eLearning and Learning Objects

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6 Nov 2009

Contents

- What I hope to achieve in this presentation
- Demonstrations of some learning objects
- e-learning, Learning Models, Learning Standards & learning objects
- Background of learning objects
- Some implementations of learning objects
- Some issues on learning objects
- Future of learning objects

What I hope to achieve in this presentation

- Connection between learning objects, learning standards and e-learning
- Discuss some issues pertaining to the concept of learning objects and their implementation

Demonstrations

1. Example learning objects:

http://www.londonmet.ac.uk/ltri/learningobjects/examples.htm

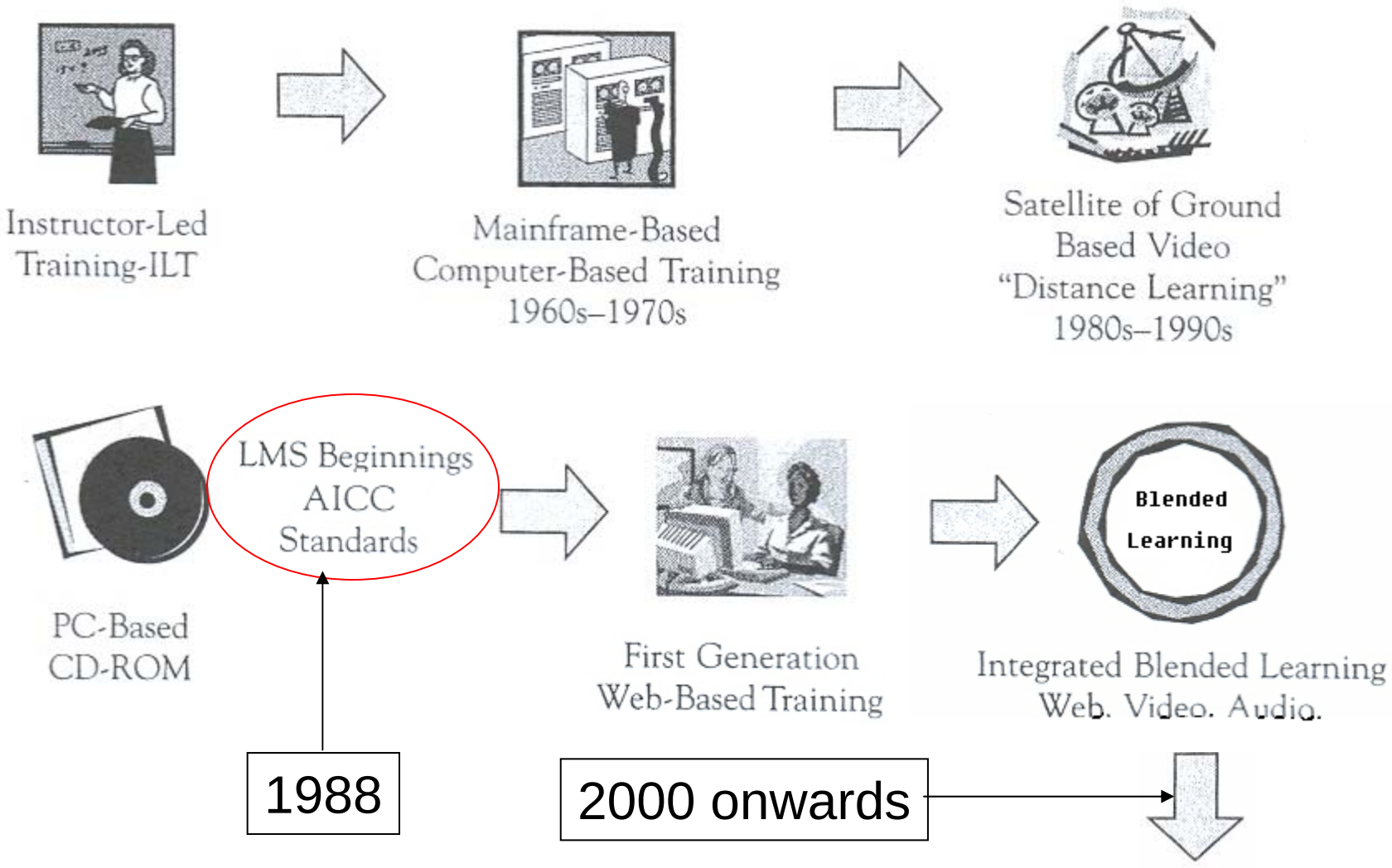
2. Cooperative Program for Operational Meteorology, Education and Training (COMET Program):

http://meted.ucar.edu/norlat/snow/index.htm

3. Golf examples:

http://testtrack.scorm.com

Evolution of Technology-Based Training

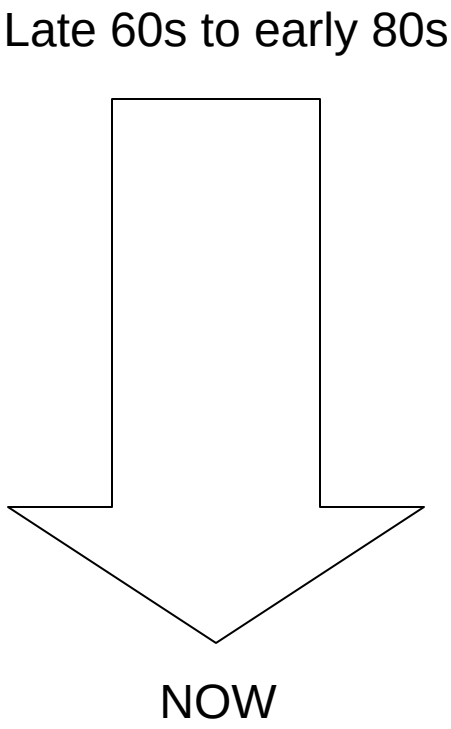


(Source: The Blended Learning Book by Josh Bersin)

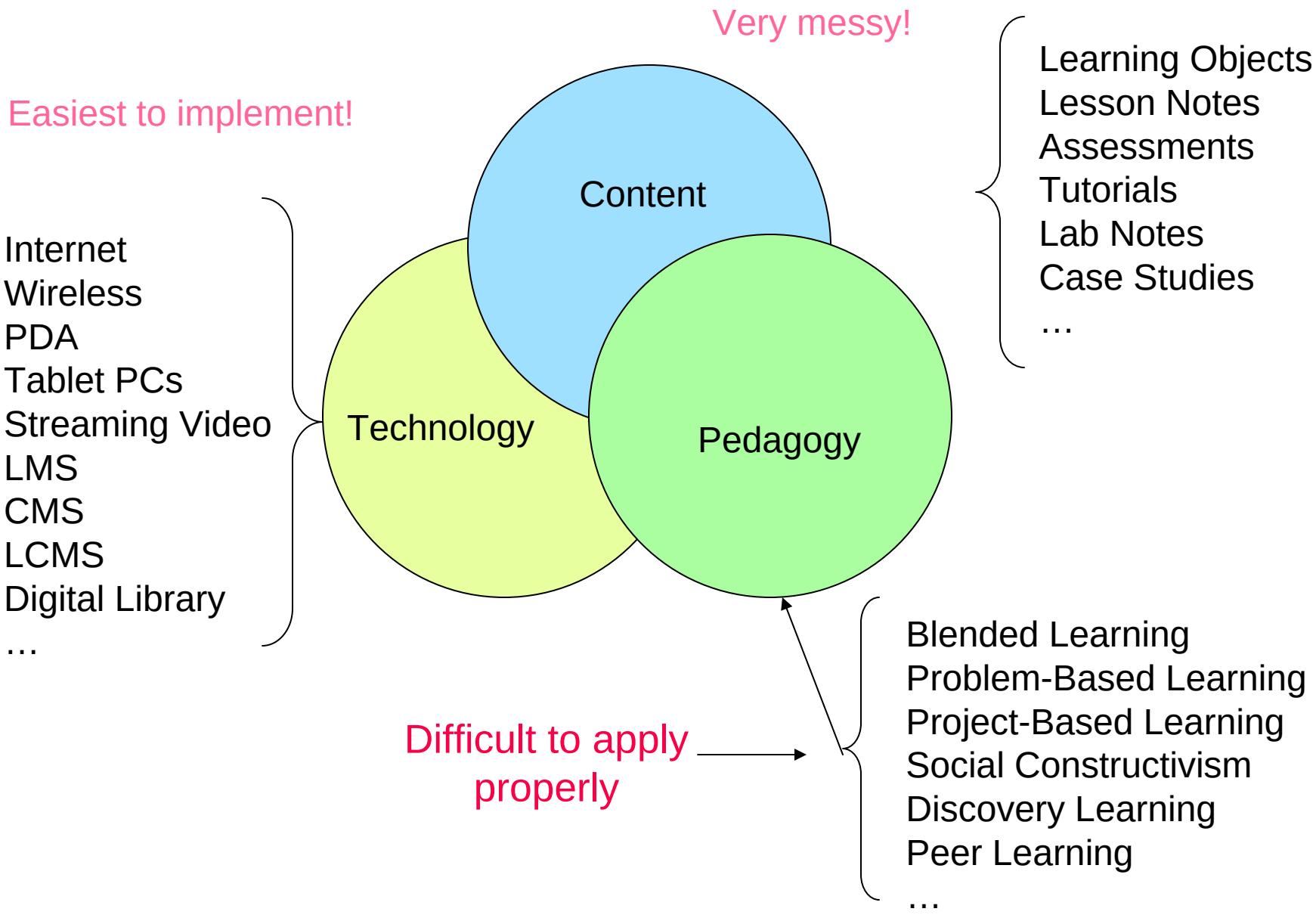
eLearning Standards

Technology Generations

- Mainframe
- Personal Computer
- Web
- Ubiquitous Access



Scope of e-Learning



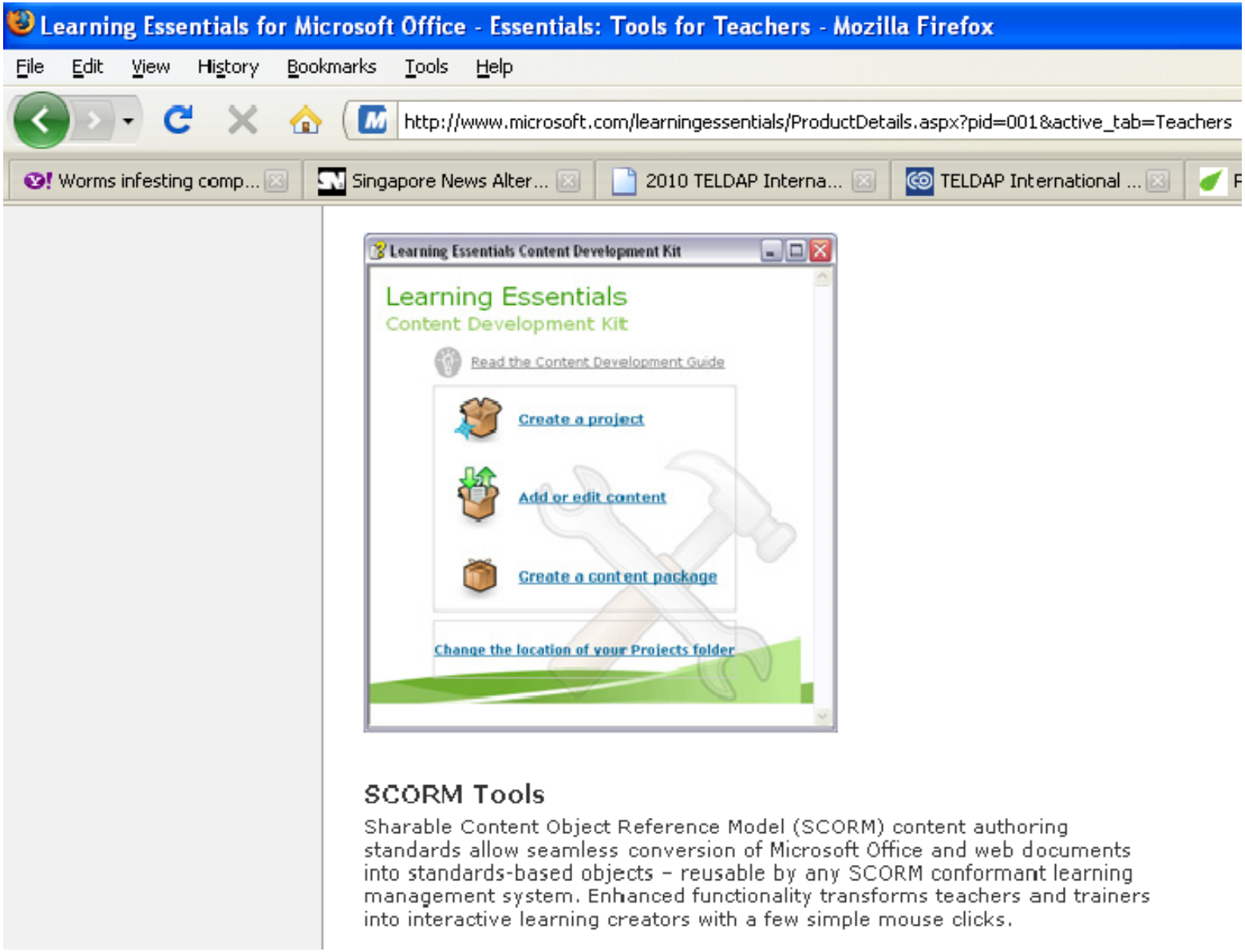
Standards and Interoperability

- AC Power (120/220 volts)
- DC Power (airplane, car)
- Internet (CAT5, 802.11 a/b/g/n)
- USB 1.0, 2.0, 3.0
- Video VGA, HDMI (High Definition Multimedia Interface)

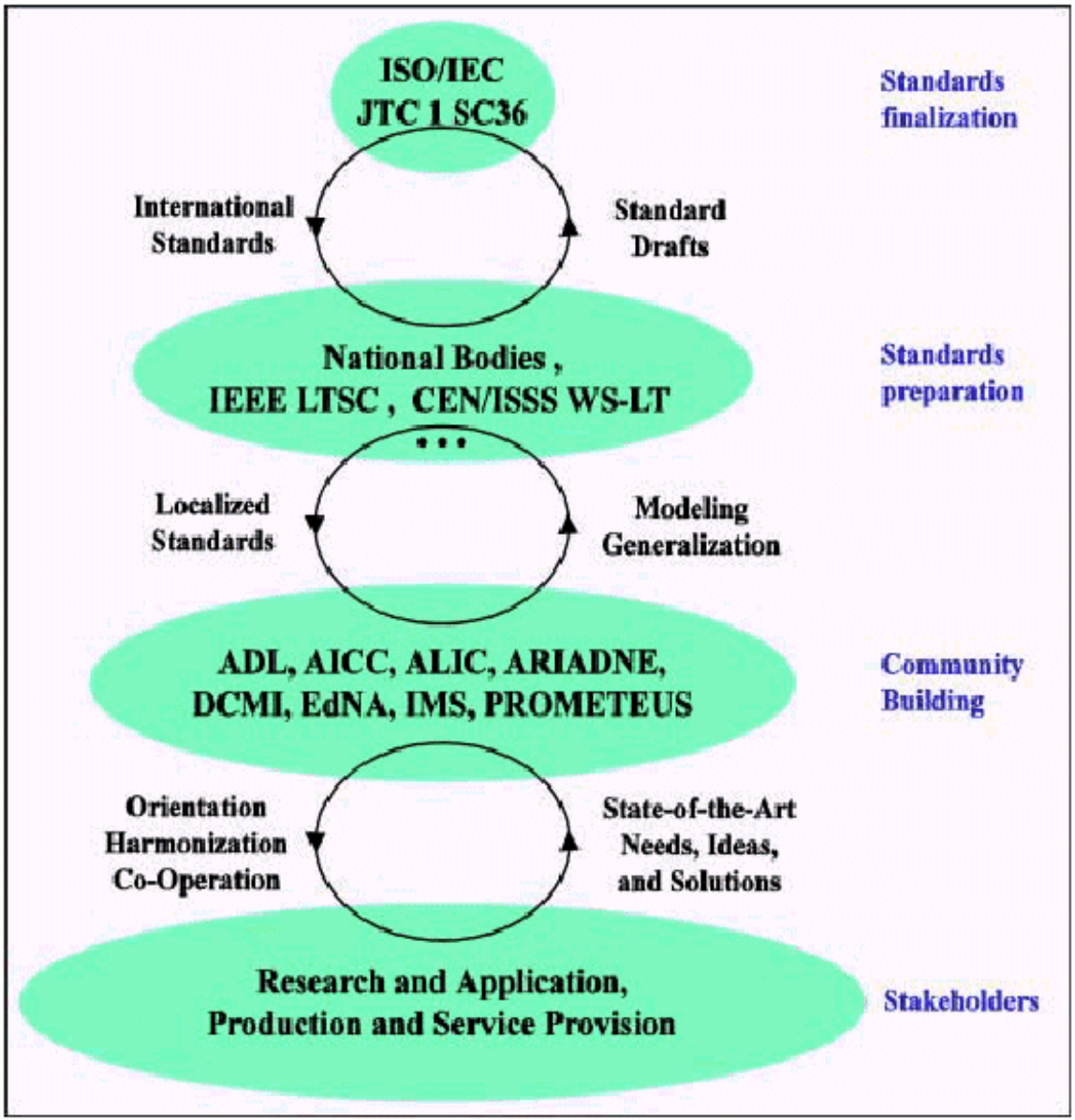
E-learning Standards

- Standards reduce the costs and risks involved in introducing new products and techniques.
- Standards allow new products and online services to be introduced alongside the systems already in place.
- Open standards maintain a level playing field for all players, new and old.

Microsoft licensed SCORM technology from HunterStone



International E-learning Standards Organizations

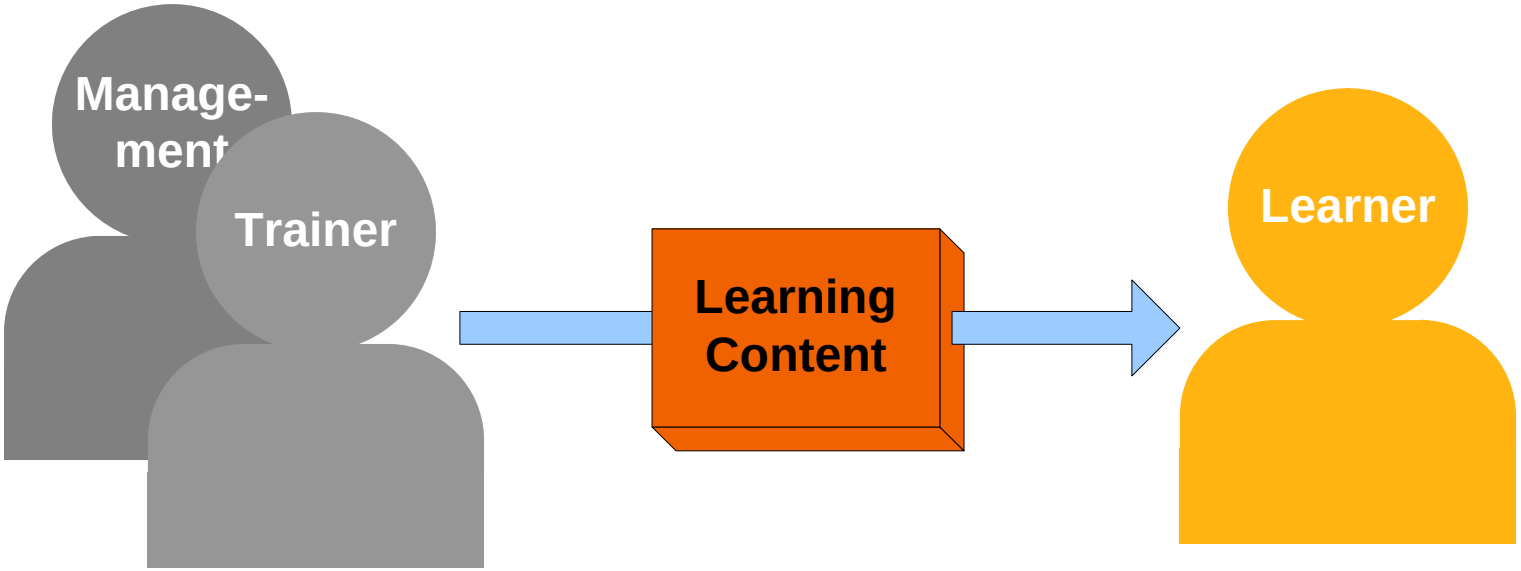


Goals of E-learning Standards

- Reusability – ability to use content again for a different purpose
- Accessibility – make the web usable for people with visual, auditory, and other physical disabilities, including cognitive processing disabilities & visually impaired elderly web users e.g. the WCAG (Web Content Accessibility Guide) from W3C
- Interoperability – make content work in different systems, e.g. AICC, IMS, SCORM
- Durability – need to support the longevity of the learning content

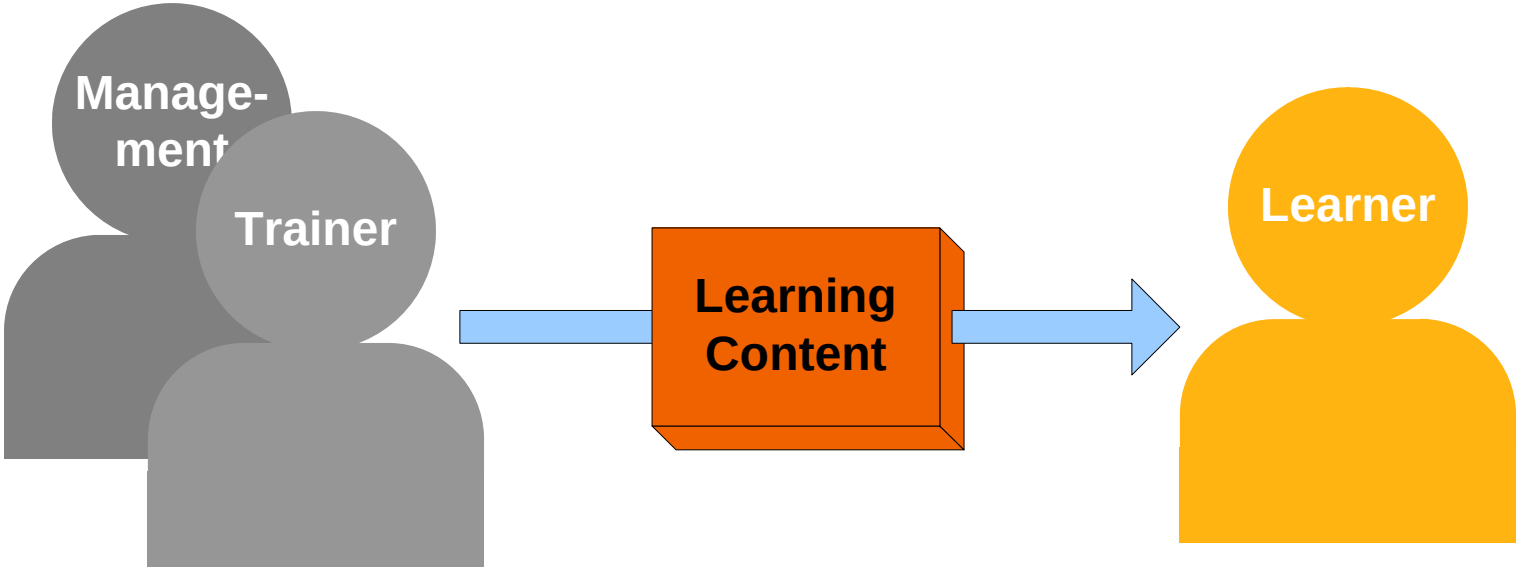
Looking at learning models

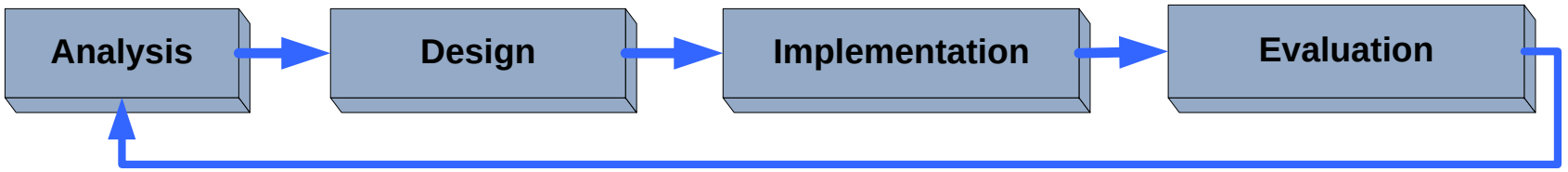
Traditional Model



The push model

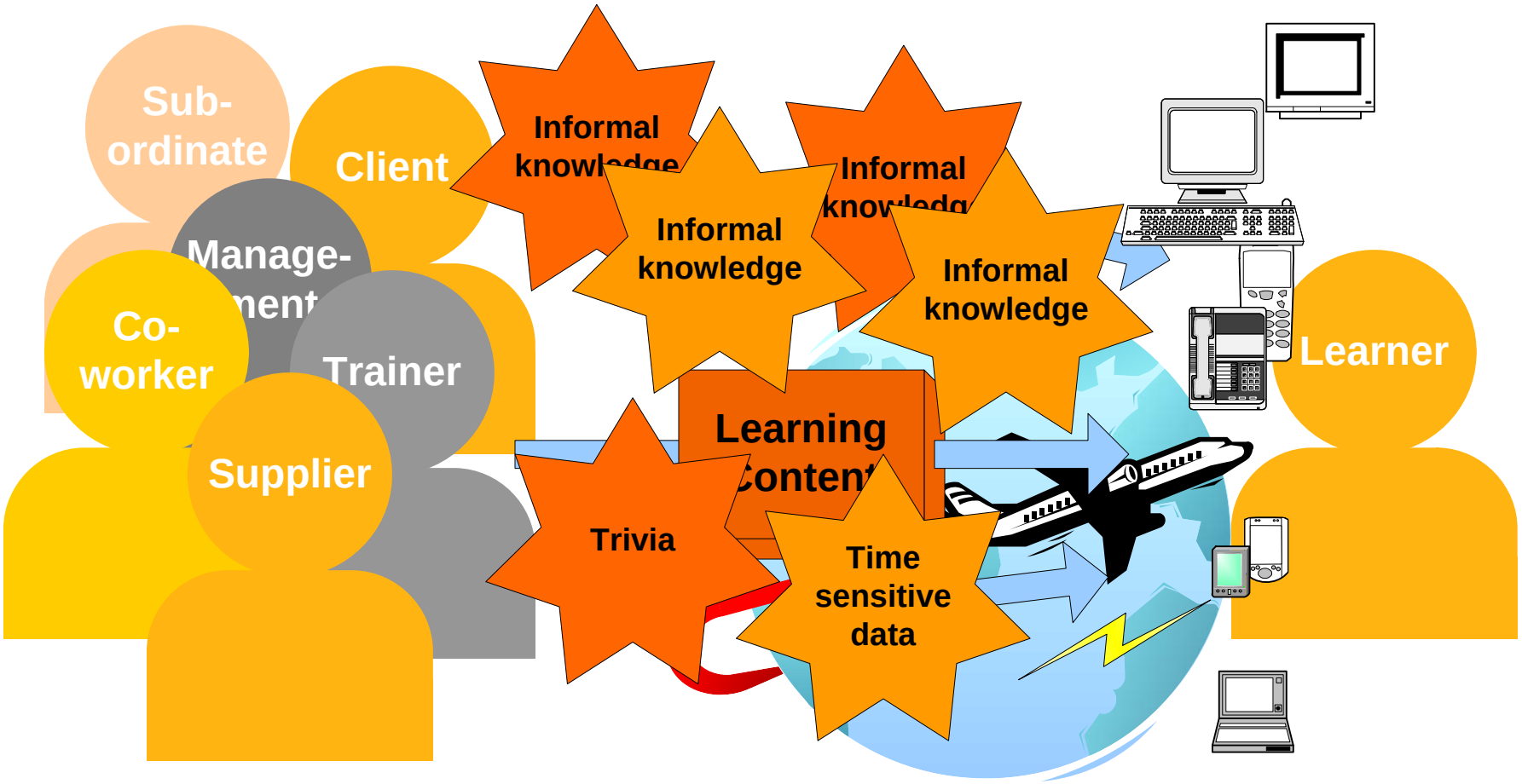
Traditional ISD





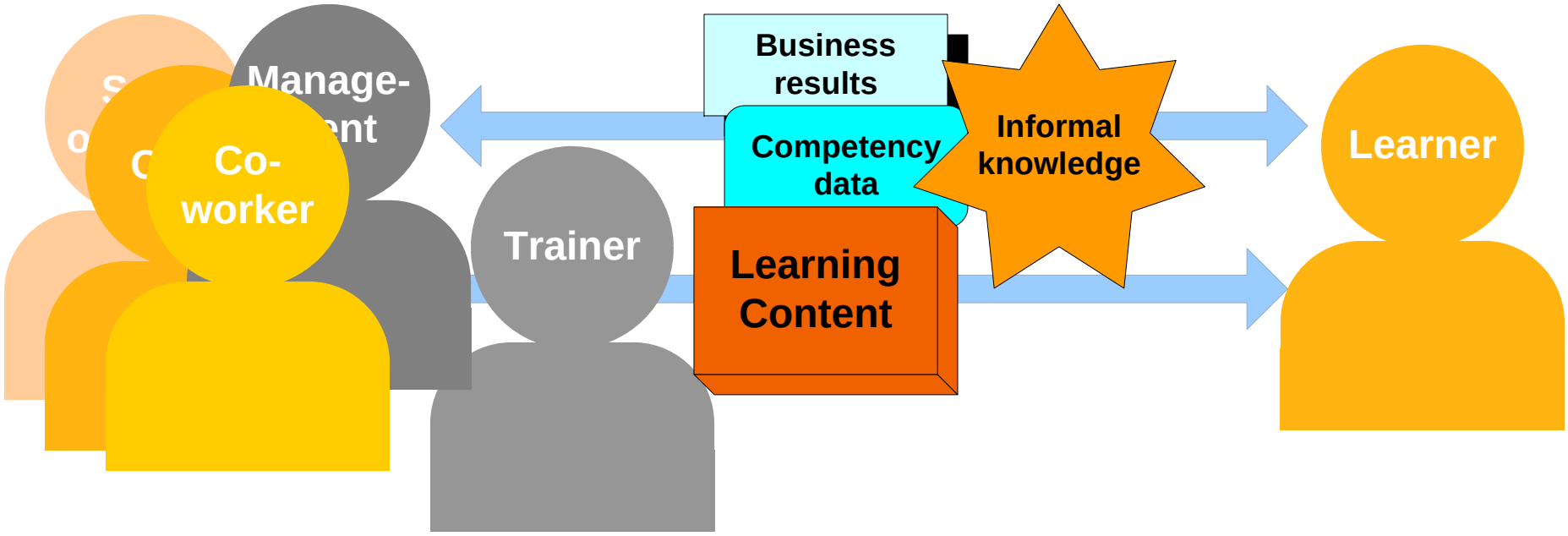
Instructional System Design

Existing Model



Working = Learning

Working & Learning



Evolution

From
- Focus on Instruction

To
- Focus on **Outcomes**

From
- Know it all

To
- **Just in time**

From
- Computer Based Trg.

To
- **Blended learning**

From
- Individual pedagogy

To
- **Social pedagogy**

From
- Lone Learner

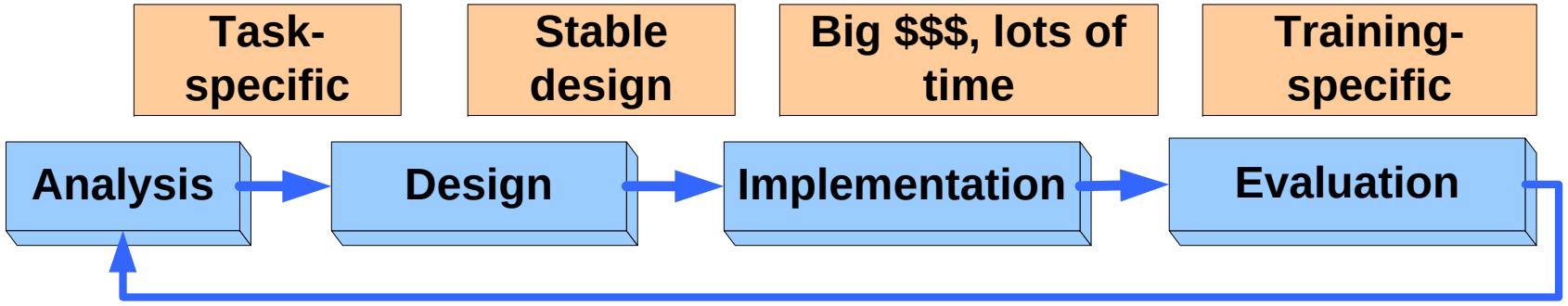
To
- **Learning together**

From
- e-learning

To
- **Learning**

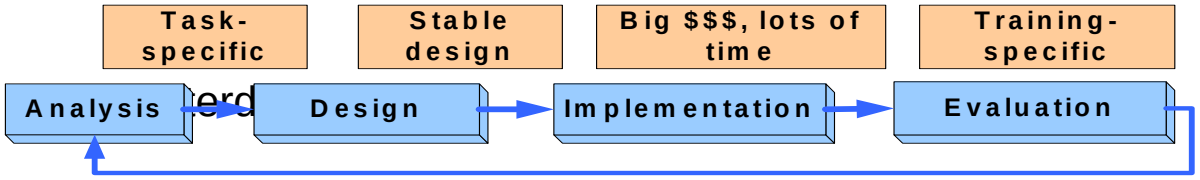
Is there still a place for ISD?

- Yesterday's model



The waterfall model

Is there still a place for ISD?



Start Here

Working & learning ecosystem

Competency requirements

Business requirements

Focus on strategy

Flexible

Reconfigurable

Short time Automation

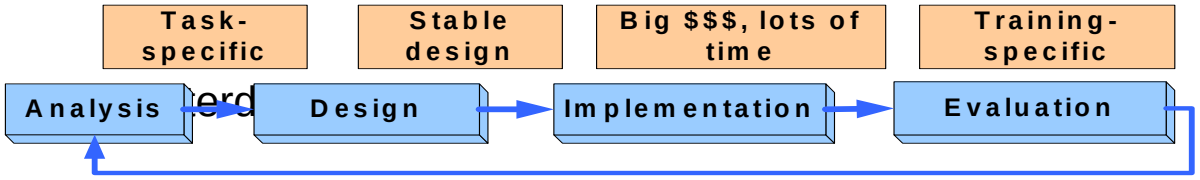
Cannibalize & reuse

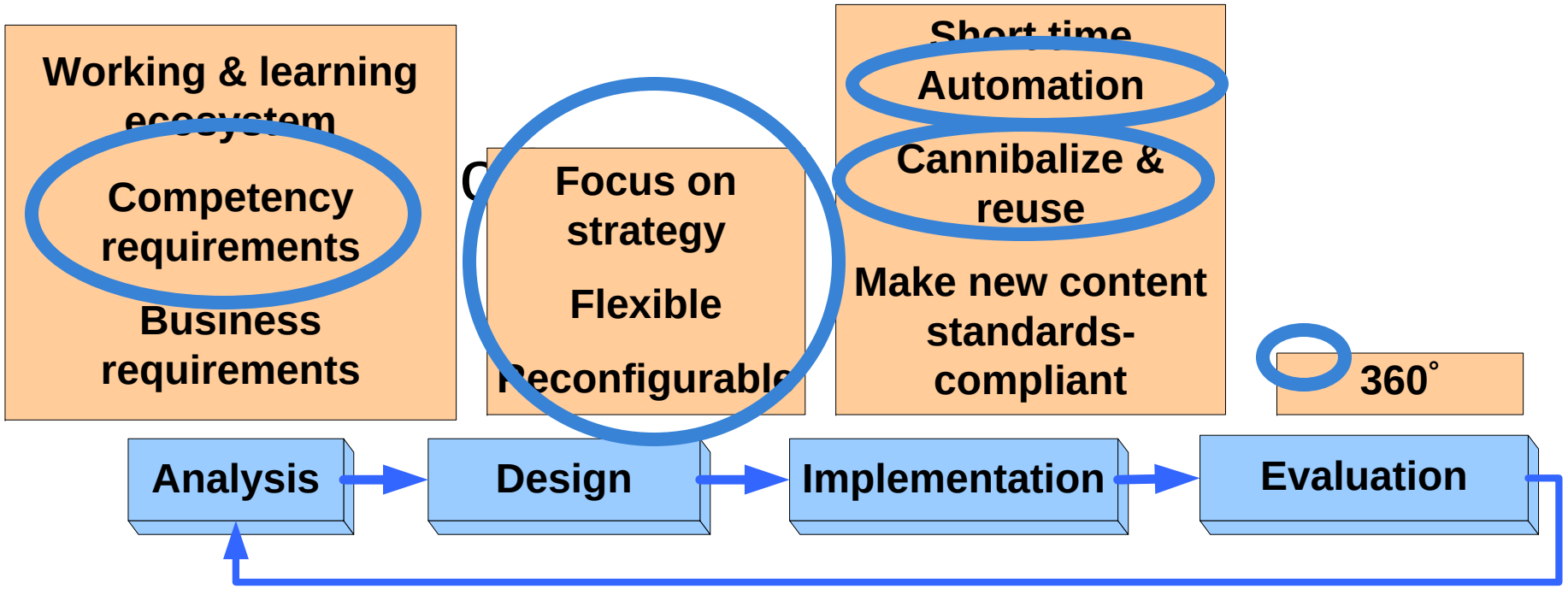
Make new content standards-compliant

360˚

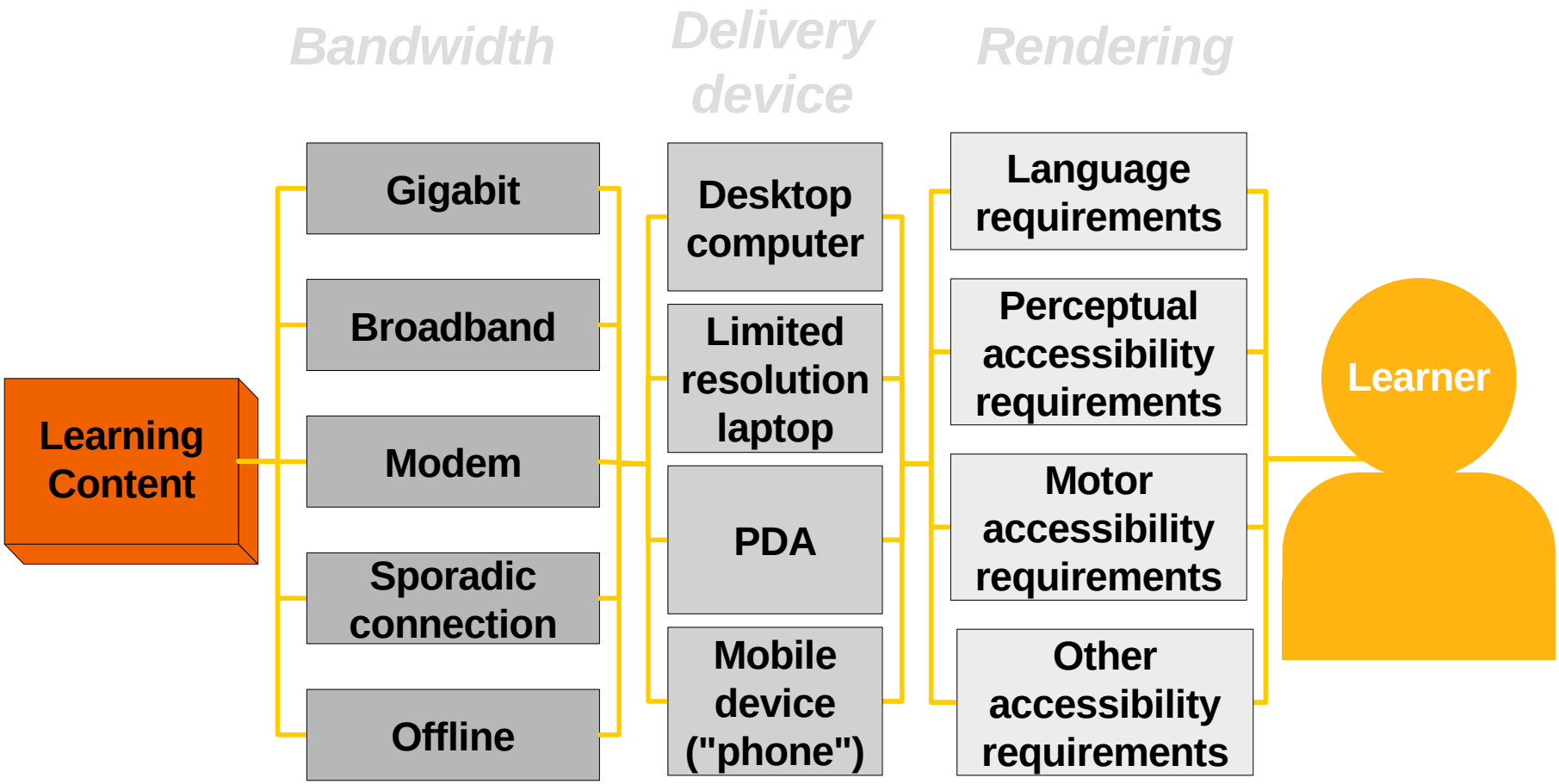
Analysis → Design → Implementation → Evaluation

Is there still a place for ISD?





The Content Delivery Challenge



Learning Objects - 1

- Definition of learning object has long been debated (Friesen, 2003; Parrish, 2004; Schatz, 2005; Wiley, 2002).
- Debate is about:
  - What is a learning object?
  - What a learning object is meant to achieve?

Learning Objects - 2

- Learning objects are
  - short instructional components that are
  - products of a design strategy and
  - software techniques
- whose goal is to facilitate their
  - discovery and
  - reuse.

(Patrick Parrish, The COMET Program).

Learning Object - 3

A typical definition for a learning object:

- A sequence of learning events
- Often around a single objective
- Often comprised many RIOs (Reusable Instructional Objects)
- Often with internal assessment/feedback for the learner
- Not necessarily course specific (context free)

Learning Objects – 4

- Inspired by the software engineering paradigm of object-oriented programming.
- Programming -> engineering discipline; Instructional technology -> design discipline
- Can instructional content be regarded like programming code?
- To avoid confusion, some people call learning objects as “online learning resources” (Littlejohn, 2003)

Learning Objects - 5

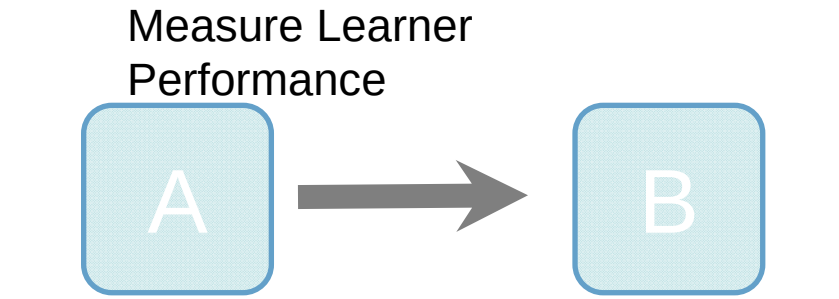
- One important purpose of learning objects is to encourage the reuse of the learning content.
- Design approaches for reuse:
  - Divide instructional content & activities into discrete, coherent units
  - Create metadata for discovery
  - Context-free design

Where we are

- Learning Activity
  - Single Participant
  - Single Resource
  - Multiple Competencies

The Point

We want to go from A to B



Learning Activity
- Participant
- Competencies
- Resource

Learning Activity
- Context
- Participant(s)
- Competencies
- Resource(s)

Some Implementation Models / Templates for Learning Objects

- SCORM's Content Aggregation Model
- CISCO's RLO/RIO Strategy
- Adobe's Learning Object Approach
- NETg's Learning Object Model

Content Aggregation Model (CAM) in SCORM

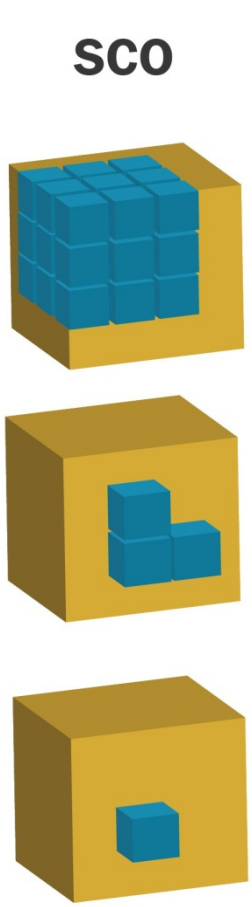
Asset

- Electronic representations of media such as text, images, sound, or any other piece of data a web client can deliver

- *The most basic form of content*
- *Can be reused in many different contexts and applications*

Sharable Content Object (SCO)

- Comprised of one or more assets that becomes an independent, defined piece of instructional material
- The smallest logical unit of information you can deliver to your learners via an LMS
  - In technical terms, a SCO is defined as the only piece of information that uses the SCORM Application Programming Interface (API) for communication with an LMS.



Data Model Elements - 1

- Enable tracking and storing of data about learner performance in, and interaction with, instructional content interoperably
  - Every LMS must support all data model elements in SCORM 2004
  - Use of data model elements in content is optional

Data Model Elements - 2

- Technical initialization
  - Launch data
  - Entry
  - Location
  - Mode
  - Credit
  - Suspend data
- Content initialization
  - Maximum time allowed
  - Learner ID
  - Learner name
  - Learner preference
  - Completion threshold
  - Time limit action

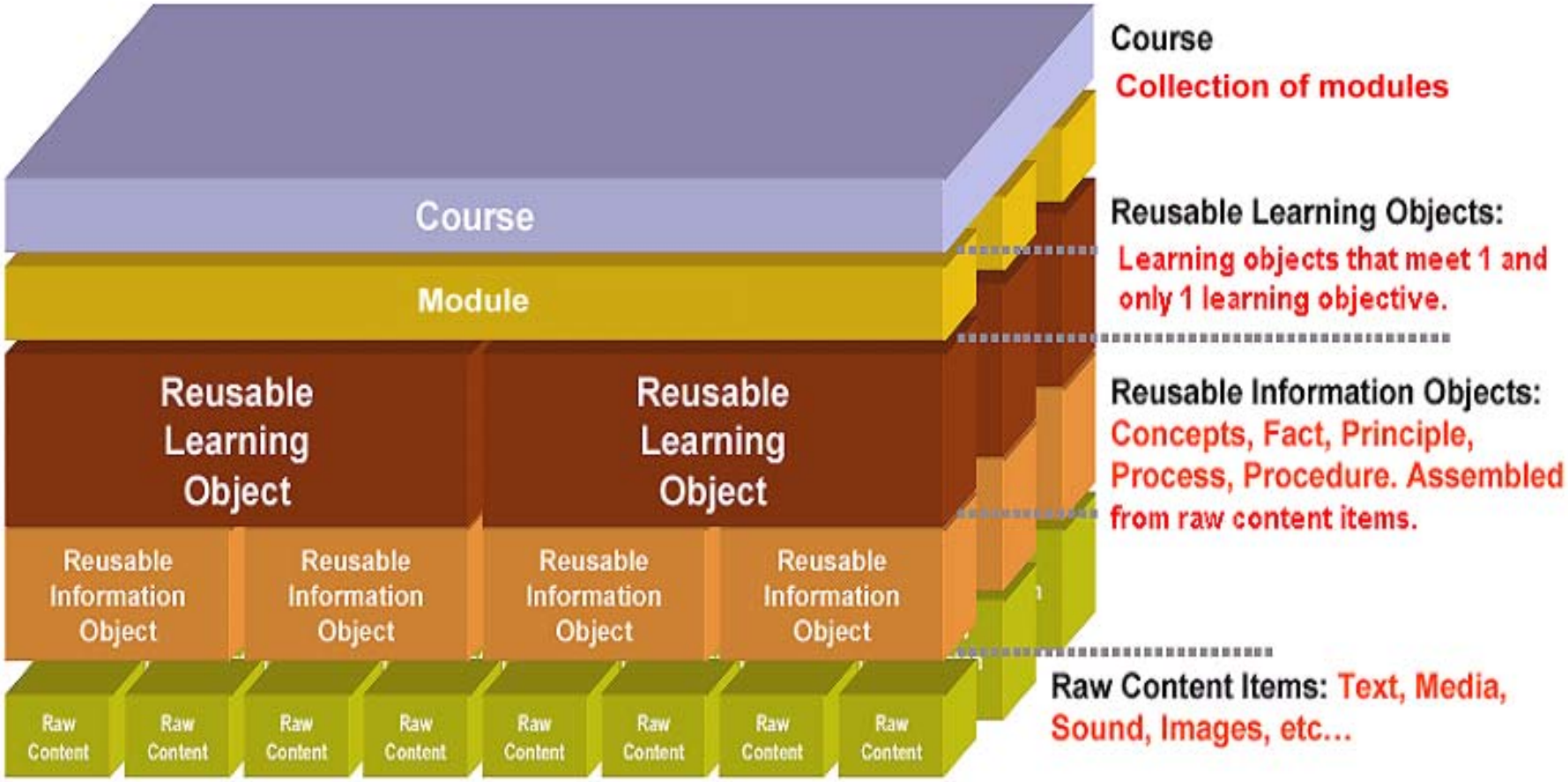
All mandatory in SCORM 2004

- Score reporting
  - Score
  - Progress measure
  - Scaled passing score
  - Success status
  - Objectives
  - Interactions
  - Completion status
- Comments
  - Comments from learner
  - Comments from LMS
- Exit data
  - Exit
  - Session time
  - Total time

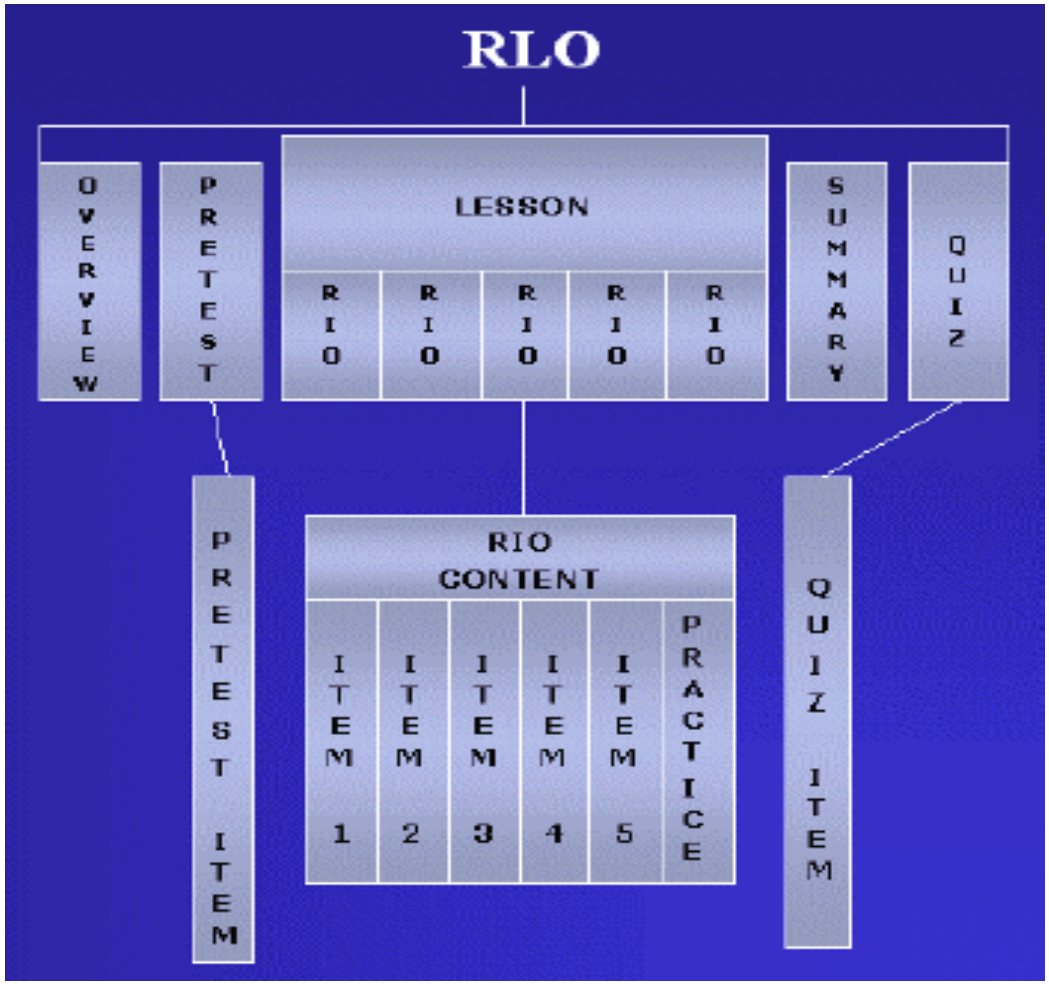
Content Package

- A standardized, interoperable way to upload content to a SCORM-complia LMS
- A SCORM content package contains two principal parts:
  - The XML manifest file that lists
    - All of the resources or assets you want to include in the package
    - The content structure diagram you created (called the organization)
    - The sequencing rules
    - All of the metadata for the SCOs, the aggregations, and the package itself
  - All of the physical SCO and asset files for the content package

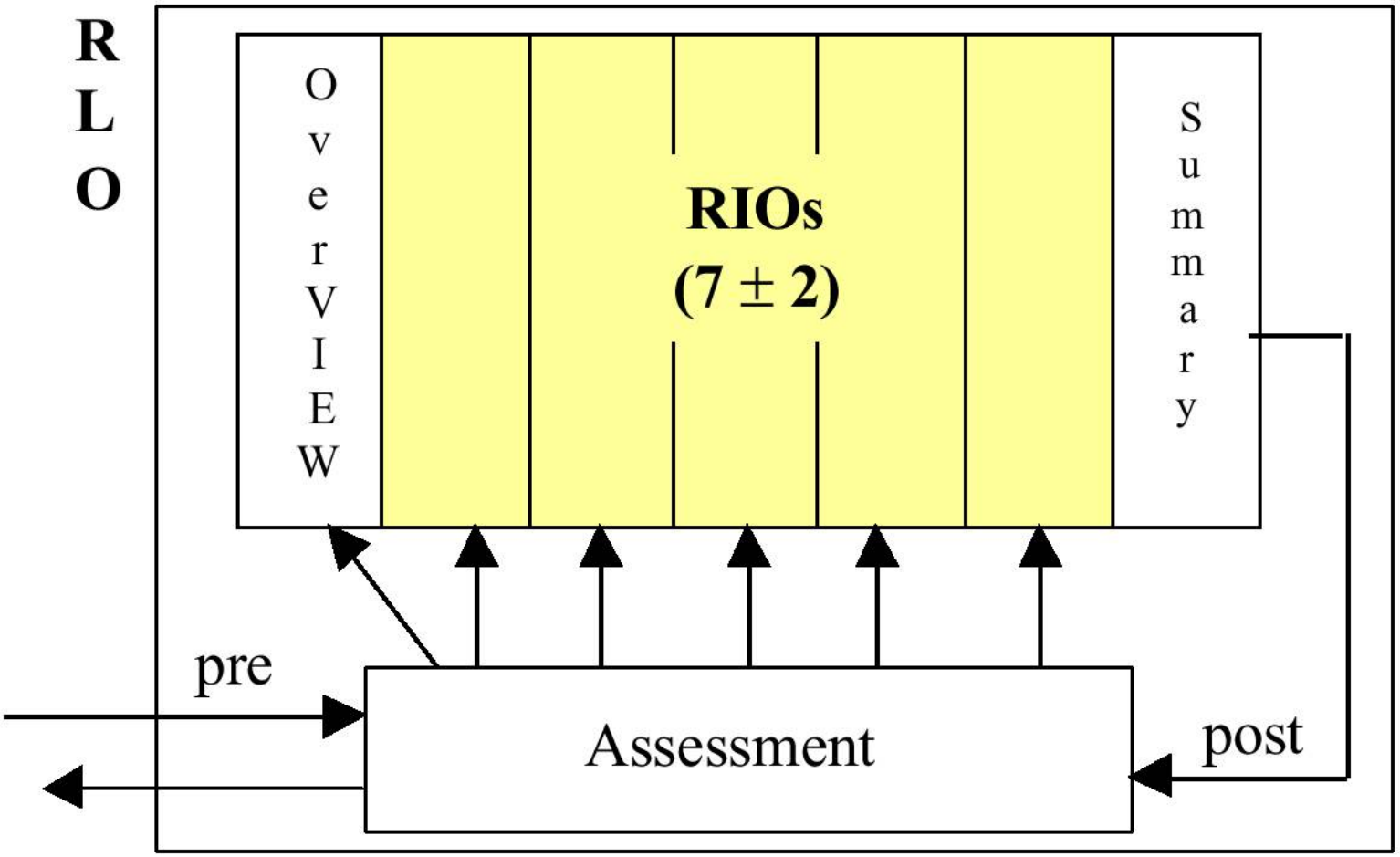
CISCO's Learning Object Model



CISCO's RLO/RIO Strategy

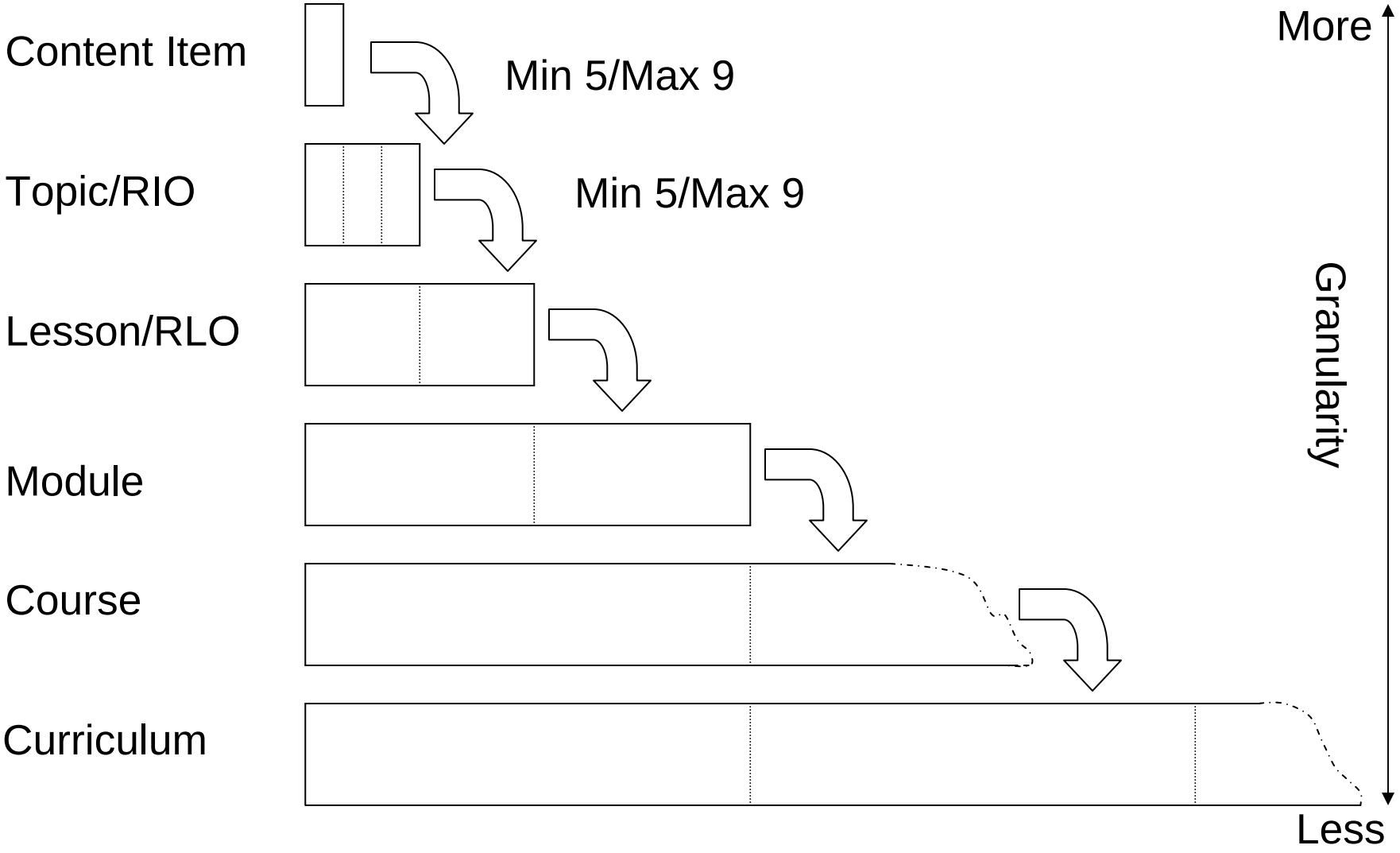


Cisco's Learning Objects

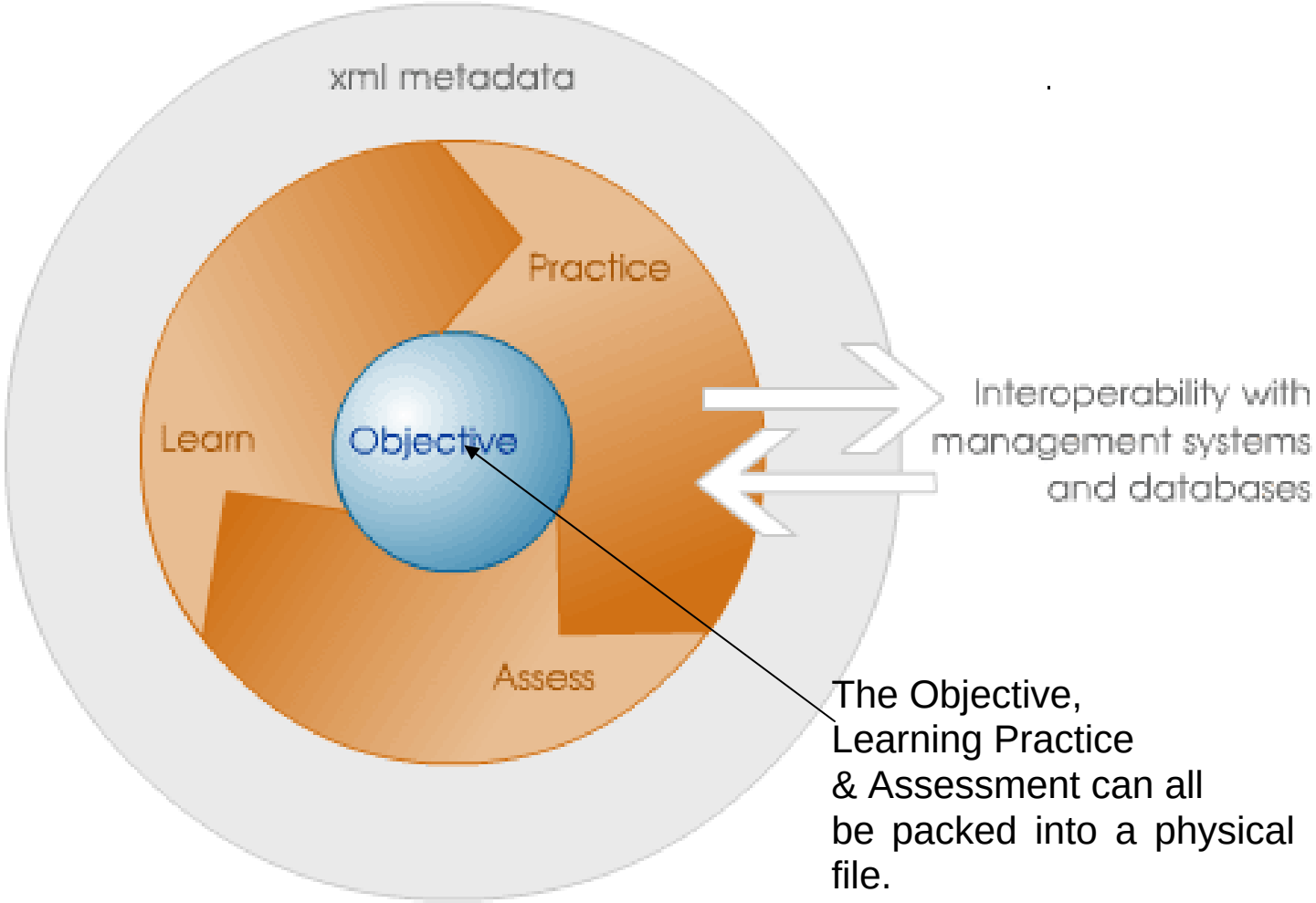


From: http://www.bitpipe.com/data/detail?id=962198364_445&type=RES&x=933961370

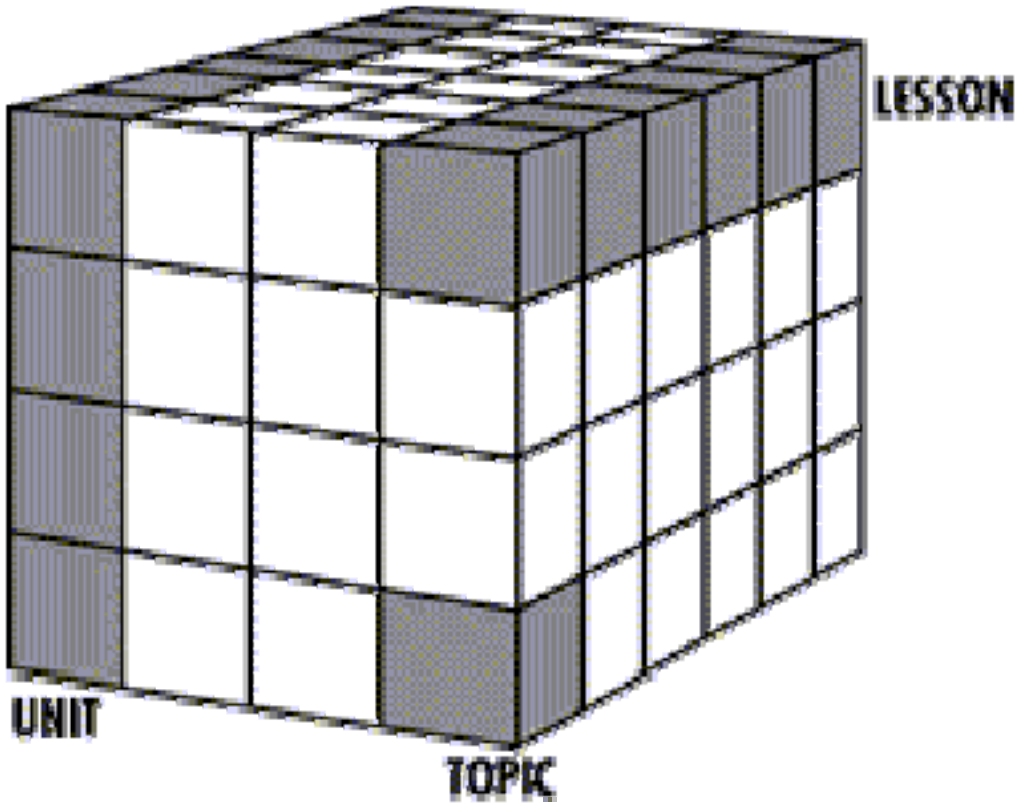
Learning Object Development



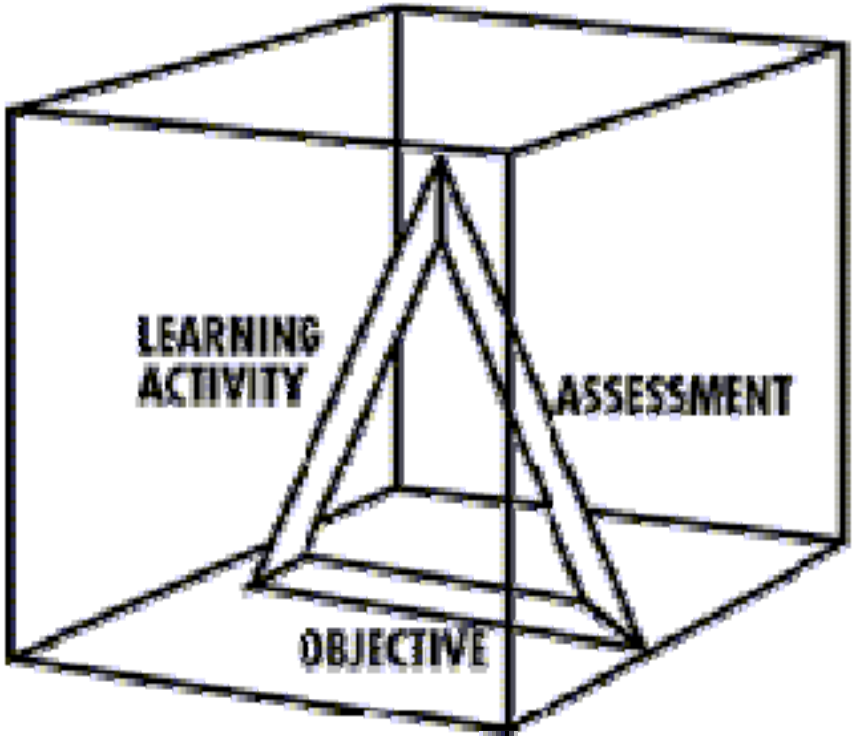
Adobe Learning Object Approach



NETg's Learning Object Model - 1

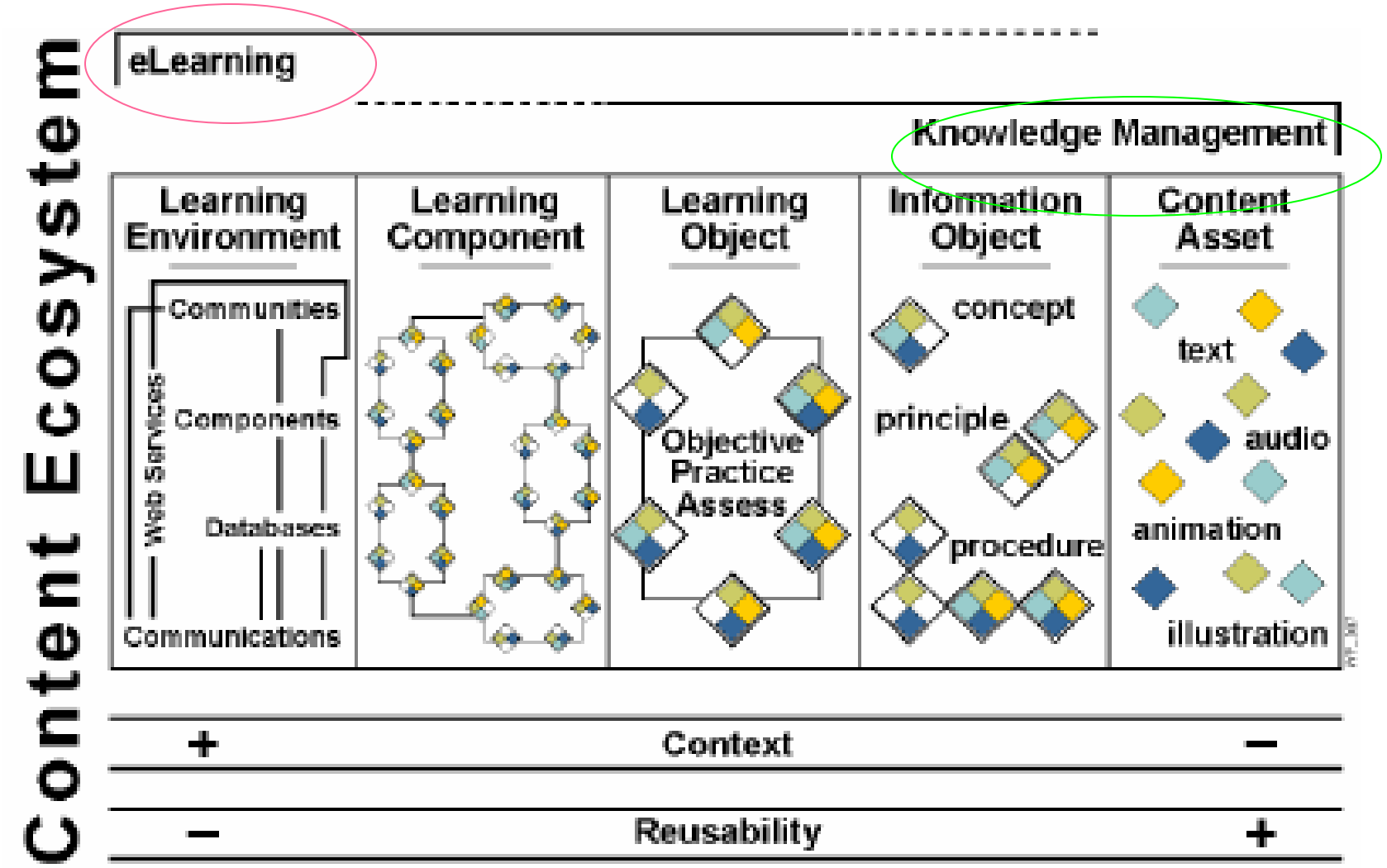


NETg's Learning Object Model - 2

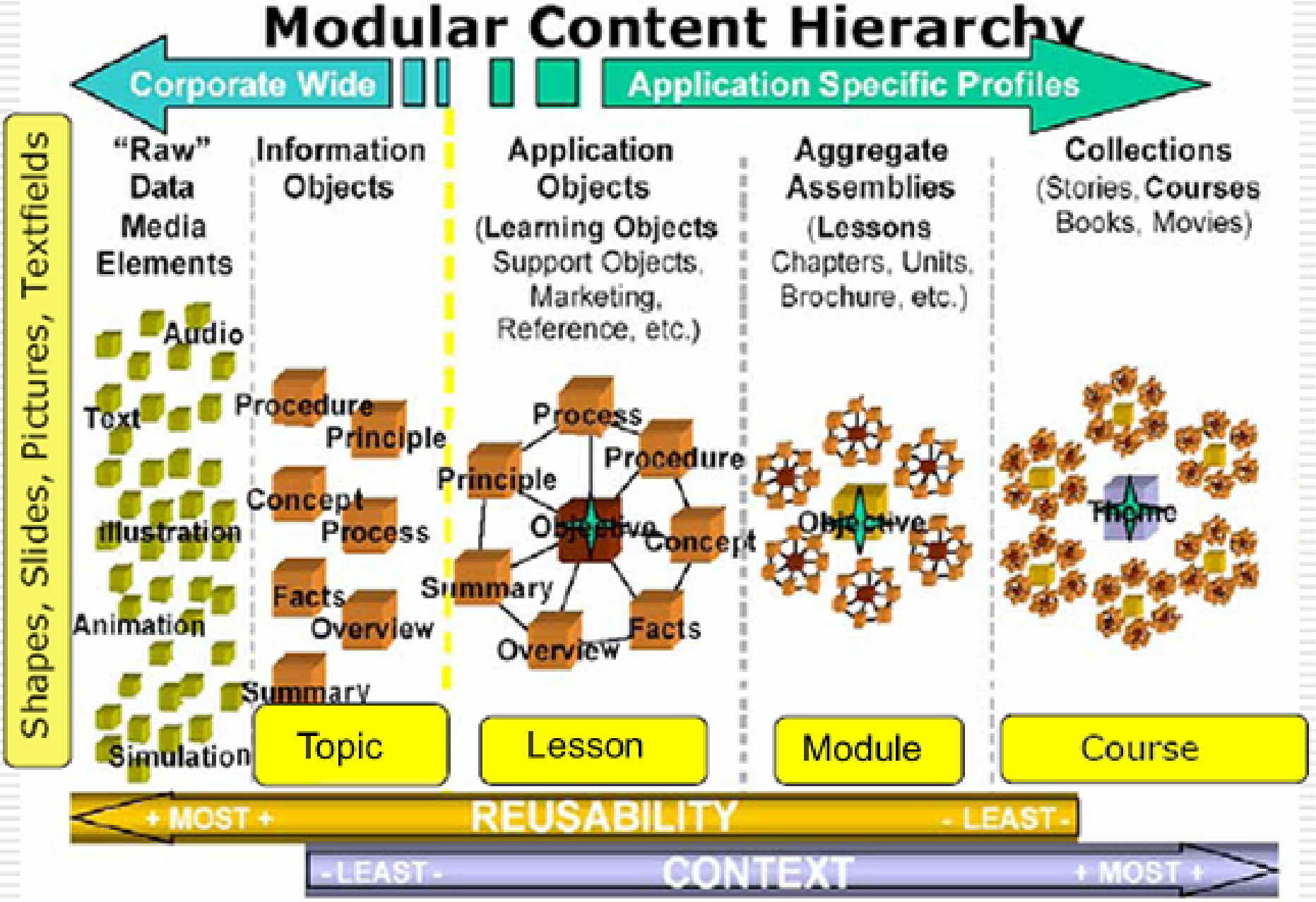


3 components in a NETg's Learning Object

Content Ecosystem



Learnativity Content Model (Duval & Hodgins 2003)



Correspondence between Models - 1

S/No.	Reusablelearning.org's Content Model	CISCO's RLO/RIO Strategy
1	Learning Environment	Course
2	Learning Component	Module
3	Learning Object	Lesson (RLO)
4	Information Object	Topic (RIO)
5	Content Asset	Screen / Page / Asset / Element

Correspondence between Models - 2

S/No.	Reusablelearning.org's Content Model	SCORM's Strategy
1	Learning Environment	LMS + Content Package
2	Learning Component	Content Package
3	Learning Object	Content Package
4	Information Object	SCO
5	Content Asset	Screen / Page / Asset / Element

Clark's 5 Content Types

Content Type	Definition	Example
Concept	A category that includes multiple examples	Democracy
Fact	Specific & unique data or instance	William Shakespeare wrote Hamlet
Process	A flow of events or activities	Photosynthesis
Procedure	Task performed with step-by-step actions	Chemical titration
Principle	Task performed by adapting guidelines	Principle of Archimedes

Evaluating Learning Objects

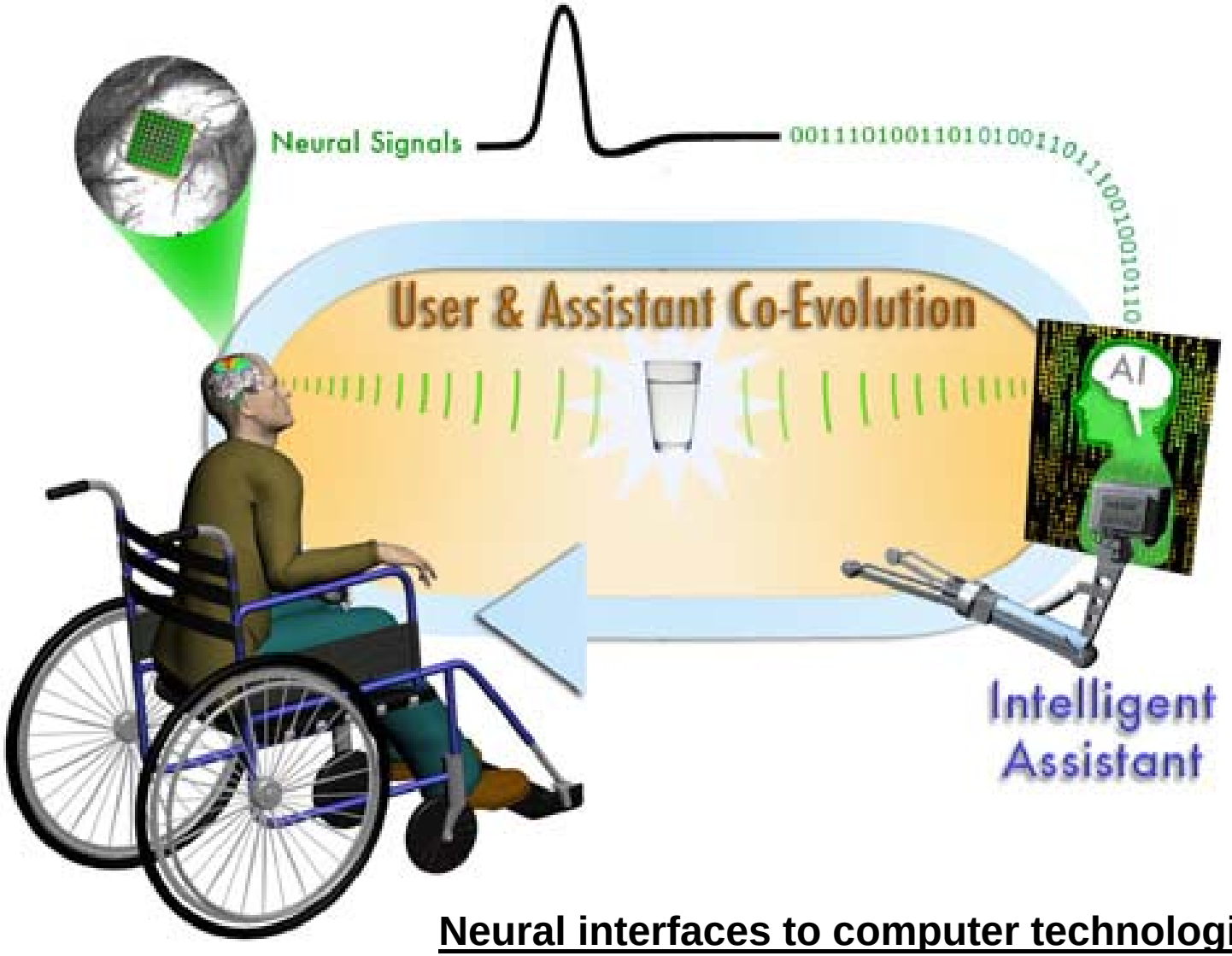
- Is the learning object appealing overall?
- Is the experience of using the learning object a pleasant one?
- Are the technical requirements easily understood and easily met?
- Is it easy to find your way around the learning object?
- Is the content complete and correct?
- Are the activities appropriate to the content?
- Is the scope of the learning object suitable: neither too limited, nor too general for your purposes?
- Does it mean the educational goal you decided upon?

(Source: Guidelines for Authors of Learning Objects by Rachel Smith)

Future - 1

- Rodney Brooks, robotics expert and director of MIT's Computer Science & AI Lab:
  - Neural interfaces for computer technologies:
    - Allow people to interact with computers and computer-driven utilities through their thoughts
    - People can be free of devices like keyboards and mouse devices
- Future e-learning development team:
  - Cognitive scientists, computer scientists, software engineers, artists, philosophers & stand-up comedians!

Future - 2



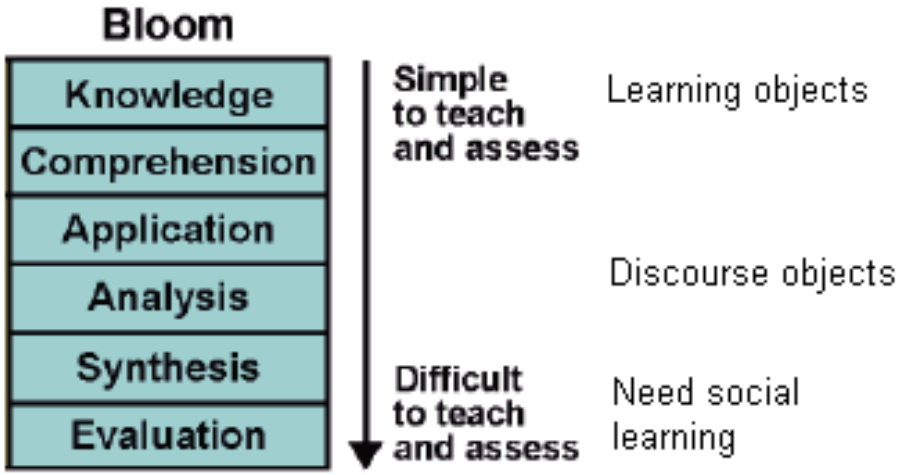
Neural interfaces to computer technologies

Future - 3

- In the foreseeable future it is possible for us to have every
  - online document,
  - training tutorial,
  - animation,
  - game,
  - webcast,
  - podcast, or
  - whatever other forms learning objects might take,
- conveniently stored in our pockets or purses – iPhones or iPods.

Future - 4

- Various types of learning objects, e.g.
  - content objects,
  - strategy objects,
  - discourse objects
- Instructional design using learning objects is actually context design.



End of Presentation

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