Tendering for RFID Systems:
a core specification for libraries

**by
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Introduction

The use of RFID by libraries over the last few years has grown dramatically. During the same period both the technology and the applications that use it have developed at an accelerating pace. What once seemed a simple decision - to introduce self-service or not – has, due to the maturing marketplace, grown into a rather more complex one, now requiring rather more understanding of both standards and systems integration to be sure of making the right decision.

An earlier attempt to offer assistance and guidance for those seeking to purchase RFID solutions for their library was initiated by Mark Hughes through the ORILS website and accompanying documentation. The intention then, as it is now, was to offer a 'sample' specification that could be modified by individual libraries to suit their own needs.

This new document, published jointly by the National Acquisitions Group and Book Industry Communication, is the result of a collaboration between Mark and Mick Fortune - independent RFID consultant – which has revisited and revised the original ORILS documentation both to bring it up to date and to make it easier for librarians to adapt to their own requirements.

The structure of the document

There are many ways to procure an RFID solution for your library and at some point in the process almost all will require you to produce a specification of your requirements. This document seeks to simplify that process.

The document is in three parts.

Part One describes the **project's scope** and details of the establishment for which a solution is being sought.

Part Two offers a **sample functional specification**. The points listed are not absolute, they are recommendations based upon our experience and knowledge of how the RFID market operates, and how it is likely to develop.

Part Three examines the **relationship with the suppliers** in more detail. We have identified some key areas that should help you determine which will offer the appropriate level of service and support for a successful implementation.

How to use it

Each part comprises a list of considerations and a 'model' statement. Please note that the statements are only examples and may not accurately reflect the precise requirements for your library. Think of this document as a template from which you can build your own 'Request for Proposals' (RFP) rather than the finished article.

For example, in Part One, the precise requirements of each purchaser will vary so in many areas you will need to enter the information as it relates to your project – not the sample text!

In Part Two, a set of mandatory requirements are outlined (marked with grading of 3 in the I column). These requirements are reflective of a fully specified solution. If your preferred solution does not require all of these mandatory elements, be sure to remove those you don't need before you issue this document!

Part One

This section gives an outline structure which will help you to set out the project scope and all the necessary details of the establishment for which a solution is being sought.
The precise requirements of each organisation will vary so in many areas you will need to enter the information as it relates to your project – Note: Please don't use the sample text as this is for guidance only and your requirements may differ.

GENERAL INFORMATION

1. Introduction

   1.1. Overview of the project.
   Provide clear aims of what is expected to be achieved in terms of RFID implementation

   1.2. List of sites covered by this procurement.
   Do not list statistical data here, just names and locations.

   1.3. Statement of specific high level deliverables
   Sample text:
   Services that we wish to deliver are:
   - *Self-issue of book and non-book material*
   - *Self-return of book & non-book material*
   - *Patron account management via self-service terminals (e.g. renewals, reservation management)…*

   1.4. Project deadlines.
   Sample text:
   These services are to be fully implemented across all sites by overall project completion date.

   1.5. Supplier response guidance.
   Sample text:
   Tenderers must, through their responses to the functional requirements and any necessary explanatory documentation, state fully how their proposal meets the project aims.

   1.6. Procurement milestones.
   Date for submission, plus information regarding any pre-tender meetings, demonstration dates etc.

2. Project Timetable

   2.1. Project milestones.
   Full details of timetable – provide project objectives in terms of start and end dates, any pilot sites etc.

   2.2. Project limitations.
   Note any limitations on the project implementation e.g. work confined to vacation times during an academic term, other refurbishment work going on etc.

3. Summary of Objectives

   3.1. Provide more detailed objectives for the project.

Sample text:
- *Target levels for self-service usage.*
- *Specifics on integration with existing systems.*
- *Requirements for training, implementation and support…*

3.2.   Detailed requirements.

Sample text:

The functional specification provides detailed requirements for the software, hardware, the implementation, and the support services. The table reply form should be completed as fully as possible and returned as part of the tender submission along with any supporting documentation.

4. The Libraries

4.1.   Sites/Branches.

Overall statement of how many sites are to be covered by the implementation, and/or if there is more than one institution involved. Remember to identify which sites have which specific requirements in the Functional Requirement.

4.2.   Statistics.

This will need to be adapted for your organisation.
Sample text:
The following figures are offered for guidance only:

Borrower(Reader) Numbers	
Annual Issues/Renewals	
Annual additions to stock	
Current stock levels:	
Books	
Journals	
Cassette	
Videos	
DVDs	
CDs	
Current Opening Hours	
Mon - Fri	
Sat	
Sun	

5. Corporate Standards

5.1.   Detail any corporate standards requirements e.g. operating systems, network policy compliance etc.

Sample text:
The system provided should be e-GIF (V4) compliant. Where appropriate the British Standards BS7666 2.0 and BS8766 2.0 (or any European or International equivalent) must be adhered to…

5.2.   Details of existing systems in use on site.

Sample text:
Windows version n systems are currently used across all institutions…

5.3.   Details of any anti-virus or other software requirements

Sample text:
Any computer that is to be connected to a network should be capable of running anti-virus software….

6. Hardware Procurement

    6.1.   Details of any requirements affecting hardware purchase.
Statement of whether the supplier or the organisation should provide or purchase some / all necessary hardware.

7. Capacity

    7.1.   Statement of requirements for future capacity.
Sample text:
The capacity of the systems proposed must be adequate for the operations as described, and capable of dealing with an increase of up to n% in stated transaction levels...

8. Training

    8.1.   Statement of training requirements.
Sample text:
Training in the operation of all aspects of the RFID system will be supplied by the supplier to selected library staff at suitable venues of the library services' choice, on the basis that this can then be cascaded to others.

    8.2.   Documentation requirements.
Sample text:
Full documentation of system functionality, including user guides, is expected to be provided by the Supplier during the implementation process.

Part Two

The **"Functional Specification"** is a key part of your tender invitation. You should therefore ensure that it accurately reflects the precise needs of your particular establishment. The authors have prepared this section in the light of their experience, and their estimation of how RFID is likely to develop but every library will have some unique characteristics that may require some additions or deletions to be made.

The "marking" schema offered is based on one that has been used successfully by a number of libraries but it may not be suitable for everyone. In particular you should ensure that you are fully aware of any procurement criteria that your organisation may require to be included.

We have identified several elements that we would expect to be mandatory in any specification. We recommend that you use "mandatory" requirements with some caution since you are ruling out bids from any supplier who cannot meet them.

FUNCTIONAL SPECIFICATION

The following section details one possible methodology for evaluating responses.

Tender Response Guidelines

Each requirement in the functional specification table given below has three elements. These are:

Importance(I):
Each requirement has been assigned a code indicating its importance to the institution:
3 - Mandatory, these requirements must be met in full.
2 - Highly desirable, these requirements will score more points
1 - Desirable

Response Codes(RC):
Please indicate the current availability of each requirement using the following codes:
A - Available and on general release
B - Partially available and on general release
C - Planned for a future release (please supply prospective release date).
D - Not available or planned

Please note: The institution reserves the right to alter these marks if the answer given does not appear to support the code assigned.

Additional Information:
Please ensure that your replies supply sufficient additional information to enable us to fully understand your offer.

Please ensure that you identify any components – hardware, software or services – that will be supplied by a third party together with costs, if any.

Any 3rd party charges required to implement your solution that are not identified in this response will be met by the bidder.

THE REQUIREMENTS

Please read each statement carefully. If the requirement does not apply to your project – delete it! Ensure that the numerical integrity of references within the document is preserved in any amendments, deletions or additions you may make.

This first section deals with requirements that will be common to all procurements. You should determine the relative importance of each element in terms of your project. Note that many of the statements require you to add site specific data – e.g. the first requirement contains a reference to "n nominated reference sites" where "n" is a number that you will have to provide. Similarly you may wish to omit the reference to "UK" libraries. LMS should be the name of any **LMS** (Library Management System) with which your required solution should interoperate.

All optional elements within statements have been indicated by **bold italics**.

#	Requirement	I	RC	Response
	Supplier			
1	The supplier must have proven experience of supplying and maintaining a comparable system within the library market. A list of (**UK**) customers is required, with at least n nominated reference sites.			
2	Please specify whether you are a certified partner (or similar) of (**LMS**).			
	Power, IT & Network			
3	Network and server security must not be compromised by the addition of any RFID enabled equipment. Supplier to specify what measures are in place to ensure this.			
4	Please confirm that there will be no interference between the RFID system and any wireless access points or other radio devices on the site.	3		
5	Please identify any additional server requirements for your solution. State the specifications, recommended operating system, your access requirements and management responsibilities.			
6	Please state the anticipated lifespan of all hardware proposed. Give details of your recommended maintenance programme.			
7	Please state the network and bandwidth requirements of the proposed system together with any prioritisation recommended to maximise transaction speed and reliability.			

8	All hardware must run on standard power (220/240v)	3		
9	Please specify electrical supply and network connection requirements for each item of hardware.			
	Design			
10	Self-service units supplied should be consistent with the aesthetics of the site.			
11	User interfaces should be of consistent design across all sites.			
	Integration			
12	Please provide details of any additional hardware and software requirements for the use of the system with existing staff PCs.			
13	Please explain how software integration with the LMS is achieved. If SIP is used please state which version is supported and details of any extensions used. Identify any additional protocols used to communicate between RFID and LMS systems.			
14	Please provide details of all or any software licensing required for 13 above.			
15	The RFID and LMS solutions should be fully integrated. Please give details of any RFID functionality that operates entirely independently of the LMS.			
16	LMS circulation rules and policies must not be compromised by the RFID system.	3		
	Hardware - General Requirements			
17	Self service units should be capable of operating with low/zero staffing levels for extended periods. Please give details of any limitations.			
18	Devices should be capable of **reading the existing borrower identification technology** where necessary.			
19	Units should be capable of being upgraded to use alternative borrower identification technologies (such as **Mifare**). Please give details of any limitations to this provision and an indication of likely costs.			
20	Please specify read method for **barcode scanning**.			
21	All RFID devices should be able to read tags on all stock items. Please give details of any limitations to this provision.			

22	Please give details of any size or weight restrictions on stock items that may be processed by your devices.			
23	Equipment must be capable of processing audio-visual materials (e.g. music CD's, DVD's, audio cassettes) without risk of damage or erasure.			
24	All self-service units must be capable of providing a printed receipt for transactions.			
25	Please give details of minimum separation distances for each piece of equipment offered – e.g. minimum distance between issue station and security gate, and between issue stations.			
	Software - General Requirements			
26	Please provide details of languages supported by your units. Include in your reply details of how the choice of a different language is presented to the user.			
27	Equal prominence should be given to different language options.			
28	Please specify how many alternate languages can be made available for use on the system simultaneously.			
29	The system should be user friendly and intuitive. Context-sensitive help screens, prompts and meaningful error messages must be provided.			
30	The user interface should be customisable to the greatest extent possible. Please supply screen snapshots showing the screen layout for major operations e.g. issue, return, account summary.	3		
31	The solution should be capable of processing mixed media, multi-part items, e.g. book plus CD.			
32	The system should be capable of prompting for a PIN as part of user authentication. Please give details of options for this provision e.g. on screen or separate keypad.			
33	Receipts should **show time, date, device ID, title, due date (for issues) and type of transaction.**			
34	Receipts should be capable of being configured by the library to add local text.			
35	All stations must be capable of providing a receipt in either English or other selected language.			

| 36 | Self-service units shall be capable of operating in accordance with a user defined schedule of opening hours and be capable of self-start and self-closedown accordingly. | | | |

The next section deals with the specific requirements for your project. Please consider each question carefully and decide whether it applies to your project e.g. are you planning to use sorting equipment as part of your installation?

#	Requirement	I	RC	Response
	Hardware and consumables – General requirements			
37	The system shall provide n RFID enabled staff workstation(s), for use with existing staff PCs			
38	The system shall provide n RFID self-service station(s) for client use			
38	The system shall provide payment facilities at some/all* self-service stations			
40	The system shall provide n sets of security gates			
41	The system shall supply n mobile stock management device(s)			
42	The system shall provide automated sorters.			
43	The system shall provide automated accession units.			
44	The system shall provide interactive shelving or display units for special exhibits, recent acquisitions etc.			
45	The system shall provide interactive shelving for some/all* stock.			
46	The Supplier shall supply sufficient tags for the current level of library stock: n book / periodical tags n Video / Cassette tags n CD / DVD tags			
	RFID Devices – Specific Requirements			
	Staff Workstations			
47	Units must manage the issue, renew and return of both tagged and untagged items.			
48	A barcode reader must be able to operate concurrently with an RFID reader			
49	The system should be fully integrated to provide the full staff functionality normally available within the LMS.			
	Self-service Issues			
50	All units should have touch screen operation			
51	Provision must be made for access to the system by people with disabilities and be compliant with DDA regulations.			

52	Access to account details should be restricted to the holder/authorised users only. Please state what measures are in place to prevent unauthorised account access			
53	All issue stations must be capable of simultaneously reading multiple items. Please give details of read ranges.			
54	Self-issue units must offer both issue and renewal functions.			
55	Units should provide a running total of items issued or discharged during a transaction.			
56	Units should provide bibliographic details of items issued or discharged (title/author as minimum) during a transaction			
57	Units should be capable of showing the status of all current loans on a customer's record			
58	Units should allow customers to view the status of any current reservations.			
59	Units should offer access to customers to cancel any current reservations			
60	Units should be capable of being configured to limit functionality to issue or return , to cope with dynamic changes in demand. Please give details of the process required to make such a change.			
61	Units should be capable of directing borrowers to place reserved items in a nominated location (e.g. shelf or bin) as determined by the LMS.			
62	All text and graphics should be customisable by the library. The interface should also provide suitable access for visually impaired users.			
63	All units should require users to indicate when their transactions have been completed. Once completed the system should clear current user details before accepting the next customer			
64	Receipt printers should be integral to the units			
65	Receipt printers should be easily maintainable by staff. Please give details of the process required to change a roll.			
66	Receipt printers should provide a warning to staff of operation problems (e.g. out of paper). Please give details of the methods by which this may be achieved.			
67	Please indicate size, type and cost of replacement printer paper rolls.			

	Self-service Returns			
68	The return process must identify the item as having been returned and must update the LMS in real time.			
69	The automated return system should be capable of sorting to n levels. Please indicate any known restrictions placed on this operation by the LMS.			
70	The automated sorter must have the capability to work with books of varying sizes, weights and thicknesses. Please specify any limits for each of these metrics.			
71	Automated sorter must be capable of returning audio-visual materials (e.g. music CD's, DVD's, videos, audio cassettes). Magnetic media must be handled without risk of damage or erasure			
72	Returns should not be updated by the LMS until the item being returned has been processed by the RFID device, and can no longer be retained by the customer.			
73	The sorter should alert members of staff when a return bin is almost full. Please state what remote indication method(s) is/are supported by your solution (e.g. visual, audible, email, IM etc.)			
74	Please give details of how the system deals with non-RFID tagged items.			
75	Returning an item should automatically re-activate the security status on items.			
76	Please give details of any contingency procedure(s) available to continue service in the event of failure of the automated sorter and /or return station.			
	Payments			
77	Payment facilities should be available for fines and fees on self-service units as required. Please detail how this functionality is provided.			
78	RFID system should be capable of displaying customer account details, showing a borrower's outstanding fines, charges etc.			
79	Payment stations should offer self payment of charges via **Chip and Pin, Smartcard or cash (notes and coins)**. Please provide full details of functionality available e.g. change given.			

80	Stations should be capable of printing a receipt giving full details of any payment transaction, e.g. time, amount paid, reason for charge.			
81	Units capable of taking payment transactions should provide an end of day printable report of card transactions at each unit for reconciliation and audit purposes			
	Security – Stock and Equipment			
82	The security gates shall trigger an alarm signal and/or send a message to staff upon attempted removal of unauthorised items.			
83	Security gates shall provide a real-time report back to a nominated staff workstation showing details of any item which has triggered the security alarm.			
84	The security gates shall generate and store a report detailing the ID of any items illegally removed from the library.			
85	Please specify read ranges, read speeds and successful detection rates of security equipment provided for all material types.			
86	Gates shall not interfere with any other ICT or electrical equipment in close location e.g. people counters, PC's etc.			
87	Please give full details of your procedures for ensuring the security of CD and DVD collections.			
88	Please specify standards met/procedures in place to ensure secure transmission of data			
89	System and workstation components should provide protection against theft. Please specify anti-theft devices/systems supplied			
	Stock Management			
90	Please provide a full description of collection management functionality offered by your system.,			
91	Please describe in detail how your system facilitates the selective identification of stock e.g. missing or lost, misplaced, special collection management etc.			

92	Collection management device(s) should be capable of carrying out multiple routines simultaneously e.g. looking for lost, reserved or missing items at the same time.			
93	Data collected by the device shall be in a format suitable for use and manipulation in standard desktop software packages. Please specify options available.			
94	Please give details of options available for exporting data from the collection management device(s) to the LMS.			
	RFID Tags			
95	RFID tags must be read/write, operate at 13.56MHz and be compliant with ISO standards 15693 and, 18000-3. Please provide full details of the tags you propose to supply including IC, form factor and antenna composition.	3		
96	Tag data must comply with ISO 28560-2 and the UK National Profile for this standard.			
97	Please provide details of any tag serviceability guarantees e.g. longevity			
98	RFID tags should possess anti-collision capability allowing the reading of multiple tags simultaneously.			
99	Please supply details of all library suppliers/tagging specialists currently tagging stock for use with your system **compliant to the UK National profile / ISO 28560 standard**. Include details of the **conditional / optional field data** they are able to write to tags **where required**. List any versions of your software with which the suppliers are not compatible.			
100	Tags suitable for use *in rare and antiquarian material* should be available for use. Please provide details of options available.			
	Item Tagging			
101	The tagging process shall be as simple and speedy as possible. Please give examples of anticipated tagging rates.			
102	The stock tagging process should not require a connection to the LMS.			
103	Please supply an estimate of required work time to tag all necessary stock at each site using the proposed system			

104	The system shall provide a means of tagging stock both at the shelf (for initial conversion) and at a staff workstation (e.g. for re-tagging). Please provide details of the solution offered.			
	Remote Management			
105	The system should be capable of being managed and maintained remotely, preferably via a secure web interface. Please give full details of solution offered.			
106	Usage statistics for each individual machine connected to network shall be available to view and/or download via remote management interface			
107	Collated usage statistics for user defined groups of devices (e.g. all self service units at a particular site) shall be available to view and/or download via remote management interface			
108	Remote management software shall provide an alert when any device connected to it generates an error message (e.g. out of receipt paper..cash bin full etc..)			
109	Remote management software shall provide an alert should connectivity be lost to any device being monitored through it			
110	Authorised users can make operating parameter changes to relevant programs on connected devices via remote management software			
111	Authorised users can access and / or export statistical, error and transaction logs via remote management software			
112	Authorised user capable of viewing the user interface 'as seen by the end user' of any connected device via remote management interface			
	Resilience and Backup			
113	The system shall be capable of 24/7 operation.			
114	System failure should not compromise data integrity			
115	The system shall be capable of operating in offline mode if connection to the LMS is lost. Please specify system capabilities in this eventuality.			
116	Data captured whilst in offline mode shall be uploaded to the LMS when the connection is restored. Please specify system capabilities in this area.			
117	Please give details of procedures in place to preserve loan policy rules whilst the connection to the LMS is absent.			

118	The system shall provide diagnostic information to staff when problems or errors occur.			
119	The system performance shall not be adversely affected at peak usage periods. Please specify performance level capabilities of the system.			
	Usage Statistics & Reports			
120	The system shall supply management information on the usage of the self-service units both individually, and by group and site. Please detail the range of management information reports available and any applications/software required to undertake reporting functionality			
	Legislation and Legal Requirements			
121	All hardware and software provided must conform to relevant national and international legislative requirements including, but not limited to, Disability Discrimination Act, 1995, Data Protection Act 1998, Health & Safety at Work Act 1974, Copyright, Designs & Patents Act 1988, Computer Misuse Act 1990 etc. Please comment on the legal compliance of your system.			
	Installation, Maintenance and Technical Support			
122	On-site training for library staff shall be provided. Please provide detailed proposals.			
123	Full documentation for all functionality and any user maintenance of the system shall be provided.			
124	Any future upgrades to the system shall be accompanied by full explanatory documentation.			
125	Upgrades to the LMS shall not affect functionality of the RFID System			
126	Upgrades to the RFID System shall not affect functionality of the LMS			
127	Upgrades to the RFID system shall not affect local customisation work done (e.g. localisation of user interfaces)			
128	Please provide a copy of your standard Service Level Agreement including details of standard service hours, response times and escalation procedures.			

129	Please give details of your preventative maintenance plan.			
130	Suppliers are invited to provide a system development roadmap covering planned future upgrades/hardware releases over the period of the contract.			

Part Three

This section identifies some key areas of the relationship with your supplier that should help you determine which will offer you the appropriate level of service and support for a successful implementation. The following suggested text should be amended where not appropriate to your situation.

9. Project Plan & Methodology

    9.1.   Suppliers are required to submit an indicative project plan and accompanying project methodology as part of the tender response. This should include information about the risks and contingency arrangements, including proposals for responding to change, examples of financial control mechanisms, progress reports, and include detailed schedules of the costs. The project plan should specify high-level activities, milestones, and activities to be performed by the Supplier and the Partnership jointly.

    9.2.   Give details of the resources you expect to use to service the contract. Include the number of staff you expect to use for providing the service. Also include an organisational chart indicating responsibilities and reporting lines. Please indicate where staff will not be employed full-time on this contract. Indicate in each case whether you expect staff to be drawn from within your organisation, to be newly recruited, or to be contracted in.

    9.3.   Set out your plan for the training of staff to be employed on the contract.

    9.4.   Provide details of the structure and composition of your project team, and curriculum vitae of key staff.

10. Training Proposals

    10.1.   Suppliers are required to submit detailed training proposals for the onsite training of system administrators, system users and management users, specifying:

- The training levels that will be required for different personnel to use the system proficiently
- Minimum times of training per level required
- Provide details on training structure, approach, delivery & methodology, including an indicative timetable/schedule

11. Quality Plan

    11.1.   Suppliers must provide details of how they will ensure that a high quality service is maintained and that all performance targets set out in the specification will be met.

- Set out your proposals for the monitoring and reporting on the quality of the services delivered, including the performance checks you will perform, their frequency and scope, and who will perform them
- Set out your proposed contract management and supervisory systems

    11.2.   Set out your customer liaison arrangements, including procedures for dealing with complaints and problems and customer support arrangements.

Information and feedback

For more information or to suggest enhancements to this document, please contact us using the details below:

About the authors

Mark Hughes

Mark's varied career in Libraries has encompassed work at many different levels, mainly in the systems and service management fields, across both public and academic sectors.

He has managed two successful large scale RFID implementations: the first for Swansea Public Libraries; then on a second occasion for a consortium project for the 3 Universities in the South West Wales Higher Education Partnership, and was one of the original authors of the Open RFID in Libraries Specification.

Mark has been in post as 'Head of Collections' at Swansea University since March 2009. His current duties include management of finance, collections and library systems. He remains strongly involved in RFID development, and is an active member of the BIC/CILIP RFID in Libraries Group.

Mick Fortune

Mick was one of the UK's first systems librarians - at the British Library – and a pioneer, working on the original ARPANET project that spawned the Internet. After leaving the public sector he joined Dynix Library Systems (forerunner of SirsiDynix), becoming European MD before leaving to work on projects for IBM in Belgium and Holland in 1999. He led Nielsen's BookNet division for two years before attempting to retire in 2006. Having initially had an interest in RFID aroused by acting as adviser to 2CQR Mick set up his own company - Library RFID Ltd - in 2009 to offer advice and consultancy to both suppliers and their clients. He is a keen advocate of data standards and played a significant part in facilitating the adoption of the UK National Profile for ISO 28560-2 in the BIC/CILIP RFID in Libraries Group.