



Advanced Distributed Learning

A Presentation to DoD's Government and Industry Partners

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ADL

- **Collaboration**
- **Learning Technologies**
- **Shared Problems**
- **Shared Solutions**



"LEARNING"

“Learning” encompasses:

- Training**
- Education**
- Performance Mentoring**



ADL Vision

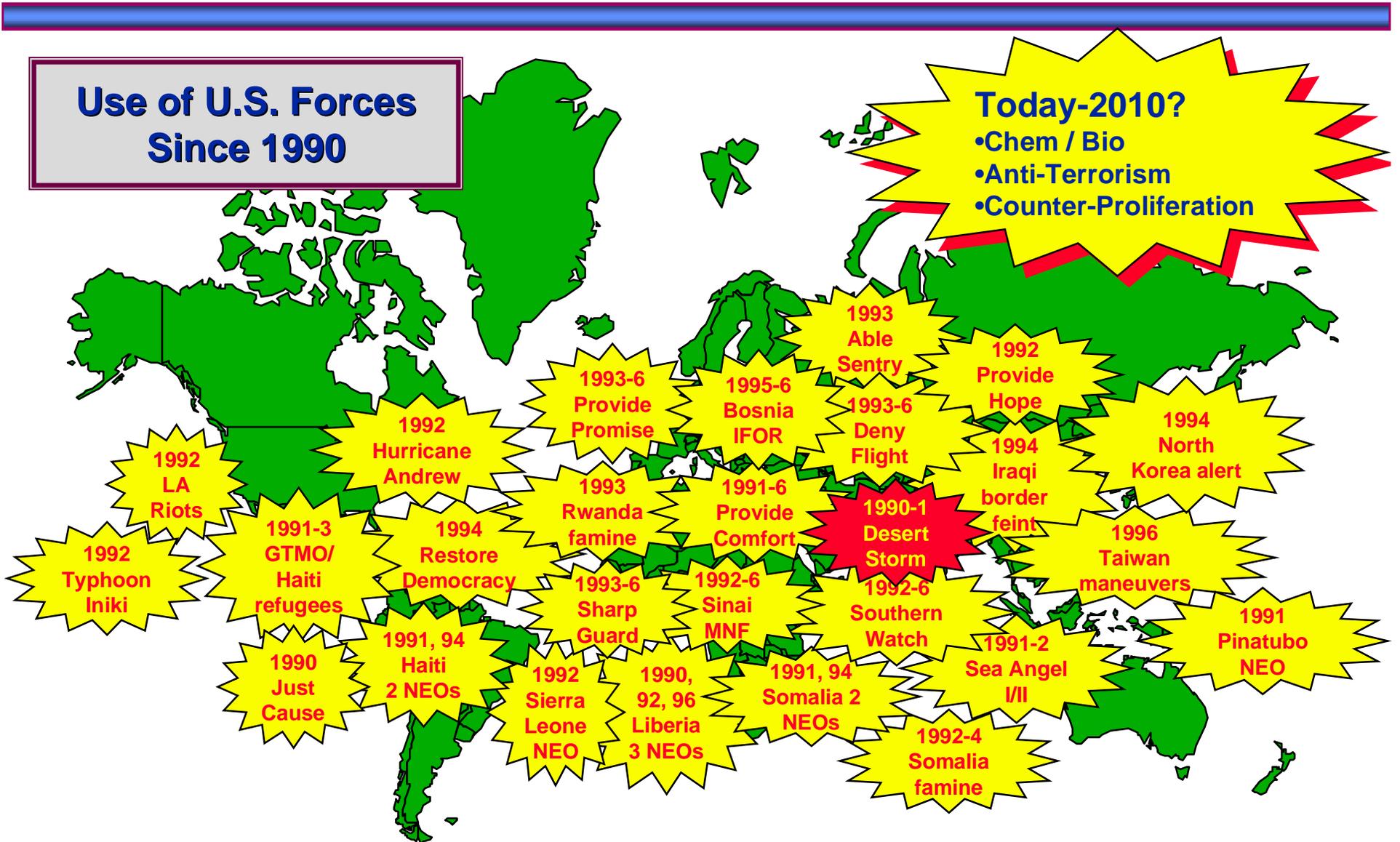
- **Quality Education and Training**
- **Tailored to Needs**
- **Delivered Cost Effectively**
- **Anytime**
- **Anywhere**

Builds upon the success of the Defense Modeling and Simulation Initiative



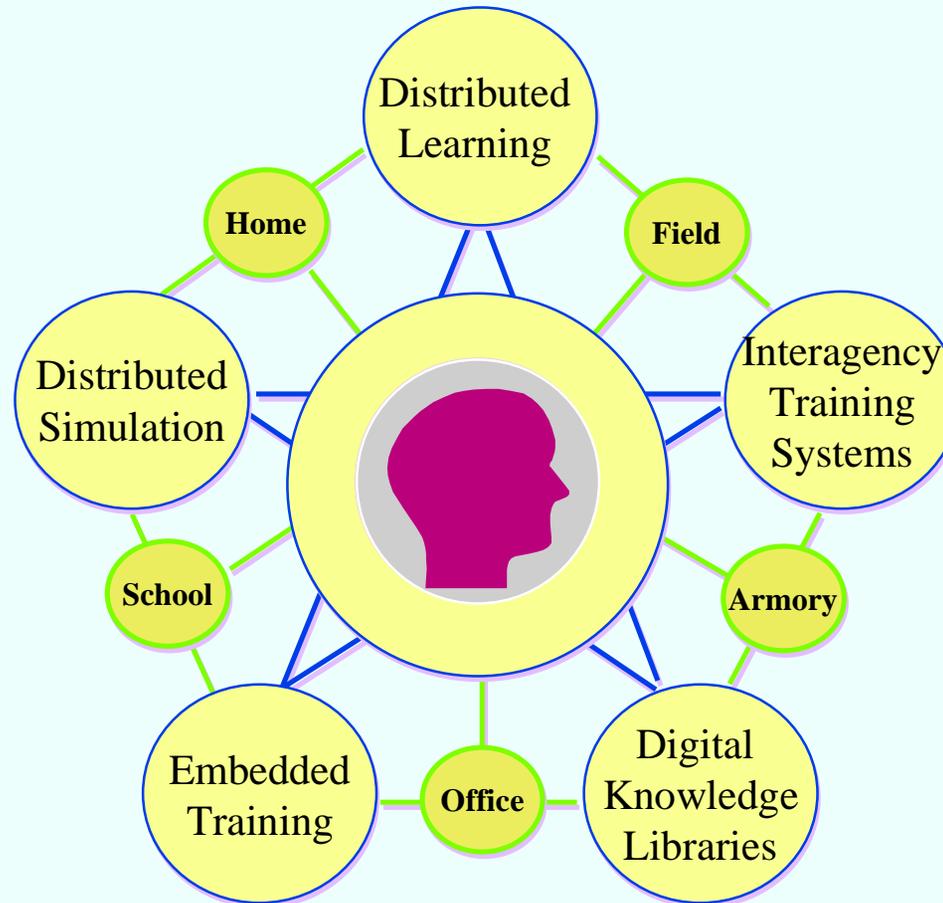
Trained and Ready for What?

Future Missions Like the Recent Past -- and More





ADL Perspective





ADL Strategy

Use learning technologies to modernize DoD training

- ◆ Exploit existing network-based technologies
- ◆ Create platform neutral, reusable courseware and content to lower costs
- ◆ Promote widespread collaboration to satisfy common needs
- ◆ Enhance performance with emerging and next-generation learning technologies
- ◆ Develop common framework that drives COTS product cycle
- ◆ Design the “computer managed” learning framework
- ◆ Establish a coordinated implementation process



Key ADL Characteristics

Accessibility: the ability to access instructional components from one remote location and deliver them to many other locations

Interoperability: the ability to use instructional components developed in one location, with one set of tools or platform, in another location, with a different set of tools or platform

Durability: the ability to operate instructional components when base technology changes, without redesign or recoding

Reusability: the ability to incorporate instructional components into multiple applications

Affordability: the ability to significantly increase learning effectiveness while reducing time and costs

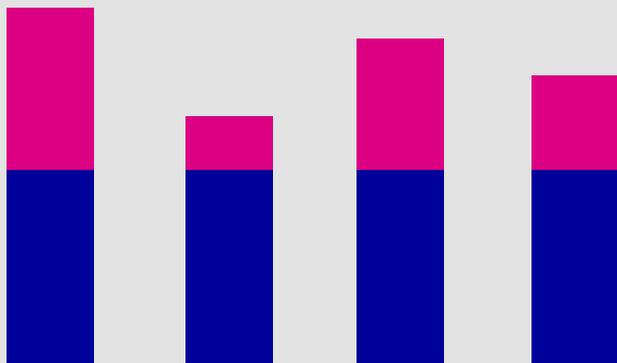
Common Open Technical Architecture and “Object Oriented” Software Are Keys to Reuse

Simulation Software Components

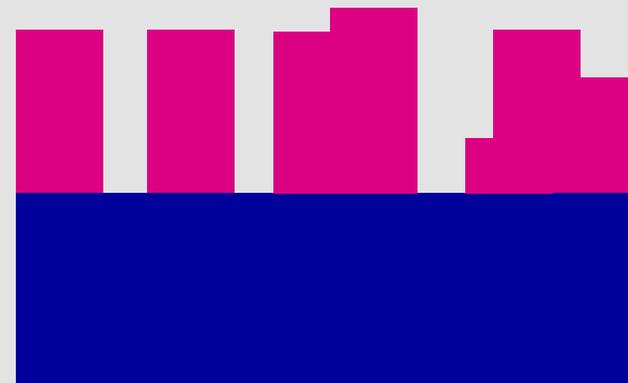
 **Common Software**
(utilities/services consistent
across applications)

 **Unique Software**
(objects tailored to particular use)

**The Old Way: Stove-
piped by Service,
Mission, Location**

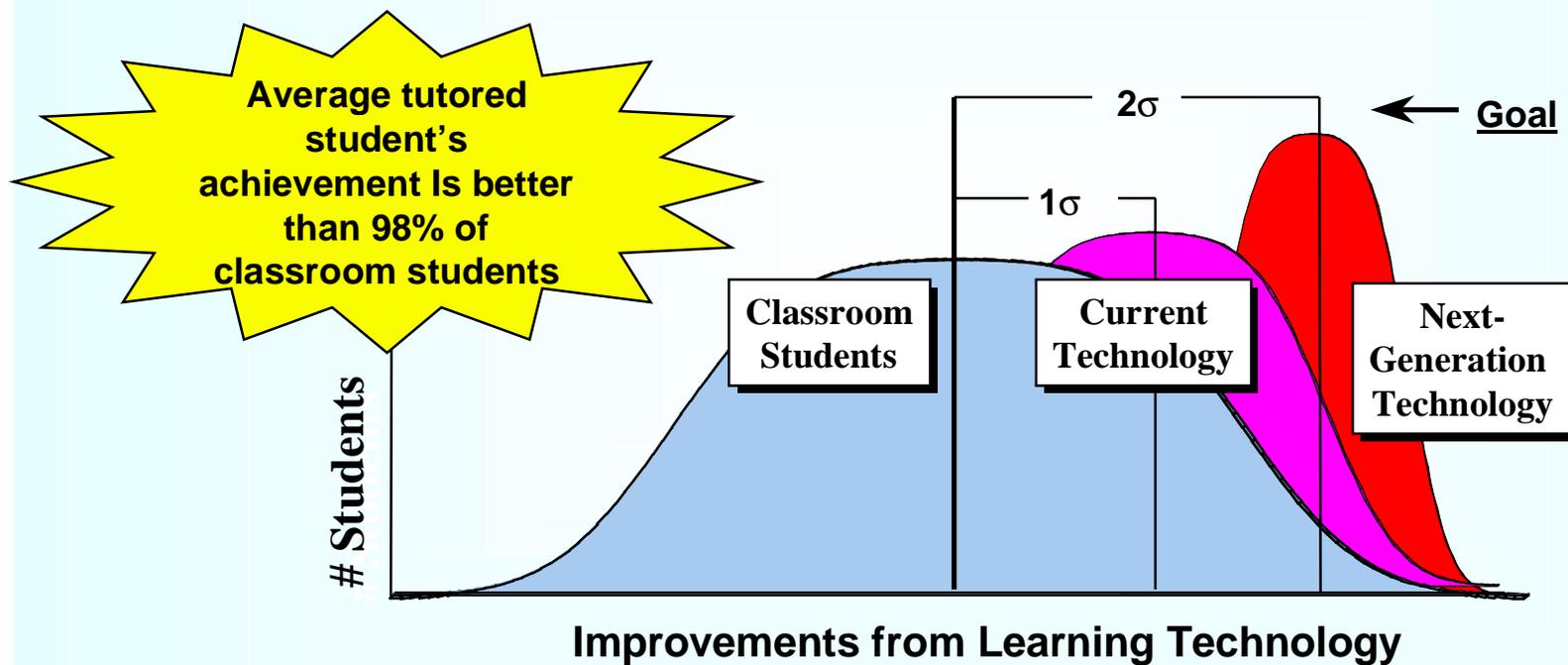


**The New Way:
Shared Core,
Re-Used Applications**



Next Generation of Learning Technology Offers Potential for Even Greater Efficiency

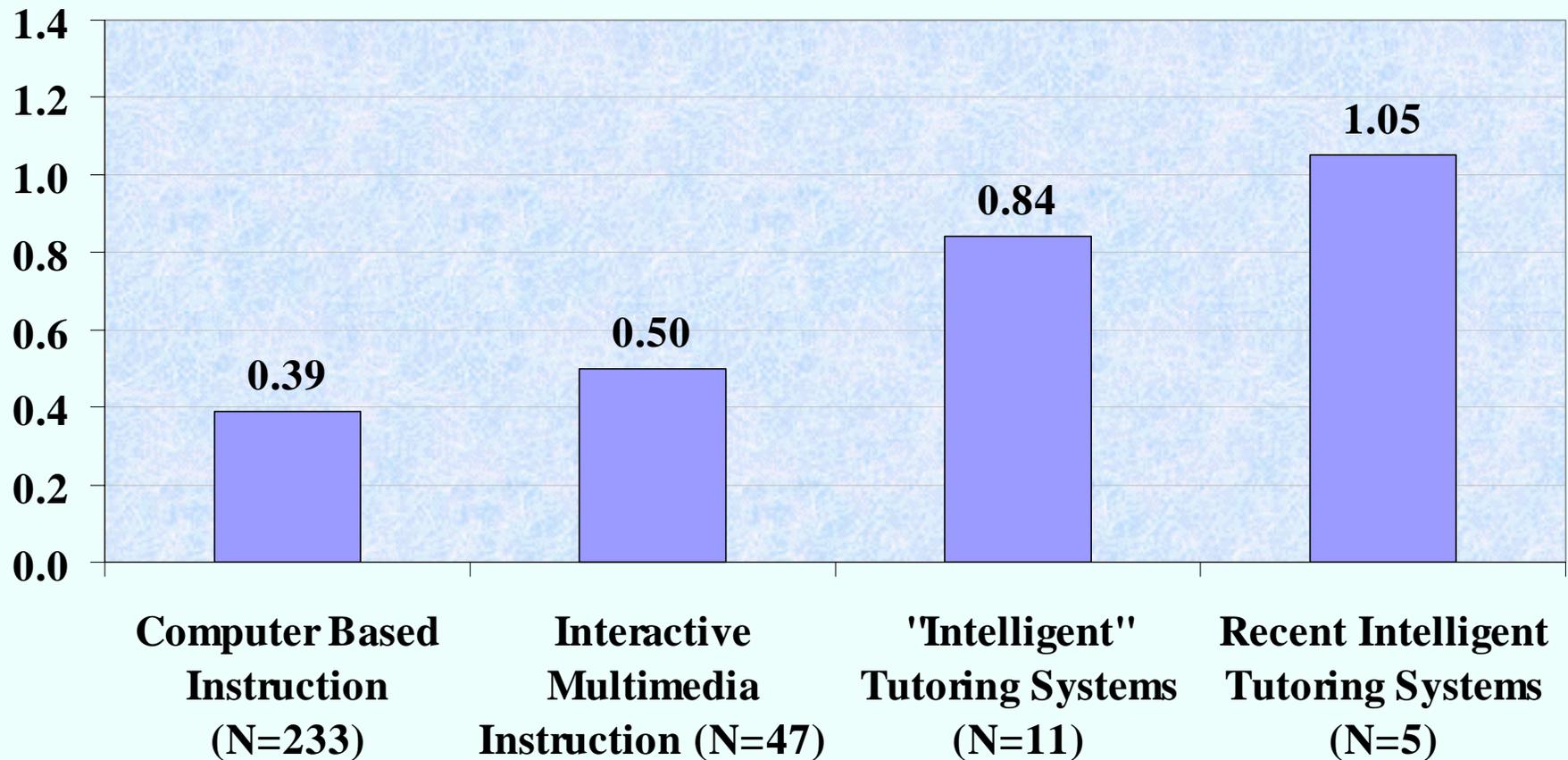
Studies suggest that Tutor Learning Achievement Is Better than Classroom Achievement by 2 Standard Deviations



Adapted From: Bloom, B.S. The Two-Sigma Problem: The Search for Methods of Group Instruction as Effective as One-to-One Tutoring. Educational Researcher. 13,4-16 (1984)



Some Effect Sizes for Technology-Based Instruction (Standard Deviations)





Classroom and Tutorial Interactivity

- **Average number of questions asked by any student during a classroom hour -- 0.11**
- **Average number of questions asked by a student during a tutorial hour -- 21.1 (Research methods); 32.2 (Algebra)**



Directives and Activities

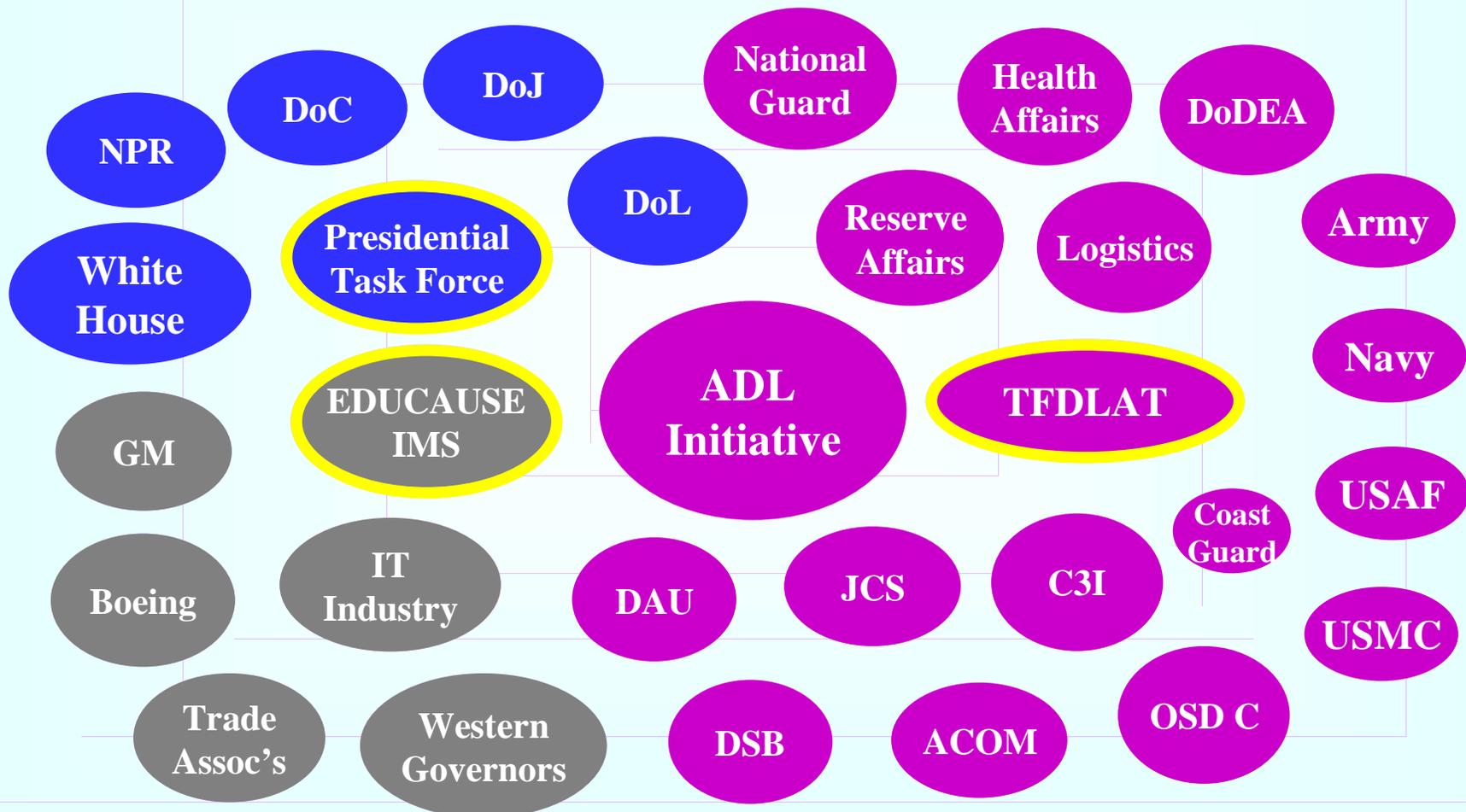
Develop a strategy and master plans for using learning technologies on a broad scale

- **QDR**
- **President's Executive Order / FTTI**
- **Deputy Secretary's Direction**
- **Congressional Reports**
 - **HASC**
 - **SASC**
- **DSB TF on Military Training and Education**



Ongoing ADL Activities

Opportunities for DoD to leverage resources within the Department and across the Public and Private Sectors





ADL Standards Focus

ADL is focusing on web-based learning system standards

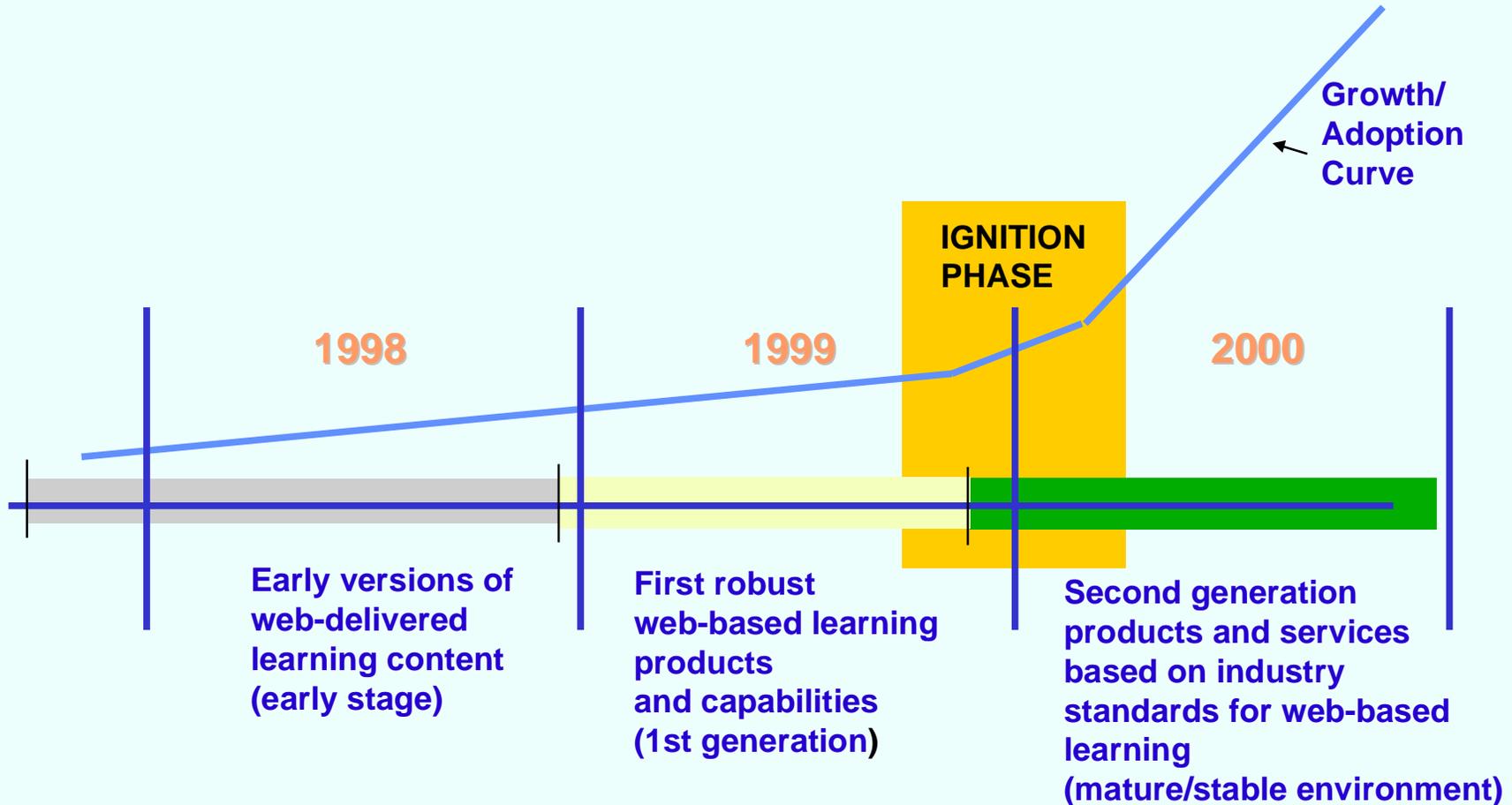
Learning System Standards
content
metadata
LMS data model
....

Internet Technologies
HTML
HTTP
XML
JAVA/JavaScript
...

**But not Internet standards
(others are doing that)**



Evolution of Web-based Learning Technologies





ADL Approach

- **Examine military training learning models**
- **Develop a common “Shareable Courseware Object Reference Model” (SCOM)**
- **Map learning models to SCO reference model (to determine standards requirements)**
- **Submit requirements to appropriate groups**



SCO Terms

Shareable Courseware Object Reference Model

A software model that defines the interrelationship of course components, data models, and protocols such that courseware “objects” are shareable across systems that conform with the same model.

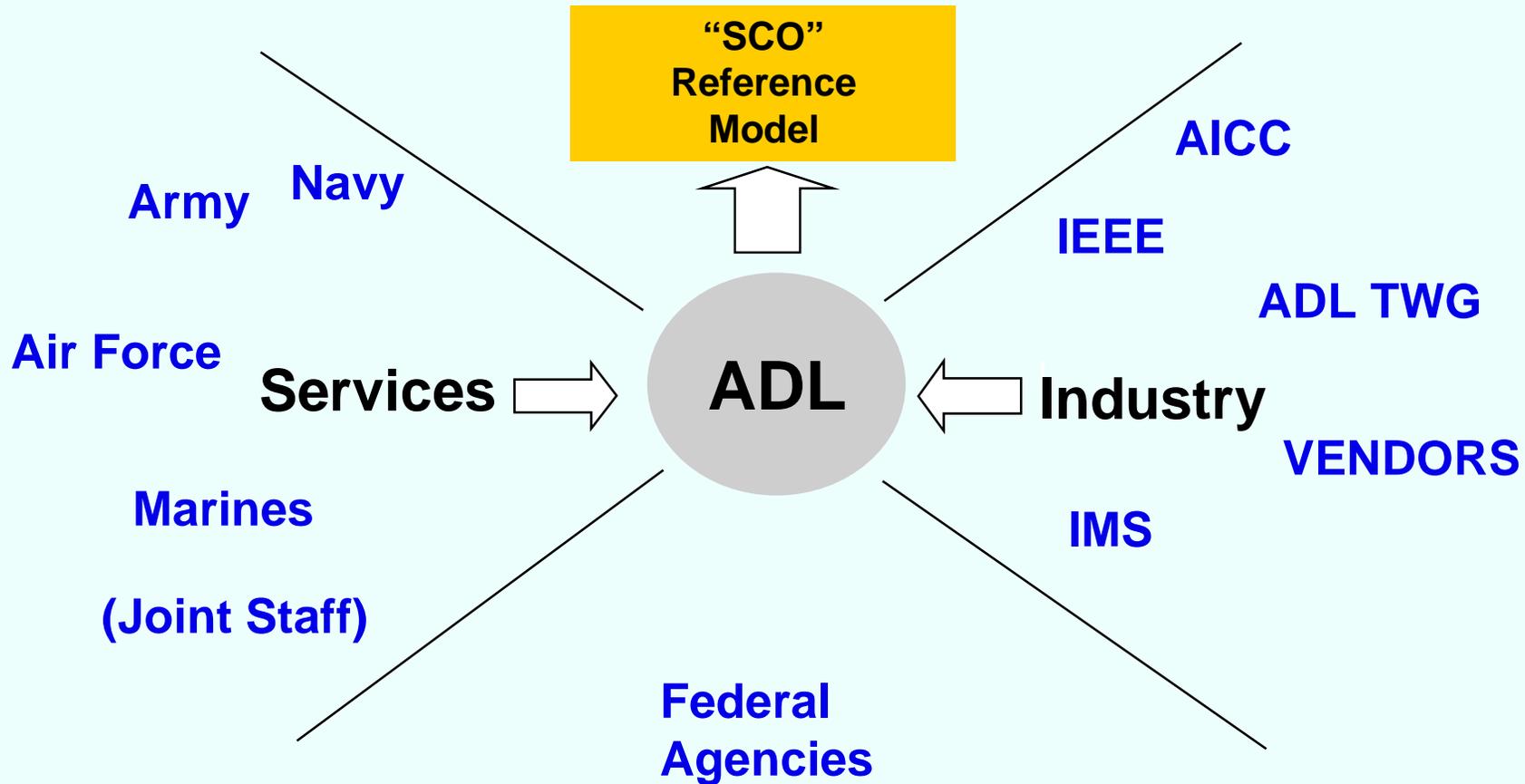


Standards Efforts

- IEEE 1484 (meeting June 10, 99 with Chair)
 - *de jure* standards body
- IMS
 - Closer to “consortium” model
- AICC
 - Airline industry-based
- Macromedia/Oracle/Netg/Asymetrix
 - *de facto* standards
- ADL Technical Work Group
 - Catalyst
- President’s Federal Training Technology Task Force
 - Lead agency with NIST for Standards Focus Group

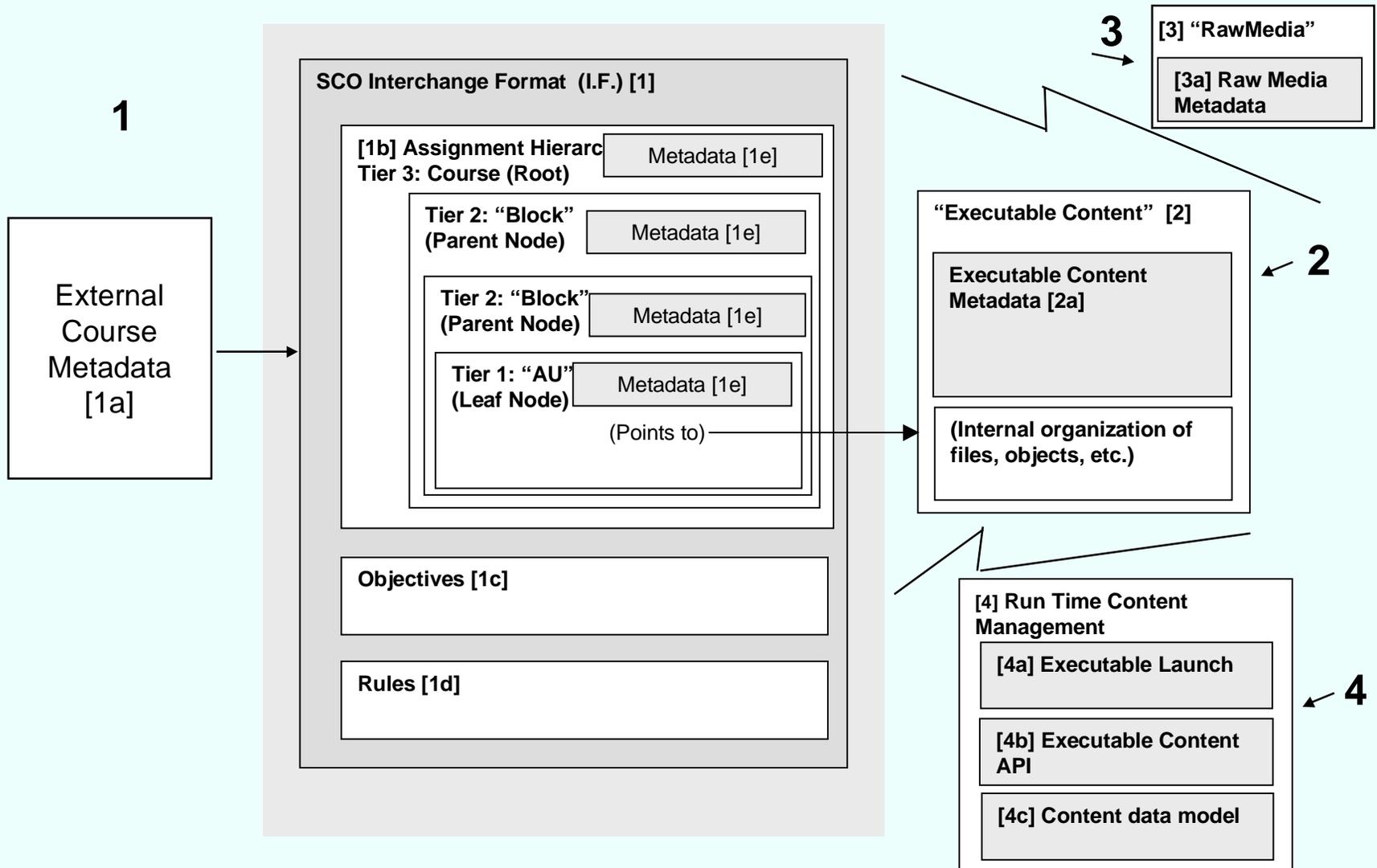


ADL Process





SCO-RM (0.5.2)





Summary of ADL Prototypes

- **Performance Mentoring Example: Repair and Maintenance / GM**
 - Objective: Apply GM methodology for training mentoring on demand
 - Status: DUSD(L) providing "Dual Use" incentives - multiple proposals
- **On-line School Example: DAU's ADL Prototype**
 - Objective: Provide equal or better education opportunities to a wider audience
 - Status: Course delivery and management system with 5 courses on line today and another 14 courses in FY 99
- **Joint Training Example: JCS ADL Prototype "DOCNET"**
 - Objective: Provide high quality doctrine education to the Total Force, anytime, anywhere
 - Status: Initial Prototype on the web - 3 more modules planned
- **Interagency Training Example: DoJ - DoD WMD**
 - Objective: Increase Readiness to respond to WMD situations
 - Status: Areas of common interest being discussed



Where we are headed ?

- **ADL**
 - **Vision**
 - **Strategy**
 - **Implementation Plan**
- **Federal Training Technology Initiative**
 - **Uses ADL as a model**
 - **Develop technical standards**



Benefits of ADL

Potential to significantly reduce costs by up to 30% while satisfying education and training requirements

- **Makes “learning” available to Total Force**
- **Enables just-in-time, just-enough, performance aiding.**
- **Leverages private-sector intellectual and financial investments: architecture, industry standards, courseware, etc.**
- **Creates an “open forum” for broad public and private collaboration: among DOD, federal agencies, technology suppliers, private businesses, national workforce, etc.**



Bottom Lines

DoD must:

- Fundamentally reengineer how it does business to educate and train effectively in tomorrow's knowledge-based environment
- Provide incentives for change
- Collaborate across DoD as well as with the public and private sectors
- Develop common architectures that will allow it to take advantage of rapidly changing technology
- Experiment



Advanced Distributed Learning

www.adlnet.org

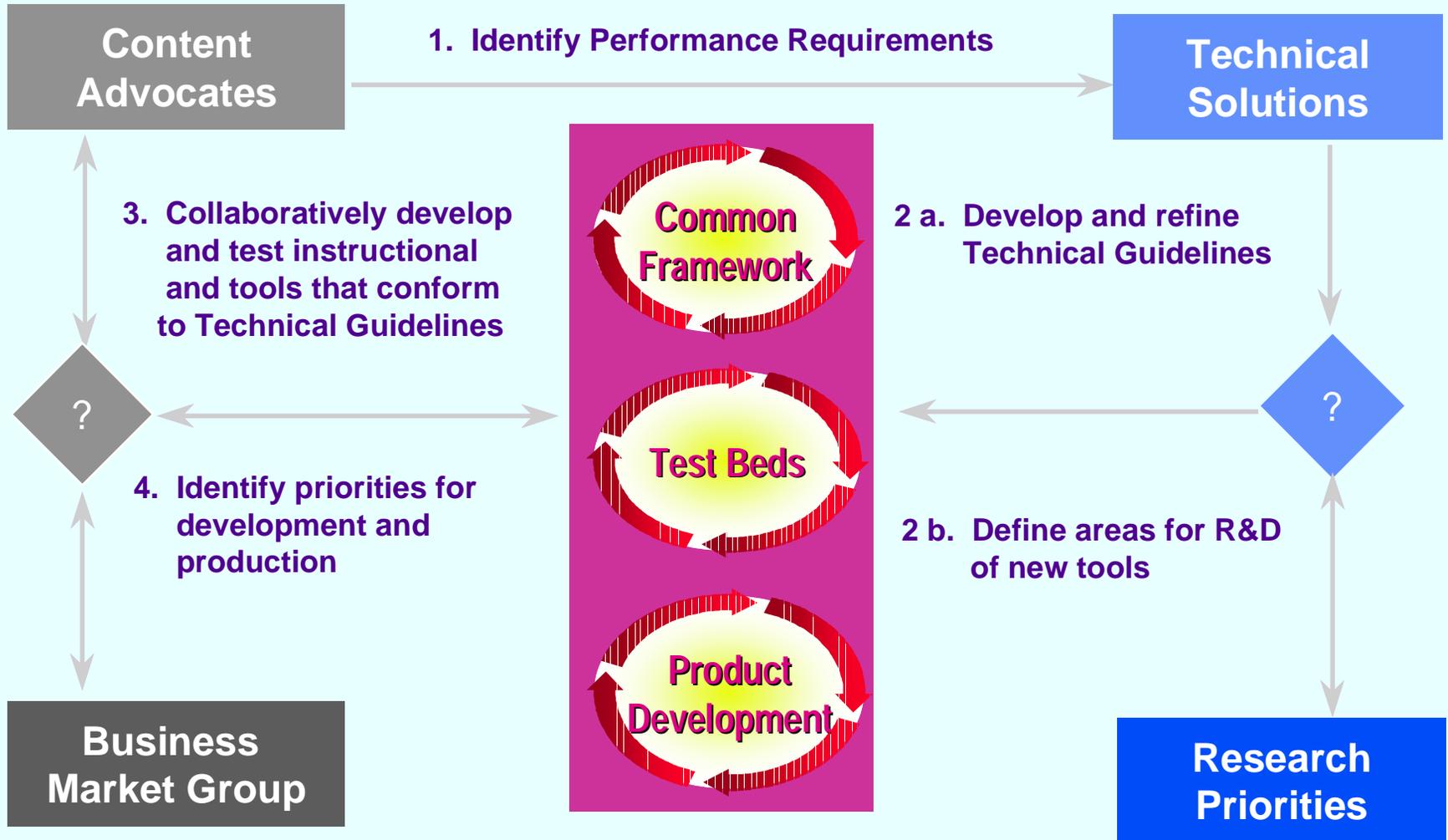


Advanced Distributed Learning

Backup Charts



ADL Collaboratory Concept





Projected ADL Time Table

- **Build consensus (Q1 99 - under way)**
- **Issue draft ADL SCO Model (June 30, 1999)**
- **Refine SCO specifications with industry DoD, and government communities (Q2/3 1999)**
- **Release Version 1 ADL SCO specifications (Sept. 1999)**
- **Industry implementation/adoption (Q3/Q4 1999)**



Some Terms

- **Distance Learning:** Structured learning that takes place when the instructor is not physically present
- **Distributed Learning:** Structured learning that takes place anytime, anywhere it is needed or desired



Some Example ADL Technologies

- **Computer-Managed Instruction (CMI)**
- **Computer-Based Instruction (CBT)**
- **Interactive Multimedia Instruction (IMI)**
- **Intelligent Tutoring Systems (ITS)**
- **Networked Tutorial Simulation (NTS)**
- **Web-Based Training (WBT)**