NTER: National Training and Education Resource

An infrastructure for next generation learning
• We don’t do anything like we did 20 years ago, but we educate our kids the same way we did a century ago
• Lecture format seen as irrelevant for today’s students who are plugged in everywhere but when they are at school
• Schools in some large cities have only a 50% high school graduation rate (WH announcement, March, 2010)
• Of all OECD countries, US has the highest non-completion rate (over 50%) for students who start a tertiary education program
New Learning Tools make possible:

- Highly interactive environments
- Inquiry-based learning
- Bridge theory to practice (explore, operate equipment without the consequences of failure)
- Varied and Contrasting examples
- Demonstration
- Access to expertise
- Feedback
- Continuous assessment
- Collaborative environments
- Endlessly patient medium
• Just putting the same material online does not solve the problem

• Current methods to produce online, immersive education:
  – Expensive ($50B per year)
  – Little to no interoperability of online resources
  – Costly to maintain & update

• Platform wars have prevented updating and improvement of online resources

• Metadata wars have not been resolved for cataloging online resources

• Repository wars have not prevented gross duplication of materials

• Firewalls in schools, universities and agencies often prevent access to online resources
Support the growth of a capable and flexible workforce by providing quality education and training easily and efficiently through the advances of information technology and recommendations of learning science.

- Create a flourishing ecosystem for next generation learning content
- Develop easy-to-use tools to empower anyone to develop engaging content
- Integrate with existing online projects and standards to amplify individual efforts
- Leverage the power of social media to enable collaboration and improvement of online materials
- Use the flexibility of open source licensing to grow and develop the platform and tools
Advantages of OPEN Source

• **Enhanced Reliability and Quality** - open source has been quality assured by a large team of testers on more technical platforms than a commercial vendor could afford or consider

• **Open Source Communities Find and Fix Bugs More Quickly**

• **Security Patches are Released More Quickly** – often more secure than classic commercial software

• **Benefits of a Community of Practitioners** - the benefits of customers, developers and project team members all working together in a extensive, large community; and

• **The open source model builds open standards and achieves a high degree of interoperability**

• **Endorsed by NSA** - for ability to deliver security at a lower cost
<table>
<thead>
<tr>
<th>Subsystem</th>
<th>Function</th>
<th>Lines of Code</th>
<th>Main Sponsor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ilias</td>
<td>Course Management (LMS)</td>
<td>1,300,000</td>
<td>DOD/NATO</td>
</tr>
<tr>
<td>Liferay</td>
<td>Enterprise portal (for displaying and configuring other services)</td>
<td>2,150,000</td>
<td>Cisco</td>
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<td>MySQL</td>
<td>Database Management System</td>
<td>1,280,340</td>
<td>Oracle</td>
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<td>Jasper</td>
<td>Reporting Engine</td>
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<tr>
<td>Apache</td>
<td>Web Server Software</td>
<td>248,980</td>
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<tr>
<td>Apache-httpsd</td>
<td>More Web Server Software</td>
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<tr>
<td>Solr</td>
<td>Full text search &amp; navigation</td>
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<td>Apache</td>
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<tr>
<td>Nutch</td>
<td>Web-search software</td>
<td>82,181</td>
<td>Apache</td>
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<tr>
<td>Hadoop</td>
<td>Support data-intensive distributed applications in the cloud</td>
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<td>Yahoo! / Apache</td>
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<tr>
<td>WebGL (deprecated O3D)</td>
<td>Enables browser-based interactive content</td>
<td>34,369</td>
<td>Google</td>
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<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>7,961,908</strong></td>
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Leveraged code valued at $600M -- $800M
• **Advanced Authoring Tools** make it easy, and inexpensive, for organizations to build, and deliver state-of-the-art learning experiences and continuously improve them

• **An eLearning Repository with Advanced Search capability** – gives access to thousands of courses that can be used as is, edited or used as individual searchable content objects to jumpstart course development

• **A Learning Management System** for collaborative development, delivery of online & eLearning content
What does NTER do?

Users

U.S. Department of Energy

Registry

UMass/Dartmouth

Blackboard

NRCERT

U.S. Department of Defense

U.S. Department of Education
NTER Branding Examples

DOE NTER Node

Process Heating
Steam User Training

Medical Technician Training

Interview Skills

Kids Energy Education

Green Buildings

Other NTER Nodes
• Build 3D simulations without programming
• Runs in browser; no heavy downloads
Trading this.... For meaningful, performance-based assessment

Leaky, recessed light fixtures can cause:
- Electrical problems
- Ice dams
- Furnace malfunction
- All of the above
- Poor light quality

Correctly install the proper type of wall joint to complete the structure.
Commercialization

4 ways to build a market:

1. Courses
2. Instruction (blended)
3. Content
4. Degrees / certificates

- Icons allow users to identify permissions
- Presents information about source
By reviewing this lesson, participants will:

- Know the proper location of thermal and air barriers
- Recognize the driving forces of air leakage
- Understand the connection between air leakage, energy waste, and moisture problems
- Understand how air ducts effect pressure balance within the home
- Understand the principle behind the blower door as a tool for measuring air leakage
Recent NTER Accomplishments...

President Obama Launches Advanced Manufacturing Partnership

The White House
Office of the Press Secretary

For Immediate Release
June 24, 2011

Today, at Carnegie Mellon University, President Obama launched the Advanced Manufacturing Partnership (AMP), a national effort to build on America’s existing strengths and emerging technologies in manufacturing. The AMP is a public-private partnership that will engage our global competitors in new and creative ways, and will help ensure we remain competitive and productive while creating jobs and economic opportunity.

The Partnership will leverage existing and emerging technologies to help American manufacturers upgrade their facilities, increase productivity, and accelerate the creation of new manufacturing technologies. The Partnership will complement federal manufacturing efforts, which will support key sectors of the economy and help us win the global manufacturing race of the future.

The President said that to secure a manufacturing future, we must invest in the capabilities we need to compete in the global marketplace. “We must invest in the workers we need to grow our companies and our economy, because we need workers with both skills and a strong work ethic,” President Obama said. “We need workers who can design, build and maintain our products and technologies and who understand how to make them more energy efficient so we can win the global competition and compete with any country in the world.”

The Department of Energy (DOE) will invest more than $500 million to help make these investments in the AMP a reality. DOE has already invested billions of dollars in critical national R&D projects and facilities to modernize and increase the energy efficiency of manufacturing, and the DOE Office of Energy Efficiency & Renewable Energy will complement these federal efforts by helping to support AMP projects.

2011 Chief Learning Officer Learning in Practice Awards

The Innovation Award
Gold, Division I

DOE Announces New Partnerships to Support Manufacturing Job Training

U.S. Secretary of Energy Steven Chu announced a series of new manufacturing job training partnerships using the Department of Energy’s National Training and Education Resource (NTER). DOE will be...
• **Searchable Virtual eLearning Content Repository** – a clearing house for high interest content with advanced search capability

• **Enterprise eLearning Platform** – NTER can launch, track record progress and generally manage eLearning content without licensing costs

• **Agency Customer (External) Training** - at least 1.3 million external learners need this service

• **Collaboration Tools** – Includes, web boards, wikis, blogs, rosters, calendars, and other collaboration and course management system capabilities

• **Sophisticate 3d Authoring Tools** – NTER provides sophisticated authoring capability, with a library of 3D content SCOs; and

• **508 and more** – Tools are provided to help authors create 508 compliant materials and meet next generation standards for accessibility. Integrated NCAM media player (support for screen readers and Closed captioning)
Thank You

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• DOE’s Energy Technology Programs (Solar, Vehicles, Advanced Manufacturing, Industrial Technologies, Federal Energy Management Programs)
• Other DOE Offices: Health, Safety and Security, Office of Electricity.
• National Labs: LBL, NREL, PNNL, INL
• Advanced Manufacturing Initiative: National Association of Manufacturer’s Manufacturing Institute; Ford’s Partnership for Advanced Studies; MAGMA (representing the big 3 automakers); Macomb Community College
• The Center for Energy Workforce Development: Troops to Energy Jobs
• A significant number of the winning applicants in the Department of Labor’s Trade Adjustment Act ($500 million solicitation)
• Department of Defense
• 6 Weatherization Centers
• Under consideration by 4 other cabinet level agencies and emergency response training center
TECH SPECS
• Operating System: Linux (Debian or Ubuntu) or Windows Server
• Nutch: an open source web search engine based on Lucene Java for the search and index component.
• Solr: an open source enterprise search platform from the Apache Lucene project
• Shibboleth: federated identity-based authentication and authorization infrastructure based on SAML
  – Security Assertion Markup Language (SAML): an XML-based open standard for exchanging authentication and authorization data between security domains, that is, between an identity provider (a producer of assertions) and a service provider (a consumer of assertions.) SAML uses a SOAP binding within an HTML message.
• Database Server software: MYSQL or MSSQL

  MYSQL: relational database management system (RDBMS) that runs as a server providing multi-user access to a number of databases under General Public License, as well as under a variety of proprietary agreements.

  MSSQL: a commonly used relational database server, developed by Microsoft
• Cloud Services:
• Amazon web services
  – Hadoop (software framework that supports data-intensive
distributed applications under a free license)
Development technologies:

- Apache-HTTPD (web server software)
- Liferay (Liferay Portal is a free and open source enterprise portal written in Java and distributed under the GNU Lesser General Public License and under proprietary licenses)
- Java and PHP programming languages
- Jasper Reports: JasperReports is an open source Java reporting tool that can write to screen, to a printer or into PDF, HTML, Microsoft Excel, RTF, ODT, Comma-separated values and XML files. Used in Java-enabled applications, including Java EE or Web applications, to generate dynamic content
- **RESTful**: a style of software architecture for APIs

- **SOAP APIs**: Simple Object Access Protocol, is a protocol specification for exchanging structured information in the implementation of Web Services in computer networks. It relies on (XML) for its message format, and Hypertext Transfer Protocol (HTTP) or Simple Mail Transfer Protocol (SMTP), for message negotiation and transmission.
• **Kuda**: an advanced JavaScript library and World Editor that enables web developers to quickly build interactive 3D web solutions. Allows abstraction of the complexity of 3D behaviors into easy to use building blocks for common functions, allowing developers to create compelling user experiences by setting up a complex sequence of events that respond to user input.

• **WebGL**: a software library that extends the capability of the JavaScript programming language to allow it to generate interactive 3D graphics within any compatible web browser. WebGL code executes on a computer display card's Graphics Processing Unit (GPU), which must support shader rendering

• **three.js**: There are several developer libraries for WebGL development, three.js being another

• **HTML5**: a language for structuring and presenting content for the World Wide Web, and is a core technology of the Internet. An aim of the most recent version 5 has been to improve the language with support for the latest multimedia while keeping it easily readable by humans and consistently understood by computers, devices, and web browsers.
• JavaScript: JavaScript is a prototype-based scripting language, is a multi-paradigm language, supporting object-oriented and functional programming styles.

• 3D modeling / Collada: COLLADA is an open standard (COLLAborative Design Activity) for establishing an interchange file format (via XML schema) for interactive 3D applications. Allows for exchanging digital assets among various graphics software applications that might otherwise store their assets in incompatible file formats.

E-commerce:
• NTER supports an e-commerce system if allowable
• PayPal
- Currently Planned NTER Enhancements
  - Enhanced SSO
  - Accessibility
  - eCommerce capability
  - Ontology Support
  - Additional LMS Support
- Future NTER Enhancements
  - Enhanced ontology support
  - Enhanced eCommerce
  - Rich Authoring
  - Learning Registry and other system integration
  - Intelligent tutor
  - IP Protection
  - Additional Content Areas
  - Improved Mobil Support
So what’s really new?

- Distributed search (end the portal wars: enables customized control and real sharing across institutions)
- Deep content search (end the metadata wars)
- Authoring tools for 3D content creation (the SME can create rich content)
- 3D simulations in browser (no download)
- Integrates with commercial game engines (for deeper immersion)
- Integration platform (to address the fragmented education and training space)
- Assessments in 3D environments (ties to the learning management system—broadens assessment options)
- Portlets (custom tools)
- Skinning (for personalization)
- Social media tools (rate courses to help improve the content)
- Single sign on