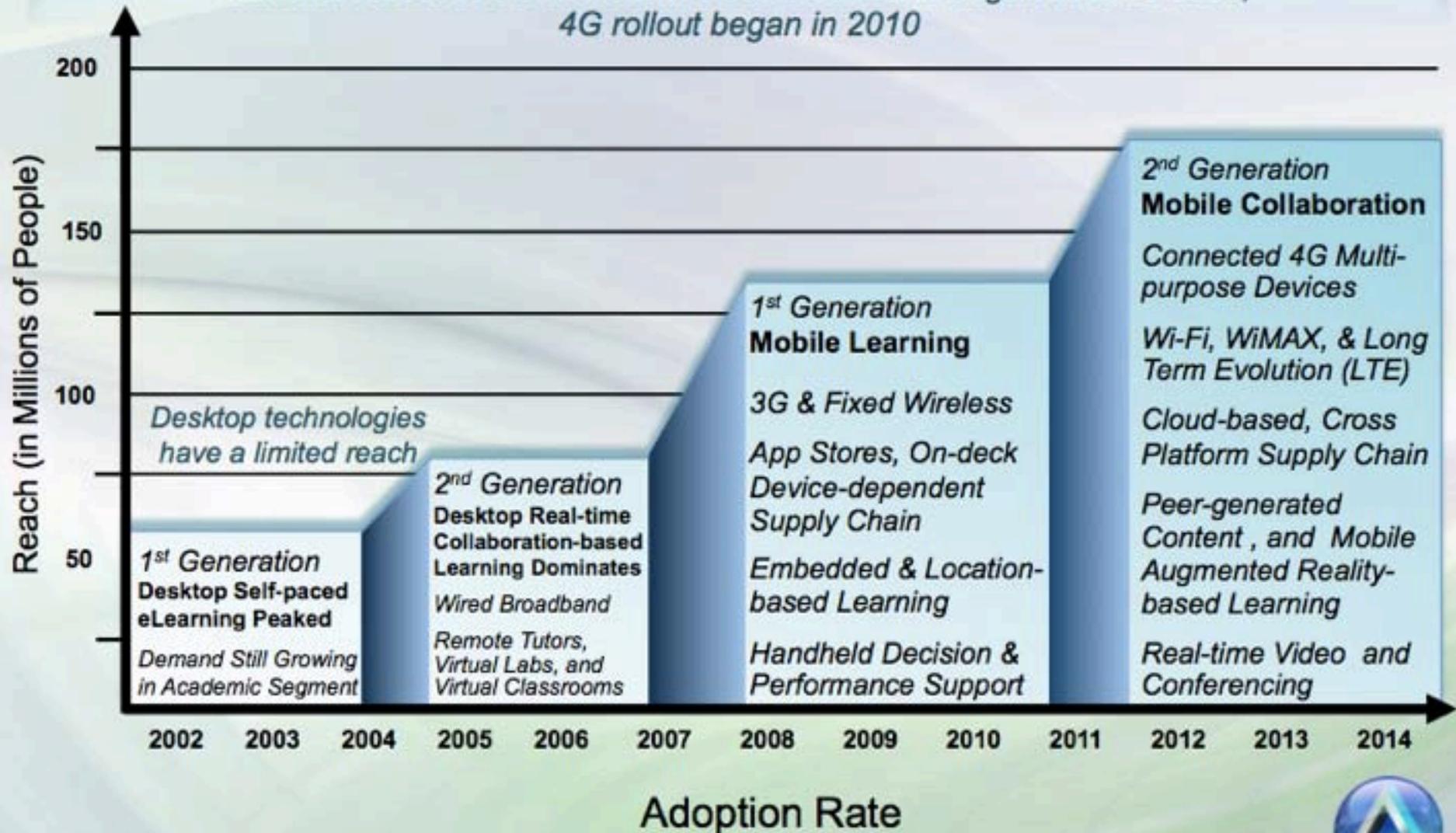
Advanced Distributed Learning

Mobile Learning Opportunities



2014 US Mobile Learning Reach and Adoption Across All Eight Buyer Segments

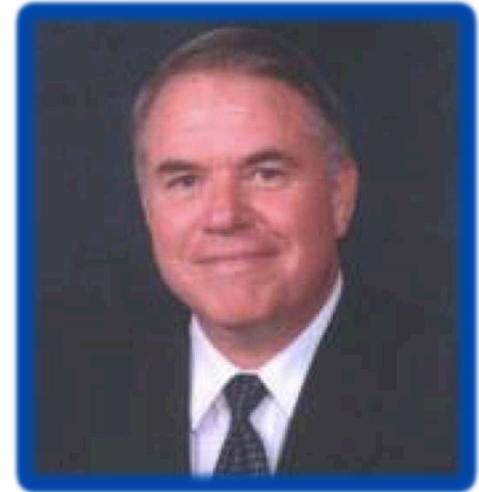
National rollout of 3G & fixed wireless broadband began in 2005-2006,
4G rollout began in 2010





Five Moments of Learning Needs

- When learning for the first time
- When wanting to learn more
- When trying to remember
- When things change
- When something goes wrong



Dr. Conrad Gottfredson

Ball State University Research

- 99.8 percent of students have a cell phone
- Nearly nine in 10 students with smart phones access the Internet
- 97% of students send/receive text message; 30% e-mail; 25% IM
- 97% smart phone owners take and send photographs; 87% take and send video



Tomi Ahonen Almanac 2010

- 4.6 billion subscriptions - 68% of planet
- 3.4 billion unique users - half the planet
- 1.2 billion PCs (including notebooks)
- 3x as many camera phones in use today than any kind of stand-alone camera, digital or film-based - ever manufactured
- 1.13 billion handsets sold last year compared to 270 million new PCs
- More internet users on mobile than on personal computers



"You can't teach people everything they need to know. The best you can do is position them where they can find what they need to know when they need to know it."

Seymour Papert, MIT



Challenges

- Security
- Changing markets
- User expectations
- SCORM



Looking Ahead...

- Devices
- Location
- Mobile broadband
- Recognition
- Accelerometers
- Context aware
- Augmented Reality
- Machine to machine
- Near Field Communication
- Personalization
- 3D
- Sensors
 - Orientation
 - Heart rate
 - Blood glucose
 - Pulse



SCORM Implementation Strategies for Mobile



Objectives

- Generate a list of mobile learning initiatives that use SCORM.
- Publish general best practices for developing SCORM content for mobile devices.
- Identify which technologies are available when implementing SCORM for mobile devices.
- Identify potential requirements for future versions of SCORM.

Use Case #1: Mine Lab (Taiwan)

■ PocketSCORM

- SCORM reader on mobile devices + LMS Server + SCORM repository
- Part of larger Hard SCORM project
- Can dynamically adjust the content to adapt
- First released in June 2004 for Windows Mobile

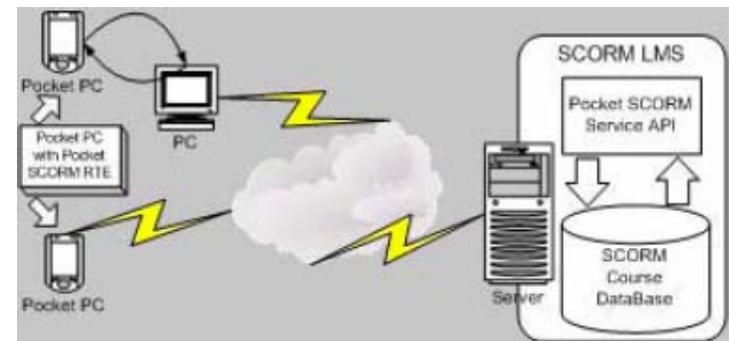
Hyper Pen and Book



Chapter 1: Introduction to Data Structures

A computer is a machine for manipulating information. The study of computer science is the study of the information it manipulates. This is a somewhat abstract definition, but it is the one that is most useful. In this sense, the study of computer science is the study of the manipulation of information. It is the study of the manipulation of information that is the most important part of computer science. It is the study of the manipulation of information that is the most important part of computer science.

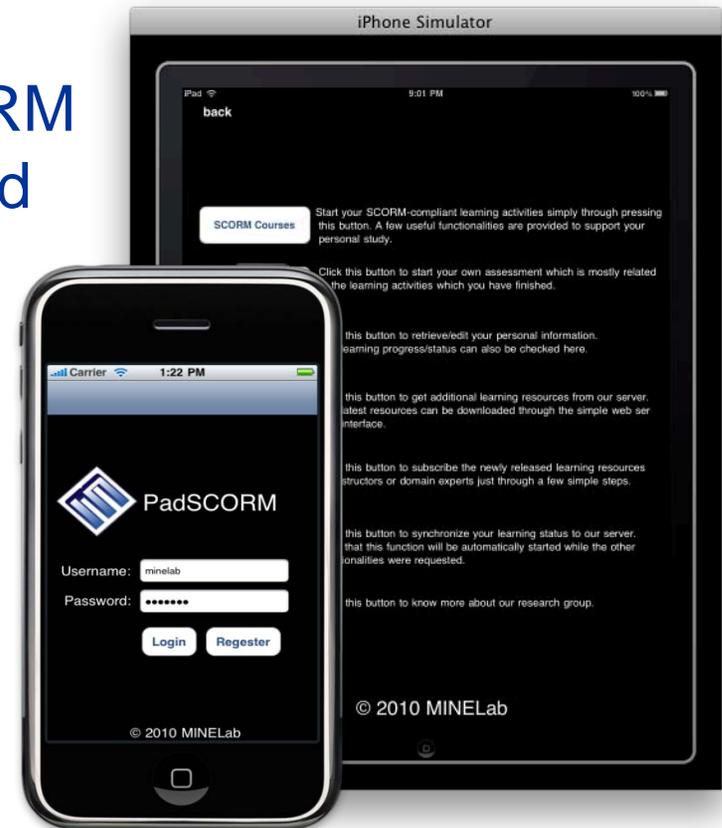
PDAs



Use Case #1: Mine Lab (Taiwan)

■ PAD SCORM

- Stand-alone Native App for SCORM content that supports iPhone, iPod Touch, and iPad
- Released in 2010
- Submitted to iTunes App store



Notable Findings: MINE Lab (Taiwan)

- Both Pocket SCORM & PAD SCORM Apps provide offline/disconnected capability in case connectivity is lost
- Both Support SCORM 1.2 and SCORM 2004
- Native Mobile Apps provide more local storage capability, and better support for multimedia and human interaction than Mobile Web Apps.
- Biggest challenges were not technical, but related to:
 - Promoting their products
 - Finding and keeping SMEs & instructors onboard to create the materials
 - High cost of development

Use Case #2: Bank of America

Situation 1

>> The Situation >> You be the Judge >> Situation Summary



Merrill Lynch Over the Line 2007

Scenario 1

Hey Bill, how was your weekend?

← Back

Hey Bill, how was your weekend?



Great weekend. I had a date with that girl who I was telling you about on Saturday night...and all I can say is

Use Case #2: Bank of America

- GoLearn – First started development/pilot in 2006
 - Largest use case
- Repurposed existing SCORM content to fit on smaller screen (BlackBerry)
- Can differentiate between mobile & computer-based learners
 - Tracking activations, completions, and demographics
 - Conduct surveys to collect Level 1 data (Kirkpatrick Model)
- SCORM needed in order to provide standard way of tracking completions & bookmarking
 - Using Intuition Player to handle SCORM



Notable Findings: Bank of America

- 12% higher completion rate during initial 45-day pilot
- Averaged 45% less time to complete content on mobile device (no loss of comprehension)
- Completion Locations: 32% business travel, 24% work commuting, 26% at home, %18 office



Use Case #3: Accenture



Use Case #3: Accenture

- First began Pilot in 2007; internal success now part of their offering to customers
- Conducted surveys during prototype phase
 - Goal was 100% mastery of compliance training
 - 92% of those surveyed would jump at the opportunity to use their mobile devices for this compliance training
- Repurposed existing SCORM content in-house to fit on smaller screen
- SCORM needed for standard tracking of completions (Intuition Player)
- Internet connection needed only during initial download and when completed



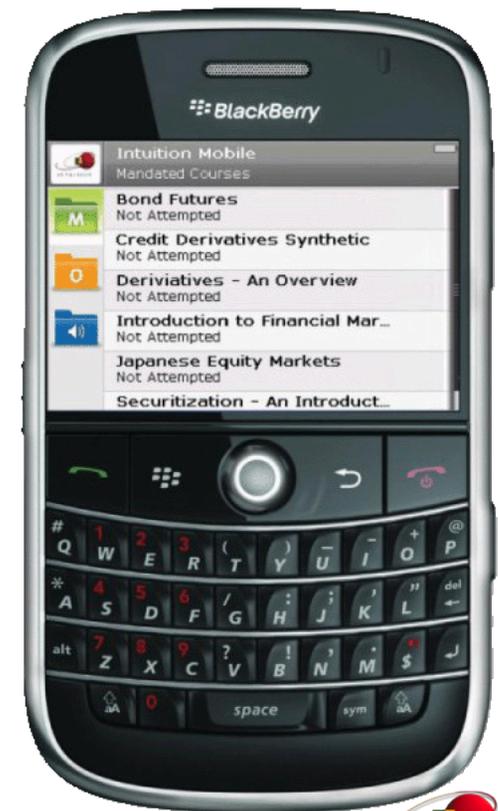
Notable Findings: Accenture

- More than 1,000 completions (2009)
- Overall learner satisfaction ratings averaged 4.4 on a 5.0 scale
- Compared to 4.0 for traditional e-learning courses



About the Intuition Mobile Player

- Started in mLearning in 2006 (first customer was Bank of America)
- Made 3 key decisions for the App to:
 - Allow content to be available anywhere, anytime
 - Fully support standards (e.g. SCORM)
 - Develop solution that easily integrates with any LMS
- Targeting Windows Mobile, BlackBerry, iPhone
 - Built using SDK for each platform
- SCORM 1.2 Now and SCORM 2004 (later this year)
 - Stores bookmarking data locally then sends to server
 - Developed to not use pop up windows or framesets



Use Case #4: Upside Learning



Use Case #4: Upside Learning

- First released in February 2010
- Developed both web-based (mobile browser) App and Native App
- Web-based (mobile browser) App implemented using JavaScript
 - Provides front-end LMS functionality
 - Accommodate multiple devices using device detection script and checking the following headers:
 - user-agent (most widely used)
 - x-operamini-phone-ua (opera mobile browser)
 - x-wap-profile (older wap devices)
 - x-skyfire-phone (skyfire mobile browser)
 - Developed solution that doesn't use pop ups or framesets
 - Requires continuous internet connection



Use Case #4: Upside Learning

- Native App solution built using JavaScript + device-specific SDKs
 - Currently support iPhone, iPod Touch
 - BlackBerry 5.0+ (targeted because previous versions were problematic/inconsistent)
- SDKs provide access to JavaScript methods
 - JavaScript methods provide an API for the content to communicate with
- Native BlackBerry App provides the following:
 - Offline tracking
 - Downloads content to the device
 - Synchronization of learning data



Use Case #5: Litmos



Use Case #5: Litmos

- Currently in beta stage with a handful of customers
- Web-based (mobile browser) App provides front-end LMS functionality
- Focused on HTML5, CSS, and JavaScript for development
 - Currently targeting iPhone and Android with plans to support BlackBerry
- Provide tracking of audio, video, and SCORM packages
 - Back-end LMS automatically creates multiple optimized video formats
- Certified for SCORM 1.2
- Working on offline storage of CMI data using SQLite DB (supported by webkit browsers)



Notable Findings: Litmos

- Developing Mobile Web Apps enforces the KISS principle.
- Agile approach to Mobile App development allows for more immediate updates



Use Case #6: OnPoint Digital



Use Case #6: OnPoint Digital

- Release date upcoming (currently in beta);
CellCast Mobile SCORM Player
- Targeting: Windows Mobile, BlackBerry, iPhone, iPad, Android, and Symbian (Nokia)
- Native App approach using SDK & build CellCast widgets for each platform for development
- Also offer Web-based (mobile browser) App that doesn't use pop up windows or framesets

Use Case #6: OnPoint Digital

- Can support Flash-based SCORM content on:
 - Windows Mobile 6.0 & 6.5
 - Android 2.2
- No problems with supporting SCORM 1.2 & 2004
 - JavaScript support is consistent across mobile devices
 - Lightweight mobile API for SCORM with less complexity & offline support?
- Current screen size challenges for developers trying to repurpose existing content will improve
 - Nexus One Android now supports 800x480
 - Apple's new iPhone 4.0 now supports 960x640 display



SCO Playback – Debugger Enabled shows SCO details captured

The image displays two windows from an Android development environment. The left window is the Dalvik Debug Monitor (DDM), which shows a list of running processes and a detailed view of the selected process. The right window shows an Android emulator displaying a mobile device screen with a 'View Content' page.

Dalvik Debug Monitor (Left Window):

- Info Tab:** Shows details for the selected process:
 - DDM-aware? -
 - App description: -
 - VM version: -
 - Process ID: -
 - Supports Profiling Control: -
 - Supports HPROF Control: -
- Log Tab:** Shows a list of log messages with columns for Time, pid, tag, and Message.

Time	pid	tag	Message
06-10 23:47:19	198	global	Default buffer size used in BufferedWriter constructor. It would...
06-10 23:47:19	198	OnPointCellCastWidget/ScormPlayer	onPageStarted
06-10 23:47:52	52	ActivityManager	Displayed activity com.onpoint.opmw/.scorm.ScormPlayer: 825
06-10 23:47:19	198	OnPointCellCastWidget/ScormPlayer	Url is content://com.onpoint.opmw.localfile/sdcard/onpoint/co
06-10 23:47:19	198	OnPointCellCastWidget/ScormPlayer	Allowing page load to continue: content://com.onpoint.opmw.l
06-10 23:48:19	198	OnPointCellCastWidget/ScormPlayer	Url is content://com.onpoint.opmw.localfile/sdcard/onpoint/co
06-10 23:48:19	198	OnPointCellCastWidget/ScormPlayer	Allowing page load to continue: content://com.onpoint.opmw.l
06-10 23:48:19	198	OnPointCellCastWidget/ScormPlayer	onLoadResource
06-10 23:48:19	198	OnPointCellCastWidget/ScormPlayer	JavaScript alert(): student_name = Gadd, Robert
06-10 23:48:19	198	OnPointCellCastWidget/ScormPlayer	student_id = 2
06-10 23:48:19	198	OnPointCellCastWidget/ScormPlayer	lesson_location = Screen 2
06-10 23:48:19	198	OnPointCellCastWidget/ScormPlayer	suspend_data = Screen 2 test suspend data

Android Emulator (Right Window):

- Device:** HTC
- Time:** 11:49 PM
- Page Title:** View Content
- Image:** A mobile device displaying a scorm player interface.
- Mobile devices support:**
 - Video
 - Audio
 - Animation
 - Graphics
 - Internet
 - Office suite applications
 - Business networking
- Navigation:** Previous | Home | Next
- Copyright:** © 2010 OnPoint Digital Inc
- Button:** Show Scorm Data

Use Case #7: Rustici Software



Use Case #7: Rustici Software

- Early stage of offering a mobile solution, but completed the following:
 - Integrated SCORM Cloud (web-service SCORM engine) with Moodle
 - Developed SCORM content prototype using JQTouch framework for iPhone
- Upcoming integrations of SCORM Cloud with:
 - Google Apps
 - Google Cloud Course
 - Wordpress
 - Facebook

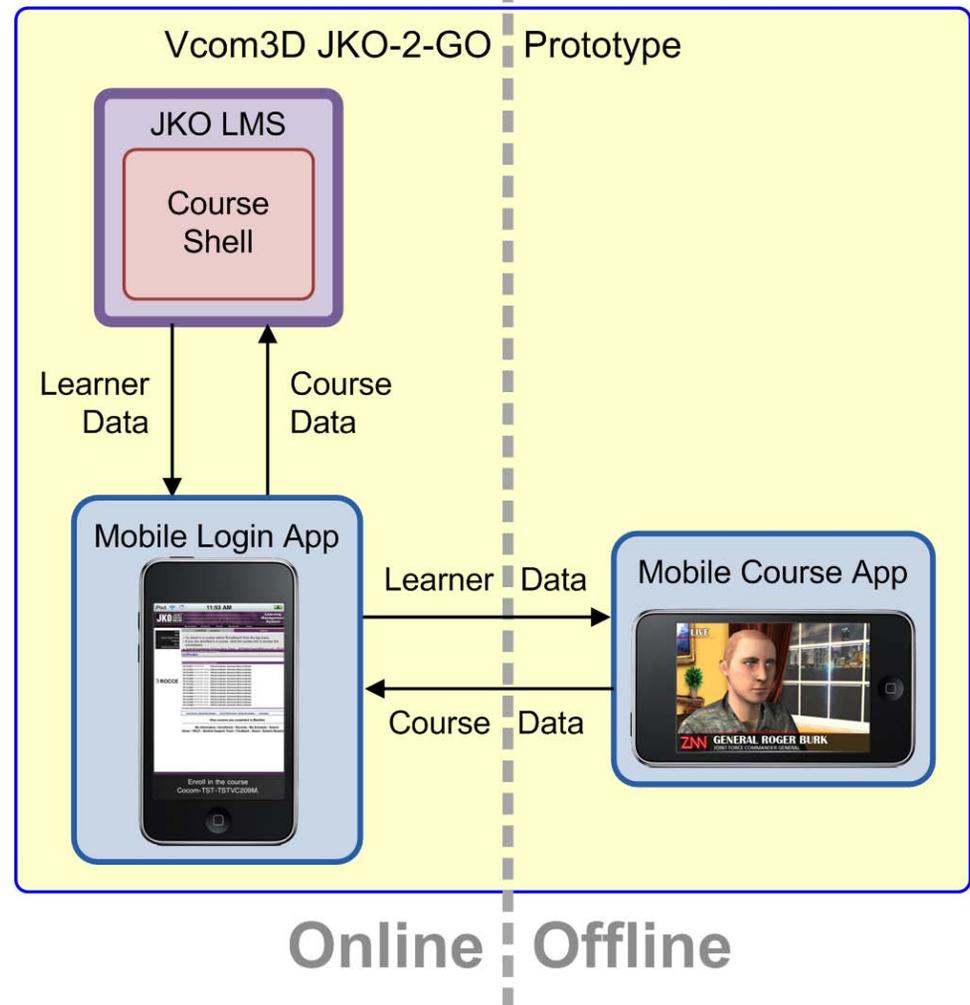


Use Case #8: VCOM3D



Use Case #8: VCOM3D

- Prototype effort started in March 2010
 - Developed exclusively for JKDDC (JKO and ROCCE)
 - Developed other Apps for language & cultural training for Military
 - Consists of two Apps:
 - Login, Enrollment
 - Course Content

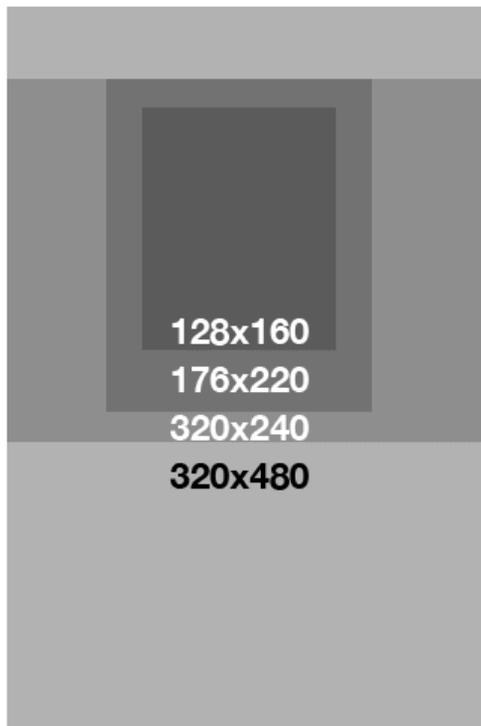


Use Case #8: VCOM3D

- Initially targeted for iPod Touch, but was expanded to support:
 - iPhone & iPad
 - HTC Evo
 - Droid Incredible
 - Nexus One
- SCORM 2004 2nd and 3rd Edition
 - API communication from Mobile App to JKO uses JavaScript
 - Student's progress is tracked within the App and only looks for active connection when course is completed
 - Making specific use of `cmi.learner_id`, `cmi.learner_name`, `cmi.exit`, `cmi.completion_status`



Common Technical Challenges



Common Technical Challenges

- Support for multiple OS versions (BlackBerry)
- An emulator is not always consistent with the actual device
- Small screen dimensions for displaying content
 - This will eventually improve as legacy smart phones shelf life quickly approaches
- Limited battery, memory, and storage space
- Limited support for Flash player
 - Windows Mobile 6.5 & Android 2.2 only
- Limited connectivity
- Limited video support
 - Varying formats supported; this will also improve in time
- No support for pop up windows and framesets
- Files must be optimized for quicker load times
 - This is starting to improve with new era of Smartphones
- Lack of authoring tools to create mobile SCORM content (looking for use cases)
 - SumTotal Toolbook, Lectora Trivantis, Articulate (flash-based)....others?



General Best Practices (A Start)



General Best Practices

- Gather Requirements: “If You Fail to Plan, Then You’re Planning to Fail”
 - Define goals and requirements for your project
 - Prototype, prototype, prototype (start small, think big)
 - Make distinction between “learning” and “performance support”
 - Identify target device(s) and potential OS version(s)
 - Native App or Web App? Or Both?
 - Who will provide support? Help Desk?



General Best Practices

- Design with Usability and Accessibility in Mind
 - Determine smallest screen area to support (4x6 cards)
 - When repurposing content, provide a comparable learning experience:
 - Replicate assessment interactions whenever possible (true/false; drag/drop)
 - Use bullets to make contextual information more concise
 - Increase use of color, bold, and font types to boost effectiveness/prevent loss of emphasis
 - Reduce or replace audio and video with static graphics and transcripts
 - Follow W3C guidelines for creating Accessible content:
 - With BlackBerry there is significant differences between browsers
 - Explicitly setting the width and height of an image in the HTML can resolve issues with text wrapping around images



General Best Practices

- Plan for the Disconnected Mobile User
 - Provide an offline or disconnected version of your content?
 - Poor connectivity issues can result in bad user experience

Use Case Credits

- Accenture: <http://www.accenture.com>
- Bank of America: <http://www.bankofamerica.com>
- Intuition: <http://www.intuition.com>
- Litmos: <http://www.litmos.com>
- MINE Research Lab: <http://www.mine.tku.edu.tw>
- OnPoint Digital: <http://www.mlearning.com>
- Rustici Software: <http://www.scorm.com>
- Upside Learning: <http://www.upsidelearning.com>
- VCOM 3D: <http://vcom3d.com>

Questions? / Comments?



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