

ROADMAP FOR LIBRARY RFID APPLICATION STANDARD

As at 1 November 2006

Progress to Date

1	In November 2005, EDItEUR took the initial step to register a set of RFID data constructs for the library community. This application was acknowledged to be incomplete, but the purpose was stated to avoid systems clash with other applications using the same air interface protocol.
2	In the period November 2005 to February 2006, the application was considered favourably, in principle. There were issues concerning the AFI proposed by the ISO RFID Application Protocols committee, which resulted in the identification of a technical problem in the way the air interface protocol standard had been written.
3	In March 2006, because there had been some comments on the incompleteness of the application from EDItEUR, additional information was provided to gain greater acceptance from some of the "critics".
4	In March 2006, at the JTC1 SC31 WG4 RFID for Item Management meeting, the proposal from EDItEUR was considered. Procedures were put in place to revise the ISO/IEC 18000-3 standard. A steering committee was put in place to act as a temporary Registration Authority until ISO/IEC 15961 Parts 2 & 3 are published. It was agreed that on re-submission from EDItEUR with the further details, the steering group would move ahead with the registration.
5	<p>The first major technical task was to decide on the common root for the object identifier. In the additional information supplied to SC31 (see Step 3 above), the options were defined as:</p> <p>A. To use a root object identifier assigned by the 15961 Registration Authority in the form of :</p> <p style="text-align: center;">1 0 15961 {arc for EDItEUR for libraries}</p> <p>B. To use a form specific to the library community, probably based on one of the sector standards.</p> <p>As Option A can be "delivered" by the SC31 WG4 steering group and carries no disadvantage over Option B this was the basis of the application. IATA had also accepted this way forward, even though it has its own published standard for RFID for baggage handling: RP1740C.</p>
6	An associated task to meet the requirements for the application for registering data constructs was to decide on the description of the unique item identifier and determine its object identifier. In the information submitted (see Step 3 above), this was defined as the primary item identifier and is equivalent to the code used in existing library bar code systems. There is no requirement as part of the application to declare the length of this, nor the format. However, consideration could be given to specifying the format using the proposal in the document <i>Possible Data Objects for a Library ID System</i> as a starting point.
7	The application from EDItEUR was considered by the SC31 WG4 Data Constructs Steering Group, and in September 2006 the relevant AFI, data format and object identifiers for the primary item identifier and other data elements was assigned (see Item 8 below).
8	The information about which particular data constructs have been allocated to the library community has been presented in a separate document (FILENAME: RFID for Libraries – Stds Advice.doc). This document also provides some advice on the implications for lenders and library managers.

9	In parallel, a meeting has been called on 1 December 2006 of ISO/TC/SC4 to deal with the standard for a <i>Data Model for Use of RFID in Libraries</i> . This meeting will address background issues such as the RFID standards to use as a basis, and some of the application issues, the general content of the standard, and future activities.
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The Roadmap Towards Standardisation

1	<p>Consideration needs to be given to an initial data dictionary, using a paper prepared for the library community¹ as a starting point. The list of object identifiers in this paper is based on proposals from within the library community, including the Danish and Dutch fixed-message structured proposals.</p> <p>There are two routes that can be taken:</p> <ul style="list-style-type: none"> • One is to gain quick consensus among the international community for a minimum set of optional data elements, to which object identifiers can be assigned. • The other is to wait for the final deliberation of ISO/TC46/SC4, when a comprehensive list can be in place for a number of years. <p>The choice between these options will depend considerably on the timeline proposed by the ISO committee to reach consensus for a Committee Draft. If this is to stretch well into – and even beyond – 2007, then the first option might be better.</p> <p>NOTE: As with all data dictionaries, there is no requirement to produce a comprehensive version on the first edition; the objective is to produce something that meets a number of requirements. Consideration should be given to the fact that many of the data objects are likely to be defined as optional. So including them in the data dictionary for a minority of users carries no penalties in encoding capability or reading efficiency for those libraries not wishing to adopt a particular object identifier.</p>
2	<p>RFID vendors will need to provide some detailed response to how they will comply with the AFI assigned by the Registration Authority, and the migration of new systems to the legitimate AFI value, together with proposals on how to retrofit implementations that are using incorrect AFI values.</p> <p>This will require responses from vendors with a national and multi-national market. The ability, and time frame, to comply will depend on the component in the system: the RFID tag, the RFID reader, any software/firmware processing of the AFI by the RFID system, and the library management system.</p>

¹ RFID comments from the UK (Possible data objects for a library RFID system) / British Standard Institute:
<http://www.niso.org/international/SC4/N594.pdf>

<p>3</p>	<p>The next logical step will be to produce some form of application standard setting out various requirements and characteristics of the RFID system. In addition to the obvious content discussed above, the following would need to be included:</p> <ul style="list-style-type: none"> • Specific identification of the ISO standards that supports the air interface protocol and the data protocol. • A clear definition for the use of a single AFI, which could be supported by alternative security techniques. • Precise rules for using a closed system AFI as a quasi-security mechanism. • Some advice about integrating with legacy systems, which may use a different air interface protocol and, most certainly, a different way of encoding data to the Data Protocol. <p>Such a document could be prepared over a reasonably short elapsed time, with inputs and reviews dealt with mainly electronically.</p> <p>One of the issues that will need to be resolved is whether the scope of the ISO/TC46/SC4 Work Item will cover all of the relevant issues, or only part of what is required to fulfil the functions of an application standard. This position should become clear following the meeting on 1 December in Copenhagen. The exact method to achieve this will depend on the scope of the ISO/TC46/SC4 Work Item. If that Work Item has a comprehensive scope, then vendors would participate through their national standards body in a more formalised manner.</p>
<p>4</p>	<p>Anything that is outside the scope of the ISO Work Item (for example achieving interoperability with legacy systems) will need to be dealt with in a different forum. Candidate organisations need to be identified to co-ordinate this work – probably on an international scale. Care will also need to be taken when dealing with the interoperability when migrating from legacy systems to future standards systems. Because different vendors already have different degrees of compatibility between their present product offerings and the new standards, the complexity of migration will differ between the vendors. This, in turn, will have implications for different library systems.</p> <p>Probably the best way to understand the migration issues is for a survey to be undertaken among vendors to be the basis of a "gap analysis". The benchmark would be a list of the features of a fully-compliant system to the expected new standard. Each vendor, whether focused on RFID technology, library management systems, or combinations in-between, would identify features of the standardised system that could not be supported with the present (legacy) system. Each vendor would also be invited to indicate if, and how, the legacy system addressed the fundamental issue. The result of the gap analysis would identify a series of specific migration paths that could form the solution to accelerating an integration of established and new RFID systems compliant with the standards.</p>

<p>5</p>	<p>There is a strong consensus that the air interface protocol shall be based on ISO/IEC 18000-3 Mode 1. This is because this air interface protocol represents the highest installed base of RFID systems in libraries that use standardised technology.</p> <p>NOTE: Sometimes this air interface protocol is known as ISO/IEC 15963, which is properly a smart card technology and is therefore a misnomer for RFID for item management. If the library system claims to be based on ISO/IEC 15963, it is probably compatible with ISO/IEC 18000-3 Mode 1.</p> <p>RFID vendors who support other (sometimes proprietary) air interface protocols will need to provide some detailed response on how they plan to address the standardised requirements for a common air interface protocol for library applications.</p>
<p>6</p>	<p>The draft application standard needs to be considered by – ideally it requires participation from – vendors of RFID systems and library management systems. This stage is important to enable development to take place on new systems and to establish methods of interoperability between tags from legacy systems, and those compliant with the new application standard. For some systems this will mean changing how data is communicated, and for others it might imply requirements of hardware upgrades.</p> <p>The gap analysis (mentioned above) will identify what changes need to be made with respect to particular features of RFID systems. A balance needs to be struck between those vendors that wish to use their commercial and technical acumen to resolve the migration issues, and those that might require support. If agreement is reached that support is required for any particular characteristic, then this can be addressed as part of this task.</p>
<p>7</p>	<p>A "sunrise" date should be agreed with vendors, when all new systems being installed will be compliant with the application standard. This does not mean that legacy systems will be redundant just that, from some future agreed date, all new systems will be compliant with the application standard.</p>
<p>8</p>	<p>A series of "sunset" dates (for complete withdrawal of support for a legacy feature) should be agreed with vendors to address features that need to migrate to a common standards approach for RFID for libraries. These sunset issues are meant to apply to the installed base of systems. Among the obvious "sunsets" that need to be addressed are:</p> <ul style="list-style-type: none"> • The use of any AFI for loaned items, other than the formally registered AFI under rules of ISO/IEC 15961. • The date when a reading system will be able to read ISO/IEC 18000-3 Mode 1 tags as well as a given proprietary technology. Effectively this marks the end of the dependency of library systems on the proprietary technology, but still allows the stock of loan items to use tags compliant with the legacy technology. This will also affect the ability of suppliers to use standardised systems to apply RFID labels, but encoding to the specific library customer's requirements. • The gap analysis will also identify a number of other issues that will require a sunset date to be defined.

<p>9</p>	<p>Throughout this process, a watching brief will need to be kept on RFID developments. Various changes are taking place that are still speculative with respect to the impact that they will have on different applications. The objective of this watching brief should be to ensure that if new RFID technologies are developed that provide the functional requirements for library systems, including performance and cost capabilities, then these might need to be considered. In contrast, the community also has to consider that with an increasing installed base, the standardised technology that it adopts will set the infrastructure requirements for a number of years.</p> <p>NOTE: To put the matter in context, the ISBN EAN bar code that appears on books is based on a 25 year old application standard, and a bar code technology that is 33 years old. Whilst there have been significant changes in bar code technology in that period of time, the cost of changing the infrastructure has far outweighed any benefits of changing the fundamental data carrier technology (the EAN-13 bar code) and the application standard.</p>
<p>10</p>	<p>A similar watching brief needs to be kept with respect to evolving application standards. There are known changes taking place with respect to coding rules from ISO/IEC 15962. These will result in potentially significant improvements in encoding efficiency, but will be fully compatible with the published standards. User communities will have a choice of using the more efficient – but more complicated – evolving encoding scheme, or retaining solutions compliant with the published version of the standard.</p> <p>In a similar way, developments are taking place – and will certainly take place in the future – about applying RFID to the media type of products that form the majority of library loan items. These developments might need to be taken into account as library systems evolve.</p> <p>Both types of change need to be considered using two generalised criteria:</p> <ul style="list-style-type: none"> • If they offer significant benefits to the library community, then further development might be required to reap those benefits by making changes to the application standards. • If they are perceived as bringing no significant benefit, then it is also important to ensure that they don't impose constraints on the established systems. Such constraints might result in interference from radio communications. If any constraints are perceived, then various actions will need to be taken to minimise this impact. This could be by using the fact of an established standard to "protest" about interference, or to make changes to the library application standards. <p>In all cases, having an application standard in place for RFID for libraries will certainly strengthen the case of the sector and give significant voice on any issues that might be impossible to be achieved from an individual library perspective, and even national standard perspective.</p>