

MULTIMEDIA 93

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COURSE NOTES 45

Survey of Formal Standards for Multimedia Systems

ORGANIZER
Barry J Shepherd
IBM Corporation

LECTURERS
Philip Dodds
Interactive Multimedia Association
Steve Newcomb
Techno Teacher, Inc
Charles Poynton
Sun Microsystems Computer Corporation
Roger Price
IBM France
Richard F Puk
Puk Consulting Services
Greg Wallace
The 3DO Company



ABSTRACT

This tutorial will describe formal (ANSI and ISO) standards for all aspects of "document" based and multi participant communication based multimedia applications. It will cover "document" architecture, specifications for various types of content, compression algorithms, communications requirements, data base access, presentation and feedback facilities, and authoring system support. Covers scope, status, schedules and contact points for further information.

BIOGRAPHIES

Barry J Shepherd Chairman of ISO/IEC JTC1 SC24, and leader of the SC18/WG1 multimedia/hypermedia model and framework group. Head of JTC1's delegation to the Joint Technical Advisory Group 2 on image related standards activities. Editor of ODA amendment 2, which added color capability to the text and image content architectures of ODA. Member of the executive board of the IEEE CS task force on multimedia computing. He is responsible for coordinating IBM's position on graphics related standards.

Philip Dodds Managing Director of the IMA (Interactive Multimedia Association), a not-for-profit trade association which is focussing on cross-platform compatibility issues. Formerly CEO of Visage Inc., a manufacturer of interactive video hardware systems, and an early technical contributor to MIDI.

Charles Poynton Staff engineer at Sun Microsystems Computer corporation, where he is working to integrate video technology -- particularly high definition television and accurate color reproduction -- into computer workstations. Poynton is a member of IEEE. He is a Fellow of SMPTE and an active participant in a number of its standards committees.

Steven Newcomb PhD in music theory. SGML consultant and electronic publishing entrepreneur. Led development of first prototype HyTime engine and now releasing an object oriented follow-on, HyMinder. Vice Chairman of the Standard Music Description Language group and SGML hypermedia SIG. Associate professor of music education at Florida State University.

Roger Price Co-editor of the MHEG draft standard Familiar with SGML, which is one of two encoding methods used by MHEG Active on SC29/WG12 which is also responsible for defining the syntax of Audio Visual Interactive scriptware (AVIs)

Richard F Puk Long history of contributions to ANSC X3H3 and SC24, especially in PHIGS and (Ada) language bindings Now active on the PREMO development group Has presented tutorials at SIGGRAPH Works as a consultant and implementer of standards related products

Greg Wallace Co-founder and past Convenor and Editor of SC29 WG10 (IPEG) and now Head of the US delegation to SC29/WG11 (MPFG) Previously employed by Digital Equipment Corporation as Manager of Multimedia Advanced Development Currently employed by The 3DO Company as Compression Technology Manager

TABLE OF CONTENTS

I Overview of the course, and the formal standards development process This will include ISO and CCITT as well as the corresponding ANSI chartered technical committees The JTC1 multimedia hypermedia reference model and framework will be described SHEPHERD SLIDES Pages I 1-4 BACKUP Pages I 1-10

II The Interactive Multimedia Association is an industry group which issues Recommended Practices (RPs) for various aspects of multimedia systems Learn about their RPs for digital audio and for interactive video systems (consisting of a video disk and a computer), as well as their three Requests For Technology which are expected to lead to RPs for scripting languages, data exchange containers, and multimedia services The RPs may be considered by ISO standards committees DODDS SLIDES Pages II 1-16 BACKUP None

III Content and content attribute semantics determine the visible and audible parts of a multimedia document or cooperative session Discover various committees views on visible content, including raster images computer graphic images, still video frames, computer generated animation and motion video Similar information will be provided on the various types of audio content including uncompressed and compressed sound and Musical Instrument Digital Interface (MIDI) sequences SHEPHERD SLIDES Pages III 1-6 BACKUP Pages III 1-10

IV The Multimedia Hypermedia Experts Group (MHFG) in JTC1 SC29/WG12 has joint participation from CCITT Hear the co-editor of the standard describe the syntax (not semantics) of the attributes required for real time interchange of final form (nonrevisable) content for presentation Interactivity and synchronization of monomedia components in composite objects, even in minimal resource environments, is an additional focus PRICE SLIDES Pages IV 1 6 BACKUP Pages IV 1 8

V The ISO/IEC has already accepted an SGML-based standard for the representation, archival storage, and interchange of multimedia and hypermedia documents, it is called "HyTime" (ISO 10744) HyTime adds conventions to the SGML (Standard Generalized Markup Language, ISO 8879) which allow a variety of constructs, including hyperlinks and rendition instructions, to be expressed in a technology-neutral fashion HyTime is being chosen as a "source-code" representation by those who make large investments in the creation of hypertext and hypermedia documents, because it will protect such information from technological obsolescence NEWCOMB SLIDES Pages V 1-2 BACKUP Pages V 1-32

VI SC24 has been given the responsibility for developing standards for supporting the presentation of multimedia and accepting operator inputs This support covers both document based and communications based multimedia applications Learn how PREMO, the newest API from SC24, will address these responsibilities Also learn how the image processing capabilities of the evolving Image Processing and Interchange (IPI) standard from SC24 can assist in creating multimedia presentations PUK SLIDES Pages VI 1-8 BACKUP Pages VI 1-14

VII Telecommunications based multimedia applications This module introduces the International Telecommunications Union (ITU) blueprint for future international multimedia telecommunication services Following two examples to introduce the concept of a telecommunications service and evaluate its impact, learn how the ITU see the conception of wide area and international multimedia applications The module provides an example of a future multimedia service which is already the subject of a series of ITU recommendations PRICE SLIDES Pages VII 1-4 BACKUP Pages VII 1-10

VIII In the strategic time frame, it is generally agreed that video information will become digitally encoded Hear about the Society of Motion Picture and Television Engineers (SMPTE) working group on digital motion video header formats Included will be their proposed digital architecture for video information which can accommodate various resolutions, screen aspect ratios, and frame rates POYNTON SLIDES Pages VIII 1-55 BACKUP None

IX Joint Photographic Experts Group (JPEG) is the informal name for ISO's SC29/WG10 Through joint participation with CCITT SG VIII, JPEG has developed a general purpose compression and encoding standard for grayscale and color "photographic" still images This method allows compression and quality to be traded-off at compression time Learn what the published standard can do, and how it works WALLACE SLIDES Pages IX 1-6 BACKUP Pages IX 1-18

X The Moving Pictures Experts Group (MPEG) is the informal name for ISO's SC29/WG11 Through joint participation with CCITT SG XV, MPEG has developed a standard (MPEG-1) for digital compression of VHS quality moving pictures and CD quality audio at around 1.5 Mbit/sec Hear what it can do, and how it works Also hear about the follow-on standard (MPEG-2), applicable to compressed data rates

from 3 to 15 Mbit/sec, with quality levels from today's laser video up through tomorrow's HDTV WALLACE SLIDES Pages X 1-12 BACKUP Pages X 1-12

XI This module provides a wrapup of the days presentations, and panel session of all the speakers available to answer questions from the audience SHEPHERD SLIDES Pages XI 1-2 BACKUP Pages XI 1-2

SCHEDULE

Module I	Overview and standards development	30 minutes
Module II	IMA RPs and RPTs	30 minutes
Module III	Content semantics and attributes	30 minutes
Module IV	MHEG content specification	35 minutes
Module V	HyTime	70 minutes
Module VI	Presentation support (PREMO)	35 minutes
Module VII	Communications considerations	35 minutes
Module VIII	Digital video formats	35 minutes
Module IX	IPEG encoding/compression	30 minutes
Module X	MPEG encoding/compression	40 minutes
Module XI	Wrapup	20 minutes