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DRAFT BUSINESS PLAN FOR JTC1/SC32: 2013-2014

PERIOD COVERED:

May 2012 through June 2014 with Chairman's remarks and Achievements to September 2013

The Business Plan was approved by the SC32 plenary meeting at Gyeongju on 2013-06-01 (SC32N2373 *SC32 Gyeongju Resolutions*).

SUBMITTED BY:

Jim Melton — ISO/IEC JTC1/SC32 Chair

1.0   MANAGEMENT SUMMARY

1. 1   CHAIRMAN'S REMARKS

SC 32 participants are progressing a wide range of projects, as shown below. These projects are to develop standards that range from revisions of relatively mature technologies to new standards for emerging technologies. Participants include major vendors, academics, and users, including government agencies. Contributions are received from North America, Asia, Australia, and Europe—a resource that is beneficial to the quantity and quality of the standards. These strengths stand against substantial risks of shifting priorities and support within participating organizations, as well as competition from other standards development organizations.

SC 32/WG 1 is continuing its e-Business standards development work, focusing on the Business Operational View (BOV) aspects of the ISO/IEC 14662 Open-edi Reference Model. The BOV standards development work of SC 32/WG 1 addresses operational aspects of Open-edi for implementation, registration of scenarios and scenario components as business objects, accounting and economic ontology, identification of external constraints of jurisdictional domains on business transactions (including privacy protection requirements), coded domains, and traceability framework. The BOV standards not only address the legal requirements for e-Business, but also facilitate the IT-enablement of business standards.

These BOV standards also serve as the basis for the high-level Memorandum of Understanding (MOU) concerning standardization in the field of electronic business signed between ISO, IEC, ITU, and UN/ECE, with full participation of international user groups.

SC32/WG 2 published two technical reports on achieving metadata registry content consistency (ISO/IEC 20943), and a family of standards on metadata registry interoperability and bindings (ISO/IEC 20944). A significant achievement in the past year was publishing Part 3 of the third edition of ISO/IEC 11179 – Metadata Registries (MDR). This edition substantially extends metadata registry capabilities to register and manage data semantics using concept systems. Substantial efforts were made to align these standards within SC32 and between WG2 and OMG, W3C, and OASIS through a series of liaison and informal meetings.

WG 2 is also releasing new parts of the ISO/IEC 19763 – Metamodel Framework for Interoperability (MFI) that provides standards for the development of a unified framework for registry interoperability to register administrative structural information and computable semantics about ontologies, processes, and services, information models and forms. These standards are

intended to lead in development of emerging technologies in these areas rather than to consolidate current industry practice, though they are informed by extensive research of these standards during the and committee stages. In addition to the standards and specifications, prototype systems are being built to confirm the validity of the standards specifications.

SC 32/WG 3 has completed a CD ballot on new editions of nine parts of ISO/IEC 9075. This includes new editions of the five parts of ISO/IEC 9075 that were published during December 2011 as well as the four parts of ISO/IEC 9075:2008 that were not included in the 2011 edition of ISO/IEC 9075, so that the next edition of ISO/IEC 9075 contains all nine parts harmonized with each other. The current drafts already include support for applying regular expressions across sequences of rows. WG3 is monitoring the ever-changing state of the database industry to identify additional capabilities. WG3 has also begun extracting non-normative explanatory material into Technical Reports. To this end, WG3 will hold PDTR ballots on three new technical reports in 2013 and has fourth new technical report that will progress in conjunction with the next edition of the 9075 standards.

SC 32/WG 4 has progressed a revision (4th Edition) of ISO/IEC 13249 *SQL/MM Part 3: Spatial*, which supports Geographic Information System requirements based on SQL. This new edition extends its capabilities to support 3D geometry. It was progressed to FDIS stage after the SC 32 plenary held in May, 2011 and it is expected to be published as an IS within 2012. The revision of the standard was developed in corporation with ISO TC 211 and OGC (Open GIS Consortium). In addition to minor corrections, substantial new content was for adding Triangle, Polyhedral Surface, and TIN (triangulated irregular network) spatial types, as well as initial 3D operations for all Geometry types. ISO/IEC13249 *SQL/MM Part 7: History* is now a Technical Specification that shows how to create and use history records for SQL applications.

1.2   JTC1 SC32 STATEMENT OF SCOPE

JTC1/ SC32

Title: Data Management and Interchange

Area of Work: Standards for data management within and among local and distributed information systems environments. SC32 provides enabling technologies to promote harmonization of data management facilities across sector-specific areas. Specifically, SC32 standards include:

1. reference models and frameworks for the coordination of existing and emerging standards;

2. definition of data domains, data types, and data structures, and their associated semantics;

3. languages, services, and protocols for persistent storage, concurrent access, concurrent update, and interchange of data;

4. methods, languages, services, and protocols to structure, organize, and register metadata and other information resources associated with sharing and interoperability, including electronic commerce.

JTC 1/SC 32/WG 1

Title: e-Business

Area of Work: Standardization in the field of generic information technology standards for open electronic data interchange needed to attain global interoperability among the information technology systems used by organizations. Such interoperability is viewed from both business and information technology perspectives.

Within this context, the scope includes:

1. establishment of methodology and framework for identification and modelling of business activities through business scenarios and their components, such as roles, information bundles, and semantic components;

2. identification and specification of formal description techniques for describing classes of business requirements and their contextual and semantic specifications;

3. identification and specification of formal description techniques for developing business scenarios and their components;

4. identification and specification of information technology services and service interfaces for accomplishing business transactions;

5 . identification and specification of facilities to manage business scenarios and their components.

Note: Priority is on work required to support the needs of electronic commerce, electronic administration, electronic business, etc. The basis of work is the Open-EDI Reference Model (ISO/IEC 14662).

JTC1/ SC32/WG2

Title: Metadata

Area of Work: The development and maintenance of standards that facilitate specification and management of metadata, metamodels, and ontologies. Use of these standards will enhance the understanding and sharing of data, information and processes to support, for example, interoperability, electronic commerce, and model- and service-based development. The scope includes:

1. establishment of a framework for specifying and managing metadata, metamodels, and ontologies;

2. specification and management of metadata, metamodels, and ontologies;

3. specification and management of data about processes, services, and behaviour;

4. development of facilities to manage metadata, metamodels, and ontologies, including registries and repositories;

5. development of facilities to exchange metadata, metamodels, and ontologies, including semantics, over the Internet, intranets, and other media.

JTC 1/SC 32/WG 3

Title: Database Languages

Area of Work: The terms of reference of ISO/IEC JTC 1/SC 32/WG 3 Database Languages are:

1. develop and maintain languages for the dynamic specification, maintenance, and description of database structures and contents in multi-user environments. The specifications may include the data type, behaviour, and any integrity constraints on the contents of the defined structures. The specifications may include mechanisms for the creation and generation of new data types and behaviours so as to support the specification of other international standards.

2. provide additional support for the integrity of database systems through transaction

commitment, recovery, and security facilities.

3. develop and maintain languages that provide for the storage, access, and manipulation of data in database structures by multiple concurrent users. These languages may be computationally complete and may contain features for the packaging and storage of modules and procedures in database structures.

4. provide interfaces for the languages developed to other standard programming languages.

5. provide interfaces or access to other standards describing data types, behaviour, or database content to users of the languages developed.

JTC 1/SC 32/WG 4

Title: SQL Multimedia & Application Packages

Area of Work: Specification of packages of abstract data types for use in various application areas. Each package of abstract data type definitions is specified using the facilities for user-defined type provided in the Database Language SQL. This may include packages such as Full-Text, Spatial, Still Image, Still Graphic, Animation, Full Motion Video, Audio, Seismic, and Music. Other packages are defined using SQL language facilities, but not user-defined types, to support user requirements for application-determined APIs to data management facilities.

1.3   PROJECT REPORT

The current SC 32 Work Programme (32N2105) is available at <http://jtc1sc32.org>

1.4   CO-OPERATION AND COMPETITION

A complete listing of SC 32 liaisons is listed in the following tables. SC 32 is continually re-evaluating its liaisons and assessing areas of internal and external cooperation and competition. SC 32 has requested JTC1 to remove the liaisons that have not expressed an interest in the work of SC 32.

Internal Liaison Membership

IEC B3 JWG15	Design Automation
ISO/IEC JTC1/SC 2	Coded character sets
ISO/IEC JTC1/SC 6	Telecommunications and information exchange between systems
ISO/IEC JTC1/SC 7	Systems Engineering -ODP & Modelling Languages
ISO/IEC JTC1/SC 7/WG7	Software engineering/Life cycle management
ISO/IEC JTC1/SC 17	Cards and personal identification
ISO/IEC JTC1/SC 22	Programming languages
ISO/IEC JTC1/SC 22/WG20	Programming languages/Internationalization
ISO/IEC JTC1/SC 22/WG23	Programming language vulnerabilities
ISO/IEC JTC1/SC 24	Computer Graphics and Image Processing
ISO/IEC JTC1/SC 27	IT Security Techniques
ISO/IEC JTC1/SC 31	Automatic identification and data capture techniques
ISO/IEC JTC1/SC 34	Document Description and Processing Languages

ISO/IEC JTC1/SC 35	User Interfaces
ISO/IEC JTC1/SC 36	Information Technology for Learning, Education & Training
ISO/IEC JTC1/SC 37	Biometrics
ISO/IEC JTC1/SWG-SG	Smart grid
ISO/TC 37	Terminology (principles and coordination)
ISO/TC 37/SC 2	Terminology and other language resources - Terminography and Lexicography
ISO/TC 37/SC 3	Terminology/Computer Applications
ISO/TC 37/SC 4	Terminology and other language resources
ISO/TC 46	Information and documentation
ISO/TC 46/SC 4	Information and documentation/Computer applications
ISO/TC 46/SC 11	Archives / Records Management
ISO/TC 46/WG2	Information and documentation/Coding of country names and related entities
ISO/TC 68/SC 2	Banking, securities and other financial services/ Security management
ISO/TC 127/WG2	Mobile construction machinery - Work-site data exchange
ISO/TC 154	Documents and data elements in administration, commerce and industry
ISO/TC 171	Document management applications
ISO/TC 176	Quality management and quality assurance
ISO/TC 184	Industrial automation systems and integration
ISO/TC 184/SC 4	Industrial automation systems and integration/ Industrial data
ISO/TC 204	Transport Information and Control Systems
ISO/TC 211	Geographic information/Geomatics
ISO/TC 215	Healthcare Informatics

External Liaison Membership Category -   A

INTELSAT	International Telecommunications Satellite Organization
ITU-T	International Telecommunication Union - Telecommunication Standardization Sector
UN/ECE	UN/Economic Commission for Europe/CEFACT

External Liaison Membership Category -   B

CISAC	International Confederation of Societies of Authors and Composers
SWIFT	Society for Worldwide Interbank Financial Telecommunication
WMO	World Metrological Organization

External Liaison Membership Category -   C

DCMI	Dublin Core Metadata Initiative
DAMA-I	Data Management Association International *
ebXML OASIS	OASIS Registry/Repository Technical Committee *
Eurostat	Eurostat

IEEE LTSC	Learning Technology Standards Committee
OECD	Organisation for Economic Co-operation and Development
OGC	Open GIS Consortium
OMG	Object Management Group
W3C	World Wide Web Consortium

* Pending JTC1 Approval

2.0   PERIOD REVIEW

Excellent progress has been made in developing SQL, SQL MM, e-Business, Metamodel, and Metadata Registry standards. We expect that progress to continue in the future. The material in section 2.2, below, details the progress made during the year.

2.1   MARKET REQUIREMENTS

Market requirements for SC 32 standards are driven by the rapid pace of hardware and software advancement as well as by the explosive growth of World Wide Web/Internet/Intranet/Extranet applications and related semantic technologies. These advances drive a stream of market requirements that are addressed by SC 32 standards for data management and interchange, including metadata models, ontologies, registries, and other tools. The data management market continues to grow rapidly.

SC 32 projects respond to an increasing market demand for semantics management and semantic computing. Better semantics are needed to ground the concepts used in databases, XML messages, text in documents (which may be stored in databases), the semantic web, etc. The work underway connects several ISO standards for terminology content and structure with standards for data management and interchange. SC 32 is exploring the market requirements for semantics management and potential extensions to new and existing standards in order to articulate and then fill unmet needs. Work is also ongoing in WG 2 on projects dealing with the relationship between metamodels and metamodel management. This work is needed to contribute to tools and technologies needed for Semantic Service Oriented Architectures and Model Driven Architectures. Study periods are underway to explore potentially new areas of standardization, including metadata registry for semantic web, metamodel management, registry of registries to support interoperation, layering ontologies upon data exchange agreements, and topics such as ontology evolution and alignment, and a metamodel for on-demand model selection.

Market demand for electronic business applications (e.g., e-Commerce, e-Government, e-Logistics), products, and services grow as firms continue to adapt to the electronic marketplace. The applications that better meet the customers' requirements are more competitive in the market. The customers' requirements about the functions and services is being addressed by a lot of standardization effort, but those requirements to support the legal, social, and professional knowledge of the customers are becoming even more outstanding. These requirements are being addressed by SC32 e-Business standards. On the other hand, e-Business standards need also to be easily conformed to by applications in a highly automated world and SC32 e-Business standards are also addressing this demand.

The market demand for SQL database products remains strong, both from commercial vendors and open-source projects. The new capabilities in SQL:2011 were driven by market priorities, so we expect vendor acceptance of the enhancements. WG 3 is currently reviewing a variety of options for additional extensions and expansions of the SQL standards. In particular, WG3 is engaged in reviewing the new market demands as the data volumes are growing at much higher rates than before. A variety of new solutions under the umbrellas of "NoSQL" and "Very Large" database systems are surfacing to meet these demands, many as open-source offerings. While it

is not yet clear which and how many of these solutions will survive over the next few years, the techniques may be useful in wider markets. Therefore, WG3 is talking to proponents of these solutions and will take into account lessons learned from these engagements in its future work.

Each part of the SQL/MM suite of standards is based on explicit requirements from a domain market. In particular, and SQL/MM Part 2: Spatial, specifying Spatial Data Management, has received much attention. This interest was shown by ISO TC 204 (Intelligent Transport Systems), ISO TC 211 (Geographic information/Geomatics), and OGC (Open GIS Consortium). Our work on SQL/MM Part 2 is proceeding under close coordination with TC 211 and OGC. Thus, we believe that our standards meet real market requirements.

2.2   ACHIEVEMENTS

Seven projects have completed and been published or are in Stage 60 – Publication Stage:

1.32.31.01.10.00   ISO/IEC FCD 15944-10:2013
Business Operational View - Part 10: IT-enabled coded domains as semantic components in business transactions

1.32.04.03.07.00   ISO/IEC TS 13249-7:2013
Database languages - SQL multimedia and application packages -- Part 7: History

1.32.15.03.03.00   ISO/IEC 11179-3:2013
Metadata registries (MDR) - Part 3: Registry metamodel and basic attributes 3rd Edition

1.32.17.01.01.00   ISO/IEC 20944-1:2013
Metadata Registry Interoperability and Bindings (MDR-IB) - Part 1: Framework, common vocabulary, and common provisions for conformance

1.32.17.01.02.00   ISO/IEC 20944-2:2013
Metadata Registry Interoperability and Bindings (MDR-IB) - Part 2: Coding bindings

1.32.17.01.03.00   ISO/IEC 20944-3:2013
Metadata Registry Interoperability and Bindings (MDR-IB) - Part 3: API bindings

1.32.17.01.04.00   ISO/IEC 20944-4:2013
Metadata Registry Interoperability and Bindings (MDR-IB) - Part 4: Protocol bindings

1.32.17.01.05.00   ISO/IEC 20944-5:2013
Metadata Registry Interoperability and Bindings (MDR-IB) - Part 5: Profiles

The following projects are completing Stage 50 – Approval Stage by being submitted to ITTF for final FDIS vote:

1.32.16.01.05.00   ISO/IEC PRF TR 20943-5
Achieving Metadata Registry Content Consistency -- Part 5: Semantic metadata mapping procedure

1.32.16.01.06.00   ISO/IEC PRF TR 20943-6
Information technology -- Achieving Metadata Registry Content Consistency -- Part 6: Framework for generating ontologies

The following projects are completing Stage 40 – Enquiry Stage with FCD/DIS/DTR ballot:

The following projects are progressing in Stage 30 – Committee Stage (CD/PDTR):

1.32.15.03.01.00   ISO/IEC CD 11179-1 ed 3
Metadata registries (MDR) -- Part 1: Framework

1.32.15.03.05.00   ISO/IEC CD 11179-5 ed 3
Metadata registries (MDR) -- Part 5: Naming and identification principles

1.32.15.03.06.00   ISO/IEC CD 11179-6
Metadata registries (MDR) -- Part 6: Registration

1.32.31.01.09.00   ISO/IEC CD 15944-9
Business Operational View - Part 9: Open-edi traceability framework

1.32.22.01.05.00   ISO/IEC CD 19763-5
Metamodel framework for interoperability (MFI) - Part 5: Metamodel for process model registration

1.32.22.01.06.00   ISO/IEC CD 19763-6
Metamodel framework for interoperability (MFI) - Part 6: Registry summary

1.32.22.01.07.00   ISO/IEC CD 19763-7
Metamodel framework for interoperability (MFI) - Part 7: Metamodel for service registration

1.32.22.01.08.00   ISO/IEC CD 19763-8
Metamodel framework for interoperability (MFI) - Part 8: Metamodel for role and goal registration

1.32.22.01.09.00   ISO/IEC PDTR 19763-9
Metamodel framework for interoperability (MFI) - Part 9: On-demand model selection

1.32.22.01.10.00   ISO/IEC CD 19763-10
Metamodel framework for interoperability (MFI) - Part 10: Core model and basic mapping

1.32.22.01.12.00   ISO/IEC CD 19763-12
Metamodel framework for interoperability (MFI) - Part 12: Metamodel for information model registration"

1.32.22.01.13.00   ISO/IEC CD 19763-13
Metamodel Framework for Interoperability (MFI) - Metamodel for forms registration

1.32.03.07.01.91   ISO/IEC 9075-1:2011/NP Cor 1
Database languages -- SQL -- Part 1: Framework (SQL/Framework) -- Technical Corrigendum 1

1.32.03.07.02.91   ISO/IEC 9075-2:2011/NP Cor 1
Database languages -- SQL -- Part 2: Foundation (SQL/Foundation) -- Technical Corrigendum 1

1.32.03.07.04.91   ISO/IEC 9075-4:2011/NP Cor 1
Database languages -- SQL -- Part 4: Persistent Stored Modules (SQL/PSM) -- Technical Corrigendum 1

1.32.03.07.04.91   ISO/IEC 9075-11:2011/NP Cor 1
Database languages -- SQL -- Part 11: Information and Definition Schemas (SQL/Schemata) -- Technical Corrigendum 1

1.32.03.07.11.91   ISO/IEC 9075-14:2011/NP Cor 1
Database languages -- SQL -- Part 14: XML-Related Specifications (SQL/XML) -- Technical Corrigendum 1

1.32.03.08.01   CD 9075-1
Database languages – SQL – Part 1: Framework (SQL/Framework)

1.32.03.08.02   CD 9075-2
Database languages – SQL – Part 2: Foundation (SQL/Foundation)

1.32.03.07.03   CD 9075-3
Database languages – SQL – Part 3: Call-Level Interface (SQL/CLI)

1.32.03.08.04   CD 9075-4
Database languages – SQL – Part 4: Persistent Stored Modules (SQL/PSM)

1.32.03.07.09   CD 9075-9
Database languages – SQL – Part 9: Management of External Data (SQL/MED)

1.32.03.07.10   CD 9075-10
Database languages – SQL – Part 10: Object Language Bindings (SQL/OLB)

1.32.03.08.11   CD 9075-11
Database languages – SQL – Part 11: Information and Definition Schemas (SQL/Schemata)

1.32.03.07.13   CD 9075-13
Database languages – SQL – Part 13: SQL Routines and Types Using the Java ™ (SQL/JRT)

1.32.03.09.14   CD 9075-14
Database languages – SQL – Part 14: XML (SQL/XML)

1.32.09.01.02   ISO/IEC PDTR 19075-2
SQL Technical Reports - Part 2: SQL Support for Time-Related Information

1.32.09.01.03   ISO/IEC PDTR 19075-3
SQL Technical Reports - Part 3: SQL Embedded in Java

1.32.09.01.04   ISO/IEC PDTR 19075-4
SQL Technical Reports - Part 4: SQL with Java Routines and Types

The following projects are progressing in Stage 20 – Preparatory Stage (WD) or Stage 10 – Proposal Stage (NP):

1.32.04.04.04.00   ISO/IEC NP 13249-3
SQL Multimedia and Application Packages - Part 3: Spatial 5th Ed.

1.32.09.01.05   ISO/IEC NP 19075-5
SQL Technical Reports - Part 5: SQL Row Pattern Recognition

2.3 RESOURCES

Adequate resources are currently available for all projects. SC32 actively seeks and recruits new participants.

2.4 ENVIRONMENTAL ISSUES

None

2.5 PARTICIPATION METRICS

Indicate the active participation of National Bodies in both meetings and balloting. In particular, note if the 50% voting participation requirement is being met.

JTC 1/SC 32 Performance (as of 2013-09-15)

SC 32 METRIC	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013[9]
Attendance at Meetings [1, 6, 8]	47	61	37	33	48	60	41	40	43	32
New Standards Published [2]	5	1	0	13	18	5	11	13	7	8
Total Standards Published [3]	37	41	41	54	72	77	88	101	108	116
Active Projects [4]	67	66	66	66	52	30	39	45	49	62
New Projects [5, 7]	0	2	0	0	3	5	6	10	9	13

[1] Average Attendance at Plenary and Working Group Meetings
(where a plenary includes a meeting of all working groups – if working groups do not meet during plenary meetings, a cumulative mean attendance to working group meeting should be used) **(Att. Plena**.)

[2] New Standards published **(NSP)**

[3] Total standards published (and currently valid) **(TSP)**

[4] Active projects **(AP)**

[5] New projects introduced (**NP**)

[6] At the National Body level the Working Groups are obtaining considerable participation with electronic participation

[7] Not including project subdivisions pending JTC1 approval

[8] Plus ~40 attendees at the Open Forum on Metadata Registries, held concurrent with the SC 32 WG meetings, The attendance number does not include several Open Forum attendees who are also SC 32 participants at the National Body level, but who were unable to remain a second week for the SC 32 meetings.

[9] Since May 2013

3.0 FOCUS NEXT WORK PERIOD

SC 32 has refined its program of work to ensure that it is focusing on those standards that will meet market requirements. SC 32 plans to continue to focus on developing standards for SQL, SQL/MM, eBusiness, and data semantics. SQL work is expected to be particularly active. The metadata registry market is very active, driving development of edition 3 of all parts of ISO/IEC 11179 to realign with the recently published ISO/IEC 11179-3:2013 ,and ISO/IEC 19763 interoperability framework addressing metamodels for registration of semantic descriptions of computer services, processes, information models and forms for data capture. The ISO/IEC 19763 family of standards has been complimented with development of a technical report explaining the registration and use of parts of 19763 for service registries that support semantic discovery and reuse of services.

Work on Database Languages (WG 3) is active with the focus on a revised set of ISO/IEC 9075 parts. WG 3 is continuing to track the W3C XQuery work as well as reviewing a variety of options

for additional extensions and expansions of the SQL standards. The options currently under review are:

- Support for additional temporal data management facilities needed by temporal applications.
- Addressing requirements to manage streaming data
- Additional OLAP facilities for data warehousing
- Supporting additional types of metadata
- Increased interoperability
- Providing underlying support for semantic web capabilities
- Identifying areas of support for "NoSQL" and "Big Data"
- Support for finding collections of rows that match certain specified patterns
- Multidimensional array support

The eBusiness Working Group (WG 1) is concentrating on multiple parts of ISO/IEC 15944: Information technology - Business Operational View, especially Part 9 – Traceability framework, Part 20 - Linking business operational view to functional service view.

With the completion of ISO/IEC 11179-3 Ed3, the Metadata Working Group (WG 2) is progressing with revisions to the other parts in 11179 family of metadata registry standards to align with edition 3, the major revision was the incorporation of concept systems as the basis for semantics of models. The continued development of ISO/IEC 19763 *Metamodel framework for interoperability (MFI).* metamodel for metadata registries extends the facilities for metadata registries to support registration of the semantics of services, processes, information models and forms. These two interrelated standards greatly enhance facilities for the registration of semantics and data management capabilities. Close coordination with ISO/TC 37 (Terminology and other language resources) is under way to ensure that metadata registry management of semantics will be consistent with and complimentary to other ISO standards in this area.

Updates to the other parts of the ISOIEC 11179 family and completion of the ISO/IEC 19763 family of metamodels is the current focus. ISO/IEC 19763 Part-10 describes a core model for registration of metamodels and mappings between models. Current related parts under development support registration of services, processes, business roles, and goals as specializations of the core model to help describe information technology resources, with discovery and reuse of resources in an SOA or Cloud Computing environment as primary supported use cases. A technical report is part of this family explaining how there parts are to be used together. The ability to register information models and forms, and map between them further extends the capability of the metamodel framework for interoperability. Each of these ISO/IED 19763 parts inherits from and utilizes the registration facilities of ISO/IEC 11179.

Also in WG 2, the ISO/IEC 20944 *Metadata registry interoperability and bindings (MDR-IB)* project addresses the exchange of metadata among ISO/IEC 11179-based registries that depends not only on standard-conforming software, but also on contents that are compatible across registries. Work is underway to foster interoperation between ISO/IEC 11179 *Metadata registries*, XML registries, UN/CEFACT *Core Component Technology Specification*, UN/CEFACT *Modelling Methodology* (UMM), OASIS *ebXML Registries*, and facilities that will be built in conformance with OMG's *Ontology Definition Metamodel (ODM)* and *Information Management Metamodel (IMM),* including a new class of information in registration of registries, ISO/IEC 198763-6 Registry Summary. It is expected that OMG will submit the ODM and IMM as PAS submissions. The WG 2 work is positioned to meet the deeper semantic management aspects of data management and interchange. This includes provision of semantics for semantic computing, the semantic web, classification schemes, services and associated metadata.

WG 2 organizes an *Open Forum on Metadata Registries* usually immediately preceding the SC 32 WG and Plenary meetings. The last such meeting was the15th *Forum* was held in Berlin, DEU, in May 2012. The 16th *Forum* is tentatively scheduled for China, in May 2014. This forum

would focus on Big Data and next generation analytics as topics of interest to all WGs and allow discussion of related SC 32 standards.

3.1 DELIVERABLES

See section 1.3 for those projects with upcoming target dates.

3.2 STRATEGIES

SC 32 is focused on progressing its program of work as quickly and efficiently as possible. The committee is focused on identifying and meeting market requirements, and emphasizes new projects that have well-defined, concrete objectives that are market driven. Each of the WGs welcomes the opportunity to work closely with related ISO committees to translate requirements into new Data Management and Interchange standards.

SC 32 empowers its WGs by delegating everything that can be delegated to a WG, per JTC 1 directives, along with the relevant authority and responsibility. The SC does not impose any additional management overhead. SC 32 Plenary meetings accomplish those tasks required by the JTC 1 directives in as brief a time as possible. Only an opening and closing plenary are held with approximately a half-day duration, each. Inter-WG discussions are invited during a tutorial meeting and anytime outside of Plenary. All contentious issues are identified in advance and groups appointed to resolve the issue and prepare a recommendation before the closing Plenary. This strategy is intended to make the SC as productive as the members can be. WGs strive to insure that all National Bodies are actively involved in the technical work and that all of their opinions and contributions are considered.

SC 32 maintains extensive contact with software developers and users to keep in close alignment with market forces. The Working Groups continue to utilize electronic editing meetings whenever possible in order to progress the work as rapidly as possible. SC32 has active liaisons with industrial consortia, including OMG, OASIS, W3C, UN/CEFACT, and DAMA.

3.2.1 RISKS

Each of the Working Groups within SC 32 sets its own priorities and strategies for achieving objectives. This approach has lead to increasing progress in identifying and establishing critical inter-group understanding and liaisons. Considerable effort is being given to reduce the risk of work becoming isolated within a WG. For example, at every SC 32 open plenary meeting, each WG conducts a tutorial presentation on its work to the full subcommittee.

There is some risk that major vendors may wish to re-focus their efforts within national bodies or other standards groups, with the intention to progress the resulting standards through JTC 1 as Fast Track or PAS submissions. There exists some risk that proponents of particular technologies may prefer that they be developed in an open source community and eschew formal standardization. There is a possibility that major standards such as SQL could be declared as mature and not require substantial additional effort within SC 32. There is also a possibility that major participant groups within any of the WGs may drop participation for financial, programmatic, product, or other reasons, thus severely damaging the viability of the WG and/or SC 32.

There is always the risk that a new project could be initiated that does not have clear objectives and concrete specifications. If this loss of focus occurs, SC 32 could risk dilution of its effectiveness and thus could create incentives to produce important standards outside of SC 32 and JTC 1.

Overlapping scopes of projects is an area that needs to be continually monitored and controlled. Changes in market requirements may cause some perturbation in the work schedules. However, if SC 32 loses technology leadership, it may lose control. Therefore, rapid development of new

standards, as well as producing the next edition of existing standards, is a crucial factor in future success.

If SC 32 does not pursue its work aggressively, risks exist that essential capabilities will not be available in the marketplace to support important functions, or that the marketplace will produce multiple incompatible solutions in areas where common approaches and interoperability are essential to users.

The delegation of authority and responsibility to the WGs stands in contrast to the working of some other JTC 1 Subcommittees. This management style risks making some participants uncomfortable, because it limits discussion time in Plenary meetings. There is a risk of missing some viewpoints that might be expressed in longer Plenary meetings.

Other standards bodies are very active in areas related to SC 32 standards. SC 32 must be nimble to maintain its relevance and leadership.

3.2.2 OPPORTUNITIES

The Internet, cloud computing, semi-structured and unstructured data use, electronic commerce, semantic computing, the semantic web, object technologies, data privacy, and XML represent major areas of opportunity where market forces are creating demand for SC 32 standards. SC 32 will continue to work with the others involved to identify the specific standardization needs and to respond with current and newly proposed projects. To that end, SC 32 is preparing a document for delivery to SC 38 describing the existing and emerging SC 32 standards that pertain to SOA, web services, and cloud computing. SC 32 believes that its work is synergistic with that of SC 38 and will not overlap with or duplicate the work of SC 38, nor create competing standards,

Semantic Service-Oriented Architectures represents a major area of opportunity where market forces are creating demand for standards. SC 32 is continually monitoring the work in this area, such as the need to transform data and metadata representation into semantic technology, languages such as OWL and RDF, and will react as soon as it sees and appropriate opportunity.

The topics of "next generation analytics" and "big data" are appearing frequently both in computing industry and more general news reports. SC 32 initiated a study group in these areas and has delivered a preliminary report to SWG-P and JTC1that identifies existing SC 32 standards that support these technologies and opportunities for enhancing work in these areas. The study group has been continued so SC 32 expects to produce an revised and enhanced report out of its 2014 plenary.

3.3 WORK PROGRAMME PRIORITIES

Each WG establishes work programme priorities in their project plan, which is approved in the SC 32 Plenary. These can be seen in the material, above. For example, high priority is given to the standardization of an integrated/interoperable information processing environment.

The SC has established a priority of educating each working group about the work and ideas of the other work groups. Previous SC 32 meetings have shown that there is considerable interest in the synergy that can be developed within the subcommittee. The next SC 32 plenary meeting will again include tutorials from each work group to facilitate and encourage awareness, communication, and collaboration among the four working groups.