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## BUSINESS PLAN FOR JTC 1 /SC 23

PERIOD COVERED: October 2011 – September 2012

SUBMITTED BY: Kei Yamashita, Chair of JTC 1/SC 23

### 1. 0 MANAGEMENT SUMMARY

#### 1. 1 CHAIRMAN'S REMARKS

After the last JTC1 meeting in Jeju, Korea in November, 2012, the continuing projects of the amendment of ISO 9660, Volume and File structure of CD-ROM (see 1.11), the second edition of ISO/IEC 29192, the data-migration method for CD & DVD (see 1.12), and the 4 writable BD formats (see 1.13) were published on April 14, 2013, transferred to ITTF on July 18, 2013 and published on July 1, 2013, respectively.

Furthermore, joint work with ISO/TC42, ISO/TC171/SC1 and Ecma international TC31 to update ISO/IEC 16963 (see 1.14) was confirmed at the 5<sup>th</sup> SC23/JWG1 meeting held in Sapporo, Japan on December 13, 2012 and started the discussion. At the 5<sup>th</sup> meeting, the concept of the revision of the standard, the revision creation procedure, etc, were discussed. Then at the 6<sup>th</sup> meeting held in Salt Lake City, UT USA in May, the revision standard creation procedure was confirmed by the members and a 1<sup>st</sup> WD based on the concept proposed from Japanese national body (JNB) of SC23 was discussed. At the 7<sup>th</sup> JWG1 meeting, the updated WD together with comments on the 1<sup>st</sup> WD from TC42 and responses from JNB were discussed and agreed to create a CD based on the discussion result. The CD ballot is expected to start in early October.

This project is expected to be completed in the 2Q of next year.

##### 1.1.1 Amendment of ISO 9660: Volume and File structure of CD-ROM

In 2011, SC 23 started discussion of the old but still widely used ISO 9660 Information processing – Volume and file structure of CD-ROM for information interchange standard. This standard was originally developed by SC 15, which was disbanded, and was maintained by JTC 1 directly. After the default ballot by JTC 1, SC 23 took over the maintenance responsibilities of the standard.

Today's available CD-ROMs are manufactured in accordance with extended specifications of CD-ROM rather than ISO 9660. The extended specifications are not strictly defined. Therefore, in order to avoid any confusion or misunderstanding, a proposal to amend this standard was made by the JNB. After the discussion, the amendment of ISO 9660 was published on April 14, 2013.

##### 1.1.2 Revision of ISO/IEC 29121: Data migration method for writable DVDs

During discussion of an audio archive system at IEC/TC 100 TA 6 in Japan, they found some issues in the standard of ISO/IEC 29121:2009 for their anticipated system. JNB members and Japanese IEC TC 100 TA 6 members discussed how to update this standard. IEC/TC 100 was especially concerned about the test interval for monitoring the data if the lifetime of the disks estimated with ISO/IEC 16963 is known. A new work item for the 2<sup>nd</sup> Edition of ISO/IEC 29121 was approved on May 27, 2012. After a CD Ballot, based mostly on editorial comments from ISO/TC171/SC1 and JNB, an updated version of draft was created by its editors as a DIS. The DIS ballot started on March 3, 2013 and was approved without any comment on June 29, 2013. The final text was submitted to ITTF for publication on July 18, 2013.

### **1.1.3 Standardization of BD Physical Format**

During the development of ISO/IEC 16963 (Test method for estimation of lifetime of writable CDs/DVDs), many optical disc users, including SC 23/JWG 1 members, requested the inclusion of the BD format in this standard. Therefore, after the completion of the development of ISO/IEC 16963, the JWG 1 members (SC 23, ISO/TC 42, ISO/TC 171/SC 1, and Ecma TC 31) jointly requested, in January 2011, the Blu-ray Disc Association (BDA) to make their de facto Blu-ray disc format (BD-R/RE format) an international standard. In October 2011, the BDA accepted this request. On December 23, 2011, four recordable and rewritable BD standards were proposed as new work items via the JNB. The four NPs were approved as Projects 30190(BD-R SL/DL), 30191(BD-R TL/QL), 30192 (BD-RE SL/DL) and 30193(BD-RE TL) in March, 2012. After reviewing their WDs, CD ballots (in July, 2012) and DIS ballots (in December, 2012) were started, respectively. On March 14, 2013, all four BD Standards were approved without any comment and were published on July 1, 2013.

### **1.1.4 Creation of ISO/IEC 16963 revision**

At the 16<sup>th</sup> SC23 plenary meeting, held in Lisbon, Portugal on June 26, 2012, SC23 decided to update ISO/IEC16963, by inclusion of BD recordable disks and when draft standards of four BD formats come to the DIS ballot stage (1.1.3), discussion of ISO/IEC 16963 revision would be started. After this meeting, SC23 asked other SC23/JWG1 member organizations that created the original ISO/IEC16963 standard, ISO/TC42, ISO/TC171/SC1 and Ecma International, to join this work. They all they agreed with this revision work and promised to send experts to this meeting. The first revision meeting, the 5<sup>th</sup> of SC23/JWG1, was held with the members from SC23, ISO/TC42 and Ecma International in Sapporo, Japan on December 13, 2012.

At this meeting, to confirm the convener, co-convener and editors of the revision, a procedure including collaboration with Ecma International and contents of the revision were discussed and accepted.

The 6<sup>th</sup> SC23/JWG1 meeting which was the 2<sup>nd</sup> meeting discussing the revision was held in Salt Lake city, UT, USA on May 15, 2013. A 1<sup>st</sup> draft of the ISO/IEC 16963 revision was proposed. The procedure based on the communication with ITTF (ISO/CS) and with ISO/IEC directives Part 1 change, which was approved at 56<sup>th</sup> ISO TMB meeting held on February 20/21 2013(SC23/JWG7 N48), was confirmed by the members.

The 7<sup>th</sup> SC23/JWG1 meeting was held in Tokyo, Japan on September 25, 2013 and discussion of the 2<sup>nd</sup> WD will be completed. At that time, an updated WD accepted by JWG1 will become a CD and a CD ballot will be issued in early October.

The ISO/IEC 16963 revision project is expected to be finalized by the middle of 2014.

#### **(1) 5<sup>th</sup> SC23/JWG1 meeting**

##### 1) Date and place:

Dec. 13, 2013 at Sapporo Education Center, Sapporo, Japan,  
hosted by SC23/JNB

##### 2) Attendance

SC23: 12 (Japan), 1 (Switzerland), ISO/TC42 : 2, ISO/TC171/SC1:absent,  
Ecma International: 1  
Convener :1, Co-Convener:1

##### 3) Discussion

###### (i) Appointment of Conveners

Mr. Kei Yamashita (SC23) and Mr. Mark Worthington (TC42) were approved as Convener of the JWG (for the next 3-year period – until the end of 2015) and as Co-Convener, respectively.

###### (ii) Approval of the work

The revision of ISO/IEC 16963 with the addition of the BD recordable and rewritable Disks was approved

###### (iii) Discussion of the procedure of the work.

TC42 expressed its desire to have the revised ISO/IEC16963 standard balloted in parallel in JTC1 SC23 with ISO TC42 providing feedback both standards-approval processes. SC23 accepted this request in principle, whether such procedure is possible and how to do it should be clarified by communication with the ITTF. During this procedures discussion, synchronization work of ECMA396, which created the original draft of ISO/IEC 16963, and the ISO/IEC 16963 update were also discussed.

Both will be reported and confirmed at the next (6<sup>th</sup>) SC23/JWG1 meeting.

(iv) Appointment of Project Editors:

Prof. Mitsuru Irie, Prof. Toshirio Sugaya and Mr. Mark Worthington were appointed as Project editors and will make a draft revision of ISO/IEC 16963

**(2) 6<sup>th</sup> SC23/JWG1 (WG7) meeting**

1) Date and place:

May. 15, 2013 at the Marriott Hotel in Salt Lake City, UT, USA,  
hosted by Millenniata (TC42 member)

2) Attendance

SC23: 5 (Japan), 1 (Switzerland), ISO/TC42: 4, ISO/TC171/SC1: absent,  
Ecma International: 1

Convener: 1, Co-Convener: 1

Through web online: SC23: 3 (Japan), 1(USA)

3) Discussion

(i) Procedure of the work

The procedure for creating the 2<sup>nd</sup> edition ISO/IEC 16963 (ISO/IEC JTC1/SC23 WG7 N 48) was reported by the SC23 Secretary (see below) and was unanimously approved.

1) A NWI Ballot is no longer required for revision:

(ISO/IEC Directive Part1 revised at ISO/IEC 56<sup>th</sup> TMB meeting)

2) WDs are to be discussed by JWG1

3) A CD ballot will be conducted in parallel within JTC1/SC23, ISO/TC42 and ISO/TC17/SC1.

4) A DIS ballot will be issued to JTC1 P-members while ISO/TC42 and ISO TC171/SC1 will submit their comments as JTC1 liaisons.

**(ii)** ECMA-396 will be updated by Ecma International synchronized with the final test to be published as the 2<sup>nd</sup> edition of ISO/IEC 16963.

**(iii)** The draft presented by the JNB was accepted as a WD for the 2<sup>nd</sup> edition of ISO/IEC 16963.

TC42 will provide their comments on the WD by July 1<sup>st</sup> 2013. Based on these comments, the editors will provide an update version one month before the September meeting.

(iv) Future meeting schedule

The 7<sup>th</sup> JWG1 meeting will be held on September 25, 2013 in Tokyo, JAPAN hosted by SC23/JNB.

8<sup>th</sup> JWG1 meeting; March 2014 in Switzerland.

### 1. 3 PROJECT REPORT

The following summarizes the progress of SC 23 projects since the last JTC 1 Plenary Meeting held in Jeju, Korea in 2012.

Total number of on going projects: 7

#### a) Optical Disk

Total number of ongoing projects: 4

- CD 30190, Information technology -- Digitally recorded media for Information interchange and storage -- 120 mm Single Layer (25,0 Gbytes per disk) and Dual Layer (50,0 Gbytes per disk) disk (BD Recordable BD-R SL/DL)
- CD 30191, Information technology -- Digitally recorded media for Information interchange and storage -- 120 mm Triple Layer (100,0 Gbytes per disk) and Quadruple Layer (128,0 Gbytes per disk) disk (BD Recordable BD-R TL/QL)
- CD 30192, Information technology -- Digitally recorded media for Information interchange and storage -- 120 mm Single Layer (25,0 Gbytes per disk) and Dual Layer (50,0 Gbytes per disk) BD Rewritable disk (BD-RE SL/DL)
- CD 30193, Information technology -- Digitally recorded media for Information interchange and storage -- 120 mm Triple Layer (100,0 Gbytes per disk) BD Rewritable disk (BD-RE TL)

#### b) Reliability

Total number of ongoing projects: 2

- CD 29121 (Second Edition)  
Information technology --- Digitally recorded media for information interchange and storage -- Data migration method for DVD-R, DVD-RW, DVD-RAM, +R, and +RW disks
- Revision of ISO/IEC 16963: 2011/Amd 1:2013  
Information technology -- Digitally recorded media for information interchange and storage -- Test method for the estimation of lifetime of optical media for long-term data storage

#### c) Magnetic Tape

Total number of projects: 82

Total number of ongoing projects: 0

#### d) Removable Hard Disks

Total number of projects: 1

Total number of ongoing projects: 0

#### e) Volume and File Structure

Total number of projects: 1

Total number of ongoing projects: 1

- ISO 9660:1988/Amd 1 2013, Information processing-- -- Volume and File structure of CD-ROM for information interchange – Amendment 1

### 1. 4 CO-OPERATION AND COMPETITION

SC 23 has three internal liaisons within ISO and IEC (ISO/TC 42, ISO/TC 171 and

IEC/TC 100/ TA 6), one Category A external liaison (Ecma International) and one Category B liaison (World Intellectual Property Organization; WIPO)

#### **1.4.1 Ecma International**

SC 23 has a close relationship with Ecma International (TC 31). This relationship has been one of fruitful cooperation for many years. After creation of ECMA-396 specifying a CD/DVD life-estimation test method, revision of ECMA-396 was jointly discussed in SC23/JGW1. (ECMA-396 was approved as ISO/IEC 16963 through fast track procedure.)

Furthermore, for data archive purposes, a new Disk cassette and a format for writing and reading 5 disks in parallel were proposed at the 96<sup>th</sup> TC31 meeting on Dec.16, 2012. These 2 standards are expected to be approved by Ecma's General Assembly in December, 2013.

#### **1.4.2 IEC/TC 100/TA 6**

SC 23 has been concerned about the activity of IEC/TC 100/TA 6 for many years. In 2011, TC100/TA6 requested an update of data-migration method ISO/IEC29121. SC23, working together with Japanese TC100/TA members, completed discussion of a revision of ISO/IEC29121 by the end of July, 2013. In parallel, IEC/TC 100/TA 6 is working on the creation of an audio-archive system standard comprising a part 1 for the Physical layer and part 2 for the Logical layer. In this standard, using ISO/IEC 16963 and ISO/IEC 29121 as referenced, disc-life estimation and data-migration methods for extending storage times of audio data were specified. The life time is divided into three ranks. They are 30 years, 60 years, and 100 years for disks stored at 25 deg. C and 50% RH.

#### **1.4.3 ISO/TC 42 & TC 171/SC 1**

As a large number of optical disk cartridges are used in various fields, the life and preservation conditions of optical disks have become very important for users.

ISO/TC 42 - Photography - has developed international standards on methods for estimating the life expectancy of CD-R (ISO 18927:2002) and MO (ISO 18926:2006).

During the standardization process of ISO/IEC 10995 by JTC 1/SC 23, ISO/TC 42 proposed creation of a Joint Working Group (JWG 1). After the establishment of JWG 1, the liaison was transferred to JWG 1. Experts from ISO/TC 42 joined JWG 1 meetings either in person or via teleconference. SC1 of ISO/TC 171 - Document Management - has also designated a liaison to JWG 1. The 2nd edition of ISO/IEC 16963 (see 1.1.4) is being developed by JWG 1 now. This project is expected to be finalized by the middle of 2014.

## **2. 0 PERIOD REVIEW**

### **2. 1 MARKET REQUIREMENTS**

The total amount of digital data distributed world-wide will expand from 4 ZB (a ZB is 1,000 Exabytes or 1,000,000 Petabytes) in 2012 and become 35 ZB in 2018 (data from IDC). On the other hand, the total storage capacity on all storage media, which includes HDD, Magnetic tape (MT, including LTO), Semiconductor memory (SSD), Optical disc (ODD) etc., will also expand from 2 ZB in 2012 to 12ZB in 2018 (data from TSR). Even though all of the distributed digital data will not have to be stored in some types of storage devices, it is expected the storage-capacity enhancement of each type will steadily increase.

Under such conditions, recently, the data-archive storage market has become a most-considerable business area. The total archive storage capacity will rapidly increase from 135EB in 2012 to 1.2ZB in 2018.

Regarding usage of media for this market, before 2010, more than 60% was covered by MT. However, HDD will take over MT's position gradually and become more than 80% of the data archive market in 2018. On the other hand, usage of ODD will be limited for this market because of the lesser capacity per disk than the other media. Even under such conditions, it is noted that users are being encouraged to understand the unique features of optical disks such as being water proof. These characteristics will help users recover stored data from disasters, such as Hurricanes and/or Tsunamis.

Furthermore, Optical Disk's other characteristics, such as long life and low system power consumption are useful in data-archival applications.

Therefore, Optical storage media with higher capacity over 1TB and ODDs with higher data-transfer are expected. (data from Fujikimera)

#### **(1) Optical media market**

In Japan, BD players and recorders have penetrated over 70% of the consumer market and writable BD Drives cover over 45% of the PC market even though PCs without internal ODDs have increased to over 20% of the PC market in the middle of 2013 (data from GFK Japan).

Total shipments of ODDs will be decreasing slightly from 650 Million units in 2010 to over 500 Million units in 2015. This optical disc market will continue to shrink.

But ODD still retains a big position in the storage market.

Drives for consumer use in 2013 will slightly decrease to 295 Million units from 344 Million units in 2010. And total shipment of PC and business-use drives will also decrease to 280 Million units in 2013 from 310 Million units in 2011. (data from Fujikimera)



## **(2) Magnetic media market**

### 1) HDD

HDDs are the most widely used type of storage devices from PC applications to the enterprise market. However, the growth rate of HDD shipments has decreased recently because SSD memory has become popular.

HDD shipments are forecasted to increase from 700 Million units in 2013 to around 800 Million units in 2017. (data from Fujikimera)

### 2) Magnetic tape

Magnetic tape has often been used in total concentrated data-base backup and archival systems in recent years. The number of magnetic tape drives (including those in tape automation libraries) decreased to around 620k units in total (LTO; 480k units) in 2012 from 1200k units in total (LTO only 570kunits) in 2010.

Significant reduction continues in the tape drive market. On the other hand, the tape automation market has steadily grown in recent years. The reason for the decline of tape drives in primary backup and archival applications is that HDD and SSD are beginning to be used instead. (data from Fujikimera)

### 2) Removable Hard Disk Drive (R-HDD)

The iVDR cartridge is an emerging R-HDD cartridge technology. The opportunity looks bright for R-HDD adoption, even though the iVDR market decreased in 2012 due to the shrinking Japan TV market. It is reported that iVDR market is returning to a good business condition, and the potential market in 2014 is expected to be 1M units. iVDR is categorized as both cartridge embedded types. iVDR has potential application areas, for expanding the external storage market, such as tablet PCs, smart phones and Set-Top Boxes. The percentage of the cartridge-type iVDR is increasing from 16% in 2010 to 70% in 2012.

The storage capacity of iVDR has increased steadily from 250GB in 2008 to 500GB in 2010 and 1TB in 2012.

## **2.2 ACHIEVEMENTS**

In this period, as outlined below, 6 standards were published.

- ISO 9660:1988/Amd 1 2013, Information processing-- -- Volume and File structure of CD-ROM for information interchange – Amendment 1[2013-04-15]  
Project editors: [Prf. Yushi Komachi and Mr. Shouichi Hachiya]
- ISO/IEC 30190, Information technology -- Digitally recorded media for Information interchange and storage -- 120 mm Single Layer (25,0 Gbytes per disk) and Dual Layer (50,0 Gbytes per disk) disk (BD Recordable BD-R SL/DL)[2013-07-01]  
Project editor: [Mr. Fumio Yokogawa]

- ISO/IEC 30191, Information technology -- Digitally recorded media for Information interchange and storage -- 120 mm Triple Layer (100,0 Gbytes per disk) and Quadruple Layer (128,0 Gbytes per disk) disk (BD Recordable TL/QL) [2013-07-01]

Project editor: [Mr. Yutaka NAGAI]

- ISO/IEC 30192, Information technology -- Digitally recorded media for Information interchange and storage -- 120 mm Single Layer (25,0 Gbytes per disk) and Dual Layer (50,0 Gbytes per disk) BD Rewritable disk (BD-RE SL/DL) [2013-07-01]

Project editor: [Mr. Nobuo AKAHIRA]

- ISO/IEC 30193, Information technology -- Digitally recorded media for Information interchange and storage -- 120 mm Triple Layer (100,0 Gbytes per disk) BD Rewritable disk (BD-RE TL) [2013-07-01]

Project Editor: [Mr. Osamu KAWAKUBO]

- ISO/IEC 29121 (Second Edition), Information technology --- Digitally recorded media for information interchange and storage -- Data migration method for DVD-R, DVD-RW, DVD-RAM, +R, and +RW disks

(approved 2013-06-29 and transferred to ITTF 2013-07-18, will be published soon)

Project editor: [Prof. PARK, Prof. Toshiro SUGAYA and Mr. Nobuo AKAHIRA ]

## **2. 3 RESOURCES**

Adequate resources are available for all current and anticipated projects. However, current JTC1 proposed areas such as, Flash memory, Storage-class memory, digital preservation, and Big Data storage need more expert engineers.

## **2. 4 ENVIRONMENTAL ISSUES**

Within SC 23, there are no direct environmental issues.

## **2. 5 PARTICIPATION METRICS**

Among seven P-members, seven NBs responded to the recent letter ballots conducted within SC 23.

## **3. 0 FOCUS NEXT WORK PERIOD**

### **3. 1 DELIVERABLES**

A discussion of a revision of ISO/IEC 16963, a test method for the estimation of the lifetime of data stored on writable CDs, DVDs and BDs under JWG 1; joint work with ISO/TC 42, ISO/TC 171/SC 1 and synchronization work with Ecma TC 31, was started in December, 2012. The discussion on the 2<sup>nd</sup> edition of ISO/IEC 16963 will be completed in 2Q next year.

### **3. 2 STRATEGIES**

### (1) Optical Media

For the past few years, manufacturers have been using a fast-track procedure through Ecma International and the National Body of Japan (JNB) for standardization of optical disks based on established and well-recognized technologies. SC 23 will carry forward in international standardization in collaboration with Ecma International and the JNB. SC 23 will continue to monitor the activities of disk-format creation parties, such as the BDA and others, and encourage them to propose their specifications for adoption as International Standards.

Other new optical-memory technologies, such as Holographic memory, are being developed throughout the world. New standards are anticipated for optical memories that will be developed based on such new technologies.

The vital application of optical media in the future will be archival storage. We have started to develop standards for archival life-testing and migration methods, and will investigate further related issues.

### (2) Magnetic Media

Standardization proposals for upgrading the capacity of tape systems have not been submitted in recent years. Users seem to be satisfied with de facto appliances, even though the initial format specifications were published as IS's. New Standards proposals to JTC 1 in the magnetic-tape field seem unlikely because only a few countries still have either magnetic-tape or drive industries.

### (3) Terminology

SC 23 understands that terminology is important

#### 3.2.1 RISKS

There is a risk that other standardization groups will take leading roles in standardization issues within the Title and Scope of JTC 1/SC 23. SC 23 should therefore continue to watch standardization groups outside JTC 1

#### 3.2.2 OPPORTUNITIES

There are many advanced storage media within scope, and their standardization is expected in the near future.

Magnetic media are used for practical archival-storage and life-expectancy methods, also monitoring of stored data may be proposed in the near future just as for optical archive storage media.

### **3. 3 WORK PROGRAMME PRIORITIES**

Industrial consensus mainly determines priorities.

#### **3.3.1 ARCHIVAL POLICY**

SC 23 will follow the JTC 1 policy for maintenance of archives.

The SC 23 Secretariat retains all of the SC 23 N numbered documents, either in hard copy or electronically. From N 551 to N 1014, all are available in hard copy. For N 1015 or later (the latest is N 1830), all are available digitally. SC23 web site at ITSCJ has been transferred to ISO e-committee from July 2013.