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N9290

SC 29 Business Plan & report on marketing initiatives

~Coding of Audio, Picture, Multimedia and Hypermedia Information~

Kohtaro Asai

SC 29 Chairman

Scope of SC 29

- Coding of Audio, Picture, Multimedia and Hypermedia Information
  - Standardization of coded representation of audio, picture, multimedia and hypermedia information - and sets of compression and control functions for use with such information such as
    - Audio information
    - Bi-level and Limited Bits-per-pixel Still Pictures
    - Digital Continuous-tone Still Pictures
    - Computer Graphic Images
    - Moving Pictures and Associated Audio
    - Multimedia and Hypermedia Information for Real-time Final Form Interchange
    - Audio Visual Interactive Script ware
    - Excluded: Character Coding

Summary of the last period

- SC 29 has two active WGs and Advisory Group on Management.
  - **WG 1: Coding of Still Pictures**
  - **WG 11: Coding of Moving Pictures and Audio**
- SC 29 has 27 P-members and 16 O-members.
- In the last period, SC 29 held one SC Plenary meeting, WG 1 held three WG meetings, and WG 11 held four WG meetings. The numbers of participants are shown below.
  - SC 29: 21st SC 29 Plenary meeting (12)
  - WG 1: 43rd (61), 44th (58), 45th meeting (49)
  - WG 11: 82nd (355), 83rd (267), 84th (219), 85th meeting (272)
- SC 29 had more than 90 Ballots in this period and had sufficient number of participation of P-members.
- 95 International Standards developed by SC 29 were published in the last period.

Programme of work

- **WG 1**
  - Coding of Still Pictures
  - WG 1 Program of work

- **WG 11**
  - Coding of Moving Pictures and Audio
  - WG 11 Program of work

Where our standards work

- **WG 1 (JPEG, JBIG)**
  - Digital Still Camera and photo viewers
  - Digital Cinema
  - Digital images on the web, personal photos,…
- **WG 11 (MPEG)**
  - Digital broadcasting & video delivery system (terrestrial, satellite, cable and IPTV)
  - Digital music player (MP3, AAC,…)
  - Mobile videophone, portable video player
  - DVD and Blu-ray player, recorder
  - Camcorder
  - Broadcasting programs, Internet streaming, home video,…

Participation in SC 29

- Plenary Meetings

ISO/IEC JTC 1/SC 29

Status of P-members' Participation

Part 1: Plenary Meetings

Last Updated: 2008-08-08

No.	Date Place	AU	BE	BR	CA	CN	CZ	DK	FI	FR	DE	IN	IE	IL	IT	JP	KR	LU	MY	NL	NO	PL	PT	RO	RU	SG	ES	SE	CH	TR	GB	UA	US	TTL
19	06-07-24/25 Klagenfurt, Austria	X								X	X	X				X	X		X						-	-		X	X	X	X		X	9
20	07-04-30/05-01 San Jose, USA	X			X	X				X	X	X		-		X	X		X						-	-			X	X	X		X	10
21	08-07-28/29 Hannover, Germany								X	X	X	X		-		X	X		X			-			-	-		P	X	X			X	9
	%	33	32	0	48	42	33	0	67	95	100	0	45	52	95	100	76	0	0	0	5	47	0	11	0	8	11	0	86	81	95	0	100	

- Ballots (>90)

DueDate	Ballot	AU	BE	BR	CA	CN	CZ	DK	FI	FR	DE	IN	IE	IL	IT	JP	KR	LU	MY	NL	NO	PL	PT	RO	RU	SG	ES	SE	CH	TR	GB	UA	US	total
07-10-18	14496-5:2001/FPDAM18	X			X	X	X	X	X	X	X		-		X	X	X		-	X	X	X		-	-	X		X	X	-	X	X	X	21
07-10-18	CD23000-10	X			X	X	X	X	X	X	X		-		X	X	X		-	X	X	X		-	-	X		X	X	-	X	X	X	21
07-10-20	13818-1:2007/FDAM3	X		X	X	X	X	X	X	X	X		-		X	X	X		-	X	X	X		-	-	X		X	X	-	X	X	X	22
07-10-30	14496-10:200V/FDAM1	X		v	X	X	::	X	X	X	X		-		X	X	X		-	X	X	X		-	-	X		X	X	-	X	X	X	22
08-09-07	21000-8:2008/FPDAM1	X	X	X	X	X	X	X	X	X	X		-		X	X	X		-	X	X	X		-	-	X		X	X	-	X	X	X	23
08-09-07	23000-3:2007/FPDAM1	X	X	X	X	X	X	X	X	X	X		-		X	X	X		-	X	X				-	X		X	X	-	X	X	X	23
08-09-08	FCD23004-8	X	X	X	X	X	X	X	X	X	X		-		X	X	X		-	X	X				-	X		X	X	-	X	X	X	22
	%	99	71	47	96	97	95	69	85	99	99	39	54	95	99	98	4		98	98	97	36		91	94	99	97	99	91	99			
DueDate	Ballot	AU	BE	BR	CA	CN	CZ	DK	FI	FR	DE	IN	IE	IL	IT	JP	KR	LU	MY	NL	NO	PL	PT	RO	RU	SG	ES	SE	CH	TR	GB	UA	US	total

Cooperation

- Liaisons in JTC 1: 5
- Liaisons within ISO/TC and IEC/TCs: 8
- Category A Liaisons: 17
- Category B Liaisons: 3
- Category C Liaisons: 34
- SC 29 Liaison members

- Example
  - Joint Video Team (JVT) in WG11 – ITU-T SG16
    - MPEG-4 AVC | ITU-T H.264

Emmy Award

- JVT received Emmy Emmy Award from The Academy of Television Arts & Sciences for the development of MPEG-4 AVC (ISO/IEC 14496-10) High Profile, in August 2008

- AVC High Profile is used in Blu-ray disc, broadcasting, IPTV and so on

Recent achievements of WG 1

- **JPSearch** (Still Image Search) TR published
  - covers the Framework and System Components of the standard
- **Digital Cinema** AHG has been working on archival profiles for Digital Cinema movies
  - Allow both long-term storage of content using lossless compression and fast scalable access to archives with lossy compression
- **JPEG XR** image coding system to leverage the tools developed in and around JPEG XR image coding
  - The specification of the image coding is Part 2
  - It aims to bring JPEG-standardized high dynamic range imaging and compression to a new generation of digital cameras (FCD)
- Request for a new work item to standardize the next generation of JPEG image compression called **AIC**
  - Call for proposal on evaluation methodologies and compression technologies

Recent achievements of WG 11

- **MVC (Multi-view Video Coding)**
  - enables new applications e.g. high-quality stereo and 3D video
  - exploiting the similarities between multi-camera captures
  - MVC achieves a reduction in bit rate of approximately 20% on average, when compared to the traditional method of encoding views from each camera separately

- **FTV (Free viewpoinT Video)**
  - allows each user to view the real 3D space from different user viewpoints

- **AAC-ELD (Enhanced Low Delay)**
  - High-quality yet low delay coding of speech and music
  - Full audio bandwidth with no more than 32 ms of latency
  - AAC-ELD provides quality and compression performance that is superior to all competing technologies
  - Wide application areas expected such as VoIP, broadcasting equipment for live streaming, and super wideband mobile and fixed video/audio conferencing

Market requirements (1)

- WG 1
  - JPEG 2000 has been adopted by Digital Cinema Initiatives for distribution of digital movies to theatres, including 3D movies. The rollout of this solution can be seen at selected theaters. The International Federation of Film Archive (FIAF) is considering JPEG 2000 as a future standard for movie archives.
  - JPEG2000 has been used for surveillance, medical imaging, photo ID, photo library and other applications.

Market requirements (2)

- WG 11
  - **MPEG-4 Part 10 AVC** has been used for emerging video discs, digital television broadcasting systems, visual communication equipment, IPTV, digital video recorders, portable video players and so on
  - **MP3, AAC, HE-AAC** have been used for digital broadcasting, mobile handsets and various audio players
  - **MP4** (MPEG-4 file format) widely used in many PCs, recorders and players including 3G mobile phones
  - **LASeR** (Lightweight Application Scene Representation) adopted and used in various services for mobile phones
  - **MPEG-7** at the basis of some application standards (e.g. TV Anytime)
  - **Binary XML from MPEG-B** has been used in the commercial services e.g. Mobile TV over DVB-H and IPTV
  - **MPEG-E** multimedia middleware considered by IPTV-GSI

Recent example of industry deployment

- **MPEG-4 AVC amended with SVC**
  - SVC for Scalable Video Coding
  - Standardized in November, 2007
  - The results of verification tests indicate that for an increase of less than or equal to 10% of bit rate overhead for equivalent quality, scalability can be achieved for various types of applications
  - Now used for Teleconferencing

Long-year results in marketplace

- MPEG has celebrated its 20th anniversary
- Recalling MPEG-2 (ISO/IEC 13818)
  - 15 year old Standard
  - Still being amended, to be amended
    - Fulfilling new requirements
      e.g. newly standardized bitstreams in Transport,
      newly defined color spaces …
  - Growing use in the world
    - ~3.5 Billion MPEG-2 Devices
      (since its birth to now)

Risk analysis of SC 29 (1)

- Lack of participants: Two working groups currently have enough resources (WG 1: 50, WG 11: 300 people
  - SC 29 constantly monitors attendance of WG

- Management of documents: The WGs depend on having good electronic document repositories and systems and the maintenance of these is important for the efficient work of the WGs
  - Currently such repositories and systems are operated and maintained by the WG members and SC 29 Secretariat

Risk analysis of SC 29 (2)

- Risk associated with the uncertain presence of applicable patents
  - Parties attempting to implement the standards may find that patents owned by parties that have not participated in the development process are not available on RAND terms
  - They may also find that the licensing conditions of the standards that they expected to use in their products are unsuitable to their needs and hence they may feel to be "discriminated" in the use of the standards
  - Reduction of these risks is outside the control of SC 29
  - SC 29 and WGs continue to encourage their members to submit patent statements expecting that it helps to clarify the potential licensors of applicable patents and to increase the opportunities of licensing under reasonable conditions

Risk analysis of SC 29 (3)

- SC 29 requested to consider reducing the 5 month ISO DIS ballot period to 4 months at the last JTC 1 Plenary meeting, since the 5 month period would impede the process of SC 29's development of standards and have a negative impact [JTC 1 N8678]

- SWG-D was instructed to prepare a contribution to ISO TMB taking the SC 29's contribution into account

- SWG-D submitted a contribution on the length of the DIS ballot period, which contains SC 29's contribution, to the IEC SMB Ad Hoc Group 25 for consideration at its meeting held on 2008-05-06

  – SC 29 is concerned with the status of its request

This is about Normal Process

Strategies

- SC 29 will continue to provide information on the progress of standardization work to the public through SC's and WGs' web sites as well as press releases or awareness events in order for attention to be paid to the area of the multimedia information technology
  - SC 29: http://www.itscj.ipsj.or.jp/sc29/
  - SC 29/ WG 1: http://www.jpeg.org/
  - SC 29/WG 11: http://www.chiariglione.org/mpeg/
  - SC 29/WG 11 (for meeting): http://wg11.sc29.org/

Opportunities of SC 29

- SC 29 has been working to standardize coded representation of multimedia and their control function, interface with other elements, middleware for general/specific applications

- Many ISs from SC 29 have been adopted and used for multimedia packaging, broadcasting and communication, and those standards have been contributing to the industry

- There are still emerging needs for digital media representation with higher resolutions, higher sampling density, higher dynamic range and higher dimensions, where further efficiency in compression are needed

- SC 29 has a lot of opportunities to fulfill such requirements

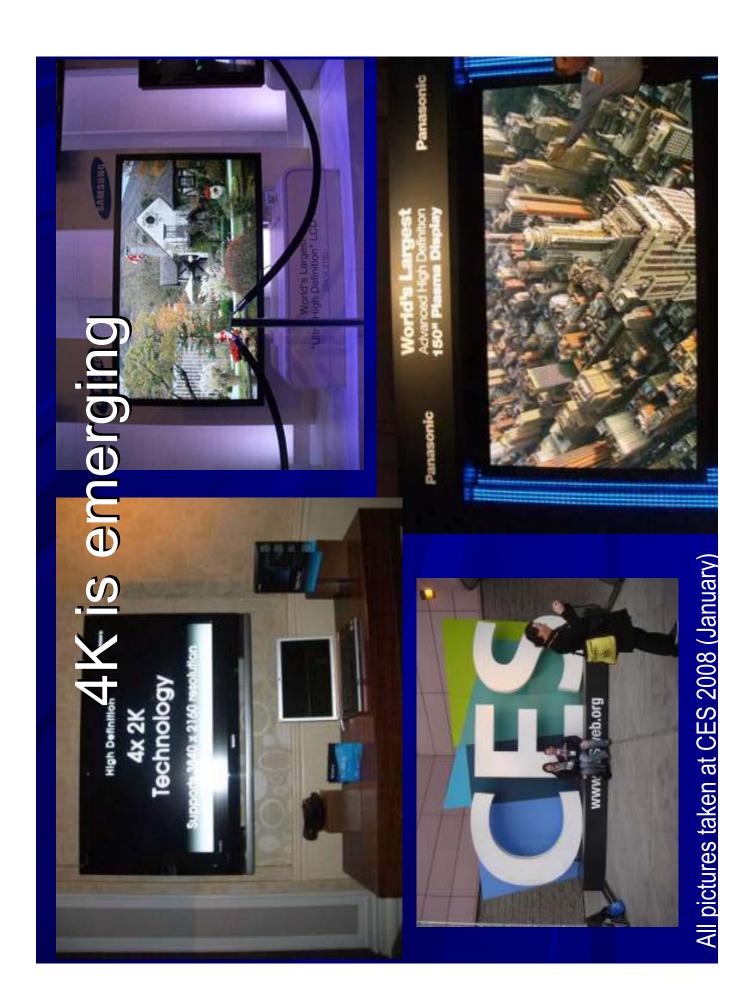# Next work period (WG 1)

- The digital cinema AHG has been working on the archival of motion pictures and related contents

- JPSearch
  - Parts 2 (schema and ontology registration and identifications)
  - Parts 3 (JPSearch query format)
  - Part 4 (metadata embedded in image data file formats)
  - Part 5 (data interchange format between image repositories)

- JPEG XR image coding system
  - Part 1 System architecture (to reach FDIS)
  - Part 2 JPEG XR image coding specification (to reach FDIS)
  - Part 3 Motion JPEG XR (just started)

- The work on AIC (Advanced Image Coding and Evaluation Methodologies) will be continued

4K is emerging

All pictures taken at CES 2008 (January)

Next work period (WG 11)-1

- Higher levels of video applications need further compression and optimization

- Industry needs even greater capabilities for the most demanding applications that require high fidelity and high picture resolutions

- We see
  - Palm-size HDTV camcorders
  - Digital cameras with more than 10 million pixels
  - Display supporting 4K resolution in horizontal (twice as HDTV)
  - Some cameras claiming 4K video

- 4K: a candidate of broadcasting after analog switchoff

- Continuing studies of UHDTV with 8K resolution

- Quality-preserving-compression is needed for these high-level applications, which could not be fulfilled by the straightforward extension of the existing standards

Toward higher quality

- WG 11 - MPEG
  - Has been made aware of new results in video compression, particularly for high resolution pictures
  - Issued a Call for Test Material
- Plan
  - Will issue a Call for Evidence in February 2009
  - Will assess the results in April 2009
- If compression results confirmed, MPEG will issue a Call for Proposals
- The High Performance Video Coding (HVC) standard could be completed in 2012

Requirements for HVC
(from ISO/IEC JTC1/SC29/WG11/N10175)

- Support of High-Quality Sources
  - Resolution: VGA to 4K (potentially QVGA to 8K)
  - Chrominance format: 4:2:0 & 4:4:4
  - Bit-depth: 8-14 bit per pixel
  - Frame rate: 24-60 fps or more
- Complexity
  - Feasible implementation at the expected time of usage
  - Parallel processing ability
  - Much more consideration of "pixel rate"
    - $Y = F(\mathbf{x})$; *Total complexity = Algorithm complexity x pixel rate*

Next work period (WG 11)-2

- Unified speech and audio coding: The Working Draft text and reference software source codes will be available in early time of the next period

- RVC: Reconfigurable Video Coding = Codec Configuration Representation + Video tool library to be finalized

- Further progresses are expected for
  - FTV/3DV
  - MXM (MPEG eXtensible Middleware)
  - ROSE (Representation of Sensory Effect)
  - MPEG-V (Information exchange with virtual worlds)
  - MVCO (Media Value Chain Ontology)
  - Rich Media UI Framework

26

Next work period summary

- SC 29 works on coding of rich media contents with the set of tools to support the production, circulation, access and consumption of such contents

- Further work on coding is under way to continue to serve industry needs as application requirements move forward into supporting ever higher levels of image/video resolution, fidelity and quality

Future meetings in 2009

- **SC 29 Plenary**
  - 22nd meeting in Maui, April 2009
- **WG 1**
  - 47th meeting in San Francisco, January 2009
  - 48th meeting in Maui, April 2009
  - 49th meeting in Sardinia, July 2009
  - 50th meeting in Xian, October 2009
- **WG11**
  - 87th meeting in Lausanne, February 2009
  - 88th meeting in Maui, April 2009
  - 89th meeting in London, June/July 2009
  - 90th meeting in Xian, October 2009

Response to SWG-A Resolution 17

- SWG-A 2008 Tokyo Resolution 17
  - A question included in NWI Proposal form
  - "Are there any known accessibility requirements and/or dependencies?"

- Observation of NP ballots (three cases)
  - The answers were
    - "No" or
    - "Not at this stage, but will be considered"

END