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Email of secretary: lrajchel@ansi.org

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BUSINESS PLAN FOR JTC 1/SC 37 ‘BIOMETRICS’

PERIOD COVERED: October 2012 – September 2013

SUBMITTED BY:

Fernando L. Podio, JTC 1/SC 37 Chairman

Lisa Rajchel, JTC 1/SC37 Secretariat

1.0 MANAGEMENT SUMMARY

1.1 CHAIRMAN’S REMARKS

During this reporting period, the Subcommittee made significant progress in advancing its Programme of Work. A large number of projects reached the next stage. The initial version of the harmonized biometric vocabulary was published (ISO/IEC 2387-37, Vocabulary – Part 37: Biometrics) and two additional parts of the “second generation” of biometric data interchange formats and three parts of the conformance testing methodology multi-part standard for the “second generation” of biometric data interchange formats were published. In addition, the Subcommittee initiated new projects to address the development of additional parts of the Biometric application programming interface (BioAPI) multi-part standard, started development of an additional part of the data interchange format multi-part standard (Palm line image data) and is working in the development of a standard to specify performance testing of template protection schemes.

Published standards during this reporting period are highlighted in Table 3 below (*Published International Standards and Technical Reports*). Overall, including amendments and corrigendum, as of 2013, there are 87 published standards for biometrics. The SC 37 structure did not change during this period. After the July 2012 Plenary meeting, the Subcommittee decided to switch the schedule from 6-month cycles between WG meetings and 12-month cycles between Plenary meetings to 9-month cycles between WG meetings and 18-month cycles between Plenary meetings. During this Plenary meeting a SC 37 Special Group (SG) was established to prepare and coordinate SC 37 contributions and responses to JTC 1 subgroups and address SC 37 strategic issues between SC 37 Plenary meetings. The SC 37 SG collocated its first meeting with the SC 37 WG meetings held in April 2013 in Winchester, UK. As a result of a recommendation from this SG, a ballot was issued for consideration of reverting back to 6-month cycles for WG meetings and 12-month cycles for Plenary meetings. This proposal was approved. This change was scheduled to be effective following the SC 37 WG and Plenary meetings schedule for January 2014. This report reflects progress made at the aforementioned SC 37 WG meetings held in April 2013 in Winchester, UK.

Development of the SC 37 PoW continues to be performed through six WGs. Clause 1.3.1 highlights representative projects under the responsibility of each WG. Clause 2 provides more details on the project status, participation, market requirements for the SC 37 standards and specific achievements. Cooperation and liaison activities, focus for the next period, and references are also included below.

1.2 JTC 1 SC 37 STATEMENT OF SCOPE

The Statement of Scope has not changed since it was approved at the first meeting of SC 37 held in December 2002. It is included below for convenience.

“Standardization of generic biometric technologies pertaining to human beings to support interoperability and data interchange among applications and systems. Generic human biometric standards include: common file frameworks; biometric application programming interfaces; biometric data interchange formats; related biometric profiles; application of evaluation criteria

to biometric technologies; methodologies for performance testing and reporting and cross jurisdictional and societal aspects.

Excluded is the work in ISO/IEC JTC 1/SC 17 to apply biometric technologies to cards and personal identification.

Excluded is the work in ISO/IEC JTC 1/SC 27 for biometric data protections techniques, biometric security testing, evaluations, and evaluations methodologies.”

The hierarchy and interrelationships between the scopes of work in SC 37, SC 27 and SC 17 and work conducted in these SCs remains the same.

1.3 PROJECT REPORT

1.3.1 PROGRESS

The last SC 37 Plenary meeting was held in July 2012 in Paris, France (progress out of this meeting was reported in the previous SC 37 annual report to JTC 1). This report reflects the results of the SC 37 WG meetings held in April 2013 in Winchester, UK. The overall progress in this period has been excellent as detailed above. It is expected that during the next reporting period many of the projects at FDIS/DIS/DAM/CD/PDAM stage will be completed. Accounting for amendment projects, technical corrigenda, the revision of existing standards and new projects recently approved, the SC 37 PoW currently includes thirty projects subdivided into one hundred and thirty-five subprojects (published and ongoing projects are included). A list of published standards and technical reports as well as standards under development can be found at the following web page:

http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_tc_browse.htm?commid=313770&published=on&development=on

Highlights of representative projects under each SC 37 WG’s responsibility follows.

WG 1 – *Harmonized biometric vocabulary* completed the development of the initial version of ISO/IEC 2382, Part 37 - Biometrics. The standard was published in December 2012. The main purpose of this part of ISO/IEC 2382 is to provide a systematic description of the concepts in the subject field of biometrics and to clarify the use of the terms in this subject field. The subject field of biometrics is broken down into sub-fields. The terms are listed in a systematic order under a number of general headings. The document layout follows the directions given in ISO 10241. Thus, the elements of an entry appear in the following order: (a) Entry number (mandatory); (b) Preferred term(s) (mandatory); (c) Admitted term(s) (mandatory); (d) Deprecated term(s); (e) Definition; (f) Example(s); and (g) Note(s). During this period WG1 developed version 18 of Standing Document 2 (Harmonized Biometric Vocabulary) (SD2) and as part of this work, it has continued developing Concept Maps for this Standing Document.

SD2 is periodically sent to SC 37 Liaison Organizations including SC 17, SC 27, and ITU-T SG17. WG 1 also has responsibility for the development and maintenance of the Overview Standards Harmonization document (Standing Document 11) and recently undertook the responsibility to develop a revision of ISO/IEC TR 24741:2007 - Biometrics Tutorial.

WG 2 – *Biometric technical interfaces* continues to address the standardization of all necessary interfaces and interactions between biometric components and sub-systems, including the possible use of security mechanisms to protect stored data and data transferred between systems. A revision of ISO/IEC 19784-1, the BioAPI specification is under development. The document is at the 5th WG stage. This specification defines the Application Programming Interface (API) and Service Provider Interface (SPI) for standard interfaces within a biometric system that support the provision of a biometric system using components from multiple vendors. Two new parts of this multi-part standard were initiated: ISO/IEC 19784-5: Biometric application programming

interface – Part 5: Biometric processing Algorithm function provider interface and ISO/IEC 19784-6: Biometric Application Programming Interface – Part 6: Biometric matching algorithm function provider interface. Initial WDs for these two standards have been developed.

WG 2 continued the development of the Object-oriented BioAPI, which currently consists of three parts: Part 1, Architecture, Part 2, Java implementation and Part 3, C# implementation. These documents are at the CD2/CD 2/CD3 stages respectively. The Biometric Identity Assurance Services (BIAS) project reached DIS stage. Revision of two parts of the BioAPI Conformance testing methodology standards

WG-3 – *Biometric data interchange formats* addresses the standardization of the content, meaning, and representation of biometric data formats which are specific to a particular biometric technology or technologies. The ISO/IEC 19794 multi-part standard specifies biometric data interchange formats for a number of biometric modalities including finger, face, iris, signature/sign, vascular, hand geometry silhouette data and DNA data. During this period Part 11 (Signature/sign processed dynamic data) and Part 14 (DNA data) have been published. The only part of the second generation of this multi-part standard still under development is Part 13 (Voice data) which is at the WG4 stage. Development of the planned associated conformance testing methodology (CTM) standards specifying test for the syntactic requirements of the base standard for the first generation of biometric data interchange formats (ISO/IEC 29109) was completed. An amendment of ISO/IEC 29109-2 specifying Level 3 (semantic) conformance testing for finger minutiae data is under development.

As shown in Table 3, three parts of the associated CTM for the 2nd generation of data formats were published. These standards were developed as amendments to the data interchange format standards. The development of different parts (modality specific) of the biometric sample quality multi-standard (ISO/IEC29794) and the Presentation attack detection standard (ISO/IEC 30107) continues. Amendments to a number of parts of the 19794-x (2nd generation) standards specifying XML encoding are under development. With the exception of part 1: Framework for XML which is at the DAM stage, the other parts are at PDAM stage.

WG-4 - *Biometric functional architecture and related profiles* addresses the standardization of biometric functional architecture and related profiles that bind together the various biometric-related base standards in a manner consistent with functional blocks of operation of biometric systems. These profiles identify the pertinent biometric-related base standards. They also define which optional fields of the base standards shall be used, as well as how to set the configurable parameters, in order to achieve interoperability within a set of pre-defined constraints. This WG has developed three parts of the ISO/IEC 24713 multi-part standard. They were published during previous reporting periods: Part 1, Overview of biometric systems and biometric profiles, Part 2, Physical access control for employees at airports, and Part 3, Biometric Based Verification and Identification of Seafarers. Part 3 was developed within the ongoing liaison relationship between SC 37 and the International Labour Organization (ILO). Based on WG 4 recommendation, SC 37 approved, at the last Plenary, to recommend ITTF to confirm 24713-3 pending agreement from ILO and to withdraw 24713-2 since there are no known implementations of this profile.

The present, ongoing work is focused on generic technical best practices, guidance, and implementation requirements that support the interoperability of biometric applications. Projects being addressed include: Technical Report on Guidance for Biometric Enrolment (ISO/IEC TR 29196), Technical Report on Traveler Processes for Biometric Recognition in Automated Border Control Systems (ISO/IEC TR 29195), Technical Report on Use of Mobile Biometrics for Personalization and Authentication (ISO/IEC 30125) and Code of practice for the implementation of a biometric system (ISO/IEC 30124) which reached CD stage.

WG 5 - *Biometric testing and reporting* addresses the standardization of testing and reporting methodologies and metrics that cover biometric technologies, systems and components. Seven parts of the multi-part standard ISO/IEC 19795 Biometric performance testing and reporting have been published during previous reporting periods (six parts published as ISO/IEC standards and one as a Technical Report). An amendment of ISO/IEC 19795-2:2007 to specify testing of multi-modal biometric implementations is under development (CD stage). WG 5 is addressing the development of another multi-part standard with the goal to specify Machine readable test data for biometric testing and reporting (ISO/IEC29120). Part 1, Test reports reached DIS stage. Part 2, Test input data is at CD stage. WG 5 is also addressing other performance and evaluation-related standards and technical reports to meet current biometric technology trends and future needs in this area such as an Evaluation methodology for environmental influence in biometric systems (ISO/IEC 29197) which reached DIS stage and a Technical Report on the Characterization and measurement of difficulty for fingerprint databases for technology evaluation (ISO/IEC TR 29189) which was completed and forwarded to ITTF for publication.

WG 6 - *Cross-jurisdictional and societal aspects of biometrics* addresses standardization in the field of cross-jurisdictional and societal aspects in the application of international biometrics standards. Within this context, the scope of work includes the support of design and implementation of biometric technologies with respect to accessibility, health and safety, support of legal requirements and acknowledgement of cross jurisdictional and societal considerations pertaining to personal information. A Technical Report addressing jurisdictional and societal considerations for commercial applications providing general guidance was published as ISO/IEC TR 24714-1:2008. The WG is developing a multi-part Technical Report addressing pictograms, icons and symbols for use with biometric systems (ISO/IEC 24779). Part 1, General principles provides an overview and reached DIS stage.

Other parts under development are addressing pictograms and symbols for specific biometric modalities include Part 4: Fingerprint applications (at 2nd CD stage), Part 9: Vascular Applications (at DIS stage) and Part 5: Face (at 2nd WD stage). WG 6 is also developing other Technical Reports such The Role of Biometrics in Identity Management (ISO/IEC TR 29144) which reached TR stage and a Biometrics guide on designing accessible and inclusive biometric systems (ISO/IEC TR 29194) which is at PDTR stage.

SC 37 and WG Roadmaps

As part of SC 37 business planning activities, WGs periodically develop WG Roadmaps (SC 37 Standing Documents 14-1 to 14-6). These roadmaps provide additional information on current projects, their status, interdependencies between WGs, new work items, and perceived requirements for new standards/prospects for future standardization. The Terms of Reference of the SC 37 Special Group established to prepare and coordinate SC 37 contributions and responses to JTC 1 subgroups and address SC 37 strategic issues between SC 37 Plenary meetings mentioned above includes the develop of a SC 37 roadmap. Based on a SC 37 Chair contribution, the initial version of the roadmap is under development by the SG for consideration and approval at the upcoming SC 37 Plenary meeting scheduled to be held January 2014 in Darmstadt, Germany.

1.4 COOPERATION AND LIAISON ACTIVITIES

During this reporting period, SC 37 biometric experts, via SC 37 Special Groups (SGs) and/or liaison reports, continued to provide their expertise to other JTC 1/SCs and external organizations on their biometric-related projects. SC 37 has liaison relationships with the following organizations within JTC 1 (internal liaisons) and organizations external to JTC 1:

- ISO/IEC JTC 1/SC 17, Cards and personal identification
- ISO/IEC JTC 1/SC 27, IT Security techniques

- ISO/IEC JTC 1/SC 31, Automatic identification and data capture techniques
- ISO/IEC JTC 1 SWG-A, Special Working Group on Accessibility
- ISO/IEC JTC 1/WG 7, Sensor networks
- ITU-T SG 17, Security
- BioAPI Consortium
- International Biometrics and Identification Association (IBIA)
- International Labour Office of the UN
- CEN/TC 224/WG 18, Interoperability of biometric recorded data
- OASIS BIAS TC, OASIS Biometric Identity Assurance Services (BIAS) Integration TC
- Frontex (Category C Liaison with JTC 1/SC 37 WG4)

As reported in the previous period, at the last Plenary meeting, held July 2012 in Paris, France, two SC 37 Special Groups were re-established to prepare and coordinate SC 37 Responses to SC 17 and to provide responses to SC 27 liaison reports and input to SC 27 projects. These activities are ongoing.

Representative examples of latest cooperation activities with SC 37 Liaisons organizations follow.

1.4.1 SC 17

The technologies addressed by SC 17 and SC 37 are, for some applications, complementary in nature. The potential contributions that SC 37 can make to SC 17 through this liaison activity are substantial, particularly in the specification of use of biometric data within their projects. During this period, SC 37 forwarded to SC 17 a Liaison report on the transition period from referencing in ICAO 9303 ISO/IEC 19794-5:2005 to ISO/IEC 19794-5:2011 and forwarded to SC17 the latest draft of ISO/IEC 29794-1 Biometrics sample quality – Part 1 Framework and ISO/IEC 29794-6 Biometrics sample quality – Part 6 Iris image data. SC 37's close collaboration with SC 17 on these projects and other required projects is expected to continue.

1.4.2 SC 27

Exchange of information between both SCs on Identity Management, Privacy Technologies, and Biometrics is ongoing. SC 37 forwards to SC 27 drafts of the Harmonized Biometric Vocabulary Standing Document 2 (SD2). During this period SC 37 has also forwarded the latest drafts of ISO/IEC 5th WD 30107 Presentation attack detection. During the previous period SC 37 expressed its interest in SC 27's Study Period on Security evaluation of anti-spoofing detection techniques for biometrics and offered its assistance to collaborate with SC27 during this SP on the current landscape of standardization activities regarding anti-spoofing and liveness detection techniques and the issues which should be addressed in the future.

1.4.3 ITU-T SG 17

Coordination of work and close collaboration between SC 37 and ITU-T SG17 continues within the well-established collaborative procedures between ITU-T and JTC 1 in areas such as security requirements, specifications and authentication. SC 37 is exploring with ITU-T SG17 areas and activities of common interest on biometric and security within the SC 37 scope of work. SC 37 has identified an individual to serve as the SC37 liaison representative to ITU-T SG17. Liaison reports have been exchanged between both organizations. SC 37 WG 4 forwarded a response to ITU-T SG 17/WP 2 on Recommendation ITU-TX.tam, A guideline to technical and operational countermeasures for telebiometric applications using mobile devices and the latest draft of the SC 37 project Use of Mobile Biometrics for Personalization and Authentication (this draft was also sent to ISO/TC 68/SC 2 and JTC 1/SC 27). SC 37 also sent ITU-T SG 17 the latest draft of

ISO/IEC 29156, Guidance for specifying performance requirements to meet security and usability needs in applications using biometrics.

1.4.4 International Biometrics and Identification Association (IBIA)

IBIA continues to serve as the Common Biometric Exchange Formats Framework (CBEFF) Registration Authority (ISO/IEC 19785). SC 37 maintains an active liaison with this organization and assists them in fulfilling this important role.

1.4.5 International Labour Office of the UN

As stated above, SC 37/WG 4 developed a Biometric Profile for Seafarers (ISO/IEC 24713-3) as a result of SC 37’s collaboration with ILO. This work takes into account ILO’s requirements for a detailed biometric profile for verification and identification of seafarers with as much information on the architecture and implementation as possible (with reference to ILO Convention No. 185, and ILO’s technical requirements). At the last Plenary SC 37 approved to recommend that ITTF confirm ISO/IEC 24713-3 pending agreement from ILO. Recently (SC 37 5380), ILO confirmed that it still required this standard.

2.0 PERIOD REVIEW

Progress reflected in this report is based on the SC 37 WG meetings held in Winchester, UK, in April 2013. The SC 37 National Bodies remain very active in meetings and are very responsive to ballots and calls for comments and contributions. Four hundred documents have been posted in the SC 37 Document register during this period. Excellent progress during this period is illustrated by:

- Recently published biometric standards;
- Advancement of many of the projects to the next development level;
- Significant number of other standards expected to be completed in the next reporting period or at the beginning of the following period;
- Close and fruitful collaboration with other SCs and external organizations.

Membership in SC 37 consists of 28 P-Members and 13 O-Members. Table 1 lists the currently P-Membership and Table 2 lists the current O-members.

Table 1 - P – Member Countries

<ul style="list-style-type: none"> • Australia • China • Czech Republic • Denmark • Egypt • Finland • France • Germany • India • Israel • Italy • Japan • Korea, Republic of • Malaysia 	<ul style="list-style-type: none"> • New Zealand • Norway • Poland • Portugal • Russian Federation • Singapore • South Africa • Spain • Sweden • Switzerland • Thailand • Ukraine • UK • USA
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Table 2 - Observer Countries

<ul style="list-style-type: none"> • Austria • Belgium • Bosnia & Herzegovina • Canada • Ghana • Hungary • Indonesia 	<ul style="list-style-type: none"> • Iran, Islamic republic of • Ireland • Kenya • Netherlands • Romania • Serbia
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Participation in the SC 37/WGs has been excellent. The intensified level of work and the technical challenges presented by the development of the second generation of biometric standards (e.g. data formats, technical interface standards) are being successfully addressed through the dedication of over 120 - 130 experts from the National Bodies and Liaison Organizations.

2.1 MARKET REQUIREMENTS

Biometrics provides for secure transactions, positive identification and augmentation to human judgment. The relationship between a biometric characteristic (e.g., something that you are) and the users of a system or application provides a binding that is stronger than the binding that can be achieved between a user and other technologies that are currently in use for “personal authentication” such as passwords (e.g., something that you know) and tokens (e.g., something that you have). Used alone, or together with other authentication technologies such as tokens, they can provide higher degrees of security than other technologies and they can also be used to overcome the weaknesses of other technologies. Biometric technologies continue to be required in many public and private sector applications worldwide to authenticate an individual’s identity, secure national borders and restrict access to secure sites including buildings and computer networks.

Biometrics are being used for the protection of buildings from unauthorized individuals, in employee IDs, in retail, banking and financial institutions (e.g. employee-based /customer-based applications), associated with the management of welfare programs and in health care applications (e.g. service provider security to protect patient privacy, patient delivery verification protecting patient and provider). Other applications include verification of users’ identity in mobile devices, colleges (e.g. online identity verification) and amusement parks. Consumer uses are also expected to significantly increase for personal security and convenience in mobile devices, home automation and security systems, retail, gaming and hospitality industries and even in childcare/school applications (e.g., lunch programs, guardian verification for child release).

SC 37 is developing international standards keeping in mind the customer’s needs and the support for the mass market adoption of these standards. SC 37 strongly promotes the harmonization of biometric standards with security and token-based standards that use biometrics. SC 37 is also closely monitoring the development of related standards (e.g., cloud computing, sensor networks, ID management, use of biometric in token-based standards, security-related standards) with the view of offering its standards to other Standards Organizations. Through its work, SC 37 is helping to ensure that standards-based personal recognition systems and applications based on biometric solutions are more interoperable, scalable and secure.

SC 37 remains aware of current trends in personal identification and verification technologies. This is reflected in new projects undertaken by the Subcommittee and the SC 37 WG roadmaps which identify technical trends leading to future standardization needs such as biometric interfaces to support mobile devices, IdM applications, and authentication exchanges between a point of sale terminal and its related database. Technical reports under development have the goal to support users' applications of biometric technologies. These reports have been highlighted above.

Work is ongoing in developing amendments to the second generation of biometric data interchange formats (ISO/IEC 19794-x) that will specify XML encoding. Additional biometric image quality standards are expected to be developed as well. In addition, best practices, and additional guidelines on the use of biometrics in different applications are being developed. One of the SC 37 WG roadmaps identifies the possible need to support applications such as physical access control for travelers; verification of customers at points-of-sale; and physical/logical access control for employees in manufacturing and service sectors such as healthcare, education, transportation, finance, government, etc. Some of this work is already being addressed.

There is also a need to identify developments and technologies that are not amenable to performance testing using the current test processes. Some work in this area has started in WG5. It includes testing of behavioral aspects of biometric technologies relating to so called behavioral biometrics and behavioral elements of biological biometrics. There is also a perceived requirement for a standard or minimally a technical report specific to identification system testing. The current versions of the performance testing methodology standards address identification metrics and methodologies, but the full range of considerations specific to identification systems (e.g. ingestion, queuing, and hardware optimization) that can impact performance need to be addressed more fully.

Standardized biometric-based solutions are becoming a mandatory requirement in many personal verification and identification applications. Accounting for systems developers, resellers and the influence that biometrics will have on other industries and the IT industry (i.e. security, IdM industry); biometric technologies are considered to be a substantial catalyst for the global IT market in these applications. As reported in previous SC 37 Business Plans, many of the standards developed by SC 37 have been adopted by major international customers such as the International Civil Aviation Organization (ICAO) and the International Labour Office (ILO) of the United Nations as well as by government programs in several National Bodies represented in SC 37. Requirements related to SC 37 standards and adoption examples are provided below.

In order to support large applications of biometric data formats and large organizations such the ICAO, via Resolution 3.19 approved at the SC 37 Plenary meeting in Moscow 2009 (SC 37 N 3272) and Resolution G.12 approved by SC 37's Plenary in Kyoto 2011 (SC 37 N4559), SC 37 has requested ISO and IEC to retain the following standards and their respective amendments and corrigenda in the ISO and IEC catalogue following publication of the second edition of these standards: ISO/IEC 19794-1:2006, ISO/IEC 19794-2:2005, ISO/IEC 19794-4:2005, ISO/IEC 19794-5:2005, ISO/IEC 19794-6:2005, ISO/IEC 19794-7:2007, ISO/IEC 19794-8:2006, ISO/IEC 19794-9:2007 and ISO/IEC 19794-10:2007.

At the last Plenary meeting held July 2012, SC 37 approved a resolution reminding ISO and IEC of the SC 37 request to retain the first generation (1G) of ISO/IEC 19794 standards in the ISO and IEC catalogue and further requested ISO and IEC to allow Technical Corrigenda to be processed and published against these first generation standards until such time as the 1G standards are no longer required (Res. G.15 of JTC 1 N 11144, Resolutions Approved at the July 2012 ISO/IEC JTC 1/SC 37 Meeting in Paris). Recently the ISO TMB has approved the SC 37's request for exception (See SC 37 N 5471) to TMB Resolution 9/2012 and deviation from

ISO/IEC Directives Part 1 clause 2.10.2 and 2.10.4 such that a corrigendum (COR 3) may be issued against ISO/IEC 19794-5:2005. See approval of ISO TMB Resolution 39/2013 regarding ISO/IEC 19794-5:2005 COR3 in document SC37 N 5474. In SC 37's request for exception, which resulted in document SC37 N 5474, SC 37 has asked ITTF that the retention period should last at least until 2026.

2.2 ACHIEVEMENTS

One of SC 37's main goals is the development of international standards that support the mass market adoption of biometric technologies and this is being achieved. Adoption of SC 37 standards continues to grow and this demonstrates market acceptance of the standards. SC 37's additional goals are adoption of its standards by other JTC 1 SCs and ISO/IEC TCs (i.e. use of these standards by reference within their own standards projects) and adoption of these standards by external organizations for their own requirements. These goals are being met in great part due to continuous work in interacting with other organizations through, for example, detailed liaison reports related to ongoing work in standards organizations such as JTC 1 Subcommittees SC 17 and SC 27. SC 37 has continued to respond to a number of inquiries by ISO organizations as well as to JTC 1 requests and resolutions approved at the JTC 1 Plenaries.

Participation in JTC 1 activities continued during this period via the SC 37 Chair and/or the SC37 Secretariat in the JTC 1/SWG on Planning, JTC 1/SWG on Management and JTC 1/SWG on Directives. Related to these JTC 1 activities and SC 37's involvement, as addressed above, at its July 2012 Plenary, SC 37 established an SC 37 SG to prepare and coordinate SC 37 contributions and responses to JTC 1 Subgroups and address SC 37 strategic issues between SC 37 Plenary meetings.

Table 3 includes the International Standards and Technical Reports published to date and highlights in gray the documents published during this period.

Table 3 – Published International Standards and Technical Reports

Project	Title	IS	Publication Date
<i>SC 37/WG1 - Harmonized biometric vocabulary</i>			
1.37.2382-37	Vocabulary – Part 37: Biometrics	ISO/IEC 2382-37: 2012	2012-12-13
<i>SC 37/WG2 - Biometric technical interfaces</i>			
1.37.19784.1	Biometric application programming Interface – Part 1: BioAPI Specification	ISO/IEC 19784-1: 2006	2006-04-27
1.37.19784.1.1	Biometric application programming Interface – Part 1: BioAPI Specification – Amendment 1: 2007 - BioGUI Specification	ISO/IEC 19784-1:2006/Amd 1:2007	2007-11-26
1.37.19784.1.2	Biometric application programming	ISO/IEC 19784-	2009-07-09

	Interface – Part 1: BioAPI Specification – Amendment 2: Framework-free BioAPI	1:2006/Amd 2:2009	
1.37.19784.1.3	Biometric application programming Interface – Part 1: BioAPI Specification – Amendment 3: Support for interchange of certificates and security assertions, and other security aspects	ISO/IEC 19784-1:2006/Amd 3:2010	2010- 07-27
1.37.19784.2	Biometric application programming interface – Part 2: Biometric archive function provider interface	ISO/IEC 19784-2:2007	2007-01-15
1.37.19784.2 Cor. 1	Information technology - Biometric application programming interface – Part 2: Biometric archive function provider interface/Cor. 1	ISO/IEC 19784-2:2007/Cor. 1:2011	2011-05-11
1.37.19784.4	Biometric application programming interface – Part 4: Biometric sensor function provider interface	ISO/IEC 19784-4:2011	2011-02-16
1.37.19784.4 Cor 1	Biometric application programming interface – Part 4: Biometric sensor function provider interface/Cor 1	ISO/IEC 19784-4:2011/Cor 1: 2013	2013-02-11
1.37.29141	Tenprint Capture Using BioAPI	ISO/IEC 29141:2009	2009-11-27
1.37. 29164	Embedded BioAPI	ISO/IEC 29164:2011	2011-09-29
1.37.19785.1	Common Biometric Exchange Formats Framework (CBEFF) - Part 1: Data element specification	ISO/IEC 19785-1:2006	2006-04-26
1.37.19785.1.1	Common Biometric Exchange Formats Framework (CBEFF) - Part 1: Data element specification - Amendment 1: Support for Additional Data Elements	ISO/IEC 19785-1:2006/ Amd 1: 2010	2010-03-29
1.37.19785.2	Common Biometric Exchange Formats Framework – Part 2: Procedures for the operation of the Biometrics Registration Authority	ISO/IEC 19785-2:2006	2006-05-04
1.37.19785.2.1	Common Biometric Exchange Formats Framework – Part 2: Procedures for the operation of the Biometrics Registration Authority – Amendment 1: Additional Registrations	ISO/IEC 19785-2:2006/ Amd 1: 2010	2010-03-29
1.37.19785.3	Common Biometric Exchange Formats Framework -- Part 3: Patron format specifications	<u>ISO/IEC 19785-3:2007</u>	2007-12-13
1.37.19785.3.1	Common Biometric Exchange Formats Framework -- Part 3: Patron format specifications - Amendment 1: Support for	<u>ISO/IEC 19785-3:2007/ Amd 1: 2010</u>	2010-03-29

	Additional Data Elements		
1.37.19785.4	Common Biometric Exchange Formats Framework -- Part 4: Security block format specifications	<u>ISO/IEC 19785-4: 2010</u>	2010-08-12
1.37.24709.1	Conformance testing for the biometric application programming interface (BioAPI) - Part 1: Methods and procedures	ISO/IEC 24709.1: 2007	2007-01-29
1.37.24709.2	Conformance testing for the biometric application programming interface (BioAPI) - Part 2: Test assertions for biometric service providers	ISO/IEC 24709.2: 2007	2007-02-02
1.37.24709.3	Conformance testing for the biometric application programming interface (BioAPI) -- Part 3: Test assertions for BioAPI frameworks	ISO/IEC 24709.3: 2011	2011-01-13
1.37.24708	Information technology -- Biometrics -- BioAPI Interworking Protocol	ISO/IEC 24708:2008 ^(*)	2008-12-15
1.37.24741	Biometrics tutorial	<u>ISO/IEC TR 24741:2007</u>	2007-09-18
1.37.24722	Biometrics - Multimodal and other multibiometric fusion	ISO/IEC TR 24722:2007	2007-06-22
SC 37/WG-3 – Biometric data interchange formats			
1.37.19794.1	Biometric data interchange formats – Part 1: Framework	ISO/IEC 19794-1:2006	2006-03-31
1.37.19794.1	Biometric data interchange formats – Part 1: Framework	ISO/IEC 19794-1:2011	2011-07-01
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	- Part 8: Finger pattern skeletal data		
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1.37.19794.8 Cor. 1	Biometric data interchange formats - Part 8: Finger pattern skeletal data/Cor. 1	ISO/IEC 19794-8:2011/Cor. 1:2012	2012-03-28
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1.37.19794.11	Biometric data interchange formats - Part 11: Signature/sign processed dynamic data	ISO/IEC 19794-11:2013	2013-02-01
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1.37.29109.1	Conformance testing methodology for biometric data interchange formats defined in ISO/IEC 19794 – Biometric Data Format Standard - Part 1: Generalized conformance testing methodology	ISO/IEC 29109-1:2009	2009-07-23
1.37.29109.1 Cor 1	Conformance testing methodology for biometric data interchange formats defined in ISO/IEC 19794 – Biometric Data Format Standard - Part 1: Generalized conformance testing methodology/Corrigenda 1	ISO/IEC 29109-1:2009/Cor. 1:2010	2010-11-30
1.37.29109.2	Conformance testing methodology for biometric data interchange formats defined in ISO/IEC 19794 – Biometric Data Format Standard - Part 2: Finger minutiae data	ISO/IEC 29109-2:2010	2010-04-19
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	– Biometric Data Format Standard - Part 4: Finger image data		
1.37.29109.4 Cor. 1	Conformance testing methodology for biometric data interchange formats defined in ISO/IEC 19794 – Biometric Data Format Standard - Part 4: Finger image data/Cor. 1	ISO/IEC 29109-4:2010/Cor. 1: 2011	2011-09-29
1.37.29109.5 (withdrawn)	Conformance testing methodology for biometric data interchange formats defined in ISO/IEC 19794 – Biometric Data Format Standard - Part 5: Face image data	ISO/IEC 29109-5:2011	2011-03-22
1.37.29109.5 (Revises ISO/IEC 29109-5:2011)	Conformance testing methodology for biometric data interchange formats defined in ISO/IEC 19794 – Biometric Data Format Standard - Part 5: Face image data	ISO/IEC 29109-5:2012	2012-04-19
1.37.29109.6	Conformance testing methodology for biometric data interchange formats defined in ISO/IEC 19794 – Biometric Data Format Standard - Part 6: Iris image data	ISO/IEC 29109-6:2011	2011-09-29
1.37.29109.7	Conformance testing methodology for biometric data interchange formats defined in ISO/IEC 19794 – Biometric Data Format Standard Part 7: Signature/sign time series data	ISO/IEC 29109-7:2011	2011-09-21
1.37.29109.8	Conformance testing methodology for biometric data interchange formats defined in ISO/IEC 19794 – Biometric Data Format Standard - Part 8: Finger pattern skeletal data	ISO/IEC 29109-8:2011	2011-12-15
1.37.29109.9	Conformance testing methodology for biometric data interchange formats defined in ISO/IEC 19794 – Biometric Data Format Standard - Part 9: Vascular image data	ISO/IEC 29109-9:2011	2011-07-01
1.37.29109.10	Conformance testing methodology for biometric data interchange formats defined in ISO/IEC 19794 – Biometric Data Format Standard - Part 10: Hand geometry silhouette data	ISO/IEC 29109-10:2010	2010-12-07
1.37. 29159-1	Biometric calibration, augmentation and fusion data -- Part 1: Fusion information format	ISO/IEC 29159-1:2010	2010-08-26
1.37.29794.1	Biometric sample quality – Part 1: Framework	ISO/IEC 29794-1:2009	2009-07-23

1.37.29794.4	Biometric sample quality – Part 4: Fingerprint Sample Quality Data	ISO/IEC TR 29794-4:2010	2010-03-22
1.37.29794.5	Biometric sample quality – Part 5: Face Sample Quality Data	ISO/IEC TR 29794-5:2010	2010-03-22
WG-4 - Biometric functional architecture and related profiles			
1.37.24713.1	Biometric profiles for interoperability and data interchange -- Part 1: Overview of biometric systems and biometric profiles	<u>ISO/IEC 24713-1:2008</u>	2008-02-25
1.37.24713.2	Biometric profiles for interoperability and data interchange -- Part 2: Physical access control for employees at airports	<u>ISO/IEC 24713-2:2008</u>	2008-05-22
1.37.24713.3	Biometric profiles for interoperability and data interchange -- Part 3: Biometrics-based verification and identification of seafarers	<u>ISO/IEC 24713-3:2009</u>	2009-08-27
WG 5 - Biometric testing and reporting			
1.37.19795.1	Biometric performance testing and Reporting – Part 1: Principles and framework	ISO/IEC 19795-1: 2006	2006-03-24
1.37.19795.2	Biometric performance testing and reporting – Part 2: Testing methodologies for technology and scenario Evaluation	ISO/IEC 19795-2:2007	2007-01-12
1.37.19795.3	Biometric performance testing and reporting -- Part 3: Technical Report: Modality-specific testing	<u>ISO/IEC TR 19795-3:2007</u>	2007-12-06
1.37.19795.4	Biometric performance testing and reporting -- Part 4: Interoperability performance testing	ISO/IEC 19795-4:2008	2008-05-29
1.37.19795.5	Biometric performance testing and reporting -- Part 5: Access control scenario and grading scheme	ISO/IEC 19795-5:2011	2011-02-23
1.37.19795.6	Biometric performance testing and reporting -- Part 6: Testing Methodologies for Operational Evaluation	ISO/IEC 19795-6:2012	2012-01-23
1.37.19795.7	Biometric performance testing and reporting -- Part 7: Testing of on-	ISO/IEC 19795-7:2011	2011-01-11

	card biometric comparison algorithms		
WG 6 - Cross-jurisdictional and societal aspects of biometrics			
1.37.24714.1	Information technology -- Biometrics -- Jurisdictional and societal considerations for commercial applications -- Part 1: General guidance	<u>ISO/IEC TR 24741-1:2008</u>	2008-12-10

Examples of international and national organizations and programs that have adopted or are considering adopting many of the biometric standards developed by the Subcommittee follow. Some of the examples have been discussed in more detail in previous reports. International organizations include the International Civil Aviation Organization (for Machine Readable Travel Documents - MRTD) and the International Labour Office of the UN for their Seafarer's ID Card. The European Union (EU) password specification working document^[1] describes solutions for chip enabled EU passports, based on EU's Council Regulation on standards for security features and biometrics in passports and travel documents issued by Member States^[2]. The specification relies on international standards, especially ISO/IEC standards and ICAO recommendations on MRTDs. A number of standards are referred to in this EU document including an ICAO New Technology Working Group's Technical Report^[3] as well as the ISO/IEC 19794-4:2005 and ISO/IEC 19794-5:2005 standards developed by SC 37.

Several countries represented in SC 37 have also adopted or recommended adoption of SC 37 standards. Examples include requirements for two official documents in Spain^[4]. In the United States of America, several organizations continue to require selected biometric data interchange standards, biometric technical interface standards and some of the performance testing methodology standards. One example is the *Registry of U.S. Government Recommended Biometric Standards*, developed by the National Science and Technology Council Subcommittee on Biometrics and Identity Management. The most recent version, published in August 27, 2012, recommends some of the biometric data interchange standards as well as the BioAPI specification, the CBEFF standard and conformance and performance testing methodologies developed by the Subcommittee. Two parts of the multi-part performance testing methodology standard are also included in the Registry^[5].

The Unique Identity Authority of India (UIDAI) was chartered by the government to establish identification for all of the country's residents who want and need it, so that they would no longer be disenfranchised and excluded from the financial and medical systems. The agency is developing the Aadhaar ("Foundation") system, which will allow registrars (such as benefits agencies, banks and tax authorities) to collect basic biographic information plus fingerprint, iris, and facial images from residents. In addition to the same iris, fingerprint and face image standards used in ePassports, Aadhaar also utilises the fingerprint minutiae standard for authentication purposes (ISO/IEC 19794-2) and the CBEFF (Common Biometric Exchange Formats Framework) standard for packaging the biometric data, providing common structure, metadata and security block (ISO/IEC 19785). A reference to the SC 37 harmonized biometric vocabulary is also included^{[6],[7],[8],[9]}. These latest adoption examples of standards developed by

SC 37 by the Unique ID Authority of India were discussed in detail at Biometric Consortium conferences held in September 2010^[9], September 2012^[10] and September 2013^{[11], [12]}.

Germany's Federal Office for Information Security (BSI)'s Technical Guideline Biometrics for Public Sector Applications (e.g. German Electronic Identity Card, EU visa information system) specify some of the biometric standards developed by SC 37 such as the finger image data format (ISO/IEC 19794-4:2005), the face image data format (ISO/IEC 19794-5:2005), the BioAPI specification Part 1 (ISO/IEC 19784-1:2006) and BioAPI Part 4: Biometric sensor function provider interface (ISO/IEC 19784-4:2011)^{[13], [14], [15]}.

2.3 RESOURCES

Participation in SC 37's Programme of Work by National Bodies and Liaison Organizations is very good and has increased during this period. See 2.0 Period Review. The large number of editors and co-editors that the Subcommittee relies on allows the PoW to progress in an efficient and timely manner.

2.4 ENVIRONMENTAL ISSUES

Not applicable to this SC.

2.5 PARTICIPATION METRICS

Participation in the SC 37 WG meetings has increased. Over one-hundred delegates from twenty National Bodies participated in the SC 37 WG meetings held in Winchester, UK in April 2013. A Plenary meeting was not held during this period because of the temporary cycle change from 12-month to 18-month cycles as detailed above. The required 50% voting participation was met or exceeded in every ballot.

3.0 FOCUS NEXT WORK PERIOD

3.1 DELIVERABLES:

Most of the revised documents developed after the SC 37 WG meetings have been posted in the SC 37 document register for National Body comments or vote. A full list of deliverables at the end of this period are reflected in the SC 37 WG Recommendations approved at the April 2013 meeting: SC 37 N 5497 – SC 37 N 5502. Deliverables expected are also reflected in the ISO Project Portal for SC 37.

3.2 STRATEGIES

SC 37's strategy has not changed since its inception. SC 37 initiates work as required and engages with other organizations as appropriate. This is done to meet the needs of the IT community and other customers, in order to promote adoption of the biometric standards and to support the market adoption of biometric technologies.

The SC is responding to other organization needs (JTC 1 and external organizations) by initiating new projects in support of their standards and requirements and it is also participating in JTC 1 activities as required. Technology innovations and new customers' needs are being addressed in the "second generation" of standards such as the revision of the biometric data interchange formats, new biometric technical interface standards, performance (and conformance) testing methodology and related standards and biometric sample quality standards. SC 37 is focused on developing generic technical best practices, guidance, and implementation requirements that support the interoperability of biometric applications. SC 37 is also addressing standards and technical reports related to the field of cross-jurisdictional and societal aspects in the application of international biometrics standards, and it continues to develop a harmonized biometric vocabulary.

Information on recently approved projects is provided above. The adoption of standards is also facilitated through the close interaction and participation by a significant number of National Body experts and the extensive promotion of the SC's work through participation in technical conferences, chapters in books addressing biometric international standards, entries in a biometrics encyclopedia and articles published by ISO and other organizations written by SC 37 officers or experts from different National Bodies represented in SC 37. Examples of such publications (some reported in previous business plans) include:

- ISO Focus issues ^{[16], [17], [18]}
- a technical book on biometrics ^[19],
- a book on standards ^[20] that is used in a course of a university graduate program
- Two Springer publications ^{[21], [22]}

The IEEE Certified Biometrics Professional program learning system consists of six modules, one of which topic is biometric standards. SC 37 structure, activities, and standards are prominent among this material. Thus, those studying for their own edification or for the exam are exposed to this information and become familiar with the work and products of SC 37 ^[23]. Elements of the work of SC 37 and adoption of biometric standards have also been reflected in national and international technical conferences, seminars, workshops and an ISO Press Release ^{[24], [25], [26], [27], [28], [29], [30], [31], [32], [33], [34], [35], [36], [37], [38], [39], [40], [41], [42], [43], [44], [45]}. The Subcommittee was included as one of the examples of the “newest innovative and interoperable ICT solutions under the responsibility of ISO/IEC JTC 1” in an ISO/IEC publication ^[46].

3.2.1 RISKS

Adoption of biometric-based high performance, interoperable systems continues to depend, in part, on the timely availability of a portfolio of technically-sound biometric standards that are required by other standards bodies within JTC 1, ISO TCs, external standards organizations and other customers (end-users and industry). The major risk that may jeopardize this consumer adoption is the time associated with the development of these standards. SC 37 is doing its best to mitigate this risk through the use of IT tools, international cooperation and team work, the establishment of OWGs to work in-between WG meetings and tight program management.

3.2.2 OPPORTUNITIES

Biometric technologies are already playing a crucial role in a wide range of applications. As the marketplace for biometric-based solutions has widened significantly, the importance of these biometric technologies has also dramatically increased. Homeland defense is the highest priority for many countries. These countries are now seriously considering or have already approved new legislation that calls for the investigation and use of biometric technologies as soon as possible for homeland defense applications. The prevention of ID theft is also becoming a significant market for biometrics and the need for biometric technologies is expected to expand in the near future. Commercial applications are already using biometrics or are considering the role that biometrics will play in current or future personal verification and identification systems.

Standardized biometric-based solutions are becoming mandatory requirements in many of these applications. As SC 37 has demonstrated, the subcommittee provides the ideal opportunity to develop biometric standards that meet these customer requirements. Based on National Body and Liaison Organization contributions, SC 37 has already addressed the development of a critical set of required biometric standards which is reflected in early customer adoption. SC 37 is also rising to the challenge of technology innovations and new customers' needs and is addressing new projects, new technological challenges, and the development of the “second generation” of biometric standards and it is examining further ideas for required standardization and supporting its customers. SC 37 is also exploring the need to develop standards and technical reports in new

areas of standardization on the use of biometric technologies such as disaster victim identification, major incidents, humanitarian aid response and identity management of displaced persons (including vulnerable identities). In response to a Recommendation of SC 37 WG 6 approved at its meeting held in April 2013, a Call for National Body contributions on current activities, existing standards and best practice in this area was issued and contributions will be addressed at the upcoming SC 37 WG 6 and Plenary in January 2014. Two New Work Item Proposals were recently issued and close 6 December, 2013: a proposal for a New Work Item on Use of operator-assisted automated face recognition in CCTV systems – Part 1: Recommendations on design and specification and Part 2: Recommendations on testing and reporting practice and a proposal for a New work Item on Biometric performance testing and reporting for intelligent CCTV Systems.

3.3 WORK PROGRAM PRIORITIES

SC 37 will continue to focus on market relevant projects. Program priorities include delivering on time the standards and technical reports to maximize adoption by JTC 1 SCs as well as by external standards organizations and customers. There is consensus in the biometric community that companion standards are required for the base standards which address conformance, interoperability, performance and biometric sample quality. SC 37 is addressing these needs. Progress is anticipated on the work in each of the SC 37 WGs addressed above.

Challenges ahead for the Subcommittee include work that needs to be done to fully define Level 3 (semantic) conformance testing methodologies. Semantic conformance testing checks if the implementation of the biometric data is a faithful representation of the parent biometric data. More research on these testing methodologies is required. Work on XML encoding for counterparts of the multiple biometric data interchange format standards as defined in the multi-part ISO/IEC 19794 standard is ongoing. SC 37 started researching conformance testing methodology requirements for data interchange format records encoded in XML.

The development of BioAPI for Object Oriented Programming Languages and Biometric Identity Assurance Services (BIAS) continued during this period (both under development in WG2). As noted above the BIAS standards reached DIS stage. WG3 is also progressing the work in developing a standard for Presentation attached detection.

As detailed above, ongoing work in WG 4 is focused on generic technical best practices, guidance, and implementation requirements that support the interoperability of biometric applications. Areas being addressed include: biometric enrolment; mobile biometrics; best practices for implementing biometric systems; and biometric recognition in automated border control systems.

Existing 19795-x standards (performance testing methodologies) developed by SC 37 WG 5 address testing of single modality biometric systems. Multi-biometric systems have more complex performance and decision criteria involving, for example, decision fusion, presentation timing and sensor type. This presents a challenge to the subcommittee as there are additional requirements for repeatable performance testing of multi-biometric systems not quite defined in the existing standards. The ongoing development of an Amendment to ISO/IEC 19795-2 Testing of multi-modal biometric is starting to address this issue.

The work of WG 6 (e.g. development of pictograms, icons and symbols for use with biometric systems) and Technical Reports under development mentioned above also responds to customers' needs.

SC 37 will continue to focus on market relevant projects and is continuously seeking information from other standards organizations and customers on how to further support users' communities interested in the use of biometrics for personal verification and identification applications.

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