EURODATA COUNCIL

ISO Report 2013

Automatic Identification & Data Capture

Report on continued standardization of Bar Code & RFID

Fig. 1) Insight in an ISO/IEC JTC 1/SC 31 Meeting 2013, host: Korea

Member Nations of ISO/IEC/JTC 1/SC 31 (excerpt)

Australia	Austria	Belgium	China	Canada	Switzerland	Germany	Finland	France
Japan	Singapor	S. Africa	S.Korea	Sweden	NL	Russia	UK	USA

.. and contributing organizations

AIM	**CEN TC225**	**DOD**	**EDC**	**ETSI**	**GS1**	**IATA**	**HIBC**	**ISO TC122**	**ISO SC17**	**ITU**	**UPU**

and others such as JTC1/WG7, IEEE, ...

editor
Heinrich Oehlmann

in cooperation with AIM, DIN, EDIFICE, EHIBCC, VDA and Liaisons
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Automatic Identification & Data Capture

Report on continued standardization of Bar Code & RFID

& **ISO/IEC JTC 1/SC 31 Plenary**

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- Attachments with current list of agencies for Company ID's for Bar code & RFID and selection of AutoID Standards

Key role of AutoID

Whether automation, logistics, or distribution, automatic identification (AutoID) holds a key role always if it is about error free data capture and correct documentation. Is or was the right object at the right time connected with the right information, that can correctly be answered by help of AutoID. The classic AutoID techniques are Bar code, Optical Character Recognition (OCR) and RFID. By example of the propagation of „QR Code“ in the public area it can be recognized that there is still great potential for growth of AutoID applications. After all AutoID, also named by the technical term „AIDC“, offers features like efficiency, security and speed for any kind of process optimization. With it increasing legal requirements for traceability can be met efficiently. „RFID“, the Radio Frequency Identification technology is the invisible part of it supplying read and writ features and more. In fact RFID enables solutions which easily run in quite controversial discussions, like RFID for Internet of Things and for Machine to Machine (M2M) communication and control without human intervention. Nevertheless, AutoID solutions for cross-company, cross-industry and cross-country applications require standardization for enabling common usage.. Standardization is in the hands of interested parties who meet in the national committees like AFNOR, ANSI, BSI or DIN. These committees appoint delegates to the international acting bodies, such as ISO/IEC JTC 1/SC 31 for AutoID. By agreement liability of the standards will be achieved for all ISO member countries. The methodologies include consensus within the working groups and interoperability for the solutions. This report shall supply an insight in the standardization work with reference to the 19th plenary meeting of the committee responsible for „AIDC techniques“, the ISO/IEC JTC 1 Sub Committee (SC) 31. The productivity of the committee's corresponds to the technical developments of both: technology and market. A total of nearly 100 specifications were published as standards and guidelines since committee foundation in 1996. It includes the specifications for bar code, 2D and RFID technologies, the performance and quality assessment, as well as the relevant data structures. These standards (see Appendix) are used as "tools" in other groups, such as the ISO TC 122 Packaging writing application standards for Bar code & RFID for products, packages, shipment units, containers, etc. Likewise, specific industry associations refer to the content of the SC 31 standards for building there own recommendations tailored to specific tasks. Examples are the "Global Transport Label" of ODETTE and VDA, the "Set Label" of EDIFICE, and the guidelines for "PaperEDI by Data Matrix" of EHIBCC. New projects under the work of different groups like „IoT“, also refer to modules of the SC 31 work. Therefore, the work of the committee members is as valuable as indispensable for all who want or need to work with AutoID.

Fig. 2) concentration to meeting topics

Fig. 3) HoD meeting (head of delegations)

19th SC 31 Plenary Meeting & Business Plan

The Sub Committee 31 is a joined foundation of ISO&IEC under control of the „Joined Technology Committee 1“. This is mirrored by the short title ISO/IEC/JTC 1/SC 31. The formation took place 1996 in Brussels. Countries have been motivated to host the periodic meetings taking place in different continents. For the 19th plenary meeting the „Korean Standards Association – KSA“ invited to Incheon/Seoul. The meetings week began with working group sessions and Head of Delegation meeting (HoD). At the plenary all working group members convenors and liaison partners have been invited, authorized by its organizations. The current chairman Mr. Chuck Biss reported about fulfillment of the Business plan 2012/2013 by publishing 9 more International Standards (IS) where the total was at the time 98 published IS. This includes all standards for the area of Automatic identification and data capture techniques for technologies, performances and data structures. Not included are the "application standards" for bar code & RFID, such as written by ISO TC 122 Packaging. But such specifications required the standards of SC 31 as functional modules and refer to it and take basis elements out of it, like symbology specifications (e. g. ISO/IEC 16022 Data Matrix or ISO/IEC 18000-63 RFID/UHF). Also sector specific groups like AIG/ODETTE/VDA, EDIFICE, GS1, HIBC convert the standards or elements out of it in there own language. In addition to it, national institutes develop specific standards which have not been addressed yet by others (e. g. DIN 66401 Unique Identification Mark - UIM). This often is appreciated as the base for new ISO standards. It is to be expected that 14 more standards will be completed in the working period of SC 31 from 2013 to 2014. Convenors and project editors of the working groups WG 1 to WG 7 reported about the status of this projects. The business plan for the coming period will be updated under the lead of this years host „KSA“. For the next plenary meeting Europe is considered but the country has not yet been fixed. The business plan and other informative documents will be published again at the internet pages of the committee as well as the publishing details of the ISO/IEC standards. The published standards are available from ISO or the corresponding national standards institutes, such as ANSI or DIN.

AFNOR Proxy handed over to DIN delegation

Association Francaise de Normalisation (AFNOR), the French standardization institute could not send a delegate to the SC 31-Plenary this year and handed the voting rights over to the German delegation. This is certainly an indication of the quality of the French German cooperation.

Change of Chairmanship of ISO/IEC JTC 1/SC 31

After Alan Haberman Mr. Charles Biss (GS1) had got the chairmanship of the SC 31 in 2006, however, he announced by the meeting that he would not be available for the next period any more. The National Institutes are invited to nominate candidates for his succession. Meanwhile ANSI named Mr. Dan Kimball as their candidate for the chair. Dan Kimball is a longstanding member of the ANSI committee and US delegate to the SC 31 AutoID. As AutoID expert he is active consultant for the US Department of Defense (DoD). Currently he is Chairman of SC 31/WG 7 RFID security & file management. It remains to be seen whether another National Committee will name another candidate. The final nomination of the new chairman will happen after the regular voting procedure has been passed.

Changeover for the ISO/IEC 15459-2 Registration Authority to AIM Global

The current Registration Authority, the Netherlands Standardization Institute NEN, has terminated its function as operator for the registry
The new candidate for taking over the function of NEN is AIM, the Association for Automatic Identification and Mobility.

Thus, the list of about 33 Issuing Agencies for unique Company Identification Codes (CIN) maintained by AIM in the future will move from the web page from NEN to the website of AIM. But the responsibility for the procedural standard ISO / IEC 15459-2 (formerly EN 1572) still will remain in hands of „SC 31/WG 2 Data structures“.
The actual list of the current Issuing Agencies and their registered codes (IAC) can be found in the appendix.

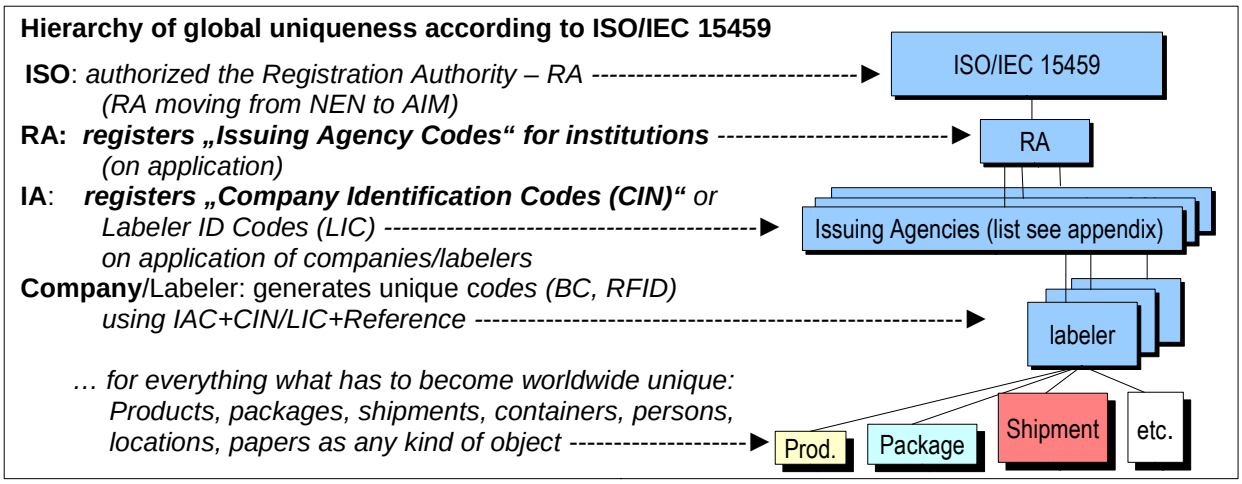

Fig.4) Shared responsibilities for unique marking and identification

Excerpts from the Working Groups activities

WG 1 Data Carriers, Convenor Sprague Ackley

WG1 is responsible for Optical Readable Media (ORM) including linear and 2-dimensional symbols, OCR and their quality measurement specifications. All major Bar codes and matrix codes are under the responsibility of this group, e. g. ISO/IEC 15427 Code 128, ISO/IEC 16022 Data Matrix, ISO/IEC 18004 QR Code, etc. One of the current topic of WG1 is to recondition the specification for the OCR font set (Optical Character Recognition) continuously used in large applications like for passports. Specifically quality measurement will be reworked taking modern printing and measurement methods into account. The older documents are in paper form only. The requirement for upgrading was initiated by the committee ISOIEC JTC 1/SC 17 Cards & Personal Identification in regard of AIDC hybrid solutions with OCR and RFID for the new identity card developments. For 2014 the convenor Sprague Ackley can imagine some new projects, e. g. a request from China for normalization of the Han Xing Code, an optical Code belonging to the matrix code family developed in 20110/2011.

WG 2 Data Syntax, Convenor Toshihiro Yoshioka

Since the first meeting in Amsterdam Aug. 26, 1996 the WG 2 developed all key standards for unique identification and unambiguity, which are independent of the AIDC media being used, e. g. Bar code or RFID. At the top of the projects stands ISO/IEC 15459 Unique Identification with specific parts for products, transport units and up to returnable containers. The basis of the standard originated from the European Norm EN 1572. Notably is that the standard defines the hierarchy of unambiguity with the shared responsibility for the parties involved: ISO, Registration Authority (RA), Issuing Agency and labeler (see fig. 4 and chapter “Changeover for the ISO/IEC 15459-2 Registration Authority”). Also another base standard, ISO / IEC 15434 Syntax for High Capacity media, is subject to the WG 2. This standard is used in areas of industrial, pharmaceutical and healthcare increasingly for encoding higher volume of data and user data. Examples of the application of the high capacity syntax in conjunction with Data Matrix are medicinal products applied with extended product information (PPN+Exp. Date+LOT+SN+...), are transport labels applied with encoded shipment content and shipment papers. One of the later development was “ISO/IEC TR 29162 Guidelines for using Data Structures in AIDC Media“, a valuable guide how to encode data in Bar code, 2D and RFID in a compatible manner.

Project NP 29161
Information technology - Data structure - Unique identification for IoT

„NP“ stands for „New Project“ and NP 29161 mirrors the development AutoID even toward compatibility to Internet applications, specifically for the Internet of Things (see also chapter “SC 31 projects on IoT”). The target is to combine different IDs which play a role when communicating to “the Things in the Internet” and being relevant o supply chain management. When communicating between Things and Internet unique identification has surely same or even higher significance as when communicating between objects and persons. Above identification of physical items IoT systems may require specific attention to other unique IDs like IDs of intelligent sensors, hubs, gateways, etc. Such IDs may not always be subject of SC 31 but may be under responsibility of committees like IEEE, ITU-T and others. Nevertheless RFID under SC 31 responsibility gets a certain priority as key data entry module for IoT, therefore even here the unique schemes of RFID UIIs are in the foreground of the project. Strong discussions about pros and cons are going on about achievement of compatibility between the GS1 EPC system and other identification systems under overarching of the ISO system. The current working draft WD 29161 evaluates compatibility on binary level by developing a list of so called “Header Values” following the EPC model but open for categories of other ID schemes used across different applications. Possibilities are under evaluation how to open unused Header values connected to the EPC range of binary values for other ID schemes. One category of Header Values is intended to match to ASC Data Identifiers (DIs) other to GPS IDs, Tag IDs, Sensor IDs, etc. To support efficient binary encoding it is considered to use a conversion tables to get fixed length binary values e. g. for the Issuing Agency Codes necessary for UIIs in RFID Memory Bank 01. Even so extended “Filters” are proposed enabling specific control of RFID tagged objects like “sorting out” and differentiate between Pallets and Returnable Transport Items (RTIs). The binary ID structure of WD 29161 shall ease the use of market available 96 and 128 bit RFID tags by system optimization. In essence WD 29161 is projected to interface to the digital world of internet and will be applied with adequate Uniform Resource Name “urn” and Object IDs (oid) for control of the data flow through the internet to the destination. Nevertheless, one other discussion point is it whether the EPC Header Values for the EPC categories of IDs shall remain in the list or not. It surely would be wishful for users and user groups for transparency reasons but GS1 may not give authorization for it yet. For completing the features of ISO/IEC 29161 contributions of user groups of different sectors are appreciated by the project editor Craig Harmon specifically from experts of areas like automotive (ODETTE) electronic industries (EDIFICE), healthcare (EHIBCC) and any other interested party in AutoID and IoT. There are signals that the project gets adequate intention and support by national institutes like DIN and user groups. Nevertheless, since the standardization process has to pass multi-tiered procedures, and the project is only at the beginning, contents may change reasonably, especially since it includes different domains for IDs relevant to IoT.

WG 3 Performance

The originally for work on performance established WG3 is not an independent WG anymore, but the projects were allocated to the relevant technology groups as directly associated subgroups for them, like Bar code performance to WG1 and RFID performance to WG 4.

WG 4 RFID, Convenor Henri Barthel

WG 4 produced all the ISO/IEC standards for the RFID air interfaces and relevant data protocols for „Low Frequency (LF)“, High Frequency (HF), Ultra High Density(UHF) and Microwave. The published standards of the ISO/IEC 18000-xx series belong to it as a base for establishing RFID in the markets. The standards for RFID conformance, RFID data protocols and Guidelines for RFID implementation complete the work. Recent projects included standardization of sensor interfaces and battery support of tags as „Software System Infrastructure“. The „Data Constructs Steering Committee“ of WG 4 is responsible for handling applications for

Fig. 5) Locations


Fig. 6) The Flag of Korea

registration of „Application Family Identifiers (AFI). *AFIs identify application relevant categories (families) of RFID Tags data content. , e. g. application of RFID for products or transport units and conforming to the specific ISO application standards (ISO/IEC 17366, or ISO 17365,...) Other AFIs indicate application of card technology, etc. Actually the International Air Transport Association (IATA) applied for new AFIs for identification of baggage and for air containers, the association for libraries (EDItEUR) for tagging books and the International Society for Blood & Transfusion (ISBT) applied an AFI to differentiate their specific system with all other systems. The registered AFI values being under the responsibility of SC 31 are listed in the standing document ISO/IEC 15961-2 Data Construct Register and accessible via the SC 31 internet page.
Time will not stand still, further technology development of RFID is evident and WG4 will need to work on updates to existing standards as on new projects in future. The delegation of Russia indicated that one of the next projects could include „Surface Acoustic Wave (SAW)“ technology.

**Note: Application Family Identifiers (AFIs) are also used for "filtering" specific RFID tagged objects very quick without access to data bases like filtering just baggage to pass a specific RFID gate and to stop any other objects at this gate like product packages or other tagged items.*

WG 5 RTLS, Convenor Marsha Harmon

„Real Time Location Systems (RTLS)“ got a specific working group due to the specific technology relevant to RFID but different in features and solutions. WG5 did not meet face to face occasionally the SC 31 sessions. The active work is dedicated to a few experts in this field and acting through national institutions like DIN. There are different techniques under work. One of it is the so called "Chirp technology". DIN NA 31.4 RFID initiated this project and accompanied it up to publication of "ISO/IEC 24730-5, Information technology - Real Time Locating Systems (RTLS) - Part 5: Chirp Spread Spectrum (CSS) 2,4 GHz air interface protocol". For true experts the two actual projects might be of interest: „ISO/IEC 24730 - Part 61: Low rate -“ and „Part 62 High rate pulse repetition frequency Ultra Wide Band (UWB) air interface“ and belonging conformance standards because even here the evolution continues.

WG 6 MIIM, Convenor Craig Harmon

The working group "Mobile Item Identification and Management (MIIM) is tasked to write the standards for automatic identification and data collection in conjunction with mobile devises like smart phones and connected communication through network. About 10 standards of the ISO 291xx series have been created already including for capture of QR codes and RFID for data communication via net, reference architecture end also for „Broker-Services“ in the net. By that the working group already touched the subject of "Internet of Things", providing functional modules for connecting "the Things" through mobile devices and enabling response from net sources.

WG 7 Security & File Management, Convenor Dan Kimball

Working Group 7 deals with the architecture of RFID Security and file management for RFID air interfaces of series ISO/IEC 18000. Focus is on encryption methods for data communication with RFID transponders but not to develop new methods but to identify common encryption schemes suitable for adoption as standard option for RFID. The standard „ISO/IEC 29167-1 Automatic identification and data capture techniques -- Part 1: Air interface for security services and file management for RFID architecture“ was published already 2012. Additional parts deal with about 10 different options of cryptography methods like „SIMON“, „XOR“ and „RAMON“. Cryptography for RFID is always appropriate for RFID if security relevant data data are to be carried as in case of „Smart Cards“. But it is less or even not appropriate in case of item or shipment data carried by RFID for use in an open supply chain. Where appropriate encryption might be useful for securing the user area of a RFID tag.

ISO/IEC 19762 Glossary with 900 terms in 5 languages (en, fr, de, kr, ru)

Standardization processes produce the demand for common terms, so anybody will get the same understanding for the meaning of specific terms, specifically for high tech areas like AIDC on international level. SC 31 found an effective procedure how to collect the special terms from all the different working groups by the editor of the vocabulary, Craig Harmon. He started a very challenging project “ISO/IEC 19762 Automatic identification and data capture (AIDC) techniques - Harmonized vocabulary” as multiple language glossary of terms. Already 900 terms have been listed and applied with a brief definition and this has been done in 5 different languages (English, French, German, Korean and Russian). It is to be expected that other language, like Chinese will follow. The multiple language vocabulary will be an ideal reference guide for all those who work with AutoID in different languages. Potentially CEN TC 225 will think about withdrawing their English/French/German vocabulary EN 19762 becoming unnecessary when the ISO/IEC upgrade has been published end of 2013.

Contributions from the National Institutes and exchange of information

Each member national institute is requested by SC 31 to submit an annual “activity report” on country specific activities in the field AutoID. These reports enable comparison of the market developments in the different regions of the world supplying valuable insight. The "activity reports" quite testify that AutoID still is subject to a market trend. But also country specific specialties can be seen like China reported about the national standard for „Han Xing“ Code, a matrix type of symbology but Germany reported about requirements for extension of ISO/IEC 16022 Data Matrix for additional “rectangular formats. Other reports lead easily to questions, e. g. Slovakia writes in its report, that in health care 2-dimensional codes (Data Matrix) are required only for export for Turkey and France which is totally different from practices in other countries like Germany where Data Matrix is of extremely high usage e. g. in hospitals, sterilization centers and even with dentists. Russia reported about market developments for the “Piezo” based RFID technology Surface Acoustic Wave – SAW potentially requiring standardization. However, who would hope to get reliable market figures about the growth of AutoID would be disappointed. Merely the US report ventures a forecast of 7,2% in average up to 2016 for bar code printers, scanners and RFID & RTLS systems. The main factor for the number surely has been influenced by the 5 years contract of $540 Million for RFID&RTLS systems for Veteran hospitals. The report predicted as well, that the USA will reach 38% of the global market by than. He who would understand to read between the lines of these reports would get the confirmation about what was already suspected: Yes – contribution to ISO standards makes much sense where the benefit will be earned by the user groups, the users and the customers by gaining all what AIDC can optimize: Handling speed, data capture, system security for all partner in a supply chain and much more.

The "German report" found interest through specific developments and applications, like:

Automotive – Initiative for implementation of RFID and *interest in ISO support
Pharma – Data Matrix for identification & verification and a „[1]PZN becomes a [10]PPN“
Electronic industries – “Set Label”, Data Matrix carries device + component data
Healthcare – „PaperEDI“, Data Matrix on delivery notes transmits shipment content
Live-Cycle Management – DIN 66277 electronic name plate with link to IoT

The report triggered individual discussions about pros & cons aside the agenda.

**interest in ISO support: Specific interest in support of ISO conforming RFID solutions for the automotive industry was discussed aside the meetings. Actually the interest has been expressed for extended “filtering” features by help of AFIs or alternatives of it. In this context it was recommended to check the new project ISO/IEC 29161 whether or not the binary solution for filtering could be beneficial in comparison with AFI + DI solutions. However, there will be substance for further discussion in conjunction with new options of identification schemes but first the interested parties need to be informed about the background of the developments, which is interfacing AIDC to networks and IoT (see WG2 report and NP 29161).*

[1]*PZN – Pharma Zentral Number, the registration number for medicinal products in Germany*
[10]*PPN – Pharma Product Number, the ISO conforming wrapper for national product codes*

Developments around the Internet of Things

According to the number of working groups dealing with the "Internet of Things (IoT)", it must be a real big deal. These are strong groups working on IoT separately or in liaison: ISO/IEC JTC 1/SC 31 ISO TC 122, ITU-T, and others like JTC 1/WG 7 specifically for automatic sensor networks where “Smart Grid” belongs to. Fig. 7 illustrates relationships and links to IoT as a "Mind Map" from the perspective of the ISO TC 122.

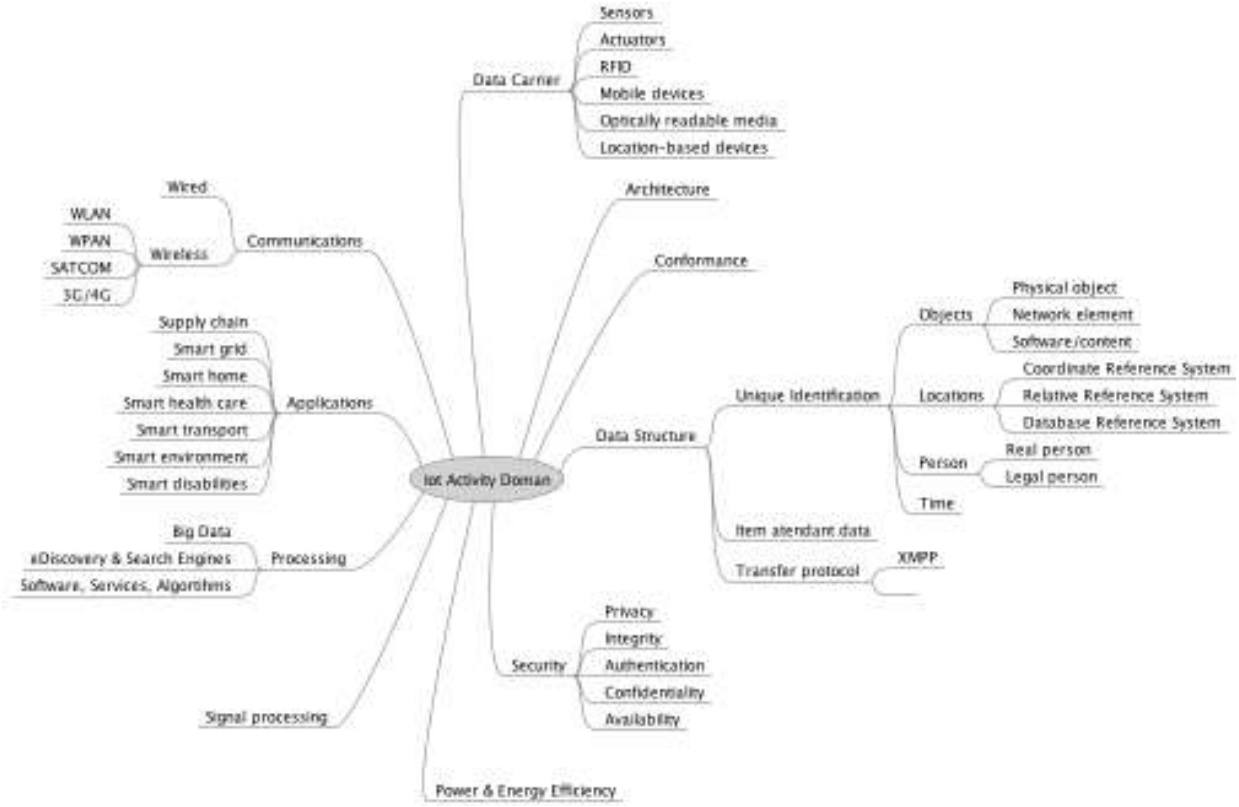

Fig. 7) Mind Map to an IoT system with wide ranging multiple links
Source: Craig Harmon (ISO TC 122/WG 12)

This year the establishment of a new group has taken place in Berlin through the parent "Joined Technology Committee 1 (JTC 1)", namely „ISO/IEC JTC 1/SWG 5 IoT“. It is the committees job to coordinate the activities of the various groups and beginning with the base, the definition of what is it “the Internet of Things". From a number of definitions, one contribution submitted by Craig Harmon (Q.E.D. Systems, chair ISO TC 122, WG 12) on behalf of *ITU-T JCA IoT as there formal definition:*

> *“Internet of Things - A global infrastructure for the information society, enabling advanced services by interconnecting (physical and virtual) things based on, existing and evolving, interoperable information and communication technologies. Through the exploitation of identification, data capture, processing and communication capabilities, the IoT makes full use of things to offer services to all kinds of applications, whilst maintaining the required privacy.“*

However, the definition will be subject of continued intense discussions and which one ever will be found overarching the subject, it will be a consensus effective for all of the potential applications of AutoID and Internet for fully automated processes.

SC 31 will deliver the technology standards for data carriers to be applied to mobile or fixed mount objects but also SC 31 supplies the key standard for unambiguity of the object IDs which is ISO/IEC 15459 Unique Identification relevant for uniqueness of data elements for Bar code and RFID. The SC 31 project Mobile Item Identification and Management (MIIM) supplies

the specification for data capture by means of smart phones including scanning Bar code & RFID and communicating the data through the net. The title of the new SC 31 project ISO WD 29161 „Data structure - Unique identification for IoT“ shows the developments of further modules useful for connecting AIDC to IoT.
In addition to the concept of the communication "Thing to the Internet", also communication "Thing to thing" will be possible as anticipated by Machine to Machine (M2M) communication systems (see fig. 8).

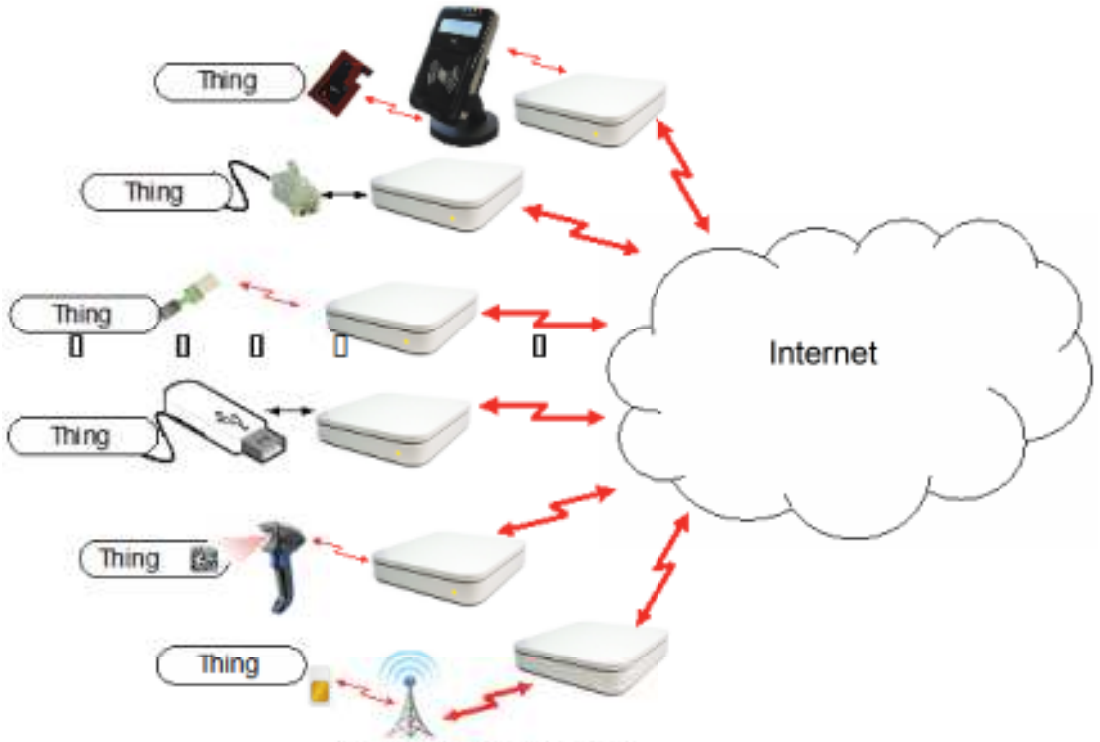

Fig. 8): Source ISO/IEC WD 29161, rev. 2013-06-12, fig. 4

Another indication of intensive efforts toward IoT is that ISO TC 122/WG 12 started 4 projects already in 2012 addressing IoT in the Supply Chain:

- NP 18574 Internet of Things (IoT) in the Supply Chain – Containerized Cargo
- NP 18575 Internet of Things (IoT) in the supply chain -- Products & product packages
- NP 18576 Internet of Things (IoT) in the supply chain -- Returnable transport items (RTIs)
- NP 18577 Internet of Things (IoT) in the supply chain -- Transport units

If we compare already published standards for Bar code & RFID applications it is striking that same layers of a supply chain have been addressed like from product packages up to the layer for container identification and it can be concluded that this is to extend the effective range from object identification to object communication via internet. The development is in full move for preparing new features for AIDC support supply chain systems which will be IoT support in the near future. This is the target and this is what can be expected.

IoT – Big Bang versus small effective steps e. g. by the electronic name plate

Obviously the “Big Bang” for IoT systems did not happen yet based on large concepts supported by „Information Broker“, special services, central data bases etc., but what has been achieved effectively within a short period was the access to specific internet addresses (URLs) via QR code. Examples can be seen everywhere, QR on products, advertizements, catalogs and what so ever. Why not, and that is what AIDC experts of AIM Germany asked themselves, why this principle would not work with codes used for logistics and supply chain management? The reason of such thoughts was the development of “DIN 66277 Electronic Name Plate”, where information not being resident in Bar code and/or RFID should be provided for the operator by linking to internet sources. The target was it to enable automatic access to Material Safety Data Sheets (MSDS), maintenance instructions, etc. for maintenance personal

equipped with mobile devices and even automatic entry in data bases for central monitoring of services or maintenance processes. The anticipated functionality, and this has been achieved in the meantime, was it: “Scanning the object, getting basis data, e. g. “type, production date, serial number” from the tag (name plate), linking to the home address and getting relevant instructions. In principle a simple QR would enable same access but not by help of a URL jointly with equipment data being resident at the object but by help of two codes, one for the resident data and on for the link to Internet. Data Identifiers (DIs) would enable to distinguish between different encoded data elements but there was no DI available yet for Internet addresses (URL). For solving the problem the project partner Eurodata Council (E.D.C.) and DIN developed a specification for a new DI for purposes of integrating URLs in DI headed data strings and AIM passed the request to the DI maintenance committee for registration this new DI for entry in the list ASC Data Identifiers of ISO/IEC 15418, part ANS MH 10.8.2. After the usual careful check and validation of the request agreed the world wide acting Data Identifier Maintenance Committee (DMC) to publish the new DI under category “Location Codes” The new DI was announced Jan. 28 2013 applied with the following definition:

> *Uniform Resource Locator (URL)*
> *Includes all characters that form a URL, including header data such as e. g. http://. Character set as listed in RFC 1738.*

Applied with DI “33L” any URL can be embedded in a AIDC data carrier like BC, 2D and RFID jointly with product reference, production date, unique serial number or with any other data elements of this kind. See below a sample of an integrated URL in a typical unique item code and encoded in Data Matrix ISO/IEC 16022.

DI Company SN + **DI** production date + **DI** URL
25S*QCELMI1234567* + ***16D****YYYYMMDD* + ***33L****WWW.ELMICRON.DE*
IAC CIN *(example)*

Immediately the solution was adopted by DIN 66277 Electronic Name Plate completing the 2d + RFID hybrid solution with a link to Internet sources for object relevant information.

One more option has been documented already which would enable generating a target URL out of the encoded data elements, e. g. SN, and a fragment of an URL for pointing straight to a data base entry of a specific Serial Number of an item.

Even the solution ensures a back up functionality because basic data are always resistant and available in a code yet if the connection through the network would fail once.

Thus, the step to the Internet of Things by AutoID has been enabled without the “big bang” of brokers and service providers but by a by help of a little Data Identifier as a smart solution.
Interested parties may use this simple method for immediate solutions and will surely get assistance by the technical committees like from the TC of Eurodata Council.

„IoT“ solutions by help of Data Matrix & DIs

By a simple idea direct communication between an object and a counterpart in the Internet became as easy as attractive. QR code shows the principles how it works but not in a perfect manner yet. The idee was optimized by connecting a “logistic code” with an “Internet code” as one. This was achieved by registration of the new ASC Data Identifier „33L“. Applied with DI „33L“ any Internet address www.xyz can easily be encoded in popular 2d-symbols or RFID jointly with other data elements headed by DI. Immediately code to Internet communication can be realized. The registration of the new DI did not take much time. The application was submitted by the TC of AIM Germany Austria Switzerland in Dec. 2012 and released for public use by the responsible committee in January 2013. This is an indication how quick the developments proceed around the Internet of Things and with it the tiny tools as enabler for simple solutions (see also article „Internet Bar code / Internet RFID“ published in the IDENT Year Book 2013, page 128).

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Annex 1 List of „Issuing Agencies and their IACs“

Excerpt of the REGISTER of ISSUING AGENCY CODES for ISO/IEC 15459
Source: NEN, NL, version 2013-05-13

Register ordered by Issuing Agency Name	IAC
ABOL SOFTWARE INC. 413 Creekstone Ridge, Woodstock GA 30188 USA	LN
Bosch und Siemens Hausgeräte GmbH, Carls-Wery-Strasse 34, D-81739 MUNCHEN, DE	VBS
Ghana Revenue Authority, PMB, TUC Post Office, Accra, GHANA	GH
DALO, Danish Defence Acquisition & Logistics Organization, Pbox 220, Arsenalvej 55, 9800 Hjorring, DK	KDK
DHL Express Benelux Terminalweg 36 3821 AJ AMERSFOORT, NL	VGL
DHL Freight GmbH, c/o Deutsche Post AG, Finance Operations, SSC Accounting, 44113 Dortmund, DE	ND
DOD-DLIS, Department of Defense - Defence Logistics Information Service, 74 Washington Avenue N 7 BATTLE CREEK, MI 49037-3054 USA	LD
Dun & Bradstreet 103 JFK Parkway Short Hills, NJ 07078 USA	UN
Federal State Unitary Enterprise “NIISU”, Sokolnichesky Val str. 37/10, 107113 Moscow, RUSSIA	VDS
GS1 AISBL, Avenue Louise 326, bte 10, BE 1050 Brussels, BELGIUM	0 to 9
ECRI Institute, 5200 Butler Pike Plymouth Meeting PA 19462-1298 USA	VEC
EDIFICE, Electronic Data Interchange for Companies with Interest in Computing and Electronics, Tiensestraat 2/12, B-3320 Hoegaarden , BELGIUM	LE
EHIBCC, Jozef Israelsplein 8, 2596 AS DEN HAAG, NL	LH
Eurodata Council, Koesener Str. 85, 06618 Naumberg , DE	QC
FIATA, International Federation of Freight Forwarders Ass. Schaffhauserstr. 104, 8152 GLATTBRUGG, CH	LF
Försvarets Materielverk (Swedish Defence Materiel Administration), Myndighetsuppgifter / MS 520, Försvarsstandardisering, 11588 Stockholm, SE	KSE
GTF, Group of Terrestrial Freight Forwarders, 50, rue de Châteaudun, 75009 PARIS, FRANCE	VGT
Health Industry Business Communications Council 2525 East Arizona Biltmore, Phoenix, AZ 85016 , USA	RH
IBM Deutschland Management & Business Support GmbH Wilhelm-Fay-Str. 32, D-65936 Frankfurt , DE	VIB
ICCBBA, International Council for Commonality in Blood Bank Automation Inc. P.O. Box 11309, San Bernandino, CA, 92423-1309 , USA	LI
IFA, Informationsstelle für Arzneimittel GmbH, Hamburger Allee 26-28, 60486 Frankfurt am Main, DE	PP
JIPDEC, Japan Information processing Development Corporation / Electronic Commerce Promotion Center, Roppongi First Building 9-9 Roppongi 1-chome, Minato-ku TOKYO, 106-0032 , JAPAN	LA
KIDL, Korea Institute of Distribution and Logistics, 17F KCCI Bldg. 45 Namdaemunno 4-Ga Jung-Gu SEOUL 100-743, KOREA	KKR
Ministerie van Defensie, Commando Diensten Centra IVENT Dienstverlening, Postbus 90004, 3509 AA UTRECHT, NL	KNL
NSPA (Nato Support Agency), 11, Rue de La Gare L-8302 CAPELLEN G.D. LUXEMBOURG	D
Odette International Limited, 71 Great Peter Street LONDON SW1P 2BN, UK	OD
Post NL, Prinses Beatrixlaan 23 2595 AK 's-GRAVENHAGE, NL	NL
Namsa, 11, Rue de la Gare, 8302 Capellen , G.D. LUXEMBOURG	VNA
SIEMENS AG, Industry Automation Division I IA IT D SR, Gleiwitzer Str. 555 , 90475 Nürnberg, DE	SI
Siemens Enterprise Communications GmbH & Co. KG, Hofmannstr. 51, 81379 MUNCHEN , DE	VEG
TCJ5/4-I, United States Transportation Command, 508 Scott Drive, Scott AFB IL 62225-5357 , USA	KUS
Telcordia Technologies, Inc. 1 Telcordia Drive RRC-6C137 PISCATAWAY, NJ 08854-4151 USA	LB
Telefonaktiebolaget LM Ericsson Torshamnsgatan 23 Kista SE-16483 STOCKHOLM, SWEDEN	LM
Xifrat Daten AG Poststrasse 6 6300 ZUG SWITZERLAND	RG

EURODATA COUNCIL

Annex 2 selection of AutoID Standards

Documents of ISO/IEC JTC 1/SC 31/WG 2 Data Structure“
ISO/IEC 15418 GS1 Application Identifiers and ASC Data Identifiers
ISO/IEC 15459 Unique Identification, Part 1 to 6
ISO/IEC 29162 Guidelines for using ADC Media (Barcode & RFID)
Documents of ISO/IEC JTC 1/SC 31/WG 4 RFID for Item Management
ISO/IEC 18000-1 REV 1 (including Battery Assistants, Sensor functions)
ISO/IEC 18000-2 AMD 1 (including Battery Assistants, Sensor functions)
ISO/IEC 18000-6, part 61 to 64, rev. 2 (incl. Battery Assistants, Sensor functions)
ISO/IEC 18000-7 REV 1 (including Battery Assistants, Sensor functions)
ISO/IEC 15963 Tag ID: applied with the list of IC manufacturer ID‘s
ISO/IEC 29160 RFID Emblem
Documents of ISO/IEC JTC 1/SC 31WG 4/SG 1 RFID Data Protocol
24791-Part 1 to 6 Software System Infrastructure (SSI)
ISO/IEC 24791-1: Architecture
ISO/IEC 24791-2: Data Management
ISO/IEC 24791-3: Device Management (incl. reader configuration commands)
ISO/IEC 24791-4: Abstracted Application interfaces (open)
ISO/IEC 24791-5: Device interface
ISO/IEC 24791-6: Security (based on prework of AIM Global)
ISO/IEC 24753: RFID & Sensors with reference to IEEE 1451.7
ISO/IEC 15961, 15962: RFID Data protocol – Update
ISO/IEC 15961-4: Sensor commands (NP)
Documents of ISO/IEC JTC 1/SC 31WG 5 MIIM
ISO/IEC 29172-19179 Mobile item identification and management
ISO/IEC 29143 Air Interface Specification for Mobile Interrogators
Documents of ISO/IEC JTC 1/SC 31WG 7 Security on Item Management
ISO/IEC 29167 Air Interface for file management and security services for RFID
Documents of the Liaison ISO TC122/WG 10 for BC&RFID applications
ISO 22742 Linear bar code and two-dimensional symbols for product packaging
ISO 28219 Labeling and direct product marking with linear bar code and 2d- symbols
ISO 15394 Bar code and 2d- symbols for shipping, transport and receiving labels
ISO 17363 Supply chain applications of RFID – Freight containers
ISO 17364 Supply chain applications of RFID – Returnable transport items
ISO 17365 Supply chain applications of RFID – Transport units
ISO 17366 Supply chain applications of RFID – Product packaging, and
ISO 17367 Supply chain applications of RFID – Product tagging
Documents of the Liaison ISO/IEC JTC 1/WG 7 Sensor Networks (under work)
ISO/IEC CD 29182 Sensor Network Reference Architecture (SNRA), 7 parts
ISO/IEC WD 30101 Sensor Network and its Interfaces for Smart Grid System
ISO/IEC WD 30128 Generic Sensor Network Application Interface
DIN standards
DIN 66401 Unique Identification Mark – UIM
DIN 66401 System Identifiers
Other standards, application related
Global Transport Label V3, www.odette.org
Global Guideline for Returnable Transport Item Identification, www.aiag.org
GS1 Global Specifications, www.gs1.com
HIBC Health Industry Bar Code, www.hibc.de
PaperEDI Standard, www.eurodatacouncil.org
Set Label Standard, www.edifice.org (June 2011)

Note 1: ISO, CEN and DIN standards are available via www.din.de or other ISO or national bodies
Note 2: For more information please contact the author or DIN NA 043-01-31

Fig. 9) ISO/IEC JTC1/SC 31 Plenary meeting in Seoul, Korea

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www.eurodatacouncil.org