

# Understanding and Using Standards

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**Chair, IEEE Learning Technology Standards Committee**

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# There are *LOTS* of standards relevant to Digital Libraries

- Metadata
- Search / Discovery
- Resource Aggregates
- Identifiers & resolution systems
- Rights
- Enterprise Infrastructure Interoperability
- Content formats (e.g. Scientific Markup Languages)
- *And more ...*

So as we look to the future, what can we learn from the past?



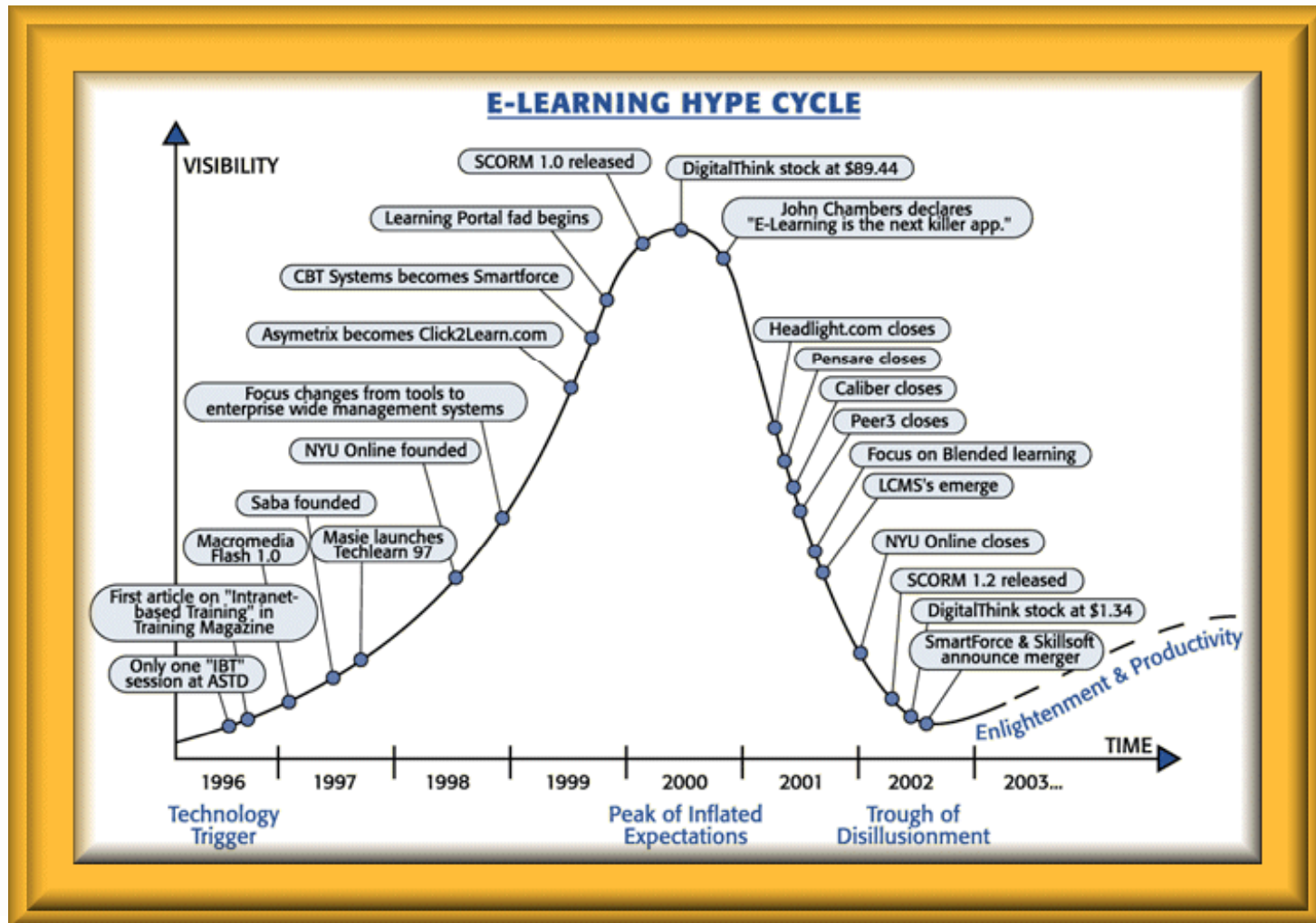
# **Learning Technology Standards**

**What's been done and where  
we are headed**

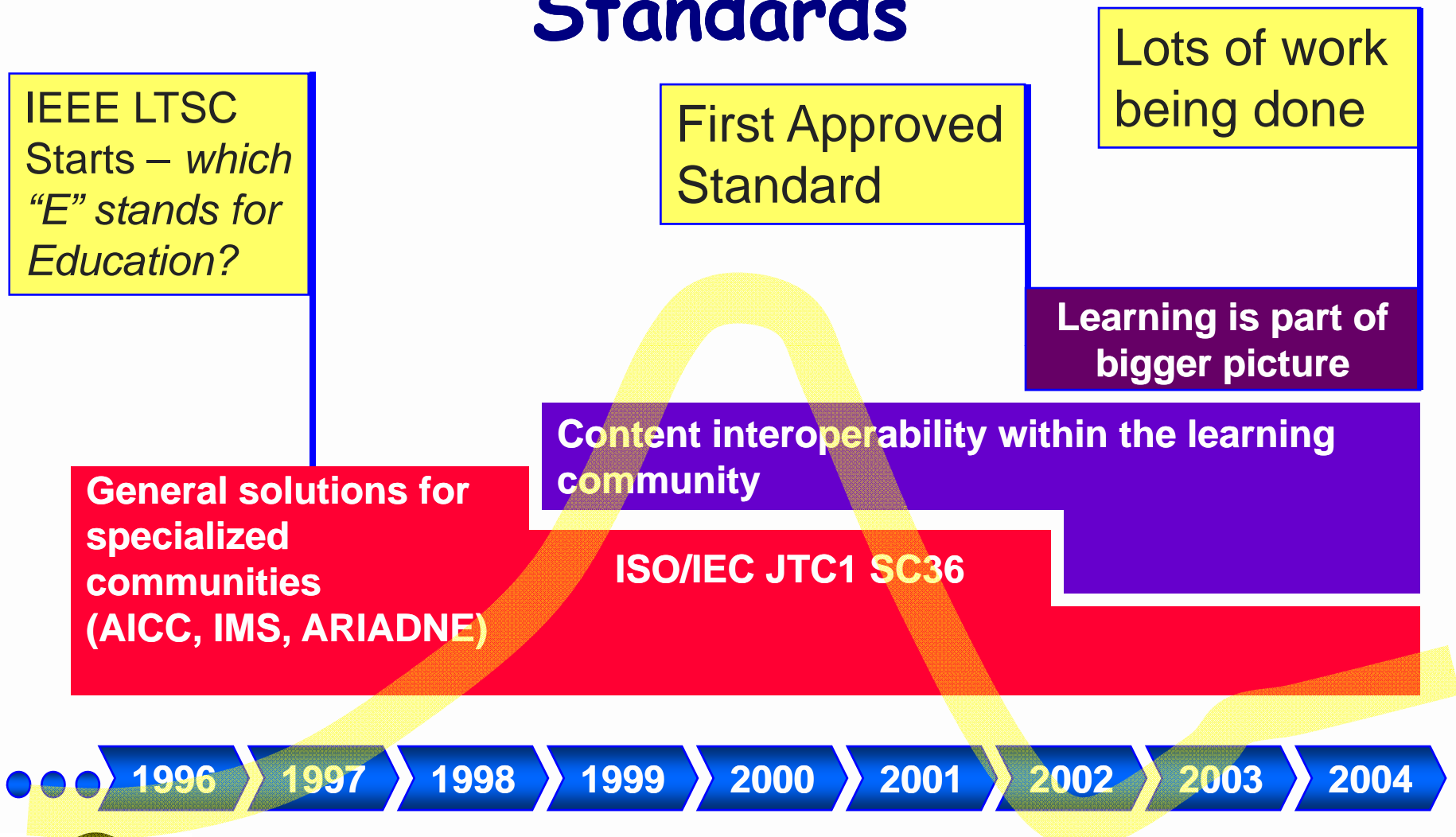


# E-Learning Hype Cycle

Courtesy RCA Wilson



# Progression of Learning Technology Standards



# IEEE LTSC Standards

- Learning Object Metadata
  - Data Model & XML Binding
- Content to Runtime Environment Communication
  - ECMAScript API, Data Model, XML Binding (in final stage of approval)
- Architecture Reference Model

# Current Projects / Directions

- Recommended Practice for Rights Expression Languages
  - Learning/Education/Training requirements for a standardized REL
- Reusable Competency Definitions
  - Adoption of an existing specification
- Reference Model for Resource Aggregates
  - Interoperability among existing standards and specifications: MPEG, METS, IMS Content Packaging, DITA, S1000D, Open Document ...
- Future of Metadata
  - RDF Binding → Dublin Core Abstract Model
  - LTSC / DCMI Collaboration
- Contemplating: Query Languages



**Observations**

**And Lessons Learned**



# Standards are not always needed

- Standards emerge when markets go from being under-served to over-served\*.
- Proprietary solutions are faster to develop and easier to control
- Standards make sense when “good enough for everyone” is better than “best for me.”

\*From: Clayton M Christensen & Michael E Raynor, (2003). *The Innovator's Solution: Creating and Sustaining Successful Growth*, Harvard Business School Press

# You can't make a standard!

*Only the market can make a standard*

## Pre-standards Activities

- Principles
- Requirements
- Early Specs
- Prototypes

## Standardization

- Compromises
- Champions
- Prototypes

## Early Adoption

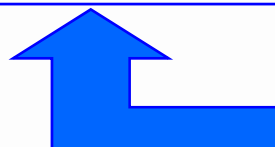
- Publication
- First Products
- PR

## Rude Awakening

- User feedback
- Revisions

## Real Adoption

- Stabilization
- Test Suites
- Products
- Conformance
- Compliance



# Adoption Comes at Different Times

- **INFRASTRUCTURE PRODUCERS**
  - Adopt when convinced its coming
- **APPLICATION DEVELOPERS**
  - Adopt when convinced its real
- **CONSUMERS**
  - Adopt when convinced its working

# Case Study - MathML

- Standard wasn't needed
  - Had good standard (T<sub>E</sub>X)
  - Vendors working on related standard (OpenMath)
- Standard was done right
  - Imprimatur of W3C
  - Consumer interest
  - Clear vision (separation of content / presentation / semantics)
- Adoption was minimal
  - Browsers did not adopt
  - Community did not promote
- 8 years later
  - Upswing in adoption
  - Significant emerging applications

# Standards Work Behind the Scenes

- Standards encode information for computers
  - They are not UI designs
  - They are not necessarily human readable
  - They are not product designs
- Don't confuse:
  - Element names (tokens) with display names
  - The ability to encode data with the requirement to collect it
  - Formats for exchange with formats for storage
- *Misunderstandings in this area has interfered greatly with community adoption of standards*

# Standards Don't *Guarantee* Interoperability

- Implementers still need to implement
- Communities still need to agree
- There are almost always semantics

# Case Study

- Metadata worst practices
  - Lots of long forms
  - Forcing internal metadata into standardized fields
  - Making lots of extensions – and exposing them to other communities
  - Assuming any two people use the same term in the same way

# “Formal” Standards *are* Important

- **Volunteer Consensus Standards Bodies:**
- Use agreed-upon procedures.
- Are defined by the following attributes:
  - Openness
  - Balance of interest
  - Due process
  - An appeals process
  - Consensus

References:

[SDO Advancement Act of 2004](#) & [OMB Circular A-119](#)

# Process Counts - And is all you get



Welcome to *IEEE Standards Development Online*

- *Initiating a Project*
- *Working Group Development*
- *Writing the Draft*

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- *Balloting the Draft*
- *Final Approval*
- *Publishing the Standard*



WORKING GROUP & SPONSOR PROCESS

SOLUTION IS FORGED  
FORMALITY VARIES  
LOTS OF MEETINGS

IEEE STANDARDS ASSOCIATION PROCESS

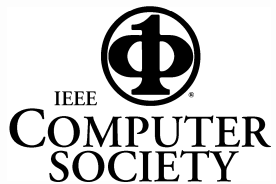
FORMAL PROCESS  
*BALLOT NEEDS 75% PARTICIPATION and 75% APPROVAL TO SUCCEED*

CREATION



APPROVAL

**Sponsor:** Organization that assumes responsibility for a particular standards idea within the IEEE.



**IEEE**

# Different Entry Points

- Start at the development stage
  - Takes 2 – 4 years
- Start at the consensus building stage (Start with an existing document)
  - Takes 1 – 3 years
- Start at the approval stage (Adopt an existing specification - “Fast Track”)
  - Takes about a year / can take less

## SC4 Activities

### TC46/SC4 Activities

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#### SC 4/WG 4 - Format structures for bibliographic information interchange in machine readable form

Report from 1996-09-30:

Balloting on the ISO international adoption of the ANSI/NISO standard Z39.50-1995 will close November 13, 1996.

Seven proposed Draft International Standardized Profiles (pDISP) for use with the ILL and Information Retrieval protocols have been forwarded to SC4 by the European Workshop for Open Systems (EWOS) to undergo the special TC46 approval process for profiles. The first four were approved and comments sent to the editor. The last three are out for ballot until November 11, 1996.

ISO 10160 and 10161, the protocol for Interlibrary Loan, is being republished by ISO in a consolidated text, incorporating the amendment approved in 1995 and correcting the 22 defects that had been found since the protocol was first published. A new amendment to the ILL protocol is being considered by SC4/WG4. It will enable certain extensions to be made to the protocol via a registration mechanism. The process has begun to officially designate the [National Library of Canada](#) as the Registration Authority for Object Identifiers (OIDs) needed when using that protocol.

Working Group 4 will meet in 1997 after a Z39.50 Implementors Group (ZIG) meeting, following the completion of balloting on the international adoption of ANSI/NISO Z39.50-1995 as an ISO standard.

<http://www.niso.org/international/SC4/wg4-0996.html>

# Summary Lessons Learned

- We are us
- The process is flexible
- Information models come first
- A dedicated technical editor is vital
- Adaptation is the sincerest form of flattery
- Standards bodies are not research labs
- “Working code trumps all theories” (Philip Dodds)
- Broad perspective makes better code
- Standardization activities build developer communities



# DISCUSSION

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