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BUSINESS PLAN FOR JTC 1/SC24
COMPUTER GRAPHICS, IMAGE PROCESSING AND ENVIRONMENTAL DATA REPRESENTATION

PERIOD COVERED:
July 2009 to June 2010.

SUBMITTED BY:
Mr. H. J. Kimn ISO/IEC JTC 1/SC 24 Chairman
Mr. D. Hyde ISO/IEC JTC 1/SC 24 Secretariat

1.0 MANAGEMENT SUMMARY

1.1 CHAIRMAN'S REMARKS

This version of the 2009-10 Business Plan is the result of a review and updates made at the SC 24 Plenary, London, 2009-07-10. It was sent for review by the National Bodies for a minimum period of 4 weeks, with no comments being received, prior to being submitted to JTC 1 by 11 September 2009.

1.2 JTC 1 SC24 STATEMENT OF SCOPE

The current approved scope for JTC 1/ SC 24 (Computer graphics, image processing and environmental data representation) is:

Area of Work: Standardization of interfaces for information technology based applications relating to:

- computer graphics,
- image processing,
- virtual reality,
- environmental data representation and
- interaction with, and visual presentation of, information

Included are the following related areas: Modelling and simulation, related reference models; application program interfaces; functional specifications; representation models; interchange formats, encodings and their specifications, including metafiles; device interfaces; testing methods; registration procedures; presentation and support for creation of multimedia and hypermedia documents.

Excluded: Character and image coding; coding of multimedia and hypermedia document interchange formats, JTC 1 work in user system interfaces and document presentation; ISO TC 207 work on ISO14000 environment management, ISO TC211 work on geographic information and geomatics; and software environments as described by ISO/IEC JTC 1 SC22.

1.3 PROJECT REPORT

1.3.1 Programme of Work

The current JTC1/SC24 Programme of Work, when approved by JTC 1, will be found at http://isotc.iso.org/livelink/livelink/fetch/2000/2489/Ittf_Home/ITTF.htm

Pending JTC 1 approval, a brief summary of the SC24 projects, current and completed, is given in this sub-section and by the programme of work in Annex A.

1.3.2 Active current work:

18026/Am 1	SRM Amendment 1 to Edition 2
18042-4/Am 1	SRM LB Amendment 1
18025/Am1	EDCS Amendment 1
18026/Am 2	SRM Amendment 2
19775-2.2	X3D scene access interface
19776-1.2	X3D encodings XML
19776-3.2	X3D encodings Compressed binary
TR 24788	Templates for SEDRIS DRM

1.3.3 Work Items completed and now inactive

7942-1, -2, -3, -4	Graphical Kernel System
8651-1, -2, -3, -4	GKS Language Bindings
9592-1, -2, -3	PHIGS
9593-1, -3, -4	PHIGS Language Bindings
9636-1, -2, -3, -4, -5, -6	Interface Techniques for Dialogues with Graphical Devices (CGI)
10641	Conformance Testing
11072	Computer Graphics Reference Model
12087-1, -2, -3	Image Processing and Interchange (IPI)
14478-1, -2, -3, -4	Presentation Environment for Multimedia Objects (PREMO)
19776-2.2	X3D encodings Classic VRML encoding
9973	Procedures for registration of items

1.4 CO-OPERATION AND COMPETITION

SC 24 continues its co-operative work with other JTC 1 SCs, ISO TCs and Industry Consortia and Fora that share common objectives within the scope of the SC24 work area. These include ISO TC 211, the Web3D Consortium, the World Wide Web Consortium (W3C), Open CGM Consortium and the SEDRIS Organization.

A number of Liaisons have been established with external organizations. The following subsections detail the areas of work most pertinent to SC 24.

1.4.1 Applicable to all SC 24

A Joint Task Force (JTF) was established in September 2005 by JTC-1/SC 24 and ISO/TC 211 Geographic information/Geomatics for the purpose of coordinating the work programmes of the two committees. Currently (July 2009), the Co-chairs for both TC 211 and SC 24 of the JTF have resigned and have not been replaced, hence alternative methods are being pursued to coordinate their respective work programmes.

1.4.2 WG 6: Computer Graphics

In co-operation with the Web3D Consortium, several eXtensible 3D (X3D) projects have been advanced as transposed standards. ISO/IEC 19775-1.2 was published in 2008. The ballot for the FCD text of ISO/IEC 19775-2.2 ended in March. An editing meeting to process comments

received was held in July resulting in a recommendation to progress to FDIS. FDIS text is expected later in July.

Revisions to Parts 1, 2 and 3 of ISO/IEC 19776 corresponding to ISO/IEC 19775-1.2 have been or are being processed as described below. ISO/IEC 19776-2.2 has been published. FDIS text for ISO/IEC 19776-1.2 has been forwarded to ITTF for further processing. FDIS text for ISO/IEC 19776-3.2 has been authorized with the text expected to be available in August.

New Work Item Proposals for amendments to the various parts of ISO/IEC 19775 Edition 2 and ISO/IEC 19776 Edition 2 have been circulated and discussed. These NPs have been submitted for ballot.

1.4.3 WG 7: Image Processing

In direct co-operation with ISO TC 211, standards dealing with metadata are being developed. These are significant to the contribution of multi-consortia metadata harmonization and crosswalks and include the following TC 211 imagery content standards;

ISO/TS 19130 Geographic information – Imagery sensor models for geo-positioning;

The North Atlantic Treaty Organization (NATO) Joint Capability Group for Intelligence, Surveillance and Reconnaissance (JCGISR) proves to be a primary user of the WG7 standards and employs them in data capture and exchange systems, generating interoperability architectures that can be adopted or adapted to other user applications. The ongoing relationship between SC24, TC211 and JCGISR serves to provide expert assistance and to assure the application of interoperable standards as a result of this three-way relationship.

Additional topics that are of interest to SC 24/WG 7 as co-operative efforts include:

- Development of standards that support data from spectral, optical, radar, laser, polarimetric and other advanced remote sensors that can be portrayed and fused with imagery.
- Expanding and increasing application of satellite imagery and remotely sensed data, for power and site planning, assessment and monitoring purposes
- Application of remote sensing in non-stationary platforms such as Unmanned Aeronautical Vehicles (UAVs), hand-held devices such as mobile phones and digital cameras
- Environment management applications
- Application of image processing for home, social life, and industry, such as home security systems, intelligent robots, automated inspection systems and autonomous navigation systems.

SC 24/WG 7 continues to seek ways to co-operate with JTC 1/ SC 29. Work within this SC 24 reporting period includes incorporation of implementation of SC 29 JPEG 2000 standards used inside the BIIF standard. As new spectral data types are defined and formatted for dissemination and exploitation, compression of these data types is required; SC 24/WG 7 looks to SC 29 to conduct these standardization projects, including earth surface models (terrain elevations), LIDAR, Synthetic Aperture Radar (SAR), hyper-spectral data and applications of International Standards Organization - Open Systems Interconnection model (ISO/IEC 7498-1). SC 24/WG 7 places high value on the work of SC29, though collaborative efforts between SC 29 and SC 24 have recently been peripheral to the work of both subcommittees. SC 24 is working to commit more active liaison resources to our interests in SC 29 work.

1.4.4 WG 8: Environmental Representation

In co-operation with the SEDRIS Organization, the standards relating to SEDRIS technology have been developed, published and subsequently enhanced.

ISO/IEC 18023 parts 1, 2 and 3 address the representation and interchange of environmental data. ISO/IEC 18025: Environmental Data Coding Specification (EDCS) provides unambiguous ways in which to specify environmental features and their attributes. ISO/IEC 18026: Spatial Reference Model (SRM) provides unambiguous ways in which to specify locations and their related data.

SEDRIS standards, either as a whole or as independent components, may be applied to work in other areas. Examples are WG 6 and in committees and organizations external to SC 24.

SC 24 liaises with the NATO Modelling and Simulation Group, the Simulation Interoperability Standards Organization (SISO) and the Defence Geospatial Information Working Group (DGIWG) to support the use of the SEDRIS standards by these organizations.

2.0 PERIOD REVIEW

In the Business year 2008 to 2009, the achievements of JTC1 SC24 were principally related to the advancement of published standards.

2.1 MARKET REQUIREMENTS

The Information and Communication Technology (ICT) fields that are addressed by the standards developed in SC 24 are summarized as:

- mediation of environmental data exchanged among multiple users and producers;
- intelligence and information systems which utilize high resolution imagery formats supporting a variety of applications, including modelling and simulation (M&S) environments and displays;
- geospatial and geopolitical applications with metadata and data layering;
- web and document graphics technologies that utilize 2-D and 3-D imagery files for presentation and exchange;
- and “virtual” or 3-D environments that incorporate imagery, content concepts and interaction with virtual or synthetic environments applications in modelling and simulation.

Market requirements where SC 24 can play a major role in standards development are identified as:

• The development of effective multi-vendor, cross-platform cross-application data interchange formats that combine data objects and metadata for interchange. Our work with ISO TC 211, Geographic information/Geomatics, and NATO establish applications of BIIF, CGM, and SEDRIS technology standards. We are meeting existing market requirements in military, satellite and airborne imaging communities. Expansion into electronic or intelligent documents, biometrics, and medical imaging communities is still within the objectives for SC 24.

• SC 24 recognizes that the market for commercially available, remotely sensed imagery is now reaching fruition. Satellite imagery based on ISO/IEC 12087-5 Basic imagery interchange Format (BIIF) is produced commercially by three companies and can be purchased on the Internet.

• Spectral sensing and fusion of collected information with imagery is an emerging segment in the market sector of Information and Communications Technology. SC 24 establishes and maintains correspondence with sensor developers and the

user community through its national and liaison bodies. Work in this area includes collaboration with ISO TC 211 and participation in the development of its ISO 19130 Sensor model standard.

• Application of remote sensing in non-stationary platforms, such as Unmanned Aeronautical Vehicles (UAVs), have strong application requirements to incorporate metadata into the imagery/sensed data files. This will enable the incorporation of not only the location, dates and times of the collected image, but also features of the image.

• Increased use of satellite and remote imagery will offer improvements for environment management applications in resource development, for human and natural environments and for modeling climate change and assessing its impact.

• Opportunities exist for the application of image processing for home, social life, and industry uses, such as home security systems, intelligent robots, computer vision systems and automated inspection systems.

• Opportunities exist for the application of autonomous navigation systems to intelligent robots and unmanned vehicles.

• Imagery exploitation methods need to be able to process terabytes of collected imagery and remotely sensed data that generate requirements to automate exploitation and analysis capabilities. SC 24 is developing links to research enterprises in the light of developing standardization projects in this area of image processing.

• Continue the standardization of Internet protocols and interfaces to provide effective 2D and 3D graphical interaction. Widespread commercial adoption of VRML, Humanoid Animation, and X3D technologies is evident in both large and small companies. Our continuing work on VRML/X3D and PNG are examples where SC24 has been successful. These forms of standards work are the highest of objectives held by the SC24 National Bodies.

• Continue to support the Web3D Community by working in partnership with the Web3D Consortium to evolve the base X3D standard and to advance other specifications of 3D and interactive web-based techniques. Over the past five years SC 24 has progressed a number of Web3D initiatives including a VRML amendment, a new VRML part; the original X3D functional specifications; X3D encodings and X3D language bindings; and a Humanoid Animation specification. Edition 2 of X3D part 1 has recently been approved as an ISO/IEC standard. Work is underway to revise part 2 of X3D, as well as the X3D encodings and X3D language bindings. An amendment to Edition of X3D is planned to add additional functionality to support CAD, Geospatial, and Medical vertical markets.

• Continue to work in co-operation with the SEDRIS Organization and similar groups to recognize areas that can benefit from standards for the representation of environmental data. The aim is to bring applications that were once specialized technologies developed for military and government applications into widespread commercial use.

2.2 ACHIEVEMENTS

In the period since June 2008, SC24 has published 2 International Standards, with 2 queued for publication.

2.2.1 Documents published:

19775-1.2	X3D architecture and base components Amendment 1
19776-2.2	X3D encodings Classic VRML Amendment 1

2.2.2 Documents approved for publication:

18026	Spatial Reference Model (SRM) Edition 2 (Incorporating Amendment 1 and Technical Corrigenda 1, 2 and 3)
19776-1.2	X3D encodings XML

2.2.3 Documents approved for progression to FDIS/FDAM in the current planning year:

19775-2.2	X3D Scene access interface
18026	SRM Amendment 1

2.2.4 Documents approved for progression to FCD/FPDAM/DTR in the current planning year:

18042-4	SRM Language Binding ‘’C’’, Amendment 1

2.2.5 Registration Actions:

- BIIF Profile of JPEG 2000, Version 01.10. A registration ballot for the BIIF Profile of JPEG 2000, Version 01.10 was conducted. The profile was approved without comment for registration on 2009-07-03.(SC24N3111,SC24N3133).

- *EDCS Register Submissions*. Five EDCS submissions have been reviewed and evaluated by the Rapporteur Group during the year. A ballot (SC24N3092) has been conducted on one of the submissions (2007-Q3) and approved. The other four are awaiting ballot. Submission 2008-Q2 was withdrawn. Submission 2008-Q4 was withdrawn and subsequently re-submitted as 2009-Q3.

Approved Register Classes:

Acknowledgment Type
Annotation Style
Application Structures
Colour Model
Compression Type
Echo Type
EDCS (set of classes)
Edge Type
Error
Escape
GDP
GDP-3
Generalized Structure Element
Hatchstyle
Interpolated Interior Style
Line Caps
Linetype
Markertype
Measure Format Identifier
Modeling Clipping Operators
Patterns
Prompt & Echo
Prompt Type
Selection data type selector
Set data type member
SRM (set of classes)
Textfont
BIIF Profile
CGM Profile
EDCS Profile
PIKS Profile
SRM Profile

Classes with approved entries, and number registered:
Colour Model, 3 registered items
Compression Type, 3 registered items
EDCS (set of classes), see following section
Error, 11 registered items
Escape, 47 registered items
GDP, 5 registered items
GSE, 9 registered items
Hatchstyle, 19 registered items
Linetype, 16 registered items
Markertype, 26 registered items
BIIF Profile, 4 registered profiles
CGM Profile, 2 registered profiles
SRM (set of classes), see SRM classes section
SEDRIS - Part 1 (set of classes), see SEDRIS classes section

EDCS classes and number registered:

EDCS classification (EC)	(122 registered items)
EDCS attribute (EA)	(127 registered items)
EDCS attribute enumerant (EE)	(261 registered items)
EDCS attribute value characteristic (EV)	(0 registered items)
EDCS unit (EU)	(0 registered item)
EDCS unit equivalence class (EQ)	(0 registered items)
EDCS organizational schema (EO)	(0 registered items)
EDCS group (EG)	(0 registered items)
EDCS Profile	(0 registered items)

Four batches of submissions have been evaluated by the Rapporteur Group, but have not yet been balloted. One batch is being evaluated currently by the Rapporteur Group.

SRM classes:
SRM Abstract coordinate system (CS)
SRM Temporal coordinate system
SRM Reference datum (RD)
SRM Object reference model template (ORMT)
SRM Object reference model (ORM)
SRM Reference transformation (RT)
SRM Object binding rule set (OBRS)
SRM Spatial reference frame template (SRFT)
SRM Spatial reference frame (SRF)
SRM Spatial reference frame set (SRFS)
SRM Designated spatial surface (DSS)
SRM Profile
There are currently no registered items for SRM classes, nor have any been submitted to the Registry.

SEDRIS classes:
Selection data type selector
Set data type member
There are currently no registered items for SEDRIS classes, nor have any been submitted to the Registry.

2.3 RESOURCES

The strategies adopted by SC 24 are based on a co-operative philosophy of working with consortia. Many of the projects within SC 24 are introduced into the programme following the accomplishment of early-stage work by the consortia. Experience in SC 24 has demonstrated that co-operative partnering with consortia, whose work is consistent with the SC 24 scope of work, has contributed greatly to both the technical content and SC 24's ability to develop

applicable and relevant International Standards. As a result, many consortia members continue to serve as project co-editors, resulting in an increased base of SC 24-trained ISO editors. Improving and expanding this expertise continues to be a priority for SC 24. We are grateful for the continued expert assistance provided by the BSI Secretariat. SC 24 benefits from the cross-cultural interplay that demands a more worldwide view of our work and ideology. Continued support from BSI on this part of the resource equation is critical to the continued high quality endeavors of SC 24.

2.4 ENVIRONMENTAL ISSUES

The work of SC 24 has no negative impact on the environment in terms of resource consumption, pollution or waste generation. SC 24 standards will continue, however, to provide facilities beneficial to the environment, where possible. The following examples are given of SC 24 facilities considered to be beneficial to the environment.

The advent of digital imagery has benefited the environment by reducing the natural resource expenditure on satellite photography and reproduction processes that required silver compounds applied to plastic film bases, chemical wash processing, etc. SC 24 standards, such as ISO/IEC 12087-5 format (BIIF), are routinely used to capture and exchange imagery of the Earth, making such data a tangible commodity and subsequently allowing the data to be shared within the general consumer sector in various formats.

Resource consumption patterns are also reduced by the application of SC 24 standards in the depiction, development, and sharing of virtual and simulated environments and integrated humanoid interactions. Modelled and simulated environments, using various SC 24 standards such as the suite of SEDRIS standards, facilitate training events with minimal or no expenditure of equipment or environmental degradation. Training facilities and technologies can be reused and enhanced in localized sites. Networked facilities support training engagements that link capabilities and prove the interoperability of applied standards implementations. Simulation thus allows training exercises to be performed without the need to drive vehicles over the terrain, fly aircraft through the air, consume fuel, deploy ammunition or utilise other effects that are harmful to the environment.

The net result from implementation of the SC24 standards provides a positive means of aiding environmental solutions and reducing resource consumption.

2.5 PARTICIPATION METRICS

There are 10 ‘’P’’ members of SC 24 and 22 “O” members. This is a reduction of one from the previous year, as New Zealand has recently changed from ‘’P’’ to ‘’O’’ membership. Of these, the following NBs actively participate;

- Australia
- Germany
- Korea
- Japan
- United Kingdom
- United States

The other “P” members are;

- China
- Egypt
- France
- Portugal

The 50% voting requirement has been met on all ballots.

3.0 FOCUS FOR NEXT WORK PERIOD

SC24 will focus on the progression of the following projects;

- X3D standards and amendments (WG 6)
- Amendment to ISO/IEC 19774—Humanoid Animation (WG 6)
- Development of the TR "Templates to facilitate the use of the SEDRIS DRM" (WG 8)
- Amendment 1 to Edition 2 of ISO/IEC 18026 Spatial Reference Model (WG 8).
- Amendment 1 to 18042-4 SRM language binding (WG 8)
- Amendment 1 to ISO/IEC 18025 Environmental Data Coding Specification (WG 8)
- Amendment 1 to ISO/IEC 18023 parts 1 and 3 SEDRIS (WG 8)
- Amendment 1 to ISO/IEC 18024-4 SEDRIS Language Binding (WG 8)
- Registration of items by WG 6, WG 7 and WG 8

3.1 DELIVERABLES

The following table contains the major deliverables for the period July 2009 to July 2010:

Deliverable	Standard	Estimated Registration or Publication Date
FDIS	19775-2.2 X3D scene access interface	July 2009
IS	19776-1.2 X3D encodings XML	November 2009
FDIS	19776-3.2 X3D encodings Compressed binary	August 2009
FPDAM	ISO/IEC 18023-1/Am1 SEDRIS Architecture	January 2010
FPDAM	ISO/IEC 18023-3/Am1 SEDRIS Transmittal Format	January 2010
FPDAM	ISO/IEC 18024-4/Am1 SEDRIS C Binding	January 2010
FDAM	ISO/IEC 18023-1/Am1 SEDRIS Architecture	August 2010
FDAM	ISO/IEC 18023-3/Am1 SEDRIS Transmittal Format	August 2010
FDAM	ISO/IEC 18024-4/Am1 SEDRIS C Binding	August 2010
IS Ed 2	18026 Spatial Reference Model	August 2009
PDAM	18026 Spatial Reference Model Amd 1 to Ed 2	February 2010
FPDAM	18042-4 SRM Language Binding, Part 4: C	May 2009
FDAM	18042-4 SRM Language Binding, Part 4: C	November 2009
Amd 1	18042-4 SRM Language Binding, Part 4: C	May 2010

3.2 STRATEGIES

Our mission is to effectively apply our resources to assist all segments of the worldwide computer graphics, image processing and environmental data representation communities in the development of International Standards.

To achieve this mission we employ the following strategies:

- explore means to facilitate the use and implementation of existing SC 24 standards
- seek out those consortia and other organizations that follow open processes as our partners;
- manage our work effectively, applying measures of effectiveness that include timeliness and window of market opportunity as well as technical quality;

• maximize our contribution by seeking out those new and innovative projects where we can add substantial value, not just "rubber stamp" efforts involving older technologies; and

• continue to seek ways to co-operate with other JTC 1 SCs and ISO TCs, especially SC 29 and TC 211.

These strategies are in keeping with the JTC 1 Business Plan, which has identified two distinct categories of standards that are needed:

• those where stability and ongoing maintenance are not an issue

• standards which establish a longer-term system and interface concept to achieve interoperability and to secure investment into individual products and where, as a result, stability and maintenance are of great importance.

3.2.1 Risks

SC 24 has developed a strong reliance on its Register of Items for the identification of implementation profiles and data coding profiles. This is currently supported by the ISO MA/RA web-site with a link to an SC 24 Registry web-site, which is dependent on the facilities provided by ISO.

Work in newer areas of technology under tight time constraints inherently involves substantial risks. One such risk is that a standard may become irrelevant due to changes in market direction. At present, due largely to the volunteer nature of our organization, we lack an effective way to cancel or redirect resources. It is mitigated to some extent by having a sufficient number of experts and countries who remain willing to continue work on a project.

A further risk is of the lack of support for a co-operative development because a partner has a change of objectives and direction. We mitigate this risk by attempting to establish co-operative agreements that ensure that standards projects are well-evolved, hold the commitment of the commercial community and provide valid standards for information and communications technologies.

3.2.2 Opportunities

SC 24 is leveraging its work programme with government agencies to increase government investments into Standardized Commercial Off the Shelf (COTS) technologies. Government agencies recognize that they must participate at the development level in order to ensure that government level requirements are addressed and incorporated as appropriate.

Topics of technical interest to SC 24 that support government policies include:

- Development of standards that describe data from spectral, radar, laser, polarimetric and other advanced remote sensors that can be portrayed and fused with imagery;
- Application of standardized metadata in support of data archival, discovery and retrieval
- Exploitation capabilities to apply to imagery and remotely sensed data.
- Application of standards for the representation, development, search, and sharing of integrated environmental data.
- Development of standards that help achieve interoperability amongst heterogeneous applications using environmental representations.
- Development of standards that promote the unambiguous, loss-less and non-proprietary interchange of environmental data.

In keeping with the JTC 1 objective to anticipate technology trends, SC24 follows developments from its cooperative agreements to build ISO standards from mature consortia recommendations. The following examples are given of such cooperative opportunities:

- The SEDRIS Organization, with which we sustain a well-established and productive co-operative relationship;
- The Web3D Consortium, with which we sustain a well-established and productive co-operative relationship;
- The WWW Consortium (W3C) with which we sustain a well-established and productive co-operative relationship;
- The military, aerospace and defense community world-wide, with which we have a well established and productive co-operative relationship, including: NATO Air Force Armaments Group (NAFAG) Joint Capability Group for Intelligence, Surveillance and Reconnaissance (JCGISR); the Digital Geographic Information Working Group (DGIWG); US NITFS Technical Board (NTB) for US Military National Imagery
- Transmission Format Standards, based on the imagery file formats, metadata, and implementation of compression methodologies adopted from ISO/IEC JTC 1/ SC 29, and other imagery formats are being evaluated for work within SC 24;
- Image processing for home, social life, and industry such as home security systems, intelligent robots, biometric systems, computer vision systems, and automated inspection systems
- Autonomous navigation systems for intelligent robots and unmanned vehicles
- ISO TC 211 *Geographic information/Geomatics.* This technical committee produces standards which are complementary to those of SC 24 and with whom we have established a Joint Task Force.
- The Simulation Interoperability Standards Organization (SISO). This organization has established an Environmental Data Representation Standards Product Support Group (EDRS PSG) to represent the modelling and simulation community interest in the SEDRIS and other standards involving the representation and mediation of environmental data. It is SISO's intention to work closely with SC 24 in the areas of maintenance and implementation of the SEDRIS standards. SISO was previously active in the development and approval of ISO/IEC 18025.
- The Khronos Group, based on authoring and playback of dynamic media in WG 6, with which we have initiated a co-operative relationship;

Specific work will consist of;

- X3D (SC24 transposition of Web3D Consortium specification in cooperative agreement): This work will augment the capabilities already provided by X3D (and previously by VRML). WG6 anticipates proposals to develop standards for augmenting X3D by standardizing facilities for defining the volume rendering, annotation, interfacing with medical imagery, enhanced geospatial capabilities (based on WG8 work), multi-user virtual environments, support for CAD B-Rep structures, and enhanced compatibility with the Khronos Group Collada products, all work to be coordinated through Web3D.
- Releases from Web3D are yielding growth in the business community, continuing to expand the capabilities of 3D on the Web while establishing Standards-based Commercial Off-The-Shelf models for Web3D and SC24. X3D is also highly configurable so that conformant profiles can be created that adapt readily to the requirements of particular data domains. Wed3D has completed Edition 2 of ISO/IEC 19775 Part 1 and Edition 2 of ISO/IEC 19776 Part 2 and is working on ISO/IEC 19775 Part 2 and ISO/IEC 19776 Parts 1 and 3. Future amendments to X3D to incorporate the functionality described in the previous paragraph are expected.

- Humanoid Animation (SC24 transposition of Web3D Consortium specification in cooperative agreement): This specification provides an important element of Modeling and Simulation technology by establishing a standardized representational set of humanoid models which can be interchanged and reused among modeling, authoring and run-time applications. H-Anim technology is already embedded in a variety of commercial projects. Additional work is underway to facilitate the sharing of avatars, providing exportable standard behaviours for the avatars, the migration of avatars between virtual environments and improved compatibility with avatar design applications.
- Authoring and playback of dynamic media: Interest has been expressed by the Khronos Group towards standardizing some of their specifications through SC 24 in a manner similar to that used by the Web3D Consortium. The Khronos Group is an international organization of about sixty companies involved in developing embedded 3D systems. The initial specification that is being considered is Collada, which provides a standard exporting and interchange capability for CAD models. Work is underway to initiate this effort.
- A study group has been established to study the requirements for 3D in mobile devices. This may result in a Mobile 3D profile for X3D.
- A study group is being established to study the requirements for standardization of augmented and mixed reality functionality . This may result in additional functionality for X3D.
- Enhancing the ease of use and efficiency of employing the SEDRIS technologies. One such effort is the on-going project for the development of *Templates for the SEDRIS DRM* (TR 24788).
- Expanding the functionality of the Spatial Reference Model (ISO/IEC 18026) to include a comprehensive treatment of the concepts of orientation, rotation, and vector quantities, along with the corresponding additions to the SRM API. Also included will be the provision of similarity transformations and a more in-depth treatment of the geodesic concept and its measurement.
- Enhancing the usability of the EDCS (ISO/IEC 18025) to include pictures in the dictionaries where they would ease the understanding of concepts.
- Electronic document archiving, discovery and retrieval: This work will establish sets of parameters by which digital documents can be stored in their native format and, using consensus-based xml schemas compliant with ISO TC 211 metadata standards, discovered and retrieved. Topics of standardization in imagery and environmental data archiving and distribution continue to hold interest for SC 24.
- Data Encapsulation: Using sensed data formats and metadata profiles, this work continues as a means to collect data in various formats and multi-sensors. This work requires collaborative development with multiple data domains and types. Commercial producers of remotely sensed data (satellite imagery), NATO JCGISR and the NITF Technical Board will also act as technical resources to progress this work.
- Biometrics: This work is being taken on in a variety of JTC1 efforts, most importantly with SC 37. The establishment of SC 37 is considered by SC 24 as a positive step for ICT standards and recognized as a high potential for cooperative work, as SC 24 continues to engage in the development and application of imaging perspectives of this technology.
- Spectral data: SC 24 recognizes that spectral sensing and its fusion with imagery are an ever more important part of Information and Communications Technology.

- Imagery exploitation methods: Increased volumes of collected imagery establish the requirement to automate exploitation and analysis of imagery. SC 24 is developing links to research enterprises in the light of developing standardization projects.
- Registry of items: With the commercial adoption of standards produced within SC 24, there is an expansion of application of registries for data and implementation profiles. This is reflected in the on-going activities of the various SC 24 registries.. For example, this year SC 24 anticipates hundreds of proposals for the registration of new concepts in the EDCS (ISO/IEC 18025:2005).
- Adaptation of compression algorithms: SC 24 also works to leverage the wavelet compression capabilities standardized within JTC 1/SC 29.

3.3 WORK PROGRAMME PRIORITIES

SC 24 leverages its work programme with government policies that increase government investments into Standardized Commercial Off the Shelf technologies. Government agencies recognize that they must participate at the development level in order to ensure standardization requirements are addressed and incorporated as appropriate.

Work programme priorities for SC 24 are those that support government policies and include:

- Development of standards that process and describe data from spectral, optical, radar, laser, polarimetric and other advanced remote sensors that can be portrayed and fused with imagery;
- Application of standardized metadata in support of data archival, discovery and retrieval
- Exploitation capabilities to apply to imagery and remotely sensed data.
- Revisions to the Humanoid Animation standard, ISO/IEC 19774.
- Revisions to the X3D standards, ISO/IEC 19775, 19776, and 19777.
- Implementation of enhancements to the SEDRIS technology standards ISO/IEC 18023, ISO/IEC 18025 and ISO/IEC 18026 and their associated language bindings, ISO/IEC 18024-4, ISO/IEC 18041-4 and ISO/IEC 18042-4.
- Development of a TR for Templates to Facilitate the Use of the SEDRIS Data Reference Model, TR 24788.

3.3.1 Archival Policy

The archival policy of SC 24 is administered by the UK Secretariat in accordance with BSI policy, as defined by BS 0, which conforms to the JTC 1 and ISO policies for archiving.

ISO/IEC JTC1/SC24 N

Annex A

Work programme for ISO/IEC/JTC 1/SC 24 **Secretariat : BSI** **2008-07-17**

Project Short Title	Document No.	WG	Editors	FCD/FPDAM	FDIS/FDAM DTR	IS/Amd. TR*	Comments
EDCS Am. 1	ISO/IEC 18025/Am1	8	Cox, Hembree, Worley (SEDRIS)	3/10	10/10	4/11	
SRM Ed. 2	ISO/IEC 18026:2006/Am.1 + Corrigenda 1, 2 and 3	8	Berner, Toms, Trott	2/08	2/09	Ed. 2 07/09	
SRM Am 1 to Ed. 2	ISO/IEC 18026:2009/Am1	8	Berner, Toms, Trott	8/10	2/11	8/11	
SRM Language Bindings, Part 4: C Amd. 1	ISO/IEC 18042-4:2006/Am.1	8	Puk	05/09	11/09	05/10	
X3D scene access interface (SAI)	ISO/IEC 19775-2 Ed. 2	6	Couch (Web3D) & Puk	9/08	7/09	12/09	
X3D encodings XML	ISO/IEC 19776-1 Ed. 2	6	Puk, Brutzman (Web3D), & Hudson (Web3D)	10/07	05/09	11/09	
X3D encodings Compressed binary	ISO/IEC 19776-3 Ed. 2	6	Puk, Brutzman (Web3D), & Hudson (Web3D)	11/07	08/09	02/10	
Templates for the SEDRIS DRM	ISO/IEC TR24788	8	Kwon & Puk		11/11	5/12	

* Anticipated data of IS, Amd. or TR publication