

BIC E4Libraries Project

Scoping Report by Simon Edwards



E4libraries Scoping Report

Report by Simon Edwards, e4libraries Consultant, E: simon.edwards@dial.pipex.com, M: 07742 988391

Author's Note

The author would like to thank the members of the e4libraries steering group who gave up so much of their time to enlighten and inform this report. Please note that some of the ideas or details in this report may be inaccurate or controversial due to author error. Also, some important points may have been missed. Please feel free to raise issues or send feedback to the author at simon.edwards@dial.pipex.com.

Executive Summary

The e4libraries project, of which this is the scoping report, will seek to encourage the library supply chain to embrace EDI and other useful technologies and to exploit these for maximum benefit. The library supply chain has already invested in EDI and is an enthusiastic user of RFID but more could be done by establishing and adhering to standards and by improving the interoperability between systems in order to deliver the benefits of these investments. E4libraries will also need to consider, possibly in a later phase, the supply chain for e-books and serials and the issues of the academic library supply chain. E4libraries will also seek to boost the profile of BIC as the ideal organisation to handle the issues of EDI standards and systems interoperability in the library sector.

The scope for EDI should cover the supply chain from the provision of bibliographic resources right through, via quote, order, order response, order fulfilment and invoice, to the eventual update of the invoice details to the local authority payments system.

The e4libraries project comes at a time when the library sector is under considerable stress. The supply chain is changing rapidly, partly due to pressure from the MLA with its top-down strategic initiatives and regional projects and partly from a number of other changes such as the perceived rise in the rate of library closures and the threat of de-skilling in the role of the librarian. There are also new technologies on the horizon such as e-readers, and new entrants such as new LMS suppliers such as Civica, new bibliographic resources such as GooglePrint and new web 2.0 phenomena such as Librarything.

The e4libraries scope therefore has to embrace a wide variety of related areas. This involves keeping a watching brief on the new technologies, providing a supporting role on library servicing standards, where NAG has already developed the standards, and addressing and solving the issues of lack of universal implementation of EDI as well as the problem of RFID standards.

After this e4libraries scoping exercise, of which this report is the primary deliverable, the project will have to conduct more detailed research where necessary: for instance, a detailed audit of EDI capability in libraries, library suppliers and library management systems. The idea is first to get the infrastructure right in terms of the LMS suppliers and their products and the ability to integrate with financial, HR, RFID, sales data monitoring and other relevant systems. The e4libraries systems workshop held in November 2007 has already begun the process of bringing the main players together to understand and start to solve the issues.

Some detailed research may be needed to understand where the EDI standards have been interpreted rather loosely and where this has caused interoperability problems. Preliminary research indicates this poor practice is quite widespread and may be growing, so an exercise should be conducted to see to what extent the existing standards and their accompanying guidelines are fit for purpose.

Once the infrastructure, in terms of standards and system capability, is in place, the project will move into its promotional phase, which involves a campaign to encourage library authorities to implement EDI and to re-engineer their workflow to enable the benefits to be delivered. One possible idea is to set a target date by which the library supply chain should have fully implemented EDI. This could help to focus attention and resources on making EDI a priority and, if there is general agreement and high level support from the MLA, DCMS, Chief Librarians and others, this could help to prompt libraries and suppliers into action.

The promotional phase should involve a questionnaire (to enable the views of librarians to be included), case studies, an accreditation scheme, a web site with downloadable guides and other resources and one-to-one coaching of decision makers and stake-holders to encourage them to implement EDI fully and obtain the benefits. The focus will be on identifying and then encouraging best practice throughout the library supply chain. This could be in bibliographic supply, quotes and ordering, order fulfilment and invoice processing, as well as tendering for LMS procurement and library supply. The MLA's stock procurement cost model could be useful in identifying the real costs involved with book buying and the savings possible from implementing new solutions.

Future phases of e4libraries should be considered and these could address related areas that have not been fully addressed in the scoping phase. This would include the academic library supply chain where journals, e-books and RFID are the priority issues. These phases could run concurrently with the work on public libraries but would need the involvement and support of additional academic librarians and academic library suppliers on the steering group.

E4libraries will need to avoid being dogmatic and instead be flexible to the needs to the library supply chain. The project should not see EDI, RFID or any other technology as an end in itself but instead as a means to improve the supply chain for libraries. The key is to obtain all the possible benefits from the successful implementation of these technologies and standards and to reduce costs and improve efficiency so that a better library service can be provided. BIC has considerable experience in standards provision and promotion, and in the successful e4books project BIC has shown how EDI and e-commerce can be encouraged and how the book supply chain can be fundamentally changed for the better. The e4libraries project will learn from BIC's previous success in this area and will apply these lessons where appropriate in the more complex library supply chain.

Table of Contents	Page
1. Introduction	5
2. Project landscape	5
3. Project objectives	7
4. Process/methodology	8
5. Scope of the project	9
5.1 EDI and e-commerce	9
5.2 Bibliographic/Product Information	14
5.3 RFID	15
5.4 E-books	17
5.5 Systems interoperability	18
5.6 Inter-Library Loans	19
6. Strategic changes in the library sector	20
6.1 MLA projects	20
6.2 Market changes in the library supply chain	21
6.3 Other initiatives	21
7. Standards	21
7.1 NAG servicing standards	21
7.2 Bibliographic standards	22
7.3 RFID standards	22
7.4 BIC EDI Standards	22
7.5 Standards working party	23
8. Library Management Systems	23
8.1 Methodologies	23
8.2 Interoperability	25
9. Role of BIC	25
10. Best practice	26
11. Data collation and dissemination	26
12. Quick Wins	26
12.1 Documenting EDI Capability	26
12.2 E4libraries website	27
12.3 Key points summary of this report	27
12.4 Questionnaire	27
12.5 Systems Workshop	27
12.6 RFID Standards	27
12.7 MLA Cost Model	28
12.8 Case Studies	28
12.9 Simple guides	28
13. Other recommendations	28
13.1 BIC Library Group	28
13.2 Accreditation	29
13.3 Review of Library tendering process to accommodate e-commerce	30
13.4 Library promotional events	31
13.5 Target Date	31
13.6 Decision Makers	31
13.7 Audit policy and electronic invoices	32
14. Next steps	32
15. Conclusion	32

1. Introduction

"The BIC board believes that the time is right to work with librarians, industry organisations, library systems suppliers, library suppliers and others to bring about change through the application of electronic solutions, the development and promotion of e-commerce and the integration of systems." (Excerpt from the e4libraries tender document)

This e4libraries scoping report provides an overview of the library sector supply chain, with particular reference to electronic data interchange (EDI), electronic communication and systems integration.

The two key areas are standards and interoperability. This involves having clear standards that enable trading partners to exchange information in a standardised format. This prevents wasteful proprietary systems development and speeds up the implementation of new technology in order to reduce costs and improve library services. This report will also look at a wider scope for the e4libraries project. This will include RFID, which is an established technology; and over the last few years as prices of RFID tags and related hardware have fallen, library take-up has accelerated. But there remains an important standards issue. There is also a future possibility that a trade-wide standard will be needed by the book industry in the event that RFID source-tagging is undertaken by book publishers as part of the book print and production process, and then delivered through both the trade and library supply chains to libraries, booksellers, wholesalers etc. If this happened it would be important to have the necessary standards in place to address both trade and library sector needs. Other areas that need to be looked at include product information (bibliographical information supply), e-books and interlibrary loans. This report seeks to examine the library supply chain in all these areas and highlight a strategy to deliver the project objectives along with any quick wins identified in the process.

2. Project landscape

The E4libraries project comes at a time of extraordinary change in the library supply chain. For years the sector has been fairly quiet with slow but steady development in a number of areas including library supply, EDI roll out, standards development and adoption and so on. Now there are several potentially significant changes that could radically affect the library supply chain and therefore the project landscape.

Most significant amongst these is the Museums Libraries and Archives Council (MLA) and its work to streamline the library supply chain. The impact of this work has been to raise awareness of the idea of centralised strategic or regional supply of bibliographic information and possibly book supply. A number of authorities and consortia are likely to implement some of these ideas going forward. Increasingly observers are using the phrase "149 times" which indicates that certain tasks have been identified as being carried out superfluously in each library authority which could perhaps be handled centrally.

Other potentially very significant changes include:

- Establishment of RFID as a cost-effective and reliable technology, offering significant benefits to libraries and acting as a catalyst for further change in library layouts and workflow.
- E-books - already very significant in the academic sector and now potentially about to become significant in the public library sector.

- The arrival of other new technologies such as e-readers, text to audio translation software, digital repositories with print on demand etc.
- New entrant Library Management Systems suppliers such as Civica (offering an alternative model featuring a local authority system with an LMS module).
- Widespread use of the Internet for product information and acquisition and the role of new entrants such as GooglePrint, Microsoft, Amazon, and new Web 2.0 arrivals such as Librarything.
- The possibility of implementing new approaches to a national Inter-library loans solution including smart cards, ID cards along the lines of Transport for London's Oyster card.

These changes are all imminent or possible within a year or two and could change the landscape for the E4libraries project. This potential for radical change mostly helps the project by making it all the more relevant. For example a major shift towards regional partners in bibliographic or in library supply would necessitate improved EDI roll out and the full adoption of mature standards in order to maximise the benefits of this investment. Basically, if the potential for change is new or radical, standards will be needed and electronic communication will almost certainly be very important in building a successful library supply chain. If the potential change makes cost reduction even more vital, then again implementation of EDI would seem to be an obvious mandatory step.

In addition to change from the adoption of modern technology and shifts in the marketplace from new entrants or the development of an improved business model, there is also a strong political dimension arising from the fact that the library service is publicly funded. Responsibility for the provision of local library services lies with individual local authorities but how this is delivered is a matter of concern for the Government (via DCMS and the MLA).

- Central v. local

The library service is essentially local at its base; but as this can be inefficient the libraries have sought to set up consortia and to group themselves into larger units in order to provide economies of scale. Local people who use libraries want local services and book stock which reflect their needs and the makeup of the local population. If the funding is locally administered, responsiveness might be excellent but there could be unnecessarily high costs from local servicing, local stock selection, local systems provision and even local library supply. A radical move to centralise to a regional - or a single strategic - model for library supply, servicing or bibliographic information supply should, however, introduce efficiencies. This should make take-up of EDI and implementation of standards easier as larger organisations have larger resources and are often more technically competent. However, imminent major strategic change can paralyse development at a local level and libraries may put off a system upgrade or EDI implementation while waiting for the change to happen.

- Value for tax payer's money

The library service costs some £1.2 billion per annum and is a significant expenditure by Government through local authorities. This sum is large enough to be of interest to the authorities looking to limit or cut public expenditure or to increase value for money. In fact less than 8% of this budget goes on books and related materials.

Approximately £85 million worth of books are purchased for public libraries whilst the actual cost of administering the purchase of these books in terms of staff time etc is very high indeed. One borough calculated that in staff time alone it cost more than £5 per book ordered. So there is a potential to cut the costs of the library service, to streamline processes and introduce improved methods, technologies etc. Meanwhile as local authority budgets are under threat a number of libraries are being closed around the country. There is therefore an imperative to do things better and to save money in order to save the library service from the threat of further closures.

- Literacy v. community

There is an accusation of dumbing down in the media and entertainment worlds and a shift in libraries from books to other information resources and other services seems to be part of this. Libraries have an important role in providing community space for use in a number of different ways. Literacy and books are seen to be under threat and this is not just the increased purchase of electronic products which is so prevalent in the academic libraries. The e4libraries project focuses on the book supply chain but should also add value to the acquisition of serials, e-books and audio books as required. Local authorities have a statutory duty to provide a library service for their population but this responsibility is not easy to define and for some authorities the library service is about provision of local services rather than about books. Libraries are closing and when a new library is opened it is often the case that books have a less prominent place than before. Not everyone in authority acknowledges the importance of books and their role in education, information and culture and some see the Internet as taking over this role. The outcome of all this is that libraries will need to make their supply chain for books as efficient as possible in order to survive.

The conclusion is that the scope of the project should necessarily be kept quite wide in order to cover any eventuality. However the primary focus should be on standards and interoperability as well as in promoting the role of BIC in the library sector. In the event of a major change to the supply chain, the scope of this project could be flexed by the steering group to adapt it to accommodate the change.

3. Project objectives

The BIC/E4libraries project concerns both public and academic libraries and divides into two phases.

- Phase one involves high level *"research to prioritise the areas where quick wins might be achievable and to identify those which will offer scope for further investigation."*
- Phase two involves more detailed analysis and putting in place measures to encourage the adoption of standards and electronic communication.

The project objectives are as follows:

It is widely agreed that the library supply chain is complex, inefficient and expensive. BIC is looking to appoint a consultant to work on this project. The consultancy will be in two stages: first, to research and produce a scoping report which will prioritise the areas where quick wins might be achievable and to identify those which offer scope for further investigation; second, and subject to the successful completion of the first, to work with BIC on a continuing basis in developing this area of work. (from the e4libraries tender document)

- *Researching the library supply chain, identifying weaknesses and promoting opportunities for improvement; devising solutions aimed at integrating library management systems with external financial systems.*
- *Encouraging the deployment of e-commerce and automation in the book and serials supply chains.*
- *Promoting the adoption of standards in EDI, XML, web services, product information and RFID in the library supply chain.*
- *Developing communication lines with systems suppliers, researching capabilities of their systems and promoting usage of standard e-commerce messages.*
- *Planning and moderating a workshop for systems suppliers, service providers and users.*
- *Co-ordinating an integrated structure for BIC's interaction with the library sector (EDI and other e-commerce standards, supply chain, RFID etc).*
- *Build BIC's profile in the library community*

4. Process/methodology

The e4libraries project started with the setting up of a steering group and agreement on project objectives. The consultant was then appointed and the research to establish the project scope and any quick wins was undertaken. The output from this work is this scoping report. The next steps are likely to be:

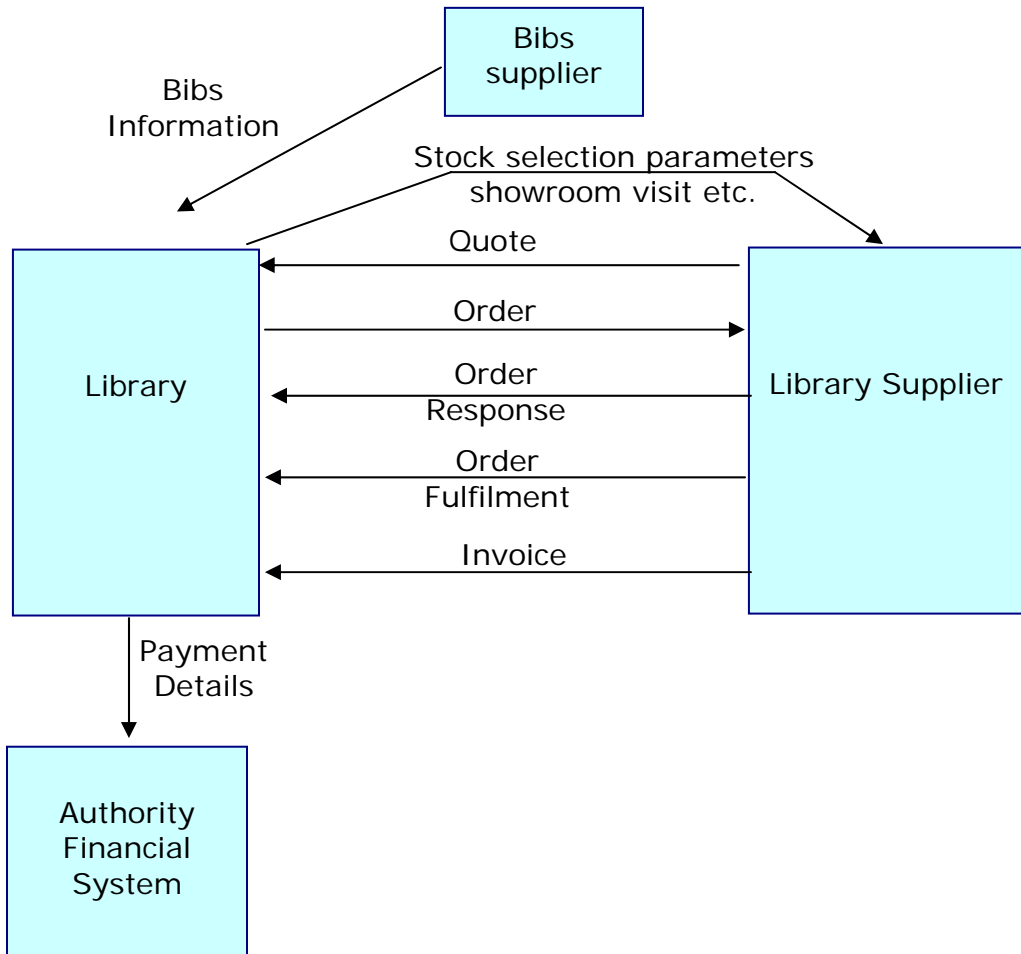
- Publish this report and collect feedback
- Continue to consult with key constituencies
- Seek to implement the recommendations of this report
- Set up a BIC Library Working Group covering
 - EDI standards and guidelines
 - LMS interoperability
 - RFID standards

Undertake further research:

- Conduct a survey by questionnaire of the whole library sector to collect ideas and input and to ensure that the whole sector feels it has been fully consulted.
- Conduct a technical survey of all library suppliers, library authorities, LMS providers and bibliographic providers and produce a definitive technical capability chart showing EDI capability, RFID implementations etc.

5. Project Scope

Schematic of EDI in the library supply chain



The e4libraries report will focus on library sector standards as they apply to EDI and wider e-commerce, product information, RFID, e-books and library servicing. The project will not seek to interfere with accepted standards administered by other organisations such as NAG or NCIP but will include these standards in the promotional phase of the project - where the work is designed to encourage best practice and standards adoption. The project will also focus on interoperability between systems such as Library Management Systems, financial systems, RFID systems etc.

5.1 EDI and e-commerce

EDI and e-commerce should cover all transactions and routine message exchange between libraries and their suppliers. This will include:

- Product information provision and online stock selection
- Quotes
- Orders

- Order Responses/order acknowledgements
- Order Fulfilment/Catalogue Services/Item Load
- Invoices

EDI statistics

The e4libraries project should undertake a focussed piece of research to quantify precise usage of EDI and e-commerce in the library supply chain at the start of the project. The idea would be to be able to record which EDI messages are in use at which libraries, library suppliers and via which library management systems.

Some preliminary data obtained by e4libraries suggests that over 80% of public libraries are already capable of sending EDI orders. These figures need to be checked and the planned detailed analysis of EDI capability should achieve this. However, 40% of libraries do Order Acknowledgements/Order Responses, 25% do Quotes and only 5% do Invoices. This Quotes figure may be too low as several library authorities have recently implemented the Quotes message. Other preliminary data show that Order fulfilment and Invoices messages are both around the 15% mark.

Establishing current EDI usage will set a base level for the project and enable the project to track its effectiveness going forward.

EDI Capability Chart

This activity would also enable an EDI capability chart to be assembled, which would show the capabilities of all the players, libraries, library suppliers and library management systems suppliers. This could be very useful for authorities when considering upgrading to a new LMS or in changing library supplier.

EDI has become so fundamental to the way in which the more advanced library authorities function that, when considering a move to a new library supplier, it is now often crucial that this new supplier can do EDI and with the right messages to the right standard. If the supplier can't do EDI with the library authority or consortium this will weaken their bid and the business may go to another supplier. Some library suppliers pride themselves on their EDI take-on process, which offer a quick and simple way to implement a live EDI implementation with new customers as fast as possible. This process takes into account standards interpretation issues and other customisations necessary to replicate the way in which this library authority customer works.

Library Authority	ORDERS	ACKS	QUOTES	Catalogue Services/Item Load/Order Fulfilment	INVOICE	LMS NAME	COMMS METHOD (e.g. VAN or FTP)
<i>Barsetshire Libraries</i>	Y	Y	Y	<i>N</i>	<i>N</i>	<i>Biblio-Dynix</i>	<i>Nielsen Booknet or FTP</i>

This simple template could be filled in by all the library suppliers. Additional details could be given, such as which versions of the EDI messages are used and, in a comments field, any additional information on such details as any non-standard workarounds arranged with the library.

EDI Ordering

The EDI Order message is the most widely used, but increasingly libraries are seeking to implement the Quotes message from the library supplier to the library. The Quotes message saves the library a lot of time following a showroom visit or online stock selection activity: the library no longer has to key in all the books they have just ordered in these ways but they can instead look at the quote, analyse it for completeness and relevance and then, if satisfied, click a button to send an order. As library suppliers continue to develop and roll out web-based stock selection tools and as standing orders and other supplier-initiated supply grows then the Quotes message will become increasingly important. However, the Quotes message may not be sufficient to place an order as the library system needs a MARC record containing bibliographic information in order to set the book up on the LMS and the library OPAC and to place the order. Some libraries receive a bibliographic feed from a library supplier or from a specialist bibliographic supplier and some request a MARC record from their bibliographic supplier for each book they order. In studying how libraries place orders it is necessary to include bibliographic supply and Quotes as well as EDI orders.

Order Response

Order response and order acknowledgements are fairly straightforward, providing exception reporting on orders which cannot be supplied. Given tight budgets and other constraints, order responses and acknowledgements are very helpful to libraries, enabling funds to be switched from books reported in the order response message as unavailable. These funds can then be used to place new orders on books that are available.

Order fulfilment

The order fulfilment message contains the information needed to receive the books efficiently and to get the books onto the library shelves. One systems supplier provides this functionality through the invoice message whilst others use the order fulfilment message although it is called different things by different suppliers, e.g. "Item Load" or "Catalogue Services".

Invoice

The invoice message seems to be less widely used than the others, but there are certainly opportunities here to improve the whole process of payment for books received. There is also an opportunity to look at the integration with the authority accounting systems and seek to streamline the accounting process. When looking at invoices it will be necessary to distinguish between item level invoices and consolidated invoices.

One library authority receives invoice information within a customised MARC record. This is certainly not to standard.

By surveying wider library practice it may be possible to recommend a simplified methodology on selecting, ordering and fulfilling book orders. This best practice should be established and promoted using case studies, guides etc.

The aim of the e4libraries project with regard to EDI is to:

- Encourage widespread take up of the appropriate EDI messages

This is the promotional phase of the project which cannot start until the basics are all in place e.g. systems capability, robust standards. Then a campaign should be launched to encourage widespread take up of EDI.

- Conform to approved standards

It is crucially important that the EDI standards are accurate and up to date before they are promoted to the library community for use. Early research has indicated that the standards are being interpreted in different ways, and that there is a lot of opportunity for libraries and LMS suppliers to add information (text rather than coded) for trading partner staff to interpret and action rather than for computer systems to implement. Sometimes this information is provided for the computer to interpret and action but it is not included in the standard. These extra requirements can be unique within individual supply relationships rather than standard for all. This functionality creep and ambiguity in the standards and the ways they are being implemented needs to be looked at. Clearly, EDI should be able to support library business requirements but e4libraries should seek to ensure that best practice requirements are supported rather than short-term workarounds.

- Integrate these messages into the appropriate systems to deliver full cost benefits (see systems interoperability)

One of the key areas of EDI implementation lies in ensuring that the potential benefits of EDI are realised. Ideally the subject should be looked at holistically and an approach adopted which embraces all the relevant EDI messages, systems and standards and the business processes and workflow involved.

- EDI implementation must be allied to some business process re-engineering.

Libraries are very unlikely to reap the benefits of their EDI implementation if their business processes are unchanged.

- EDI implementation does not stop at orders and should embrace the full range of messages to streamline the whole supply chain.

Some libraries have now implemented the full range of messages and can report on the benefits obtained. These implementations would make excellent case studies.

- EDI implementation may include the EDI Quotes message and ideally an integrated source of timely and accurate bibliographic information.

Some of the cost benefits available to libraries come from adopting sophisticated supplier stock selection services. This stock selection fits in with EDI Quotes and EDI Orders to deliver even greater cost saving. Accurate bibliographic information drives the whole library supply chain and libraries should be encouraged to review the ways in which this information is obtained, its accuracy and timeliness and the method of supply. There are now many different ways in which bibliographic information can be obtained.

- There needs to be suitable monitoring and control of costs and benefits.

The MLA has produced a stock procurement cost model working with library authorities, and the findings of the Havering Borough Libraries implementation of EDI Quotes, Orders, Order Responses and Invoices have provided some significant statistics on the benefits of EDI

implementation. Many organisations use a cost-benefit process to justify expenditure and then fall down on monitoring the benefits once the implementation is completed.

Haivering Case Study

Haivering analysed their costs and came up with a figure for the labour cost of putting a single book on a library shelf. This figure was an amazing £5.46. This doesn't include the cost of the book or the servicing but simply the cost of the process of stock selection, ordering and receipt. Haivering had a stock selection team of about six. This model was used again after DS had implemented Quotes and Orders only and the cost had fallen to £3.35 per book ordered. After the remaining EDI implementation of order responses and invoices the costs were again analysed and the figure was down to £0.62p. This is an extraordinary cost saving, although to see the whole picture it would be necessary to know how much these changes cost to implement in terms of staff costs, systems investment etc. and whether it was this financed out of current budgets or extraordinary funds. We should note that much of this benefit was obtained by adopting supplier stock selection in addition to implementing EDI and integrating with authority financial systems.

Establishing the benefits of EDI is a crucial part of e4libraries. We need to ascertain where the benefits exist and how these can be measured and how this information can best be presented to libraries:

Benefits

- Bibliographic information supplied electronically keeps staff up to date and enables available (and correct) books to be ordered. Helps acquisition staff to identify books to order. Enables staff to answer customer queries and reader requests.
- Quotes save time in coping with the results of a showroom visit or supplier stock selection.
- Orders save telephone and postage costs and the LMS stores what has been ordered for receipting (EDI Orders provide the main benefit for library suppliers and may be crucial in getting good terms of supply).
- Order Responses enable libraries to know what cannot be supplied and this can more quickly free up scarce budgets for ordering books which are available.
- Order Fulfilment enables the efficient receipt of book stock and helps to get the books on the shelf in a timely manner.
- Invoices help the LMS to do the detailed budget tracking whilst the corporate system actually pays the invoice (often a consolidated invoice).

All these messages are delivering a slice of the total benefit cake. Libraries need to be encouraged to take a holistic view of EDI and aim to implement all the messages rather than just orders or MARC records.

In looking to persuade the libraries to do more EDI we need to:

- Identify libraries with gaps: either no EDI or only a few messages (this can be done with the help of the library suppliers).

- Identify the decision makers in the library structure, including the main stakeholder who would make a decision about EDI
- Identify the library's LMS to see if there are any issues around EDI capability which will need to be addressed.
- Work with the library supplier and the decision maker and present the benefits which are most appropriate to that library or library authority's situation.
- Show a case study with similar circumstances and show the benefits achieved.

There will also need to be a clear understanding of the costs of developing EDI. Ideally the LMS suppliers would see EDI as a core piece of functionality which is mandatory for all libraries rather than as an expensive cost option and an opportunity to make some revenue.

There could be a danger that, because some libraries are reluctant to take up supplier stock selection and because EDI is sometimes identified as a part of this, they are therefore reluctant to adopt EDI itself. A better approach is to look holistically at all book purchasing for that library authority and the costs and workflow associated with it and see where costs can be reduced. EDI does fit very well with supplier stock selection but it is possible to implement all EDI messages and derive significant benefits without using supplier stock selection.

EDI messages have to be transmitted across a network, usually a Value Added Network (VAN) or the Internet via FTP. There are issues around which of these methods should be used. A value added network offers a higher level of security, back up and an audit trail but is a chargeable service (often volume related) whilst the Internet can be used to enable free EDI messages to be sent via FTP. Other options such as AS2 are available but don't seem to be of interest to the library sector. Preliminary research suggests that at present public library EDI messages are sent 60% via a VAN and 40% via the Internet and other methods. It is not quite a simple matter of a chargeable service versus a free service as the real costs of EDI have to be understood and factored in: for example, the cost of setting up and testing with trading partners and then managing that EDI relationship. Some of this work is facilitated by the value added network.

5.2 Bibliographic/Product Information

Bibliographic and library suppliers have implemented new web-based selection tools, which are designed to help librarians choose books for their libraries. These can take a library's budget or stock needs or class weaknesses and suggest stock for purchase. A key part of this functionality is to ensure a reliable, accurate and up to date bibliographic record is supplied to the library to enable the LMS to place an order and to load the library's OPAC so that users can request the book. This can also form part of the set of transactions involving quotes and order messages already mentioned under EDI and e-commerce. Best practice would integrate bibliographic supply, supplier stock selection, quotes, orders, order responses and order fulfilment/invoices to provide a modern seamless EDI-based solution.

Library Management Systems (LMS) usually require a bibliographic record to be available before a book can be ordered or stocked. The accuracy and timeliness of this information is crucial to successful stock purchase. In advance of publication the library may obtain a record and place an order and then, when the book actually becomes available, an updated record is obtained. This would be a "book in hand" record, which provides an improved level of accuracy as the bibliographic information received from publishers and other providers will have been validated

by information given on the actual book once it is received. The ideal situation would seem to be that information about the book is made available to library visitors and online borrowers at the same time as the book is made available for issue. However, some libraries do very well with pre-publication orders by loading their OPAC with new titles well in advance of publication. Given that books typically have to be serviced and this can build in a delay, and given that it is important that new titles are available promptly on publication, timing is an important issue. Bibliographic supply of the right information at the right time is seen by libraries to be vital.

5.3 RFID

RFID is potentially one of the most exciting technological developments for many years. The RFID tag can contain a security element which can be activated and used to prevent theft but it can also store information about that specific copy of a book, who owns it, who supplied it and so on. RFID also lends itself to the self-service issue of library books. Stocktaking can be speeded up, lost books can be found and mis-shelved books can be re-shelved correctly. RFID would seem to offer the library service huge potential and some library authorities are moving forward on RFID and have ambitious plans to convert their library stock to RFID.

However, there are a number of issues regarding RFID. These involve reliability and standards.

- Reliability

The RFID tag has been designed to be read in a specific position relative to the appropriate reading device. This means that if books are put flat and sent through a detector tunnel, then reading rates are likely to be 100% accurate. Unfortunately, the tag is being deployed on books which are stored spine out en masse and sometimes on metallic shelving. The RFID tag may not register if the signal is bouncing off the metal shelf or if there is another book with a tag very close by and in the same position within the neighbouring book on the same shelf. Reading accuracy can dip as low as 60% under the wrong conditions. There are workarounds, such as positioning the tags randomly on the library books so that the chances of two tags being next to each other are reduced, but this is not ideal. Libraries using RFID or about to install it need to be realistic about what can be achieved by the currently available technology for each required function.

When issuing a book and doing so one at a time reliability is normally much higher, and if an audible beep accompanies the reading the user can be confident that the book has been read.

The reliability problem is at its most acute when using RFID for stocktaking. Nevertheless the ability to find misplaced or mis-shelved books is very helpful for libraries and if the technology continues to develop then RFID could be very useful in this area. The key is to understand the technology and its capabilities and then expect an appropriate level of performance for a specific function.

- Standards

In the short term there is likely to be a serious problem with RFID tag standards. It appears that there are now six possible RFID products on the market and despite claims to be accurate and reliable many of these products are not compatible with each other. A reader designed for one system may not reliably read the tags of another system or may not read them at all. Supporters of RFID say that the chips in the tags are all the same and so there should be no problem. This is basically true but the analogy of PCs and Macs applies here. Both PCs and Macs have operating

systems and can exchange files but the two systems work very differently and a lot of work has had to be done to provide interoperability.

Re-formatting RFID tags is apparently not very difficult but once one type of RFID tag is applied to several thousands of books in a library it will be expensive to convert to an alternative RFID tag solution. Each book's tag would need to be re-formatted, the existing data deleted, and rewritten to the tag in the new format.

The six systems may differ in the waveband/frequency, the chip, the data structure, the data sequence and so on, and these differences could lead to fundamental incompatibility. Six suppliers with different products, readers and writers in a young market could become a problem when consolidation and maturity have led to two or three suppliers holding a dominant position in the future. Libraries need to look ahead and consider the future. They should also remember that when they last undertook this sort of exercise - when barcodes were introduced - standards ensured that only one type of barcode was used rather than six potentially different RFID formats. Ensuring that the suppliers adhere to a common standard and that libraries make the right decision early on could save a lot of money in the future.

This is a basic standards issue, which must be solved urgently as libraries are still implementing RFID seemingly unaware of this problem. A thorough lab test of all six systems and their actual interoperability would be highly recommended and as soon as possible. If the ISO standard for RFID is established and several readers and writers conform to the standard and can read and write each other's tags then library authorities would be sensible only to implement solutions conforming to this standard. The nightmare scenario of having to change formats later on when upgrading RFID technology or an LMS would be avoided.

In addition there is the issue of what data should be put on the RFID tag. This could be as little as an identifier to identify that copy of the book (e.g. an accession number) and perhaps an ISBN to identify the book. Some people want to load extra information including bibliographic information about the book but, while there are reliability problems and wider standards issues, it is not yet clear what benefit the extra information on the tag may bring. For example the basic identifier information should enable the appropriate rich information to be retrieved from the library management system. Some experts would suggest that putting extra information on the RFID tag could be positively disadvantageous as the two data sets on the tag and on the LMS need to be kept in sync.

- International Standards

It is important that standards are international so that books and technology can be used in other countries. Standards for the content and structure of RFID tags in libraries are being developed within ISO (the International Standards Organisation). Disagreement about whether the RFID tag should contain information in a fixed format (the Danish model) or in a variable format favoured by the wider international community have resulted in the standard accommodating both models, and systems will have to cope with this complication. It is important that libraries investing in RFID solutions are aware of this issue and of the need to conform to the ISO standard.

- Privacy

Privacy issues around the use of RFID are seen as very significant in some markets, notably in the USA. This seems to have arisen from rumours that the FBI had access to people's library loans data and could see what books people were reading. This gave rise to fears among civil

liberties groups that a library book fitted with a tag could be detected at long range and individuals' reading activity monitored. There is obviously a science fiction flavour to this issue but it is seen as important by some. Tags which use a higher frequency wave-band (usually known as UHF - Ultra High Frequency) are easier to detect with the right equipment over a longer range. Although in the library this UHF frequency could potentially facilitate rapid stocktaking of the whole library or easy location of a missing book, there are downsides to this powerful solution: when a book is issued to the user's library card, many other books that happen to be nearby could all be issued to this card in error. These tags would need insulated issuing stations to protect the user from issuing other user's books.

- Source-tagging

RFID has been a long-running subject of interest to BIC. The organisation has kept a watching brief on RFID since the early 1990s as the technology has developed and the price has come down. The price is already low enough to warrant use in libraries as the tag will be used many times during the life of the book/tag. In retail the tag is used once only, so the relative costs are much higher. Pricing may now be approaching the tipping point at which tagging at source - as part of the print and production process - becomes a possibility. This would be a huge step forward but would be a significant standards issue as the RFID tags would need to be capable of doing the job required by both the library sector and the trade sector. RFID is not widely used in the book trade sector but a Dutch bookselling chain has implemented RFID with impressive benefits and other chains are thought to be watching developments. This is a standards issue with implications far outside the scope of e4libraries but the needs of the library sector must be kept in mind if publishers or even major wholesalers were to take on the role of tagging books. BIC is ideally situated to monitor any developments in the trade sector and to represent the interests of libraries if source tagging becomes a reality.

- Security

An important element of RFID is the security chip which can be switched on and off when issuing or returning a library book. There are apparently ways to spoof the tag so that it may not be as reliable as the old security tags used in libraries. However, it is very impressive in some university libraries that students can be stopped when leaving the library with a book and staff can look on their terminal and see the book title that the student has tried to take out of the library.

5.4 E-books

E-books are another area that requires monitoring. At present, e-book activity is restricted to one or two early adopter public libraries but with digital content having so successfully penetrated academic libraries it is likely that there will be eventual growth in the public libraries too.

There has been much debate about identifiers for e-books - whether to use DOI or ISBN - and about the many formats which are now available. The academic libraries seem to have coped with this issue and e-book business has grown until, to many academic libraries, the purchase of printed books is now in the minority. When consuming e-books on a PC, standards are much less of an issue, as the PC can easily render the documents using the appropriate reader software. However, if handheld devices such as the Sony e-Reader become popular, libraries may eventually be expected to stock e-books for use with these readers. They may even be expected to lend e-books for consumption on the actual e-readers and if there are several of these devices then the standards issue will need to be resolved.

Note that there are precedents for this with audio books. Some public libraries are already lending MP3 audio books and the MP3 reader on which to play them. Users simply have to buy or provide their own headphones. Could something similar evolve with e-readers and will libraries lend the hardware along with the content? This issue is still a year or two away but with the likely launch of Amazon's Kindle and the Sony e-Reader in the UK, then e-books could soon be a public library issue. If the readers are too expensive and initially too desirable or rare, libraries will not be able to lend the hardware; but if mass market electronics are applied to e-readers then prices could fall and lending an e-reader could become a possibility. For now, where the public libraries are concerned, the e4libraries project should just keep a watching brief on the area of e-books supply. A future phase of this project could look at the academic market in more detail and here e-book supply would be very important.

5.5 Systems interoperability

This is possibly the most important area of the e4libraries project. Given the very powerful business case put forward by Havering Borough in London which illustrates the savings available from implementing full EDI (including supplier stock selection) across all the acquisitions functions of the library, other authorities encouraged by the e4libraries project should be able to implement EDI successfully. The difficulty comes in trying to maximise the benefits of the implementation by making the systems interoperable with various systems at the library, the local authority, the library suppliers, and the bibliographic information provider. The ideal is for information to flow through the supply chain as and when it is needed without any re-keying.

This principle can be illustrated by a very simple example:

An ISBN could be supplied from a bibliographic information provider to a library management system. This same ISBN could be in a quote and/or in an order message depending how that library does its ordering. The same ISBN would be in the order response message, in the invoice and the order fulfilment message. This one piece of data can flow from a source through the supply chain, or back and forth and it need never be re-keyed. Compare this with a situation where EDI is not implemented. The ISBN may be printed and re-keyed a number of times into ordering and invoicing systems. Every time data is keyed unnecessarily, cost is incurred.

The objective is to get, for example, library management systems and authority financial systems to communicate seamlessly without human intervention except where necessary to authorise payments. LMS providers and authority financial software providers are rarely the same companies and, although they both have this interface in common and it should be of great interest to them to provide useful systems for their customers, their focus may be elsewhere. Generally systems businesses focus more on improving the functionality of their software than in improving its interoperability with other software. Nowadays this is a very backward view and most modern software providers should be web-enabling their systems and implementing new ways of communicating with other software, e.g. via web services. BIC's role here could be to persuade public finance systems providers to integrate with library management systems to appropriate standards by working with the appropriate bodies (such as Basda, which deals with standards in accounts packages). Also useful here might be the Local Government Integration Practice group which works in this area and could perhaps offer logistics and methodologies to help integration with other systems.

Library users will want their systems to be able to communicate with other systems within their authority and outside. To obtain the maximum benefits of electronic trading data should be able

to flow seamlessly from system to system without having to be translated, mapped, manipulated, or re-keyed etc.

LMS suppliers should:

- Develop open systems rather than proprietary.
- Develop using trade standards.
- Take part in BIC e4libraries working group, monitoring, setting and promoting trade standards.
- Embed EDI in their core system rather than as a cost option.
- Develop web services to improve the way that their system communicates with other systems in future.
- Compete on functionality, price, service and responsiveness to customer needs.
- Help their customers to set up EDI relationships with library suppliers.
- Promote EDI to their customers
- Improve the metrics available to demonstrate benefits of EDI.
- See the whole picture, including their customers' need to integrate information with external systems (possibly more than one).

5.6 Inter-Library Loans

The broadest interpretation of Inter-library loans could cover several different scenarios. At one level library users can request books from other libraries within that authority. They can use their library cards in different libraries within an authority and can use local services such as Internet access and printing. This idea can be extended to a number of co-operating library authorities for example in a region or within a consortium. It is vital that the systems used by these different libraries and different library authorities are compatible if these facilities are to be provided efficiently. This interoperability could apply to a common capability to read library cards, and the barcodes and RFID tags on books and to share stockholding databases. There are examples of these facilities throughout the UK library service but these tend to be piecemeal rather than co-ordinated as part of a national strategy.

Smart cards

Another element of this subject is the smart card. There is the idea of amalgamating library usage privileges onto the London Underground Oyster card, for example. This could entitle people who travel on the London tube to use services and borrow books and resources from libraries across London. Again, there are significant interoperability issues involved.

Scotland has developed a Scottish National Entitlement Card which could provide library services for all users in Scotland. There are issues around the level of service which these cards should

entitle users. Then there are the cards themselves. In other areas of public life there has been strong opposition to universal ID-cards but one element of a smart card should be that it establishes who the borrower is and their entitlement to services and this could of course be done with sophisticated biometrics or with simple pin numbers. The technology is available to deliver these services if the ambition of the library service requires them. However the lack of accepted standards and systems interoperability means that these initiatives are likely to be far more expensive to deliver than could be the case. Lack of a national strategy or political will to solve interoperability issues early on, will mean that these initiatives will remain as future projects for which a cost benefit may never be successfully made.

Protected Resources

One of the issues against inter-library loans is a natural desire by library staff to defend their own resources, materials and books. Librarians tend naturally to be loyal to their authority and their locality and to prefer to cater for their own population rather than potential library users from outside their area. They therefore wish to control reader requests and book reservations and to intervene on behalf of their local users. Librarians seek to ring-fence high demand books for their own direct users and to protect their rare collections etc from being borrowed and potentially not returned. Ring fencing high demand books should not be a problem for an LMS although the resulting service would be a two tier service: one for local people within an authority and a slightly less complete service for visitors from outside the authority, within the consortium, or the UK. There are also significant costs involved in providing stock selection for a wider area and in shipping books around the country and importantly returning them to their home library. Some libraries prefer to source second hand books on the used book market to fulfil reader requests.

National Interlibrary Loans

The idea of a fully national inter-library loans system with the ability to use library services in any library in the UK and borrow books from a library in one authority and return them to a library in any other authority, could be a long term goal of the UK library service but this would require significant systems interoperability including, potentially, universal RFID interoperability, access to a national user database and a national stock database etc. Given the current level of interoperability and adherence to standards, this would be very difficult to implement and so it remains only a future possibility.

6. Strategic changes in the library sector

6.1 MLA projects

The MLA's proposals for improving the stock supply chain have already been a significant catalyst for change, and they have caused some library authorities to look at the way in which they function and to be more willing to accept change. Better Stock, Better Libraries (BSBL) has also instigated a number of pilot initiatives to test bibliographic information supply across the library supply chain. The idea is that this could be done strategically with a single national supplier or regionally with a number of suppliers. The logical extension to the bibliographic pilot project is then to look at servicing, nationally and regionally, and finally at book supply. As this report was being produced there were major changes in the MLA and BSBL was put on hold. But even if the funding, structure or role of the MLA is radically changed, there would seem to be sufficient major consortia and suppliers committed to enable at least the bibliographic project to carry on. At least one consortium is said to be keen to proceed with a pilot. However, given the difficulties of supporting, co-ordinating and energising 149 UK library authorities to provide an improved

library service, it is likely that the sector is going to continue to need the input of some co-ordinating body if any national progress on libraries is going to result.

6.2 Market changes in the library supply chain

With wholesalers Bertrams and Gardners now involved in library supply, it is possible that the library supply chain could change quite dramatically. There could be major changes affecting systems, servicing, bibliographic supply and RFID. Anyone who thinks this is unlikely may have missed what these two wholesalers have done in the book trade supply chain. There, Bertrams and Gardners supply books, bibliographic data (much of it the book trade's version of book in hand), jacket images, e-commerce websites and shop management systems which include some of the most advanced EDI in the sector. At the moment Bertram Library Services has only just started to change things and Gardners has only just purchased Askews, so it may be quite a while before things develop. However, when competing with each other the wholesalers have shown a remarkable energy in developing competing products and services and both have a strong track record on EDI development in the trade sector. The important thing from the e4libraries perspective is to ensure that the wholesalers develop to the appropriate standards where relevant.

6.3 Other initiatives

There are a number of other initiatives that the e4libraries project should monitor.

- The new Ruislip Manor library in Hillingdon, London has had a new approach including refurbishment, a coffee bar and increased book stock. The project is said to include EDI "from the ground up" so in time this project may offer an opportunity for a case study.
- Brighton Libraries has outsourced its acquisitions work to its library supplier. In this case their library supplier makes the acquisitions decisions as if they were located in Brighton (in fact they are in Leeds). This is a different approach. The EDI messages are all the same but the library supplier is making the acquisition decisions, sending the orders etc. It may be worth documenting this model as best practice but the LMS ought to produce some loans data to support the success of this model.

7. Standards

7.1 NAG servicing standards

NAG servicing standards introduce a standard version of library servicing which reduces the amount of complexity. This doesn't suit all libraries and some seem to pay lip service to the standards but then customise items to suit their particular requirements.

The EDI order as used by libraries can accommodate simple servicing instructions within the EDI message and this could be a beneficial development. In effect, the EDI standards and the NAG standards could be working together to enable libraries to order their books and order them serviced appropriately. At present, it seems that due to the complexity of much library servicing, servicing within the EDI order is limited to supplying the class mark, subject classification or holding code of the book. The library supplier looks up the servicing required for that classification for that library customer as agreed in its contract and then services that book accordingly. It is doubtful whether including the servicing in codified form within an EDI message would add much value. If libraries were ordering on many library suppliers on an ad hoc basis

instead of by contract then including a servicing spec within EDI orders would become crucial. As it is servicing should be outside the scope of the e4libraries project.

7.2 Bibliographic standards

These standards are directly relevant to the e4libraries project as they combine bibliographic information standards and their EDI transmission. There are several different standards in use in libraries for bibliographic information e.g. UKMARC, MARC21 and ONIX.

UKMARC is an old standard which has now been officially superseded, though apparently still in use. It should be superseded by newer standards but as always there is a temptation to stick with what works. Some bibliographic agencies have developed MARC data feeds in UKMARC and MARC21 and may also have the ability to output ONIX. The Internet has offered suppliers opportunities to supply data on demand, one record at a time as requested. They also offer librarians user interfaces to enable them to select stock and this selection forms the basis of an EDI Quotes message which can be reviewed by staff and then turned into an order by the library's LMS. Other standards which are relevant to this project include XML (Dublin Core), and Z39.50. Z39.50 is a communications protocol widely used in the library sector to enable information retrieval systems to communicate with external databases over the Internet. All these standards are already in place and are widely supported. E4libraries should encourage the use of these standards where appropriate.

7.3 RFID standards

As mentioned in section 5.3 there is a need for a mature RFID standard, which will enable libraries to change their RFID solutions in the future. One library supplier has had to install six RFID reader/writers in order to be able to supply the six versions on the market. One reader should be able to read all the RFID tags assuming that the market has agreed on fundamentals such as whether to use VHF or UHF frequencies. If the market is competing over these frequencies then there should be a standard for VHF and a standard for UHF. Standards are not supposed to stifle competition or the ability of a company to launch a new product to a market. However, when you have potentially completely incompatible versions of tags being installed in the UK and the users hope and believe that all the systems are interchangeable (but expert advice is that they are not), then this is a problem which needs attention. BIC and EDIÆUR are working on the RFID standard within ISO. It is hoped that a solution will be available in early 2008.

7.4 BIC EDI Standards

There are several EDI standards such as TRADACOMS, the established UK format, EDIFACT, the slightly newer international format, and XML, the new Internet-friendly format. There are also different ways in which these standard messages can be transmitted: across an EDI value added network or via FTP or AS2 over the Internet.

In the library community EDI is very well established, at least for orders, but increasingly libraries can do more with EDI and standards are important here. The EDIFACT Quotes message which follows a showroom visit or online selection is now increasingly popular. The order fulfilment message is used to receipt stock more efficiently and this feeds into efficient invoice and payment processes.

The library supply chain already handles two different ways of specifying the class mark of a book in an order message. The standards accommodate the two methods but this duplication

slows down EDI roll out and it can give library suppliers a problem. If a library authority moves from one LMS to another and the new LMS uses the alternative method within the standard then the library supplier might have to develop new software to enable it to handle this new method for this customer. This could be an unexpected and expensive systems development requirement and the library supplier would be paying for it. One development like this can also add several months delay to an EDI roll out programme.

7.5 Standards working party

The E4libraries project should be able to give advice to the sector on which standards to use and on issues of implementation. The BIC EDI Implementation Clinic (now renamed the BIC Technical Implementation Clinic) has been established for many years and it is a forum where users bring issues relating to EDI standards: this covers library issues as well as trade issues and only recently was debating the treatment of VAT and servicing charges on library invoices. Although a more library-focused group does exist, it would be helpful if this were established on a more permanent basis in order to try to resolve the relevant standards issues that occur in this sector. Follow up workshops to the one held in November 2007 would also be desirable: there is now a growing trend for computer systems to share data and to inter-operate and a regular workshop would help to develop this process.

The RFID standards issue is one which could be assisted by a suitable workshop. It cannot be in the end-user's interests to have solutions which are not interoperable. If these issues are left to be sorted by the market then this could delay roll out as users will be concerned about buying the "wrong" version. A workshop would be ideal for getting all sides together to meet and understand the issues involved.

8. Library Management Systems

Library Management Systems are crucial to a successful library supply chain. They are also crucial to the success of the e4libraries project. These systems are the ones which send and receive EDI messages and which have to interface with RFID systems and local authority financial systems. There are a number of problems in this area including:

- Continued support for legacy systems.
- Alternative ways of classifying books within the standard.
- The need for improved interoperability.
- The difficulties of developing functionality ahead of market demand.
- The demands of a cumbersome tendering process which often causes libraries to stick to their current system and go for the upgrade rather than buying a new system.

Some of these issues could be addressed by better information about EDI and particularly about the benefits of implementation. An accreditation scheme would help here as well.

8.1 Methodologies

Library management systems are available from several suppliers including:

- Bibliomondo
- Civica
- DS
- Ex Libris
- Infor
- Innovative Interfaces
- Sirsi-Dynix
- Talis

LMS suppliers often have several versions of their systems or even several different LMS products available. These LMS suppliers will have a primary product line which they see as the future of their business and they will be quite willing to develop it and add functionality to derive some competitive advantage. However, they may also have one or more legacy products which are still in use and which still need support. Moving to a new system is often expensive and library authorities may prefer to enhance or upgrade their current solution rather than make a major change. Some of the development work which could be envisaged under e4libraries, for example work on systems integration and improving interoperability, could be undertaken for the newer primary products but the legacy systems will then fall further behind. Enhancing legacy systems which are considered obsolete will not be popular with LMS suppliers. E4libraries may have to encourage some authorities to move to newer systems in order to derive maximum benefit from the project.

There are also several different methodologies in place in the library supply chain. Library Management Systems can be hosted or distributed, or they can be standalone or an integrated part of a larger financial and management system for the whole local authority.

Doing things in different ways can cause problems and even though the standard accommodates the variety, the trading partner's systems may not. This can delay EDI roll out and introduce sudden extra costs into a trading relationship where the library supplier has suddenly to develop a software solution to cope with a different methodology because the library supplier's customer is changing their system. Clearly this is problematic and it would be ideal if library management systems suppliers and library suppliers improved their interoperability and adhered not just to the standards but to the practised ways in which the standards have been implemented. This can be a particular problem for overseas businesses seeking to sell into the UK where standards are used but they can be interpreted differently locally.

An example would be where the EDI standard might state that a particular field should be up to 35 characters in length but right across the library sector no LMS has ever implemented more than perhaps 10 characters. In this case if a newcomer to the sector develops a solution, they could use all 35 characters and then this could give all existing systems a problem. Should the standards be tightened so the 35 characters is reduced to 10 or should the trading partners expand their systems to cope with 35 because that is what the standard says? Usually the implementation guidelines are used to clarify this sort of issue and state what the sector is happy with. It could be a useful but demanding piece of work to analyse the top LMS suppliers' products and see where they differ from the standards. So for now, it might be worthwhile simply to document the major issues which many of the LMS suppliers know about and then re-visit the guidelines to provide greater clarity.

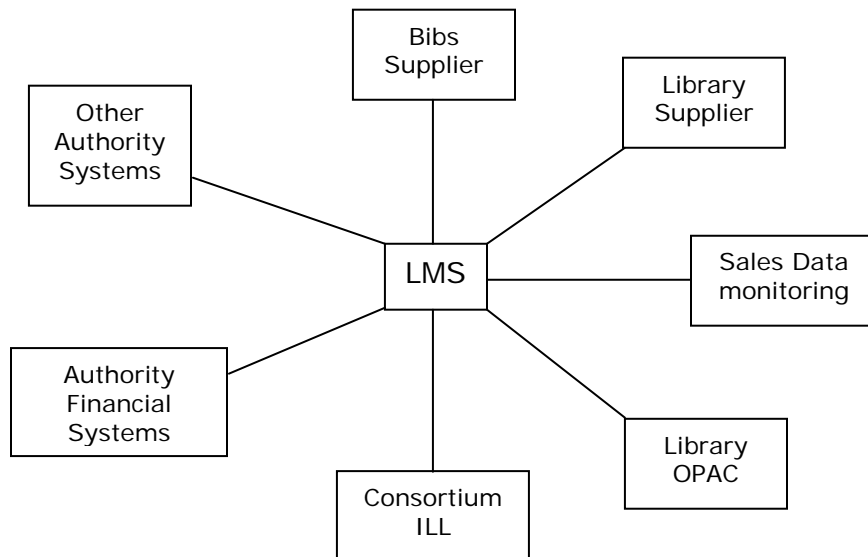
8.2 Interoperability

The LMS suppliers should be encouraged to think about their systems' interoperability with other systems. Further research could be undertaken to establish the main finance and other systems in use at local authorities and plot the integration capability of the main LMSs.

Systems	Agresso	Sage	SAP
DS			
Infor			
Talis			

This matrix should be expanded to include all the LMS suppliers and their systems and to cover which data can be exchanged and the method used.

A simple schematic of the possible areas requiring systems interoperability might be useful here:



And as the Internet world develops and as demand for information continues to grow it is likely that library systems will have to continue to develop new interfaces with external systems.

9. Role of BIC

Raising BIC's profile in the library sector is one important aim of the e4libraries project. Standards are vital if a sector is going to avoid unnecessary costs and cumbersome work-round processes and BIC is ideally placed to fulfil that role, working with the many other standards bodies in the sector. BIC has pulled together a steering group for the e4libraries project and this could form the basis for other working groups to monitor the progress on standards and EDI roll-out and other key recommendations.

10. Best practice

Practice varies across the library sector and one aim of this project will be to develop resources which will document best practice from across the sector. This is not something that BIC/e4libraries will be able to do without the support of the library community. BIC will be able to set up web pages for e4libraries and put up case studies and examples of best practice in this area but will need input from the library community. There are potentially several different examples of good practice in projects around the country and e4libraries should monitor these and pick out best practice where it occurs. One example would be a case study on Askews' experiences with their new customers, Derbyshire and Derby City libraries, providing an ideal opportunity to be in at the start of an implementation and to learn the lessons as the project progresses. It would be very useful if across the sector, libraries, library suppliers and library management systems suppliers could submit examples of case studies and best practice.

11. Data collation and dissemination

The e4libraries project needs to be judged empirically to justify the sponsorship and support of the organisations involved. Ideally all the major players would submit data to the project under a confidentiality agreement so that this data could be grouped together and collated and some overall statistics obtained. These could then be disseminated out to the library sector to show the current situation.

For example, it would be very useful to know what percentage of the 149 library authorities and approximately 4190 libraries currently order electronically using a standard methodology and what percentage can receive the other EDI messages. The bibliographic information supply is more complex but again some outline statistics would enable e4libraries to establish a base line from which to deliver improved numbers or agreed targets over a period of time. This information can only be gathered if libraries and their suppliers and LMS suppliers agree to supply it.

12. Quick Wins

For the e4libraries project, quick wins should be initiatives that are likely to have a positive effect within six months.

12.1 Documenting EDI Capability

One quick win could be the simple idea of documenting the current capability of the library sector in terms of EDI and RFID. The idea would be to issue templates for library suppliers, LMS suppliers and authorities to fill in. This would enable the e4libraries project to record empirically the situation at the start of the project which would be useful going forward in establishing the success of the project.

This would also enable an EDI capability directory to be created which everyone could refer to when planning their EDI activity. For example, it may be that a library supplier is capable of receiving orders in a different format which would suit a library authority, but the library authority is not aware of this. There is an opportunity here to connect both sides together and enable them to take advantage of this information.

12.2 E4libraries website

An e4libraries website should be developed. An e4libraries URL such as www.e4libraries.org should be registered and it should point to a microsite hosted on the BIC website at www.bic.org.uk. The website should contain sections on best practice and any case studies submitted by relevant organisations. The library sector should be able to submit ideas and comments on a news group attached to the site. This could be a simple yahoo newsgroup and it should be moderated and access given to anyone involved in libraries.

12.3 Key points summary of this report

This would be a very simplified version of this report. Once approved by the steering group for accuracy it could be distributed widely and used to spark some debate and generate feedback.

12.4 Questionnaire

It is important that librarians feel consulted. It would be good to identify very widely any prejudices against EDI, any misconceptions or counter arguments. It would also be good to understand the level of knowledge of the subject. To some librarians, is EDI simply electronic ordering? Is it the threat of technology? Is it something for the LMS suppliers to handle? Or something for library suppliers to suggest? This sort of questionnaire could be very useful in understanding the feelings of librarians about EDI and this would help our later promotional efforts to persuade decision makers to implement EDI fully and appropriately.

12.5 Systems Workshop

An early quick win for the project was the library systems workshop held in November 2007. This included librarians, library suppliers, library management systems suppliers, RFID systems suppliers and others, and looked at case studies, best practice in EDI, standards issues, RFID, and interoperability between systems (especially between the LMS and financial systems). The workshop has already been instrumental in getting the LMS suppliers to understand the increased importance of interoperability, adherence to standards and to start to develop appropriate solutions over the next six months. It also persuaded some key libraries and library suppliers that standards are worth supporting.

12.6 RFID Standards

There are some quick wins available on RFID:

- Everyone to be aware that the ISO standard is nearing completion but that decisions still need to be made as to what information to put on the tag.
- Libraries to be aware that current RFID implementations are very likely not to be interoperable with other RFID suppliers' products. Libraries need to ask questions and find out if their RFID supplier will conform to the ISO standard and what effect this may have on books already tagged.
- RFID suppliers need to conform to the ISO standard once established.
- A Lab test could be undertaken to test tag interoperability. This could be done at a supportive library supplier and the six main types of RFID readers and writers can be tested and current interoperability can be established. A similar lab test could be undertaken within

six months of the publication of the completed ISO standard for RFID. This would enable libraries to see to what extent interoperability has improved and which tags are now compliant with the ISO standard.

12.7 MLA Cost Model

The stock procurement cost model produced by the MLA could be made more widely available to authorities to validate their own acquisition processes and associated costs. It has already been published but may not have been actively distributed for this purpose. This could set in motion some useful analysis which over six months could deliver some statistics which might prompt authorities to implement EDI/RFID etc.

12.8 Case Studies

Case studies would be very helpful in persuading library authorities that other libraries have faced the same problems and solved them with EDI. Case studies can be far more persuasive than the claims of technology companies or e-commerce service providers. Some case studies could also be undertaken on RFID to document the benefits.

12.9 Simple guides

A Simple Guide to Library Supply Chain E-commerce could be a useful document. This could be written and approved by the steering group and then it could be made available on the e4libraries web pages. It could then be downloaded from the e4libraries website and referred to by anyone who needed to understand about library sector EDI and related issues. The document would be simple and easy to understand and would cover all the basic areas of obtaining, using, and exploiting EDI and e-commerce. Similar guides could be produced covering other relevant topics. This could include a generic guide to RFID, lessons learned from implementing RFID and other systems. BIC/e4libraries would have to have the right to edit the information but library suppliers or library management systems suppliers could submit papers on relevant topics. The idea is not to compete with any existing information services but rather to provide simple guidance if it is needed and focus on the key elements of EDI, RFID and other topics within a standards framework.

13. Other Recommendations

13.1 BIC Library Group

An important objective for E4libraries is to promote BIC's profile in the library supply chain. To achieve this, a more dynamic library-focused working group should be considered with a brief to address all library-related systems and standards issues. The library supply chain seems to be entering a period of upheaval and possible significant change and a BIC working group with representatives from the library suppliers and the LMS suppliers would be ideally placed to ensure that issues are dealt with as they arise. Some interested parties have said that they don't attend the BIC Technical Implementation Clinic (formerly the BIC EDI Implementation Clinic) because for much of the time this meeting does not focus on library-related issues. A more focused alternative might attract more participation. BIC's methodology of using regular conference calls for much of the year with only occasional face to face meetings, can help to reduce the costs of taking part in these meetings. This should encourage wider participation.

13.2 Accreditation Scheme

The objective of an accreditation scheme would be to reward best practice so that companies, institutions, authorities or libraries could display their accreditation as a sign to all that they are an efficient organisation capable of trading electronically. The library sector is at home with accreditations schemes and charter marks, so a BIC/e4libraries scheme should be fairly easily accepted.

The MLA could endorse the BIC/e4libraries accreditation scheme as part of its drive for efficiency in the library supply chain.

The scheme would involve a panel of experts judging, under complete confidentiality, applications for accreditation from library authorities, library suppliers, LMS suppliers, e-commerce providers, bibliographic providers etc. These applications might take the form of a questionnaire, which would ask some simple questions about the applicant's current systems, workflow, EDI implementations, volumes etc. The list of questions would have to be developed and agreed with the panel and a pass level established.

There would have to be some basic requirements in order for an organisation to receive accreditation. For example, a Library Management Systems supplier would have to offer the full suite of standard EDI messages as a core business module rather than as an extra cost option or customisable future development. This requirement is important but could be difficult for some of the LMS suppliers to deliver or perhaps agree to. Similarly, a library supplier would have to have the capability of exchanging all the EDI messages with their trading partners to standard. In addition, the library supplier would also have to show evidence in terms of trading partners and volumes so that the capability is supported by actual volume usage. Extra credit would be given for an e-vangelical stance on EDI.

These are only examples of the sort of base level requirements the panel would need to agree in order to set up a successful accreditation scheme. There is a lot of work to do to understand the exact extent to which libraries and their suppliers are currently adhering to the standards before the accreditation scheme could be implemented.

The successful applicants would be given a logo, which they can display in their marketing materials etc. and this would be a simple accreditation certificate with the year of accreditation and the BIC/e4libraries name. In the book trade this sort of logo is known as a "BIC tick".

Unsuccessful applicants whose confidential accreditation application is refused would be offered some free telephone consultancy to discuss why they failed and what could be done to improve their compliance and to enable them to be successful next time.

The idea is that accreditation should be a no-lose option. Everyone should apply and either get accreditation or some help with their EDI etc.

This is a mock up of how it might look:



Obviously, the accreditation panel and the steering group should have input as to how the logo should look, the information it should contain and to any other elements of the proposed accreditation scheme.

13.3 Review of the library tendering process to accommodate e-commerce

A further piece of research is suggested which will go into detail about the tendering process that libraries go through to set up library book and materials supply and new LMS systems or upgrades. The key points to be established within the rules of tendering are:

- EDI should be a core requirement.
- All requirements should conform to standards.

Ideally, every LMS on the market will have e-commerce built in as a core module within the system. Eventually it should be impossible to buy an LMS without including the capability to do EDI. LMS suppliers need to go further and make it easy for their customers to connect to their trading partners via EDI. It may be that some suppliers will start to facilitate the implementation of EDI either working with a VAN (value added network) or via the Internet.

A similar requirement could be built into library supply tendering so in every case the subject of electronic trading would be discussed and reviewed. Standards are a critical part of this and questions could be asked, such as to what extent the supplier conforms to standards. This would do a lot to make standard EDI a fundamental part of the tendering process rather than an option or just one of many optional requirements. This may not be practicable in reality but it does signal the way in which the library sector needs to start to think about EDI.

One of the problems of the current tendering process is that libraries ask for solutions to specific issues and both LMS suppliers and library suppliers naturally want to say yes to these requests in order to get the business. It would perhaps be better to discuss these requests and ensure that they are part of best practice rather than inefficient workarounds. Over the last few years poor EDI practice has crept in and become established. Library suppliers find themselves offering inefficient workarounds to satisfy a customer because the library supplier believes that a competitor has already offered this. Somehow we need to help libraries to ensure that their business processes and other workflows are optimised and that their EDI requirements are to standard.

A list of questions to ask when tendering would be a fairly simple resource which could be developed and made available to all libraries. This could cover EDI and RFID and ensure that servicing and cataloguing requirements are compatible with EDI standards. If there were problems these could be resolved by the working group.

It would be worth looking in more detail at how library consortia operate with regard to EDI and RFID. Some consortia already have similar LMS solutions throughout the consortium but others have a wide range of different systems and practices. There may be a way of embedding best practice on EDI and RFID into consortial agreements so that all the members of a consortium achieve the same level of implementation of these technologies or are working towards this over a specified time period.

13.4 Library promotional events such as the NAG conference, Library & Information, Online Information etc.

The e4libraries consultant should attend relevant events and meet librarians to discuss e-commerce, standards etc. One-to-one sessions should be bookable with the consultant so that librarians who want to know more about EDI and e-commerce can discuss their own circumstances with an impartial and neutral consultant. This could be a very useful service in breaking down some of the barriers that prevent EDI from being universal.

13.5 Target Date

This idea is to have a target date for libraries, library suppliers and LMS suppliers to aim for. If this was set a year or two ahead and everyone bought into the idea that after a certain date all UK public libraries would be e-enabled then that would give everyone a target to aim for and time in which to achieve it. Local authorities would have the time to budget for the changes, LMS suppliers would have the time to ensure that their systems even their legacy systems can all do EDI and adhere to standards. Library suppliers would be able to boost EDI performance in their tenders and streamline their take-on procedures. Finally, the e4libraries project would have some time to spread the word and encourage the decision-makers and stakeholders. This target date would have to have high level support e.g. amongst Chief Librarians, the MLA, DCMS etc. In the book trade an e-Day target date was set and this galvanised a number of major players to take action so that they would be seen to be compliant by or before that date (which was set at 1st May 2008). This succeeded in moving people forward but as the date approaches and organisations strive to achieve the goal, there is the problem of what to do after that date. This needs to be considered in advance so that the project achieves its objectives and the target date is "celebrated" or marked in some way. Ideally the date would coincide with a major library conference so that presentations could be made and accreditation awards could be handed out and the date marked as part of a major event.

This idea should tie into the need for an easily articulated vision for the library sector in the area of EDI and RFID. For example, if a national inter-library loan service were a required objective for the sector, this could probably only be achieved using a target date, probably more accurately sunrise and sunset dates, as LMS suppliers and libraries would have to develop improved compatibility over a period of time.

13.6 Decision makers and e-commerce champions

It would be good to develop a methodology to target the key decision makers and stakeholders in library authorities. The key stakeholders could be councillors, financial management, chief librarians, IT management and so on. In order to be able to persuade these stakeholders to implement EDI or RFID, the appropriate benefit case has to be made. For example Councillors would perhaps be most interested in satisfying their voters' wishes whilst financial officers would be most interested in the return on investment and in cost savings. By producing information about EDI, targeted to satisfy these requirements, the e4libraries project could provide libraries and suppliers with the means to persuade key decision-makers to implement more efficient systems.

It would also be excellent if local authorities would appoint an e-commerce champion to co-ordinate EDI policy and to promote the effective use of technology including EDI and RFID within the authority.

13.7 Audit policy and electronic invoices

During the research it emerged that different local authorities may have different audit policies in place, for example one authority could accept an electronic invoice as an official document whilst another may insist on a paper invoice. This makes it difficult to recommend rolling out a single method of invoice processing and payment using EDI. E4libraries should look at this issue and try to establish whether this is a genuine barrier or one which could be employed to explain lack of progress in implementing EDI and integration with finance systems. Ideally, government initiatives to modernise and move towards more efficient procurement should lead to the acceptance of electronic documents by local authorities and auditors.

14. Next steps

Next steps include the formal decision to continue with the e4libraries project and then to look at the recommendations and the quick wins.

There will also need to be additional research to look in more detail at some areas e.g. RFID standards, EDI in the tendering process, LMS interoperability etc.

The project also needs to take into account some of the other areas which need more work such as the academic libraries. These would be best served by a subsequent or possibly parallel phase of the project to focus attention on academic supply chain issues which are often very different from the public libraries and which have so far taken a lower priority in this scoping report.

It is very important given the wide range of actions discussed in this report that the e4libraries project should develop a mechanism for prioritising and planning. Much depends on the resources available to the project in terms of ongoing sponsorship but also the input and support of the key players, library authorities, library stock suppliers and library systems suppliers. Some of this planning will be undertaken in the light of the further research proposed in this report and this will lead to the development of an action plan which the steering group can monitor.

15. Conclusion

This scoping report has indicated that there is a lot of activity in the library supply chain at the moment and that standards, EDI and RFID implementation are crucial areas which must be sorted out so that libraries can deliver better value for money and better service to their communities.

The library supply chain must function as efficiently as possible so that budgets can be reduced and re-allocated or used to purchase more books rather than fewer.

E4libraries could be a very successful project by focusing effort, energy and attention on the need for standards and the benefits of EDI and other technologies and by harnessing the goodwill of all the relevant players. It is important to note that BIC and e4libraries has little or no enforcement role or ability. BIC and e4libraries has to persuade and encourage best practice and co-ordinate the efforts and energies of the library supply chain. A successful e4libraries project should enable the library sector to take significant costs out of the library supply chain and ensure the survival of the public library service into the future.