



### ISO/IEC JTC 1/SC 31, the 13<sup>th</sup> Plenary Meeting Barcode & RFID, June 4-8, 2007, Pretoria

#### What users might be interested in most – Highlights

- ❖ New work item “Mobile RFID”
- ❖ New project “Hamonisation” of Barcode & RFID
- ❖ Project “TOTAL” for fastest RFID processes turned into praxis
- ❖ National contributions show the trend
- ❖ Technical standards for Barcode & RFID in good shape
- ❖ RFID application standards on its way for publishing
- ❖ Experts view, users irritations “RFID UUI 96, 128, or 496 bits?”
- ❖ Continued world wide activities
- ❖ SIJABONGA



#### Introduction

The world's expert on Automatic Identification & Data Capture (AIDC) meet regularly in order to maintain the current standards for Barcode, its 2D variations and for Radio Frequency Identification technology (RFID), to complete updates and to decide for new work items. This year's plenary of the responsible ISO/IEC JTC 1/SC 31 took place in Pretoria (ZA). The tasks given to SC 31 (*figure 2 and 6*) have been, and still are, to write the international standards for Automatic Data Capture technologies which full fill the requirements of every geographic and any market sector. Those standards, as the result of the work on ISO level, build the basis for cross sectorial data communication related to any material flow in the world. It addresses global solutions in for supply chain management with the requirement for unique identification of products and loads for traceability reasons, no matter what the destination might be and where they may appear in the globalised world. In Pretoria National bodies and liaisons reported about their specific developments and applications to learn from each others experiences. Understanding others view was one of the essential issues among the work on the technical specifications which is not free of lobbying and commercial interests. No doubt, business areas benefit from the AIDC standards being available since the 90<sup>th</sup> and will benefit from the updates in the future. Every ISO/IEC specification will be available by the National bodies after completion for world wide use. While ISO standards for Barcode are implemented since more than a decade, the current task is to add new technologies to the standards. At



Figure 1 Loyiso Maraselo & Bertus Pretorius



Figure 2 ISO/IEC JTC 1/SC 31 Plenary

this point RFID is in focus to ease access to and use of global standards as it is the case with Barcode today. The ISO working groups are pretty successful in issuing 'state of the art' standards for RFID just in time. The ISO standardisation is in good shape enabling immediate installations for RFID. Having had printed the first set of standards for the RFID Air Interfaces in 2005, it became obvious that the development will not stand still. Nevertheless the ISO/IEC JTC 1 committee SC 31 is well prepared to handle amendments and new work items for AIDC successfully by help of its resources from all parts of the world.

#### New work item “Mobile RFID”

“Mobile Item Identification and management in support of consumer applications”, this is the title of one of the new work items. So the decision was agreed following the request from Korea. Same time an Ad Hoc group was established for it. Potentially companies in the area of communication services might be extremely interested in it, because this work item might offer better business opportunities than the Internet of Things vision have done did yet.



Figure 3  
Mobile AIDC: BC.2D & RFID

Application scenarios have been shown such as downloading music, triggered by the scan of a movie poster (figure 4). There was great interest in such a work and national bodies are asked to contribute. Companies like NXP, NOKIA, SONY, which already work together to promote RFID “Near Field Communication (NFC) surely will be attracted. NXP and ERICSSON showed deep interest spontaneously. Since QR Code is widely in use and successfully in Japan for “QR triggered” shopping, booking, information exchange, etc. via Mobile phone (figure 3), it was decided to include it with other potential AIDC data carriers. There is quite a potential, that habits of our daily life will be influenced which this time is influenced by Asian skills. Next meeting on this topic will be Oct., 2007 in Seoul, Korea.

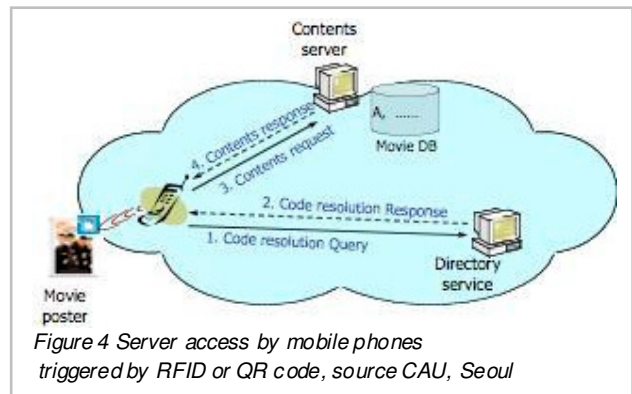


Figure 4 Server access by mobile phones triggered by RFID or QR code, source CAU, Seoul

### New project “Harmonisation” of the standards for interoperability of Barcode & RFID

Why not to add RFID to a Barcode label? This step seems logical, but isn't always as easy as that. This new work item initiated from Japan shall bring light into the jungle of standards for all users which ask the simple question: What shall I do if I want to add RFID to my old Barcode label or even if I want to replace it. The ISO & IEC experts, off course, shall supply answers for those which want to continue with running data communication and infrastructures. The saying “Never change a running system” may true for ERP-Software but not really for data carriers. So, it was agreed and the project title shall be “Harmonised data structure according to High Capacity Media standard ISO/IEC15434 and RFID Data protocol ISO/IEC 15961”. Again very technical, as it is the nature of Barcode & RFID, this shall include all types of ADC media covering solutions with linear symbols, 2-d symbols and RFID (see figure 5 Harmonised Barcode & RFID, “Unique serial number” construct and 3 choices of carriers) But not only users, RFID chip designers as well asked “how large can a number for a transport box encoded in Barcode be?”. At least some designers for UHF wrongly understood in the past, that 96 bits are what is needed world wide. This was potentially caused by the euphoric “Internet of the Things” vision. Lucky enough, aside from the Pretoria meeting it was discovered that chip builders learned from the Barcode user’s about the true requirements and showed data sheets of up to 256bits. This indicates how flexible suppliers react if the needs become understood (see table 2: Suppliers meeting 240 bits UHF capacity to meet standards and users requirements).

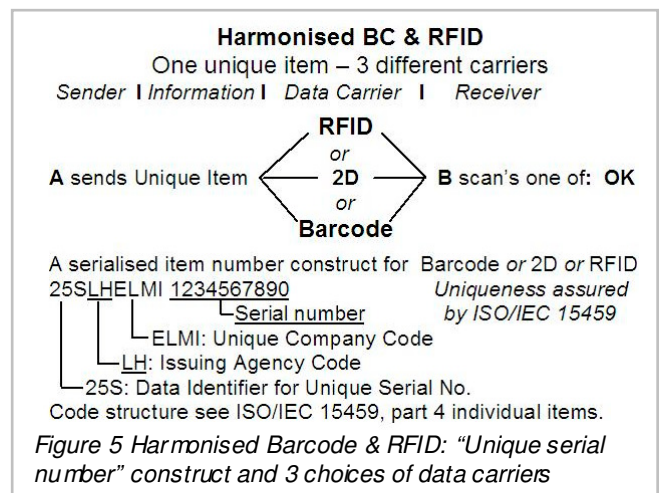


Figure 5 Harmonised Barcode & RFID: “Unique serial number” construct and 3 choices of data carriers

### National Contributions show the trend

As every year the national bodies are asked to supply a brief report on the AutoID scenario in their country. Just some contributions may be picked out of the presentations. The delegate of the South African Ministry of Traffic & Transport, Mr. **Loyiso Maraselo** (figure 1), reported on the importance of RFID for them in applications for logistics and security. RFID for car license plates was reported as the largest project today.

**Korea reported** about pilots with “Near Field RFID” and mobile phone communication featuring scanning items via mobile phone. The Korean delegation suggested a new work item on this topic. **The Japan delegation** was accompanied by the representative of the Ministry of Economy, Trade and Industry - Information Economy Division (METI), Mr **Yoshiki Endo**. The delegate presented the support program of METI for RFID. After last years suggestion to address standardisation of the “middle ware” being in progress with ISO/IEC 24729 RFID Implementation Guidelines, he suggest the new work item on interoperability. His statement was “Barcode and RFID must be interoperable”.

**Germany reported** about specific developments in the area of Real Time Location Systems (RTLS) and Organic Electronics as well as the success of national standards as e.g. DIN V66401 Unique Identification Mark (UIM). The role of the Company Identification Code (CIN), according to ISO/IEC 15459, was underlined as the key for interoperable solutions.

### Project “TOTAL” for fastest RFID processes turned into praxis

The “Tag only talks after listen (TOTAL)” RFID system is designed for extremely fast processes for different frequency ranges. Exciting demonstrations illustrated that Tags just thrown over antenna have been read even several 100 of times. The system is used for identification of running cars (e.g. 300kmh) or any fast moving items. This is the one solution preferred by South Africa for identification of Car license plates. The work item is right now in upgrade phase for interoperability with other RFID systems.

### RFID APPLICATION standards on its way for publishing

Technical specifications lead in “application standards”. Similar to Barcode application standards, e.g. for Transport Units, this is what’s happening also for RFID applications. The chairman of JWG TC104/122 Craig Harmon reported that 3 Standards have been approved already being on the way for publishing by the ISO secretariat, Geneva:

- ISO 17363 RFID for Freight Containers
- ISO 17366 RFID for Product Packages
- ISO 17367 RFID for Item Identification

Just two specifications are expected next quarter after final voting, the ISO 17364 RFID for Returnable Transport Items (RTC's) and ISO17365 RFID for Transport Units. Industries are invited to take these standards as its own guidelines for immediate RFID implementation for cross industry supply chain management.



### Technical standards for Barcode & RFID in good shape

The ISO & IEC standards today cover technology, data structures and performances but also system infrastructure. While the current work on Barcode & 2D covers maintenance issues mainly the current work on RFID targets amendments of the existing standards. New functions are in integration, such as “Sensor functionality” and battery assistance for RFID Tags, as well as data protocol upgrades. Some of the work might be high lighted which may be of general interest at least for experts:



Figure 6 Chair Chuck Biss & secr. Frank Sharkey

- The amendment of the UHF standard ISO/IEC 18000, part 6C has received 200 comments which need to be worked out, quite a challenging job meeting the time frame for completion. But not every body met the schedule as the one from GS1 was delayed for reasons of the EPC upgrading process in parallel which needs to match. The chairman Henri Barthel stated that the ISO/IEC specifications shall be as generic as possible, so EPC would fit because it might be upgraded. Nevertheless it has been achieved already that both industries and consumers numbering schemes fit in as it does for Barcode.
- **RFID Performance** coursed constructive discussions for ISO/IEC 18046 RFID performance testing. It shall be differentiated between “inductive” operating RFID techniques and “radio reflecting” techniques as UHF is one of. A test configuration spec. shall include Read & Write performances for portable antennas, one sided antennas, gates and 3D tunnels.

The potential Problem “**TAG’s of different suppliers in one system**”, was one critical discussion item. It might happen that Tag’s of different suppliers which all meet the ISO/IEC specifications might cause lower performance by interfering each other. This may occur due to different tolerances of different tags. The meeting felt, that specifications shall be precise enough to minimise tolerances. Furthermore it should be covered by system performance testing to consider multiple Tag types. TAG performance test ISO/IEC 18046-3 passed as Final Committee Draft.

*Opinions aside: UHF may not perform for every application or differently, where HF is considered as a robust solution for many applications in a supply chain.*

*Remark: Performance testing standards exist since years for Barcode and 2D symbols, printers, readers and verifiers.*

- **System infrastructure** is covered by the work for “ISO/IEC 24791 Software System Infrastructure (six parts), ISO/IEC 15961 RFID data protocol „application interface“ and ISO/IEC 15962 data protocol „data encoding rules and logical memory functions“. ISO/IEC 24753 application protocol covers encoding and processing rules for sensors and batteries in communication with the amendments of the Air interfaces of ISO/IEC 18000-1 to 7. The Data Constructs steering Committee will manage the maintenance issues for the „Application Identifiers (AFI’s)“ which identify the types of information, such as for Transport Units, Returnable Items or even for complete data constructs dedicated to specific areas (e.g. libraries).
- **RFID Implementation Guidelines** 24729 (N2235) closed July 5. It includes the following parts Part 1: RFID enabled labels and Packaging, Part 2: RFID-Recycling and RFID Tags and Part 3: RFID Interrogator/Antenna installations. The “Guidelines for the Implementation and Operation of UHF Interrogator, Systems in Logistics Applications supplied by AIM Global will be a key source for the work.



**Experts addressed user irritation on RFID: “96, 256 or better 496 bits”?**

Aside the agenda of the meeting experts discussed the situation of UHF chip availability. This was due to reported user irritation about assumed limitations of UHF Chips to 96bits. ISO/IEC 18000 but not even part 6C for UHF does limit to 96bits for the mandatory field to identify Tag and Item, the Unique Item Identifier (UII). Of course 96bits just takes about 16 characters 6bits each. This is not much and truly not sufficient for taking a “License Plate” for a Transport Unit with 20 characters alpha numeric. The norm for “Unique Identifiers” ISO/IEC 15459 allows even 35 characters for it, which would make 210bits. Nevertheless it was to learn that there are enough UHF Chip manufacturers which supply chips with sufficient capacity for the UII Memory Bank such as 256bits to carry “License Plates”, so its a matter of selecting the right product for the right application (see table 1 Unique Identifier sizes). User memory was out of discussion, because this part was reported as being supported from most chip suppliers anyway but might be a future problem if users get more addicted to use RFID as data carrier consequently. So it was felt, that’s just about a way how to inform the users properly and fully.

| Unique Identifier (UII) sizes according to ISO&IEC AIDC standards: |             |         |              |              |              |
|--|-------------|---------|--------------|--------------|--------------|
| ISO/IEC:   | 15459-1 TU  | Product | 15459-4 Item | 15459-5 RTI  | 15459-6 Gr.  |
| ISO/IEC:   | 15394       | 22742   |              |              |              |
| ISO:   | 17365       | 17366   | 17367        | 17364        |              |
| ASCII an   | 20, max.35  | 32      | max50        | 20, max.50   | 20, max 50   |
| bits ASCIIx6   | 120, max210 | 192     | max300       | 120, max.300 | 120, max 300 |
| Bit conversion based on 6bits for character set A-Z, 0-9           |             |         |              |              |              |

Table 1 Unique Identifier sizes and resulting bits volume

| Suppliers meet UII 240bits                     | User    | Tag ID  |
|--|---------|---------|
| ATMEL  | YES+    | YES YES |
| HITACHI  | YES+    | YES YES |
| NXP  | YES     | YES YES |
| ST a   | YES+    | no YES  |
| ST b   | no(128) | YES YES |
| Impinj   | no(96)  |         |
| TI   | no(96)  |         |
| To be completed according to the developments. |         |         |

Table 2 Suppliers meeting 240 bits UHF capacity to meet the standards and user requirements

**Intellectual Property and Licenses addressed again**

As a request from WG Convenors, the SC31 Secretariat was asked to obtain clarification from the JTC 1 Secretariat and ITTF regarding the subject of Intellectual Property (IP) Policy. ITU & ISO/IEC IP published an Intellectual property policy with a "dedaration form" March 1, 2007. IP references shall be added with each Air Interface standard. National bodies are asked to check and to supply links to sources. The policy shall be applied to any standardisation work assisting the working group Convenors setting clear rules for any SC31 working group or sub group meeting participant. The request was to answer specific questions how to handle situations where participants do not dedare IP’s and potential licenses.

**Continued world wide activities: Toronto invites for the next meeting**

Following the Plenary the working groups will have to complete the given tasks within the given time frames. Communication will take place via internet phone and meetings at different locations. Next Plenary will take place 2008 in Toronto invited by the Canadian National Body. This will be the next milestone for reporting on completed amendments and on the status of the new work items such as “Mobile RFID”.

**“SIJABONGA - Thank You”, South Africa!**

The Plenary expressed its appreciation’s to the South African Bureau of Standards for excellent meeting arrangements and services.

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*Special thanks shall be expressed to Erich Günter (IBM), Mikael Hjalmarsen (ERICSSON), Ulrich Friedrich (ATMEL) and Günther Vieider (EHIBCC) for their active contribution to the report.*

**Sources for specifications:**

- Guideline „ISO powered RFID“ for ISO conforming RFID application: info@Eurodatacouncil.org
- Guideline for RFID & Healthcare: info@hibc.de
- Technical papers “Unique identification” info@Eurodatacouncil.org
- European Award Composite BC & RFID: www.elmicron.de, info@microsensys.de
- ISO Codes BC, 2D, RFID integration tools (ISO standard conform): info@elmicron.de
- White Paper RFID for Health Care: www.hibc.de
- Register Issuing Agency Codes ISO/IEC 15459: www2.nen.nl/getfile?docName=196579

**AIDC-Standards** are available by national normalisation bodies as AFNOR, BSI, DIN, NEN, etc.

- DIN V66401 Unique Identification Mark (UIM)
- DIN V66403 System Identifiers
- ISO 22742 Linear & 2D symbols for product packaging
- ISO 15394 Linear & 2D symbols for transport labelling
- ISO/IEC 15418 ANS MH10 Data Identifiers & GS1 Application Identifiers
- ISO/IEC 15434 Syntax for High Capacity Media
- ISO/IEC 15459, part1-n unique identifiers
- ISO/IEC 15961,2 RFID data protocol
- ISO/IEC 15963 RFID TAG-ID
- ISO/IEC 18000-part 2-7 RFID Air-Interface

In short term completion process are among others:

- ISO/IEC 24791 Software System Infrastructure
- ISO/IEC 24753 Application Protocol
- ISO/IEC 18046 Performance Testing