

Essential Digital Infrastructure for Public Libraries in England

A plan for moving forward.



*"My dear, here we must run as fast as we can, just to stay in place.
And if you wish to go anywhere you must run twice as fast as that."*



Commissioned by
The Society of Chief Librarians



in collaboration with
The Reading Agency



With funding from
Arts Council England



Prepared by
BiblioCommons
November 24, 2015

Abstract

This report argues that a standards-based digital platform is the only viable technology for realising recent strategic goals articulated by leaders for England's public libraries. The platform would allow libraries and their partners to innovate, collaborate and share in ways they cannot now do. The report further argues that the primary mode of service on this platform must be co-production -- among library authorities, and among library staff, national and local partners, and importantly, end users. We show how new digital divides have made the mission of libraries -- literacy, learning, and community inclusion -- as relevant as it ever was. And that in order to provide an energetic response, libraries must invite their users into their digital spaces: their catalogues, their websites, their ebook readers, their online events calendars. We argue that these two measures, a standards-based digital platform and co-production of services, will reinvigorate libraries and create substantial, tangible outcomes in literacy, digital and social inclusion, health, education, and economic participation.

Contents

Overview

1	Executive Summary	6
2	Background	18

Findings

3	Library Users: Digital disruption has changed both what users can find at libraries and what they need from libraries	27
4	Managers: Stagnant IT stifles response & raises costs	52
5	Partners: Fragmented IT stifles mutual support	66
6	IT Ecosystem: An ineffective ecosystem	77

Recommendations: Strategies

7	Users: The affordances of the social web are key to making libraries relevant and visible online	81
8	Managers: Enabling best practices with IT	199
9	Partners: A standards-based platform enables shared content, programming and metrics	106
10	IT Ecosystem: From monoliths to modules	110

Recommendations: Tactics

11	Software design principles	119
12	Architecture and components	125
13	Project and Ecosystem leadership	132

Conclusion

14	Costs and benefits of going forward	138
15	Costs of standing still	144
	<i>Appendices</i>	147

Appendices

for Overview

- I Past library reports
- II Stakeholders consulted

for Findings

- III Jobs to be done and new divides

for Recommendations: Strategies

- IV Digital solutions for the “negative image” of public libraries
- V Digital solutions for operational effectiveness in libraries
- VI Digital solutions for activating existing library assets

for Recommendations: Tactics

- VII Options considered for national integration
- VIII Suite of recommended components
- IX Sample procurement criteria

for Conclusion

- X Benefits
- XI References

XII Presentation from the Digital Presence Workshop at the British Library

Overview

1 Executive Summary

Digital changes everything: Challenges and possibilities

Diverging Perspectives on Libraries

“Waste of money.

No need for libraries nowadays,
just google what you want.”

*Reader response to story about Birmingham
libraries, Mail Online (2015)*

“I'm not attacking libraries,
I'm attacking the concept behind
libraries, which is no longer
relevant.”

*Author Terry Deary, The Guardian
(quoted in Flood 2013b)*

“Close The Libraries And
Buy Everyone An Amazon Kindle
Unlimited Subscription”

Tim Worstall, Forbes (2014)

“A library in the middle of a
community is a cross between an
emergency exit, a life raft and a
festival.

“They are cathedrals of the
mind; hospitals of the soul; theme
parks of the imagination. [...T]hey
are the only sheltered public
spaces where you are not a
consumer, but a citizen, instead.

“A human with a brain and a
heart and a desire to be uplifted,
rather than a customer with a
credit card and an inchoate ‘need’
for ‘stuff.’”

Caitlin Moran, Huffington Post (2012)

Digital technologies have disrupted everything, for better or for worse. This digital disruption has made some organisations succeed (Uber, Youtube, Airbnb) and others fail (Kodak, Borders, HMV, Blockbuster). And it has done so in months and years, not decades. Digital disruption has affected every market in which we create and exchange value -- changing what people need and want, and how those demands are met.

Digital disruption creates new challenges for society as workforce needs and social life rapidly shift. At the same time, it creates new opportunities for broadening social inclusion, increasing literacy and learning, and enhancing health and economic opportunity.

While libraries are themselves challenged by digital disruption, they are also uniquely positioned to meet emerging public needs -- if, and *only* if, they are given the digital tools required to do so. These digital tools should not replace library branches or staff but can activate and complement them in new ways. A digital presence should not supplant print books -- still the leading draw to the library today -- but should be an energizing complement to them: a digital pathway to books; and a site of conversation about books, and a source of helpful context for books.

Just as the library has long been a place of refuge and learning offline, so can it become a safe space for personal and community growth online by mobilising the voices, expertise and experiences of users, partners and staff -- in a way that, on many dimensions, only libraries can do. And, through an interweaving of online and offline offerings, it can create synergies -- between national and local content, between online and offline services, between authoritative and community voices -- that make the whole greater than the sum of its parts.

The fundamental need that libraries serve has not gone away. If anything, literacy, learning, and community inclusion occupy a more central role in public policy today -- in domains as diverse as education, productivity, and health and well-being. Libraries will need to take a systematic approach to digital technology to effectively realise this mission in the 21st century.

The first steps on that path can be taken in a matter of a years, and at a cost of £20M over three years. Annualized, this is about 1/36th the annual cost of building and maintaining library buildings in England.¹ As we will show, even this ratio is far below benchmarks in other sectors, both public and private.

Digital inclusion: closing new divides

As so much of our economy and daily interactions shift online, two levels of digital divides have emerged.

The first-order divide is between those who can access the Internet and those who cannot. And it is rapidly closing. Mobile phones are

¹ The figure is per CIPFA data for public libraries in England, averaged over the last three years (2012-2014).

driving down the cost of access, and only 3% of British households say they are unable to afford a connection (UK ONS 2014). Libraries continue to play a role in eliminating this divide by offering computers and WiFi in branches.

The second-order divide, however, is between those who can effectively use digital technologies to their advantage and those who cannot -- and this divide is becoming ever more significant (e.g. Hargittai 2002). Libraries have yet fully to embrace a role in closing this divide, but doing so represents one of the greatest ways they can serve society today. They can do so not only through digital skills training, but also, and in a more scalable way, by providing online services that enable self- and peer-led learning and digital engagement.

These second-order digital divides in the *capacity to make use of* the Internet once a person has access to it are new manifestations of problems the library has long tried to solve. The library has always worked to support literacy, lifelong learning, and social inclusion -- but in order to serve the needs of people today, it must also work to support digital literacy, focus and cognition online, and social participation online (see for example Hargittai 2002).

The main digital divides we believe the library can help close are:

- **Cognitive divides** between those overwhelmed by the superabundance of information and those empowered by it
- **Focus divides** between those distracted by digital media and those inspired by it
- **Social-capital divides** between the connection-poor and the connection-rich
- **Participation divides** between passive consumers and confident contributors.

Serving those who choose, in order to serve those who need

I felt a certain level of dignity and self-respect at the library. It was about being around other people who looked like they were being productive. They must have thought that I, too, was being productive. Why else would I be there? What a great feeling!
(Reyes-Gavilan 2014)²

Bridging these divides requires that the library continue the fundamentally social practice it has always followed: bringing together people on each side of divides by creating an attractive, neutral space in which the practice of reading and learning are modelled and valorised, and in which recommendations and insight are shared.

The success of this work depends upon the library's continuing ability serve those who *choose* the library in order to serve those who *need* the library. Libraries must not become soup kitchens for the written word -- stigmatised spaces used only by those with no alternative. However, while today, library use is evenly distributed among each income quintile in England, in recent years people in the top 80% of income segments have begun to leave the library (our analysis of DCMS 2014 data).

Serving those who choose as well as those who need the library is in turn dependent on coordinating the unique assets and community of the library in compelling user experiences. We argue that both the coordination and the user experiences are unachievable in 2015 without a standards-based digital platform.

We show in this report that libraries have unique assets from which to mount a compelling response, in all segments of society, to the challenges we describe here.³ Moreover across the spectrum of stakeholders we have spoken to,⁴ there is excitement about the potential to make libraries, through digital channels, popular hubs for learning, discovery and conversation -- in realms as diverse as combatting depression, finding a great new author, or starting a business.

² Edited for clarity.

³ See a complete discussion of library assets in Section 4.1.1 of this report

⁴ See Section 2.4.3.

Digital disruption has not been kind to libraries. It has fundamentally changed how people find things -- for example in retail, 80% of offline purchases are made only after a person goes online first (Rueter 2012). And digital disruption has changed what people want and need -- for example people peer reviews have become an essential ingredient for decision-making. Yet libraries have not as yet been able to adapt. They remain difficult to find online, and difficult to use.

The desire for change among libraries, partners, users

England's libraries have shown surprising inventiveness in the face of the limited resources and siloed digital infrastructure that they have. And our interviews with library leaders have revealed both an awareness of the opportunity for coordinating their work on a common digital platform, and a consensus that it is worth trading some local IT autonomy for the new capacity enabled by such a platform.

There is also a potential ecosystem of third-sector and government partners waiting for the opportunity to engage with the public library's large audience -- especially those with needs in high-priority policy domains such as:

- Education, training, and lifelong learning,
- Literacy,
- Digital skills,
- Social inclusion, and
- Health.

Fortunately, library users are also ready.

As we argue in this report, one of the greatest assets of the public library today is the affection and goodwill of its active users -- who are still legion, numbering at 8 million in the last year. This affection is particularly strong among well-read segments of society -- library users still account for nearly half of all books read in England.⁵ The kind of enduring goodwill that users feel for their libraries is the dream of any marketing professional. In this world of digital networks, the potential to harness this goodwill in the service of our communities is enormous.

⁵ In our calculation, the number of books "read" is the sum of all issues and all purchases. For further citation and the trend, see the CIPFA v. market data comparisons in Section 3.3.2.

And many of these users are already waiting online. Even as library websites today offer user experiences that are often exasperating on desktop computers, and unusable on mobile devices, in aggregate local library sites still receive an estimated 3 million unique visitors monthly (per data shared from individual libraries and SimilarWeb).

In other words, the problem is not that public library users are leaving the library as their lives move online. It's that the library is not showing up to meet them there. As a result, public libraries are failing to serve those who need them most, and losing the interest of those who have the luxury to choose to go elsewhere -- for some of what they sought at the library.

In leveraging the power of this community and the offers of these partners, public libraries could emerge as a definitive digital public space for readers and learners, whether they are borrowing from the library, buying through retail channels, or simply connecting with other readers and learners.

To do so, libraries must coordinate their resources to create spaces online that reflect the experience long present in branches. As Stephen Fry relates:

“Libraries still for me have this extraordinary charge when I get in one; I feel this buzz, it is almost sexual. Behind these bound copies are voices, people murmuring to you, seducing you, dragging you into their world” (2011).

A need for operational change

In addition to the lost opportunity to better serve all segments of their communities, and to create value for their partners, the absence of a coordinated, standards-based digital platform for libraries is creating waste and preventing desperately needed innovation in the day-to-day operations of public libraries.

Under the current model, each library service expends effort trying to deliver basic services from library management systems (LMSs) that weren't designed for those purposes. And this wasted effort is replicated across the many flavours of LMS in 151 library authorities.

For example, close to 200 FTEs across England today are working to secure basic reports needed for management or authority reporting.⁶ In today's diverse IT environments, templates developed by one authority cannot be used by others. Ideas are shared, but implementation work cannot be shared.

It is not just the waste of staff effort that is at stake. Many of the library's investments, from collections to programming, are underutilised owing to the lack of visibility and connection within the current digital silos, and to poorly designed display environments. At the most fundamental level, many libraries cannot display ebook holdings from their central catalogues; users must know to look elsewhere. The library's investments in community programming are similarly buried; very few libraries offer even an online calendar of events. Libraries rate themselves poorly in user awareness of online services, giving themselves a 1.9/5 (Reading Agency 2011). Many users regularly suggest "improvements" of functionality or services that in fact already exist -- thanks to poor usability, they simply didn't know where to find them (e.g. ability to place requests from home, as per Macdonald 2012).

The standards-based digital platform proposed in this report would reduce these frustrations. With shared data standards and APIs, £1-2 million worth of staff time now spent on basic reporting each year could be avoided, and that time could be reapplied to social returns: for example, this technical foundation would enable staff to delve more deeply into service analytics in order to iteratively refine offers that help to bridge divides.

Change is within reach

With an investment of £20 million over three years,⁷ England's public libraries could change the existing narrative about libraries. They could reactivate their branches and play a central role in connecting communities of culture and learning online.

This is no trivial sum in times of austerity, but it is small by comparison with investments other countries are making. Denmark and Sweden, both smaller than England, are spending £2-3 million annually on

⁶ Extrapolated from survey of SCL leadership, with 38 authorities responding

⁷ This figure is broken down in Section 13.2.

subsets of the technology changes we recommend here. In the United States, the New York Public Library alone will spend \$10 million next year on digital initiatives.

The initial 3-year investment of £20 million is dwarfed by the amount that England's libraries spend on branch visits. Branches are the backbone of the public library, but as our users live more and more online, public libraries will need to find a balance between investments in the physical and digital domains.

Benchmarks in other sectors and regions indicate that England's libraries have seriously underinvested in user-facing digital services. Digital visits to public libraries often exceed physical visits in North America, while in England, in spite of higher digital activity in society at large, a meagre digital presence has meant that digital visits to the public library are substantially lower.⁸ In spite of the potential parity in physical and digital gate counts, only about £6 pounds is spent on digital visits for every £100 pounds spent on offline visits.⁹ In retail by comparison, with respect to capital costs, it is increasingly normal to invest about £1 pound in online or omnichannel endeavors for every three pounds in offline endeavors (Murphy 2015).

More generally, the initial £20 million is a small cost for the measurable benefits it will return. A preliminary estimate of this potential based on a survey of current digital-related expenditures and associated staffing is detailed in Appendix X Benefits. While some of the benefits will be longer term, direct cashable benefits by the end of the 3-year timeframe are estimated at £2 million annually, and non-cashable staff allocations, which can be re-directed to other tasks at £6 million.

And finally, the cost of “renovating” digital, while not trivial, is nowhere near the cost of renovating an aging and extensive branch network. In

⁸ Online generally, 73% of England's adults are online daily, compared to 71% of US adults (comparing UK ONS data and Pew data). Then, with respect to libraries, there are roughly 2 online visits per capita in England (using CIPFA 2014 data), or perhaps as low as 0.8 or 0.6 online visits per capita (respectively using SimilarWeb or Google Analytics data for local sites and scaling to the national population). By contrast, North American libraries receive roughly 15 online visits per capita (using PLDS 2012 data).

⁹Estimated 30M visits online, per local-level and SimilarWeb data extrapolated nationally, and 300M visits offline, per CIPFA; estimated £15M IT expenses, per BiblioCommons survey of library heads of service, and £240M building costs, per CIPFA.

2006, a study of public libraries in England found that the cost to make all service points “fit for purpose” was £950M+ (adjusted for inflation to 2015 pounds from 2006 pounds; Information Daily Staff Writer 2006).¹⁰

Sustainable change: ongoing funding for a standards-based digital platform

The initial three years will need to be funded by a one-time investment secured nationally in order to allow time for library authorities to realise benefits and to re-direct spending accordingly. The Leadership for Libraries Taskforce has had early discussions with various potential funders both inside and outside government.

Following this initial investment, England’s library authorities and the government agencies that fund them should aim to increase annual spending over the next five years in support of the online user experience (above and beyond spending on the LMS) to 5% of their total operating expenditures.

Ultimately, public library authorities must find a way to balance spending between their physical and digital channels. Over the past decade, industries hit hardest by digital disruption have had to make massive adjustments to their staffing and investment models. Some retail sectors have reduced their physical footprints by 20-30%; in journalism, news organisations were forced to cut 25%+ of costs. In both sectors, these cuts have been made while making large investments in digital infrastructure. For libraries, it is not a question of either online or offline. The key lesson is that the digital and the physical must be balanced and can be mutually reinforcing. As retail sector reports have shown, the online experience is absolutely critical to driving footfall to physical locations (UK BIS 2013, Lobaugh et al

¹⁰ To size these estimates by back-of-the-envelope maths: making a modest effort to paint and add more comfortable chairs and other superficial improvements at £15,000 per location would across 3,000 library service points still cost nearly £50M, or more than 2x the initial costs of the proposed platform. To go further and bring major central service points to contemporary building standards is even more expensive: if we estimate a need across England’s 151 library authorities for just 2 more large new buildings (£60M each) and 150 Dorset-sized new or substantially renovated buildings (£6M each), we face a billion-pound problem, or 500x the initial costs of this platform.

2015).

If public libraries are to avoid the kind of drastic adjustments made in retail and journalism, they cannot afford to wait any longer to make a more significant investment in digital infrastructure.

Managing risk: a technology strategy that is new to libraries, but common elsewhere

Not all readers of this report will choose to delve into the details of the recommended technology strategy. For those who do not, the important point to emphasise is that the strategy we recommend is not high-risk. Each element of the technology strategy laid out below is considered standard practice in other sectors (e.g. Baldwin and Woodard 2008), even if public libraries have been slow to adopt them. We are recommending that library authorities and the agencies that fund them work together to build:

- Library automation middleware that uses open standards to normalise the business logic and data of legacy software systems, allowing them to interoperate with new user-friendly applications
- A national aggregation service that coordinates conversations, offers, and enhanced materials around the titles in the collections of 151 library authorities
- Standards-based APIs¹¹ that support collaboration among libraries, with national and local partners, and with vendors
- A suite of core applications built on this platform, using a modular or “pluggable” architecture in place of a more traditional monolithic design. These core applications are user-facing, and comprise the basic tools of the trade for any online retailer or service provider (including community engagement services). In order to enable economies of scale and rapid innovation, we recommend a core-services delivery model that allows shared innovation on a single, configurable code base, as opposed to locally installed and customised software.

Given the maturity of these service models in other markets and the depth of experience of existing vendors, we believe it will be possible

¹¹ APIs or application program interfaces, allow application programs to interact with each other and share data.

to achieve fundamental, systemic change within two years of selecting a provider. Once the platform is in place and made available to other providers and national partners, a much faster rate of innovation and experimentation will be possible.

The immediate impact of this investment is outlined in more detail within the report, but can be grouped in these domains:

- **Operations** - modernising digital operations and reporting, areas in which substantial resources are being wasted
- **User experience** - enabling libraries to bring their web presence into the 21st century while maintaining local content and branding at each of 151 local authorities
- **Co-production through a social layer** - enabling users and partners, alongside staff,¹² to co-produce content that addresses the new divides in literacy, learning and community engagement, and enabling them to make libraries more visible across the web, while also creating tangible value for segments of society that may have left or be tempted to leave the library
- **Shared best practices** - a platform for sharing best practices, applications, content, and programming, used by a critical mass of users (readers, reviewers, and mentors)
- **Partner ecosystem** - collaborating at scale with the many national and local partners, such as The Reading Agency and the BBC, who are eager to connect with library audiences online

These measures will in turn create important, tangible outcomes in literacy, digital inclusion, social inclusion, health, and education, training and lifelong learning.

Not a new strategy for user experience -- just new capacity

In many ways, the central recommendation of this report -- to build the capacity for communities of readers and learners to come together to help each discover and engage more deeply with the ideas, information and stories that are at the heart of the library's collections -- is not new. It is a digital lens on what many past reports have described as a critical element of the path forward for public libraries:

¹² William Sieghart in his 2014 report called for staff to step into the role of "community Impresarios".

deeper and more sustained engagement of our communities. The vision for libraries, as described in the Arts Council of England's 2013 visioning work, "The Library of the Future" is exactly this:

Public libraries are trusted spaces, free to enter and open to all. In them people can explore and share reading, information, knowledge and culture.

What *is* new is the possibility of delivering on this vision -- affordably, at scale, and in timeframes that are measured in short years, not decades.

2 Background

This report aligns with past findings but proposes a new path to action.

2.1 The brief: a digital strategy for libraries

“Is your corporate strategy fit for a digital world?”¹³

The Society of Chief Librarians (SCL), with funding from Arts Council England and in collaboration with the Reading Agency, commissioned this work to plot a digital roadmap for the public libraries of England. In addition to the terms set out in the invitation to tender, this strategy document was required to meet challenges identified in the *Independent Report on Public Libraries*, and to further its three major recommendations:

1. Provision a national digital resource for libraries.
2. Set up a task-and-finish-force to provide a strategic framework and help with implementation.
3. Work with local authorities to improve local library services, encouraging appropriate community involvement.

These requirements were distilled into a brief for a digital strategy to support libraries in:

- Fostering literacy and digital literacy, learning, and social and economic inclusion in their communities
- Coordinating access to national and local resources, physical and digital library services, online partner offerings, and ebooks
- Achieving greater visibility for libraries nationally and locally, and attracting new users
- Managing cost efficiencies, interoperability, the sharing of best practices, and responsiveness to rapidly changing technology and customer need.

¹³ Ernst and Young 2015

This report argues that the only viable technological means for successful digital strategy for England's public libraries is a standard-based digital platform¹⁴ that allows libraries and their partners to effortlessly collaborate and share. It further argues that the primary mode of service on this digital platform must be co-production -- among library authorities, and among library staff, national and local partners, and importantly, end users. In order to be vibrant and relevant, libraries must invite their users into their digital spaces -- their catalogues, their websites, their ebook readers, their online events calendars -- to make library services visible, authentic and responsive to community needs -- and desires.

2.2 Previous attempts: a national website is not enough

England's libraries need a foundation on which national services can be integrated with local websites and catalogues.

Bookmark Your Library, the previous national website, had as many visitors in England in a year as the library catalogue in Doncaster had in a month, which is to say: not many.

The Society of Chief Librarians found that its mistake was in attempting a side solution to a core problem. As the president, Ciara Eastell, said, "We can no longer think of a digital offer as something optional or separate; it needs to be central to our thinking, as part of every offer going forward." An underlying digital infrastructure is needed.

2.3 Past reports - strong analysis, no path towards change

¹⁴ See Section 10.3 and 10.4 for discussion of platforms, and Section 12 for an overview of the recommended components.

More than 20 reports, like *The Future of Libraries in 2015* (from 2005), have documented decline and proposed service improvements.

For a list of past reports and summaries of their insights, please see Appendix I. In summary, the reports document:

- Declining visits
- Declining issues
- Inability to adopt best practices or innovate
- Overextension of staff and resources

Their recommendations can be summarised as follows:

- Change the narrative of decline and revive appreciation for libraries
- Create national services to bring coherence and cost-effectiveness to libraries
- Refocus (rather than reinvent) the library mission, creating new approaches to literacy and lifelong learning
- Involve the local community in co-producing engaging services

We will show in the next chapter how a profound digital disruption of the habits of consumers and library users is correlated with the trends identified by 20+ years of reports.

Libraries lack neither the ideas nor the leadership required to overcome these trends -- indeed, they have shown a strong capacity to collaborate. What they lack instead are the digital tools required to act, both individually and collectively. We will argue in Section 3 that digital infrastructure -- or its absence -- is key to understanding the trends identified over the last fifteen years, and to providing solutions to the problems those trends pose. Our conclusion is that the rebirth envisioned by each report was never achievable without strong digital foundations.

2.4 Methods: approach to design

This report develops a digital roadmap

- Inspired by user observations and interviews

- Checked by data trends and environmental scans
- Calibrated for requirements from stakeholders

2.4.1 Gathered insights from users and non-users of libraries

We developed the digital strategy presented here through the methods of empathetic design. Users help propose the problem to be solved (their wants, needs, and frustrations), though not necessarily the solutions (library services or programs). This method was developed by innovators seeking transformational change that answers deep user needs with new products and services, rather than incremental improvement that acts only on what users can imagine given the products and services they know today.

The main steps of empathetic design include:

1. Observing behavior, and context of users (Leonard and Rayport 1997)
2. Exploring in interviews the needs, limits of users (Ulwick 2002)
3. Analysing findings for “jobs to be done” by users (Christensen, as described in Nobel 2011)
4. Synthesising these “jobs to be done” to develop services

For a more detailed discussion of the design research and a list of the resulting jobs to be done and insights, please see Appendix III.

2.4.2 Checked against data and reports, including digital disruption

To test and develop the insights gleaned from users and later staff, we also analysed:

- Trends in libraries
- Trends in comparative industries

We assessed:

- Local library data from 4 authorities (data was limited without standards-based services)
- Local library survey data from 38 responding authorities
- National library data over 20 years
- Bookseller data over 20 years
- Government data on people and community participation

- Overall economic and consumer data over 20 years
- Industry and government reports on digital transformation, particularly the need for omnichannel retail (the use of one or more digital channels, such as mobile, to complement a customer's online or offline transaction)
- Non-profit and government reports on literacy, learning, social inclusion, health, and other public benefits.

We also looked at the People's Network project of 2000, conceived to provide online access in libraries, as a precedent for the investment we propose in this report. The People's Network was a government-funded library investment, delivered within timescale and budget, with broad positive impact (Big Lottery Fund Research 2004). In an era where access to the Internet was creating a social divide, the People's Network started many on the journey towards digital inclusion. Fifteen years later, libraries are well positioned to support the next leg of this journey by helping users in need overcome new cognitive, social-capital, participation and attention divides that now impede literacy, learning and community.

For a list of past reports and summaries of their insights, please see Appendix I. For questions about the data, please contact the authors of this report.

2.4.3 Interviewed stakeholders from libraries, nonprofits, government, and the private sector

We consulted stakeholders to ensure the digital strategy that works for users also works with:

- Library staff workflows
- Library budgets
- Partner and funder needs and priorities

We interviewed:

- Library management and staff teams at 6 library site visits
- Heads of library services and senior staff at 20+ authorities
- National partners representing 5 nonprofits
- Publishers and publisher organisations from 5 entities
- Vendors of library IT and digital content from 5 companies
- Public leaders from 5+ organisations or offices

- Consultants and professional services firms who work with libraries
- UK experts in marketing and digital development

To clarify the cost and use of digital services in libraries, we surveyed heads of library services and IT managers, with 38 responding libraries.

For a list of those interviewed, please see Appendix II.

2.5 Overview of the remainder of this report

This report is divided into six further sections that lay out findings and recommendations -- both strategic and technical -- for bringing England's libraries into the digital age. This is followed by a cost-benefit analysis for implementing those recommendations, and finally, our concluding reflections on the cost of failing to act soon.

In **Findings**, we lay out the challenges that surfaced during our interviews, literature review, and data analysis. Digital disruption makes users:

- Unable to find and use library resources online, and therefore offline, and
- Less incentivised to take advantage of them.

Meanwhile, libraries have been unable to respond because of they lack the right IT.

- Libraries and partners are unable to collaborate
- Library IT ecosystems are unable to evolve without a concerted intervention.

Alarming trends in library use force us to reconsider how libraries must meet the demands of a changing user base. And the inability to respond so far forces reconsideration of the technology required to improve operations, innovate new services, and partner at a national scale.

In **Recommendations: Strategies**, we lay out a vision for a library system powered by a standards-based digital platform.

Recommendations include:

- For users:

- Using digital tools to reactivate underutilised spaces offline
- Leveraging a standards-based platform to create new spaces online
- Inviting community co-production by making use of volunteers and partner organisations
- Providing tools that will allow users and staff to create a much bigger profile for libraries online
- For libraries and partners:
 - Implementing digital tools to support shared content, practices, reporting tools, partnerships and applications
- For library IT
 - Using middleware today to migrate towards a standards-based ecosystem that fosters interoperability and innovation
 - Establishing an agency to oversee the development of the standards-based modular ecosystem in collaboration with partners and vendors,
 - We also share recommendations for the near-term procurement process.

In **Recommendations: Tactics**, we explore the more specific technical requirements for the standards-based digital platform. Recommendations include:

- Software principles of design:
 - Guiding insights to practically translate library strategies into achievable code, including:
 - Leaving local audiences and local inventory in place, yet building middleware to connect and normalise them as a common foundation;
 - Building national applications with shared investment on top of this common foundation;
 - Sharing these applications back into local environments where they can benefit from national resources and local configuration
- Architecture and components:
 - Parts of the modular ecosystem that must be built for libraries to move forward
 - Key parts include the middleware, data aggregation and normalisation, and modules
- Project and ecosystem leadership:
 - Appropriate leadership and project phasing to complete the project and sustain future innovation.

In the **Conclusion**, we review the costs to implement the standards-based digital platform and the benefits it will yield if executed properly:

- Costs are on the order of £20M over three years
- Benefits are on the order of £2M cashable savings, £6M in staff time liberated for higher-value tasks, and £100M+ in other kinds of benefits in increased outputs and value to other partners.

We end by considering **The Costs of Standing Still**. England's libraries face great risk if those with responsibility for libraries fail to act, or if they choose to make improvements only at the margins. If the libraries are to restore the vibrancy and community-centered impact they once had, decisions -- and investments -- must be made now.

Findings

3 Library Users - Digital disruption has changed both what users can find at libraries and what they need from libraries

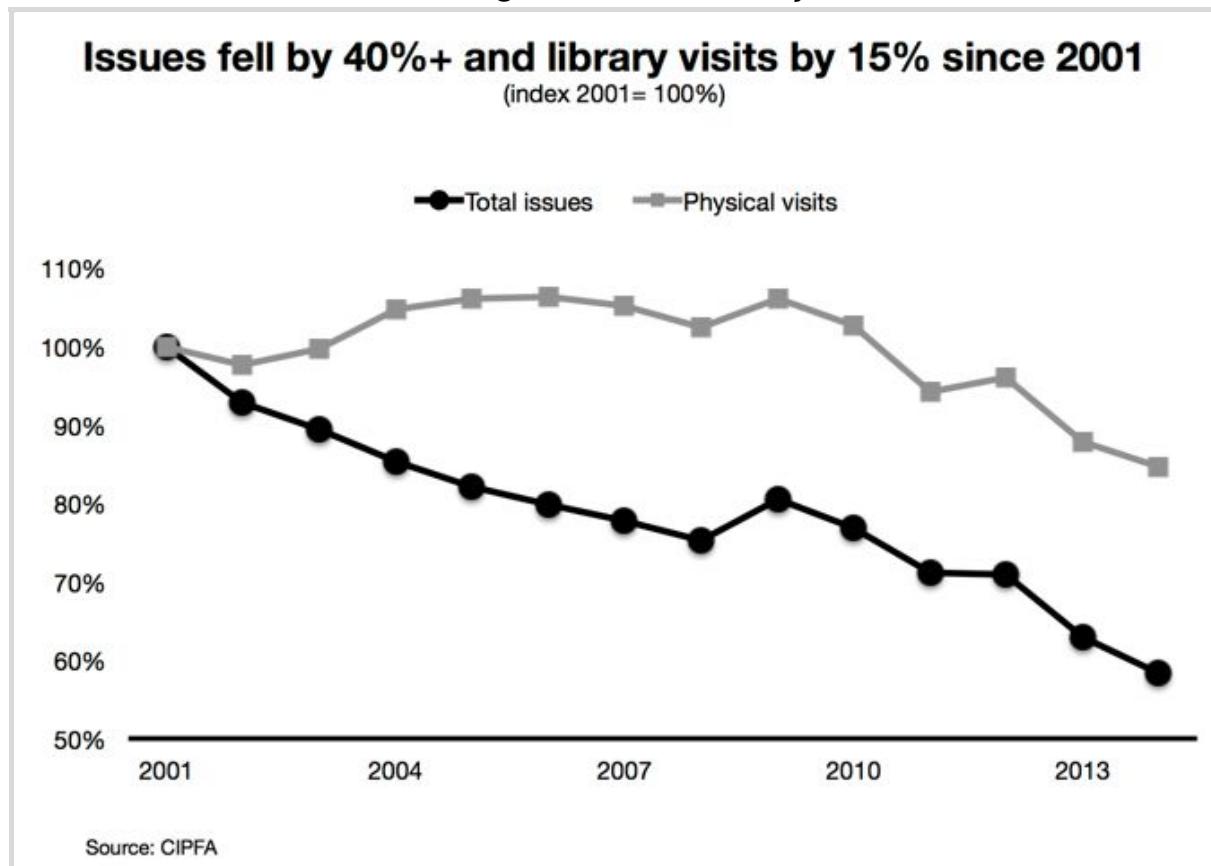
Digital disruption in society at large, more than any other factor examined, has changed:

- How people access books (they start online)
- What they value and need most to become literate, learn, and engaged in their communities (they need not just access to books but social context in which to unlock the value of books), and
- The library's role in serving them.

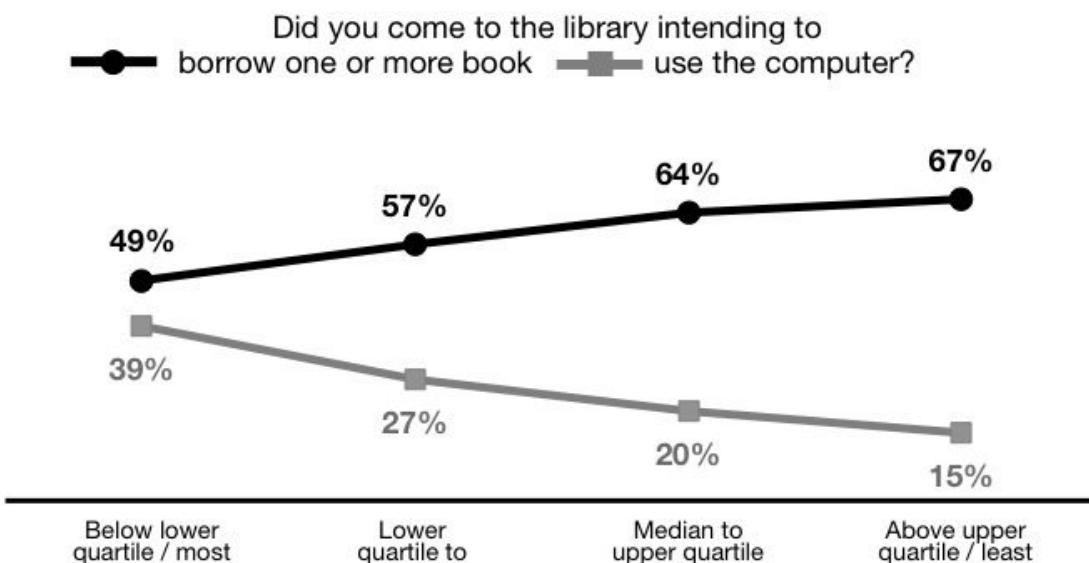
3.1 The use of libraries is still massive, but declining

A decline in borrowing can be explained neither by library budgets nor changes in consumer appetites for books. The best explanation is the shift of people to discovering books online -- and then acquiring them there. But the library has not shifted with the people. Because of inadequate IT infrastructure, the library is not easy to find or use online, nor (as yet) uniquely valuable online.

Issues have fallen more than other services (e.g. CIPFA 1998-2014). In fact, each visit to the library can no longer be explained by a book issue -- so readers are leaving while others stay.



Borrowing books is the top activity for all incomes



Source: CIPFA Public Library Users Survey: Deprivation Report 2013

This poses risk to losing all categories of customers, all of whom cite books as their top reason for visiting.

3.2 Explaining the decline in use: discarded hypotheses

3.2.1 Factors endogenous to libraries such as budgets do not explain the decline in use

Several suspected explanations are not the primary cause, though they may be contributing causes.

An examination of factors within libraries showed that these factors did not track consistently downward (or inversely) with issues across the last fifteen years (all data for England's libraries, from CIPFA 2000-2014):

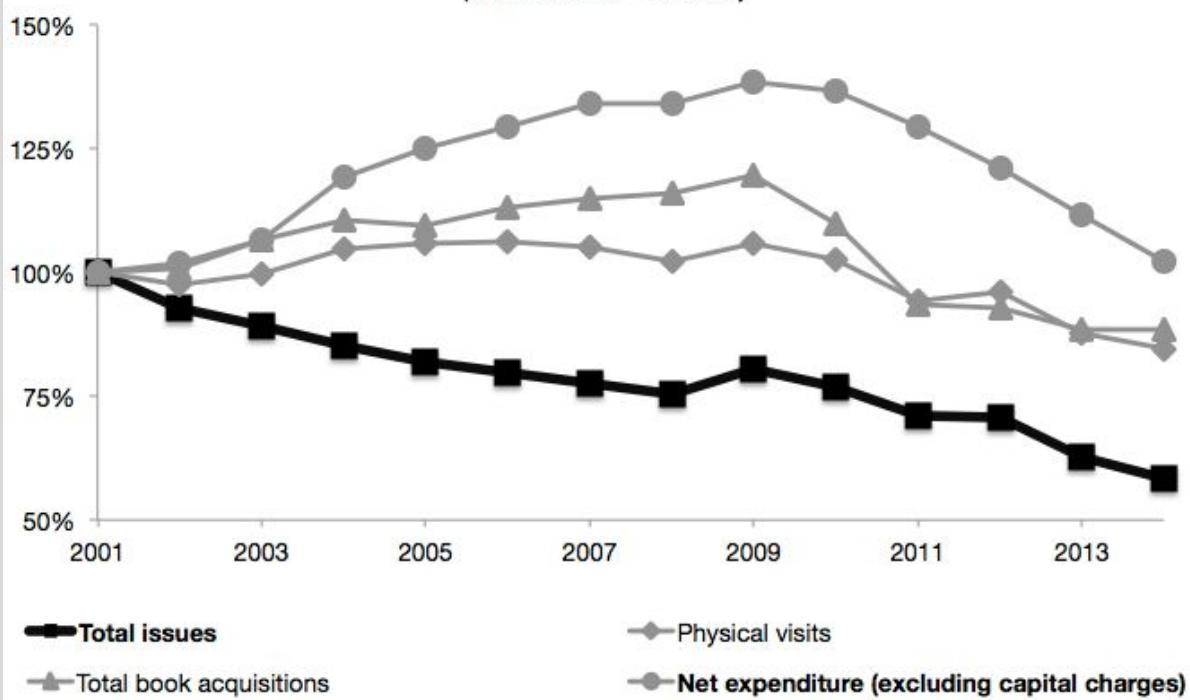
- Library expenditures have not declined for all years: on an inflation-adjusted and per-capita basis, operating expenditures were 15% higher in 2010 than in 2000, even as issues continued to decline.

- Service point (branch) locations have not declined on an absolute basis for all years, and on a per-capita basis they have decreased less dramatically than issues: in fact, there were more service points open in England in 2010 than in 2000.
- Staff members in post have not declined for all years: between 2003 and 2007, staff FTEs increased on a per-capita basis (so also on an absolute basis), even as issues continued to decline.
- While book stock has declined for all years, it appears that issues prompted library staff to decrease book stock rather than the other way around. Furthermore, stock turns¹⁵ have declined 33% in 15 years, suggesting that the number of items on the shelf is not the only driver of decreased issues. (In addition, other factors correlate more strongly to issue decline, as we will see.)
- Finally, new acquisitions, which tend to be the stock most frequently circulated, have not declined in number for all years: in fact, on a per capita basis, acquisitions were up by 10% in 2010 compared to 2000, even as issues continued to decline.

¹⁵ Stock turns are the number of times an item is borrowed in a given period.

Expenditures and book acquisitions rise and fall, while issues decline

(index 2001 = 100%)

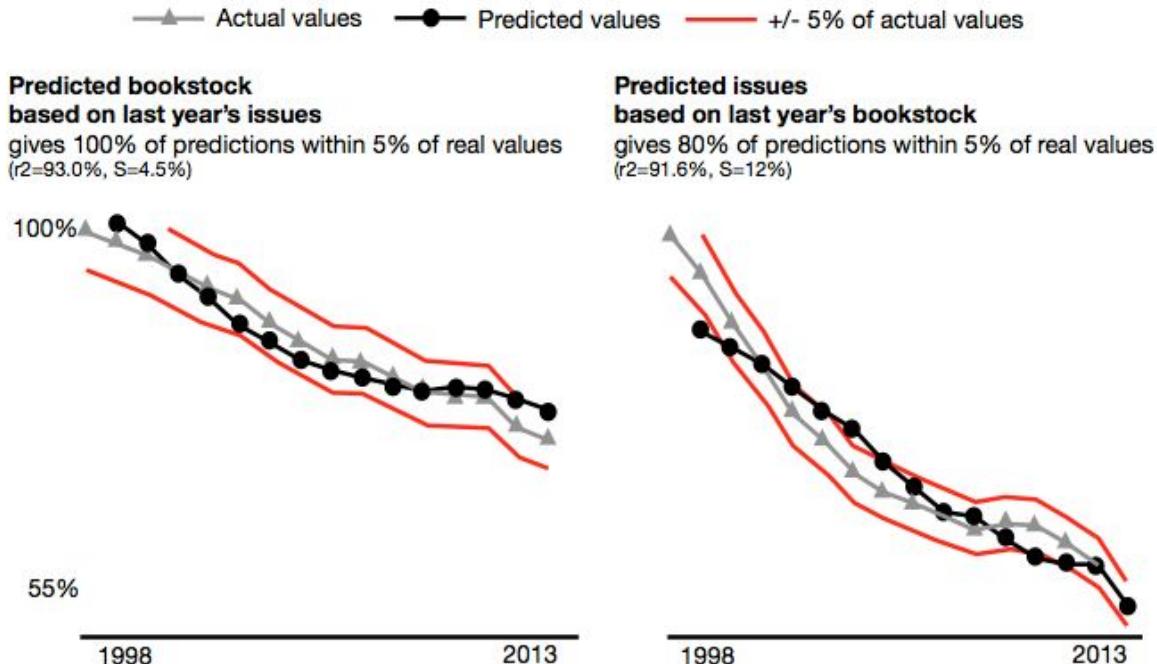


Even decline in book stocks cannot explain the decline in issues completely.

- While some have correctly noted that book stocks and issues both decline with high correlation...
- ...When using one variable to predict the other over time, the data is most consistent with the story that issues declined in year one and staff then reduced book stocks in the following year.

Issue declines appear to drive bookstock declines more strongly than the other way around

(index 1998 = 100%)



Source: analysis of CIPFA data

While this may contribute to a downward spiral, where book stock reductions in turn possibly result in greater issue decline (Grindlay and Morris 2004), the primary trendsetter seems to be issue decline. And the decline in issues in turn seems even more tightly associated with what we believe is the first driver: the rise of the Internet and corresponding digital disruption, and the failure of libraries to respond to this challenge.

3.2.2 Certain exogenous factors such as the demand for books also fail to explain the decline in use

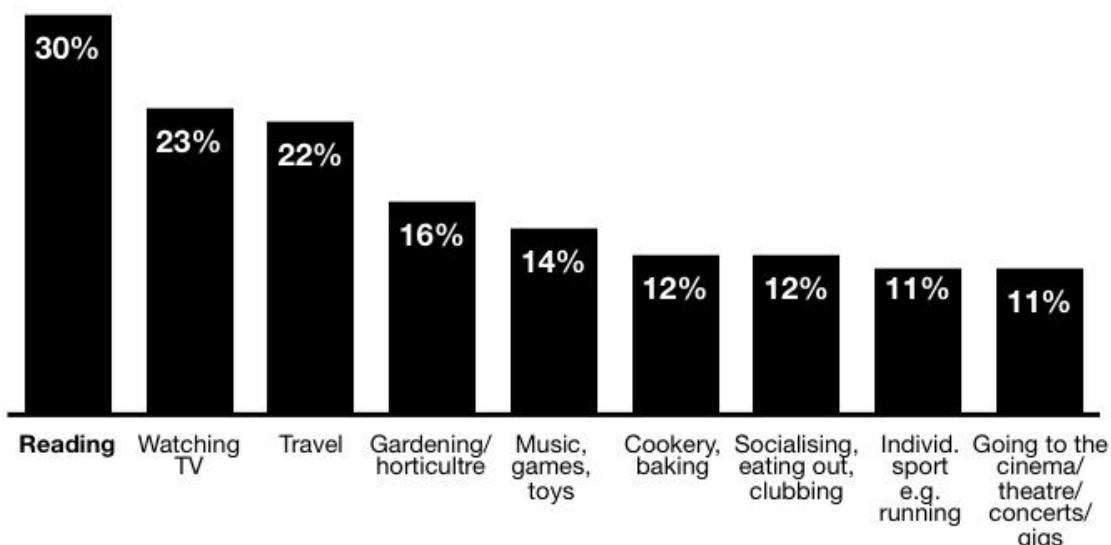
We looked at factors outside of libraries to explain the decline in use.

- Book purchases by consumers have not declined (Nielsen Bookscan 2014), and in fact Amazon has risen as a worldwide company on the strength of interest in print books.

- Reading books remains a top hobby in the UK and a top draw (as shown above) for those still going to libraries (Santander 2013).
- Median household income -- which might influence whether a person might prefer to buy or borrow a book -- grew from 2000 to 2010 before slipping thereafter (UK ONS), even as issues declined across the whole period.

Reading is the top hobby in the UK

(2013)



Source: Santander 2013

3.3 Digital disruption is the best fit for explaining decline in the use of libraries

Our research indicates that digital disruption is a better fit than the factors discussed above for explaining the decline in library use. Authors of previous reports on the library sector, including the Department for Culture Media and Sport, make the same conclusion.

“Digital disruption” is a term used to describe the seismic impact of new digital technologies on the value proposition of existing goods and services -- especially since the widespread adoption of the Internet. Libraries, like nearly every other sector, have been profoundly affected.

3.3.1 Channel Shift - digital disruption has changed how people find and use content

People across all income levels are rushing online (UK ONS 2014).

- The number of households with access to the Internet has increased ten-fold, from 9% to 84% (1998-2014).
- Only 3.6% of households cite cost as barrier to web access (2014).
- The percentage of adults who go online daily has more than doubled, from 35% to 76% (2006-14).
- The percentage of adults using mobile phones for Internet has doubled, from 24% to 58% (2010-14).

Given access to the Internet, users are finding and obtaining books differently than they did before: online.

- Books became the #1 item bought online in the UK in 2008 (BBC).
- Books bought online doubled from 21% to 48% of all books bought between 2009 and 2013 (Booksellers Association 2015, quoting Books & Consumers).
- Ebooks rose from 0% of books sold to roughly 25% of the market in a few years after the Kindle's 2009 UK launch (Andrews 2009; Nielsen Books & Consumers 2014).
- 80%+ of consumers go online before going to buy something in person (Rueter 2012).

This rush online is the best predictor of decline in issues -- more than library funding, library bookstock levels, personal income, or any other variable tested.

What factor from each year best predicts each following year's issues?

Factor	Closeness of fit between predicted and actual issues	
	Coefficient of determ. (R^2)	Standard error (S)
Operating expenditures	0.002	0.135
Book acquisitions	0.005	0.134
Capital expenditures	0.108	0.127
Staff FTEs	0.408	0.104
Service points (open 10hrs or more)	0.553	0.090
Visits	0.572	0.088
UK median income*	0.651	0.080
Book stock	0.886	0.045
Active borrowers	0.949	0.031
Households with internet access*	0.961	0.027

Source: Analysis of library factors from CIPFA data, and outside factors (*) from UK ONS data

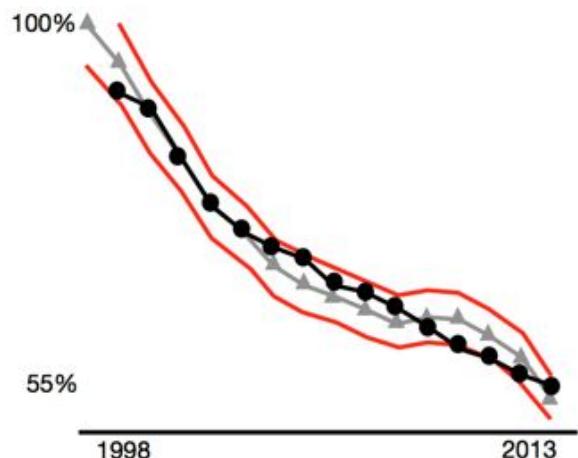
As an example, the following graphs compare on the one hand what each year's household Internet access rate predicts for the next year's issues, and on the other what each year's bookstock predicts for the next year's issues, and on the other hand what. The former (lefthand graph) is a better fit.

Issues are more accurately predicted by household internet access than by bookstock

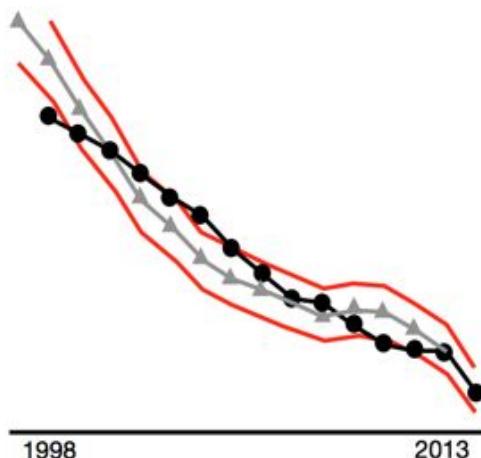
(index 1998 = 100%)

—▲— Actual issues —●— Predicted issues —— +/− 5% of actual values

Predicted issues based on last year's household internet access gives 100% of predictions within 5% of real values ($r^2=96.5\%$, $S=0.2\%$)



Predicted issues based on last year's bookstock gives 80% of predictions within 5% of real values ($r^2=91.6\%$, $S=12\%$)



Source: analysis of UK ONS and CIPFA data

3.3.2 Needs Shift - digital disruption has changed the needs that people can uniquely address at the library

Digital production, digital retail and digital fulfillment afford new convenience and cheaper prices, reducing the relative value of “free” library content. In our interviews with lapsed library users and non library users, those who are readers cited the fact that “books are cheap” as their primary reason for not using the library.

Falling prices and rising wages mean that access to books is no longer so expensive as to drive people to the library:

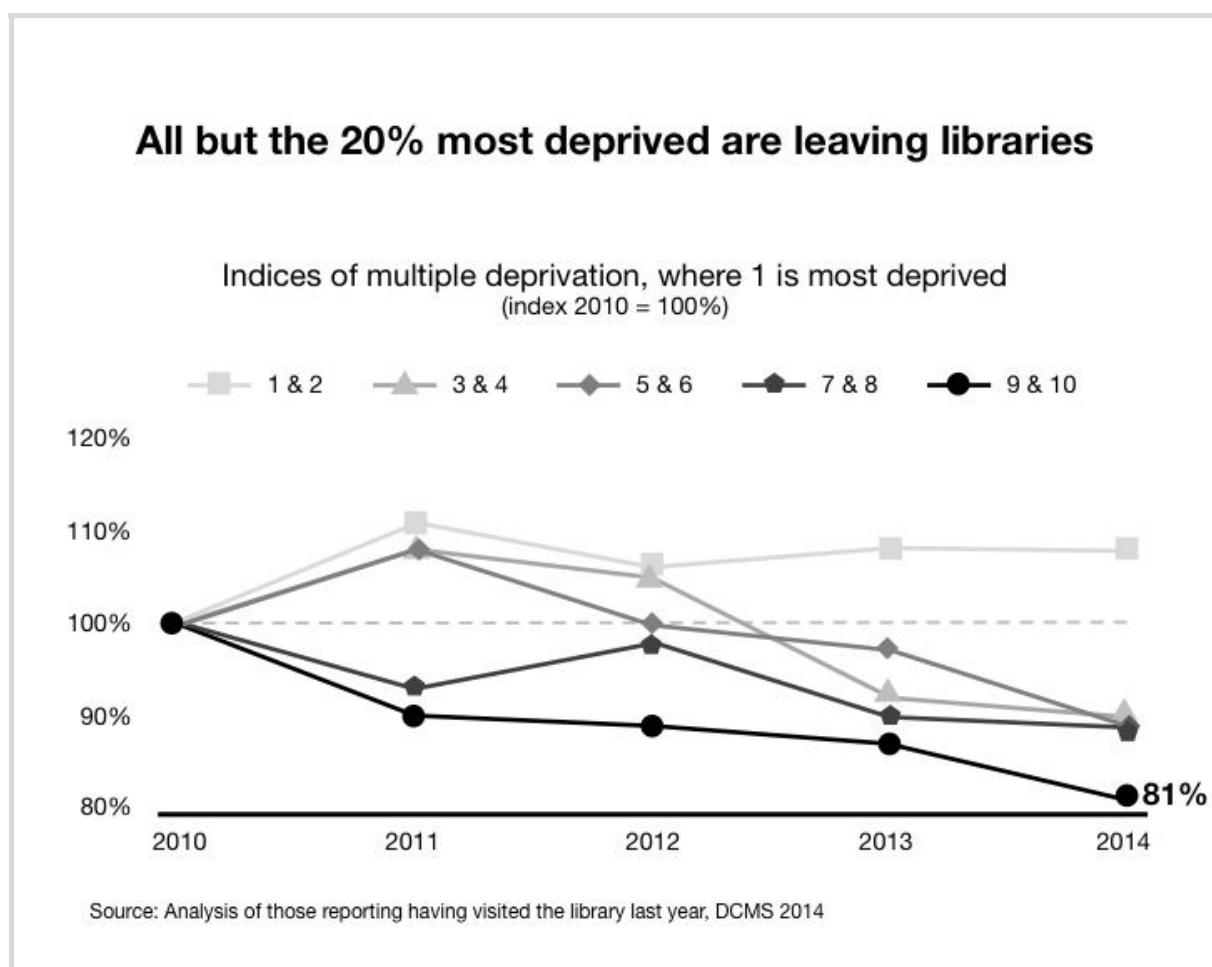
- When founded in the 1850s, the price of a new edition of a popular Dickens title (not serialised, and with no advertising) was roughly two and a half weeks of the average labourer’s salary.
- Today, even a newly released hardcover costs just one or two

hours of work at minimum wage.

Indeed, the dramatic reduction in effective price (also enabled by the end of the Net Book Agreement in 1997, as described by Fishwick 2008), has prompted disbelief among longtime industry watchers:

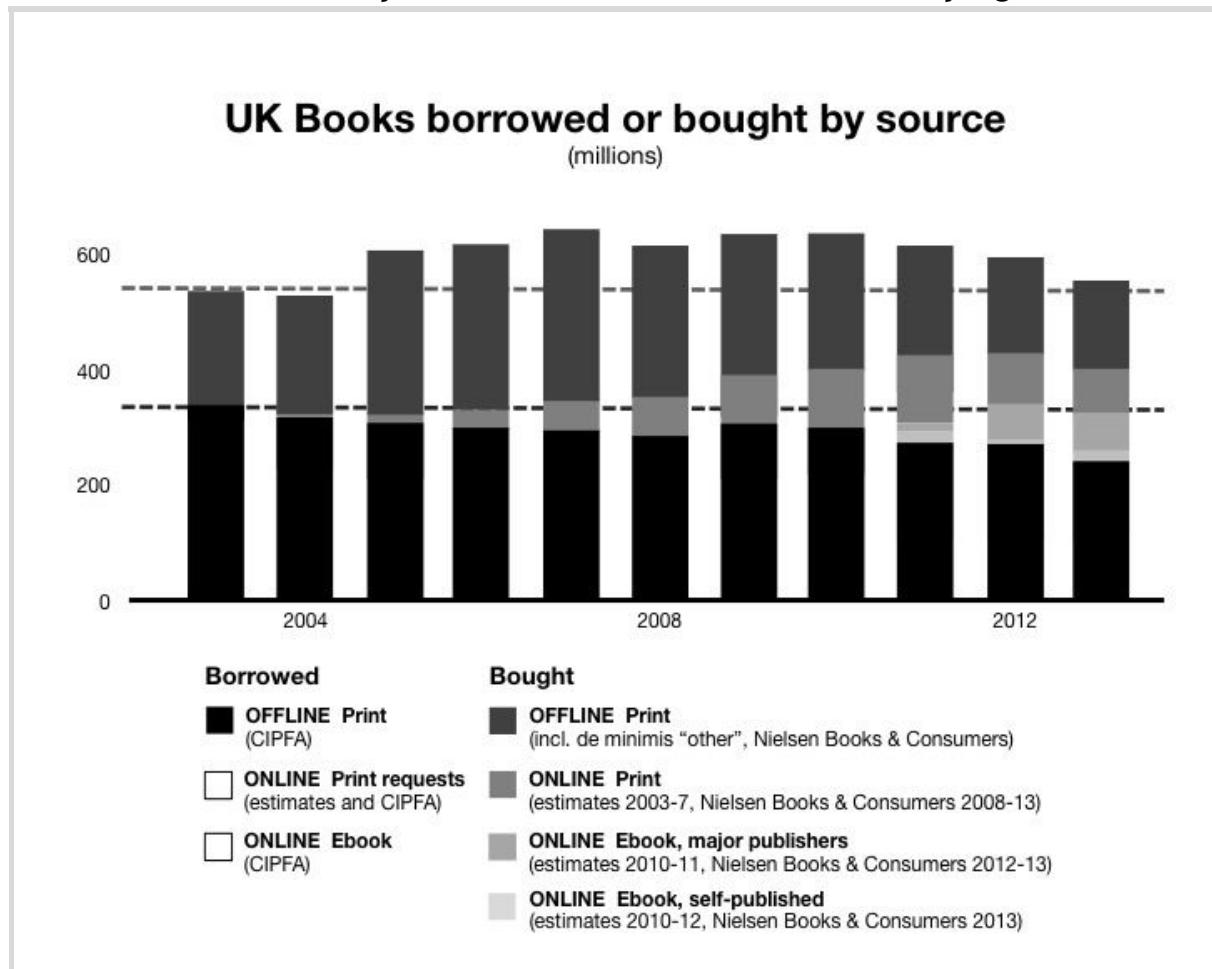
- Author Tiffany Reisz said that “paying the writer enough to keep her from starving to death is the reason why not every book can be 20p or the more common 99 cents in America’s Amazon Kindle store” (Flood 2013).
- The charts editor of *Bookseller* has said that pricing is now “ridiculously cheap” online (Flood 2013).

As a result, there is a growing gap in public library use today between those who *need* the public library (cannot afford books) and those who *choose* to use it (those who can afford books, which is 80%+ of the population):



To be clear, books remain the main draw for people who do go to the library -- others have simply left) -- and books remain a potential cornerstone of a new strategy for libraries. But just handing out books is no longer enough.

The result of the changing patterns of discovery of books (whether print or ebooks) and the ability to then buy them cheaply has turned offline customers into omnichannel customers, and shifted customers from borrowing to buying. This chart shows a stable industry overall, but a substitution away from libraries towards online buying.



It is worth noting that this shift from accessing books at libraries to buying them is already happening for access to computers, as well. The declining price of technology (cheap smart phones and cheap laptops) means that an ever-smaller number of people are compelled by necessity to access it at the library.

3.4 Libraries have not responded to the channel shift: they remain both hard to find and hard to use online

Libraries are not visible online, even to those just looking to find their locations. Overall, IT expenditures (meaning software and online websites, not computer kit) have remained steady or declined for 60% of libraries surveyed .

3.4.1 Libraries are hard to find online

People find what they're looking for offline by going online first, and today's library websites are too hard to find. Where they could be the beginning of a journey to a branch, instead they are falling off the mental map of relevance for the majority of people whose opinions are shaped by what they see online -- including influential policy makers.

Because few people find library websites, few people use them to find branches or books:

- Libraries rate themselves poorly for visibility of resources online, giving themselves a 1.9 / 5 (Reading Agency 2011);
- Less than 50% of library customers interviewed were aware library websites existed;
- The number for non-customers would be smaller still.

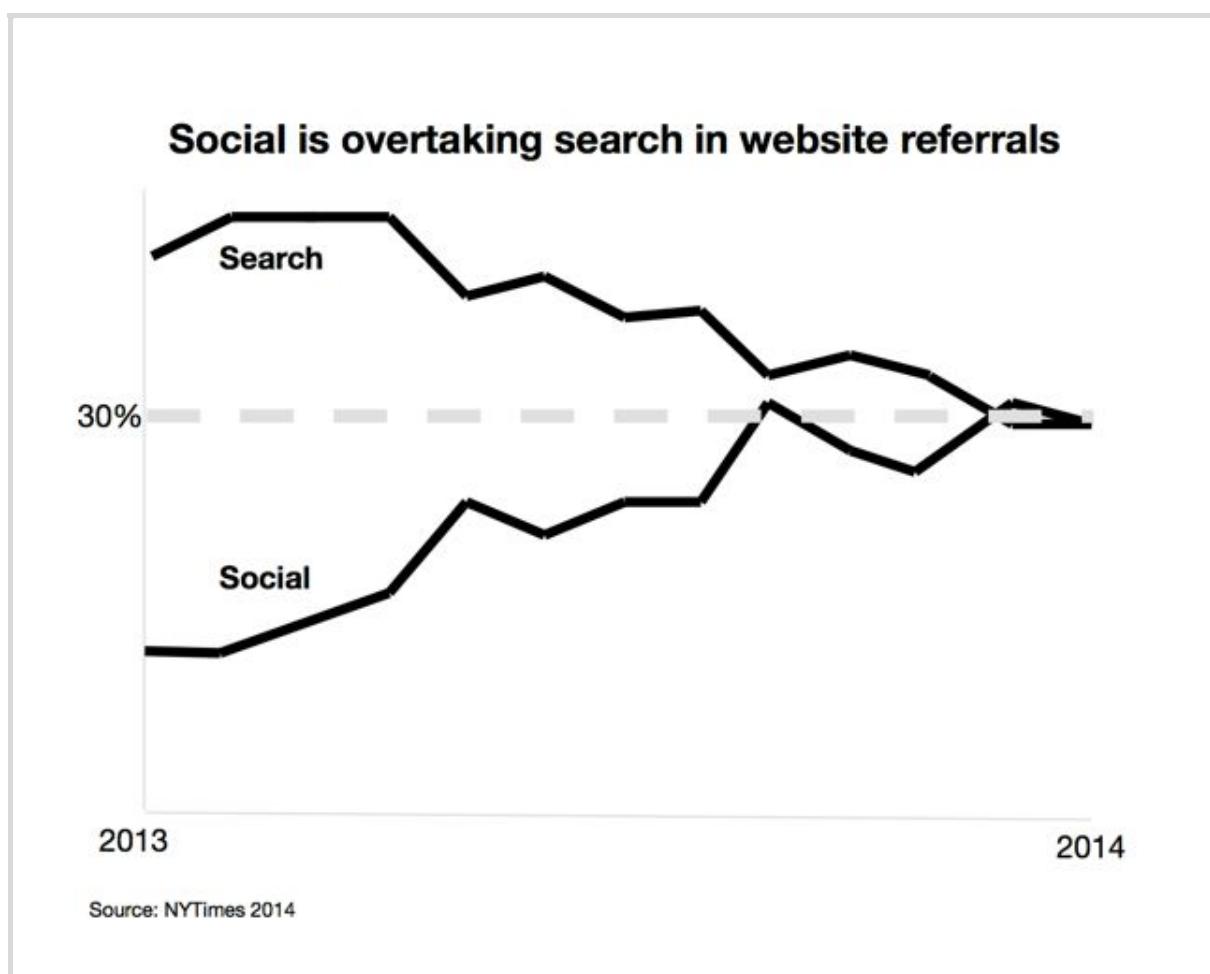
The Carnegie Trust (Macdonald 2012) reported that many users said placing requests from home "would make [them] use the library more," more than would coffee sales or longer opening hours. Despite this, they were unaware that this service was already available.

The reason why few people find library sites is that libraries fail to follow widely used good practices. Our review of 50 English library web services revealed that:

- Search-engine optimisation of the library's services is poor -- they rarely if ever appear in a search for reviews, local access or discussion of any book.

- Because library websites are buried in council websites, they are difficult to find and navigate.
- Social referrals into library websites are low because they do not have social tools integrated with websites for users to effectively create and share content, and often lack static URLs.
- There is no marketing of the library offering as a product in itself -- for instance, no way to share a book record from the library to blogs across the web, so that those blogs might point back to the library site.

We discuss the causes and strategies to address each of these deficits in Section 7.



Few libraries attempt to answer the search-engine optimisation problem. And while some libraries attempt to solve for the social referral and online marketing problems by creating separate Twitter or Facebook accounts, this does not solve two core challenges:

- The division of these channels from the context of the library catalogue diminishes the number of current library users who will see that social activity and share into it and out from it to their networks;
- The inability to share specific content from the library, and user-generated content across the web, makes it less likely that individuals will want to share and then will be able to “convert” a person who sees a tweet or post into a new library user, simply because there is nothing enticing like a self-made list of books to share out and then click back to the library to view.

This returns us to the point that marketing online today is about sharing the product, not telling about the product. Libraries have long done this offline -- for instance displaying books on tables in the library, or more dramatically taking books across the city in mobile vans partly as a way to advertise the branches -- yet they have not begun doing so online, as they could by similarly displaying books on their sites and creating links from books across the web back to library websites.

The consequence, we believe, is that libraries are falling out of view among both would-be customers and major decision-makers. Library staff interviewed were frustrated that many people, community leaders, and national decision-makers were unaware of the depth and breadth of services offered by the library. National library reports have also found this to be true:

- *Envisioning the Future* found “long-standing frustrations about the ineffectiveness of library marketing and promotion to the public” and that, “despite the public’s special affection for libraries, stakeholders saw too few examples of effective promotion and communication” (ACE 2012, 15).
- *The Independent Library Report for England* found that “not enough decision makers at national or local level appear sufficiently aware of the remarkable and vital value that a good library service can offer modern communities of every size and colour” (UK DCMS 2014, 4).

Other organisations weathering digital disruption have invested more online. In the UK, a government report advising High Street retailers urged their use of websites so that their brick-and-mortar establishments could still be “on the map” of even local buyers (UK Dep. for Business Innovation and Skills 2013). Organisations of all

kinds, serving people of all kinds, have sought to move spending to digital channels. Libraries must follow suit.¹⁶

3.4.2 Libraries are hard to use online. They do not match the basic convenience of other sites in delivering current offers.

People use websites today because they are convenient and enjoyable, and library websites are neither a smooth pathway to an offline resource nor an attractive destination in themselves.

Using a library website is difficult and unenjoyable:

- Less than 30% of library customers use library websites, including many who know about them yet cite their difficulty to use or lack of quality.
- The number for non-customers would likely approach 0% (an assumption).

The difficulty of using library websites comes from things that especially affect low-literacy and low-skilled users at the core of the library target demographic, such as:

- Remembering 14-digit barcodes;
- Search that requires special inputs rather than natural language;
- Pages that lack contemporary conventions of modern websites like icons and button types;
- Fragmentation of content (such as separate ebook and print catalogues) across sites with different branding, styles, and functional pathways.

In interviews with staff and directly with low-literacy patrons, and in observations, we found that low-literacy patrons in library branches were often able to navigate YouTube -- but not the library catalogue. For instance,

one construction worker interviewed in Islington admitted openly to not having sufficient literacy to read books from the library, but was stopping by to use Google Maps to plot out his course through town to buy new video games. The library could be doing more to capture his attention when he logs on and to usher him through to opportunities to gain greater literacy -- in a passive way, or in a more decisive and active way.

¹⁶ See strategies in Section 7.

The difficulty of use is even worse on mobile, which affects both low-income and young demographics tremendously:

- Low-income people increasingly rely on mobile phones for day-to-day Internet tasks, as they may lack desktops or laptops (see US-based reports on the “Smartphone-dependent population”, e.g. Smith 2015).
- “Nearly 55% of millennials say a poor mobile app experience would make them less likely to use a company’s products or services” (*Bloomberg* 2015).

For low-income users who may have a smartphone but not a desktop, and who may be literate but have much lower literacy in English -- a notable portion of those we spoke with in our interviews in library -- the lack of a translated catalogue can be a barrier. For instance, one Russian-speaking low-level service worker came to the Islington’s main library to download Russian documents from her email account and print them out, and said in broken English that while she was a passionate reader of Russian literature she relied on her mother to send her books and found the library hard to use and lacking in books in her language. Better IT could enable easier translations for web pages and help highlight applicable resources for that user base.

The mobile phone experience is bad both for mobile apps (important for retaining heavy users) and for mobile browsers (important for gaining new users, who are less likely to download apps):

- Mobile apps used by libraries may reformat for a different screen size, yet none fixes underlying problems listed above like search relevance, or fragmentation of content like ebooks and print books across different programs or screens.
- Web pages used by libraries are not usually responsive, particularly not the catalogue, so they do not work well on a phone.

Aside from failing the absolute basics, libraries fail to meet contemporary standards of online services, and this especially affects people more experienced online who might support libraries or volunteer for them, such as:

- Browsing and exploring functionality they find and enjoy on sites like Amazon,
- User recommendations,

- Creative learning activities or group activities built around the books.

This lack of user-friendliness drives users elsewhere. A general finding that likely applies to libraries as well is this:

- 89% of consumers surveyed began doing business with a competitor following a poor customer experience (Salyer 2014)

In the words of an Islington woman in her late 50s,

“Sometimes I go to Amazon to check on the specific name of a title, or maybe to see what else they’re recommending next for a book I enjoyed...and then to be honest, sometimes, once I’m there, I just decide to just buy it there if it’s not too expensive.”

Another man’s comments also stand out. He did not use the public library, yet his wife and daughters did. He later emailed in follow-up:

“When I got home I checked with my family and none of them were aware that [our local, large urban library] was on-line. Having now logged on to their site I can see why they need your help!”

3.5 Libraries have not responded to the shift in needs: they are failing to uniquely serve online both those who need the library and those who would choose it in place of commercial sites because of the library’s unique assets

Libraries have not responded to the shift in value and needs. Free access to books is no longer the greatest barrier to literacy, learning, and community participation. Libraries are not emphasising the opportunity to engage others in unlocking the value books hold -- online and offline.

Public libraries aim to help people become literate, learn, and so participate in economic and civic life. However, as discussed above,

digital disruption has reduced the barrier that mere access to books poses to this aim. With the price of books reduced, the relative value of borrowing books is also lower. The Department for Culture, Media, and Sport summarises this change (2009):

“Reading is still a treasured national pastime and the most widely practised leisure pursuit – 64% of adults read for pleasure. But printed books are cheaper and more accessible than ever and retail models like Amazon make book buying much simpler for the consumer. [...] The library service is diversifying its service in response to this transformation in demand. Whilst access to a wide range of up to date reading material is still the primary reason given for engagement with libraries, on its own this is no longer enough.” (4)

Yet digital disruption has also raised new barriers to literacy and learning. The challenges of “information overload” and “distraction” are only becoming harder for those who need the library; and the “decision anxiety” of choosing what to read next amid a sea of possibilities (as well as “distraction”) is only becoming more unsatisfying for those who might choose the library. Engagement in communities around books can help solve both issues. Yet libraries have not shifted their digital presence to serve these new needs effectively.

3.5.1 Libraries are failing to serve those who choose the library - a vital constituency

Free borrowing is no longer a compelling draw for those who choose the library, and libraries are not distinguishing themselves by providing a richer experience.

For the transaction of getting a book, commercial sites are now superior: they are convenient and cheap. Libraries are by contrast hard to find online (inconvenient) and hard to use online (therefore costly in time and effort). It is unlikely that libraries will be able to compete in this area, and it is not core to the public purpose libraries serve to subsidise this part of the transaction.

But libraries *could* differentiate themselves from commercial sites for the experience before, during, after, and around the reading of a book. Unfortunately, they do not. No site now provides a rich experience

around books that adds to and captures the value of that book for individuals, culture, and society. The library does not provide:

- Ability to give back to the library - creating lists or guides, tags and metadata, mentoring
- Recommendations from the library community
- Ability to share enthusiasms with others
- Ability to connect with others around reading or learning goals
- Ability to plan meet-ups or plan to attend an event at the library.

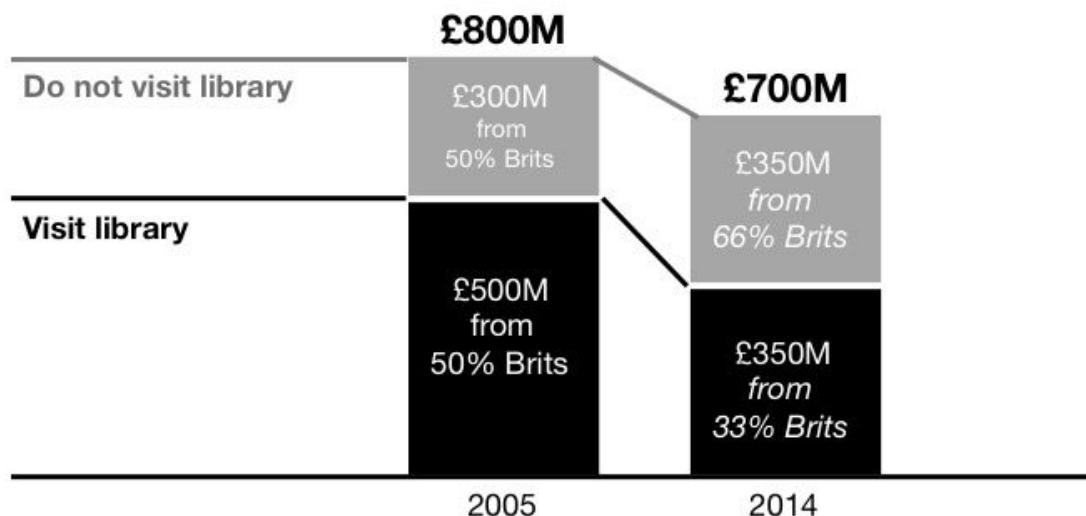
As a result of failing to engage those who choose the library, this group is leaving the library fastest (see chart above).

There are two reasons this matters:

- First, they support the libraries both politically and financially;
- Second, they support the libraries through the environment and services they help co-produce.

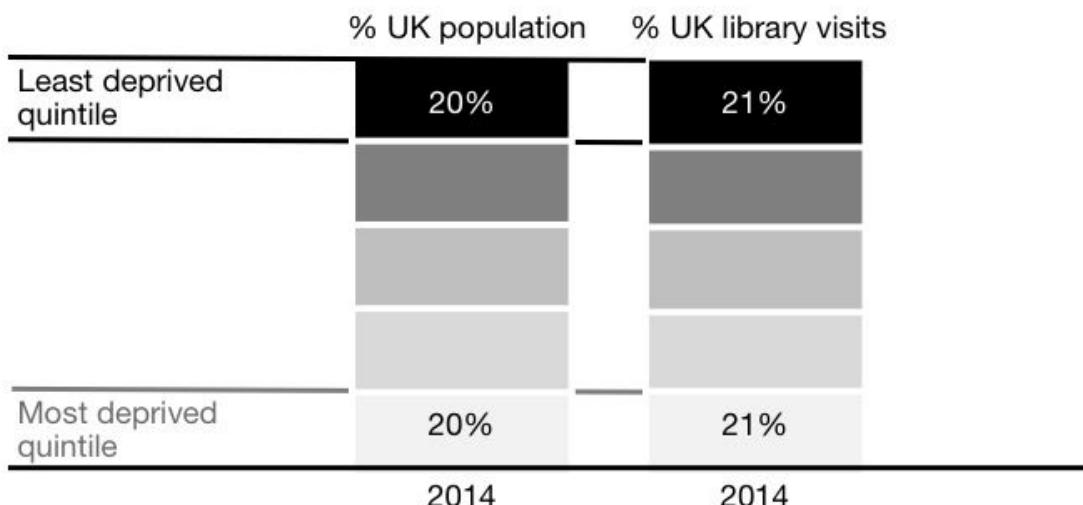
Politically and financially, as William Sieghart has said, “Socio-economic groups A and B don't visit libraries. But because they run the country and the media and much else, that means they think that libraries are a thing of the past” (Farrington 2015).

Decline in library use leads to estimated gap in “willingness to pay” for services



In terms of the environment and services they help create, the presence of users across all income segments reduces stigma and creates opportunities for sharing between people who have skills and connections and those who do not (for instance, see Smith 2012 for an account by the author Zadie Smith). Even with the large declines in use by all but the 20% most deprived, the remaining users are still drawn from all income segments. But this diversity is at risk.

Library visits still distributed evenly across income groups



Source: DCMS 2014

3.5.2 Libraries are failing to serve those who need them

For those who need the library, new barriers to literacy, learning, and community now include (e.g. Hargittai 2002):

- Motivation to read books and learn;
- Capacity to read books and learn;
- Role models and peers who read books;
- Encouragement and support for reading and understanding books.

The chart that follows outlines new divides created in our age of digital abundance: cognitive divides, social capital divides, attention divides, and participation divides. The dissolution of these divides can and should serve all. In both their physical and digital spaces, libraries must stand out as cultural institutions that help communities create and share human capital. As a complement to well-trained staff,

libraries must enlist and serve those who choose the library in order to serve those who need the library.

Digital shifts have created new divides

Divide	Digitally challenged	vs	Digitally enabled	Proposed bridge using library digital
Given digital abundance...				
Cognitive divides	The information overwhelmed		The information empowered	Co-Production, passively and actively
“The challenge becomes, not finding that scarce plant growing in the desert, but finding a specific plant growing in a jungle” Neil Gaiman (2013)	now have too much information to make sense of		with too many options to make a satisfying choice -- often rely on a narrowing set of bestsellers	Community- and staff-led curation for those with low information literacy by those with high information literacy Volunteer matching between high-skilled and low-skilled readers with similar interests

Given digital network dynamics...

Social capital divides	The connection - poor	The connection - rich	New outside connections
Online social networks build on offline ones -- increasing the gap between those who	now have fewer connections relative to others, and are falling further	now find their connections no longer span social class and viewpoint	The collections can act as an “interest-graph” -- an alternative to the “social graph” -- connecting community

know many behind spectra members not
and those around *who* they are
know few (e.g. but *what* they like to
Shirky 2003) read, learn, and talk
about

Given countless novel digital tools to participate...

Participation divides	The silent consumers	vs	The confident contributor s	A more welcoming space
Participation is hard, especially when tools are new and 40%+ of Internet users have been abused online (Dugan 2014)	are not confident online, and it's often related to low socio-economic status (Hargittai 2008)		shape popular conversation and agendas more than others (Sunstein 2001)	The library can use its unique assets to create a uniquely supportive digital space, as no other entity can. The library can foster: <ul style="list-style-type: none"> - <i>more voices</i>, with ~1 in 6 Britons already visiting the library offline (CIPFA), and more <i>diverse voices</i>, with equal distribution of visitors by income (DCMS 2014) - a <i>safer feel</i>: users linked to library cards act more tolerant than users without real-world ID - a <i>more open environment</i>: the threshold to get a library card is lower than to get other IDs - a <i>more supportive</i>

environment, as staff and public funding enable experiences commercial sites cannot
- *generosity*: interviews revealed a desire to be helpful

Given digital proximity to everything...

Attention divides	The distracted	The inspired	Norms and nudging
Old temporal and geographic limits that helped us focus are gone. The apps on our devices exploit this fact (e.g. “How to check if your app is addictive enough to make money” Abel 2014)	"Despite the educational potential of computers, ... their use for education ... is minuscule compared to ... use for pure entertainment" (Richtel 2012)	Even lifelong learners face little barrier starting a course online, but huge challenges in retention (e.g. Farr 2013)	Tools to help users set and keep goals, to find others who share them, and to be encouraged Websites with user interfaces that focus towards goals rather than distraction can become imbued with productivity. Branches already give “dignity and self-respect” and make one feel “I, too, was being productive. Why else would I be there? What a great feeling!” (Reyes-Gavilan 2014)

3.6 Conclusion

The public need for public libraries remains great, but the needs are

shifting. Just as digital technologies have created new abundances, they have also created new scarcities -- like the capacity for attention -- and new challenges. The public library is uniquely positioned to meet these needs, apart from its current lack of digital infrastructure to do so.

4 Library Managers

Stagnant IT stifles response & raises costs

Inadequate digital infrastructure in libraries has made them more expensive to administer, and less responsive to their communities. Weak digital foundations hinder the ability of library managers to increase:

- The visibility of libraries online
- The usability and enjoyment of their online services
- Adoption of the best practices among libraries
- Performance management and cost reduction in both online and on the floor
- Innovation.

4.1 Context: Strong existing library assets, weak library IT

Libraries have unique assets from which to mount a compelling response to these challenges, yet they have been held back by dependence on old IT -- a foundation that cannot easily hold a contemporary service.

4.1.1 Strong existing library assets

The library has assets, described below, that other organisations would like to use, or else develop for themselves. The following chart reviews key library assets and existing challenges. A fuller analysis of these issues additionally shows how digital tools can help reinvigorate (Appendix IV) and leverage (Appendix VI) these assets.

Quality	Quantity (as applicable)
Values Open to all, for all they aspire to	
<ul style="list-style-type: none">● Safe<ul style="list-style-type: none">○ Youth say “parents were happy with them spending time in the library, not only because of its association with education and learning, but also because parents ‘trust’ the library” (ACE 2012, 8)● Open to all<ul style="list-style-type: none">○ 74% say libraries are important to their community (Macdonald 2012)● Free to choose all aspirations<ul style="list-style-type: none">○ Philip Pullman: “The blessed privacy! [...N]o-one else even knows what’s going on in that wonderful space that opens up between reader and book” (quoted in Overbey 2011).● Internally motivated<ul style="list-style-type: none">○ Zadie Smith: “There’s no point in goofing off in a library: you are acutely aware that the only person’s time you’re wasting is your own” (2012).● Not pressured to make purchases (not commercial)● Not judged (not central government, which users seem to suspect would be interested to leap to conclusions about them based on questions or interests)<ul style="list-style-type: none">○ Bob Gann, NHS: “We found the non-judgmental space of libraries uniquely enables people to feel comfortable seeking help.”	

Challenges

- Online websites reflect “transactional” culture and not these richer values (**missing IT** to support richer online experiences that embody these values)

Community

Many, diverse, readers

- Goodwill
 - Pro bono outreach like “Premiere League Reading Stars” is unmatched by competitors
- Diverse
 - Equal use by top 20% of wealth and bottom 20% of wealth (UK DCMS 2014b)
- Readers
 - A person’s reading frequency predicts library use (Macdonald 2012)
- Children, Parents, and Retirees
 - Key and complementary life stages represented
- Large audience online
 - ~4M visit library websites each month
 - <1M visit Waterstones and ~2M visit Goodreads¹⁷
- 1/6 visit to borrow
 - ~8M borrowed last year in England (CIPFA 2014)
- ~18M visited libraries last year in England (UK DCMS 2014b)

Challenges

- Perception that they are increasingly used only by the poor (**missing IT** to enable social sharing that reveals to the wider web the broader base of library users and gives reasons to return to the library)

- Indeed, trends show diversity of income is declining (DCMS 2014b)

Collections

Tell us about the world, and the world about us

¹⁷ Both numbers based on SimilarWeb data.

- Can be part of a larger activity
 - Learning
 - Self-help
 - Exploration
- Can lead to connections
 - Excuse to meet people
 - Relevance of services
- Free access and desired serendipity
 - Free means lower penalty for bad choice
 - “Let’s see what they have about...”
 - Greater willingness to wait for exact match
- Children’s Books
 - Huge, persistent demand
 - Brings young parents of all incomes into library

Challenges

- Difficulty to maintain depth and breadth of collections now discoverable online (**missing IT** to support data for print and ebook collection development, and user experiences to improve curation and discovery)

Buildings

Local, neutral, safe places for meeting (though too many service points becomes burdensome)

- Embedded in local community fabric
- Often in places most central to life of community
- 3,000+ service points (CIPFA 2014)
- As many as Costa Coffee (Wood and Bowers 2011)

Challenges

- Not as attractive on exterior or interior as commercial sites -- and hard to find (**missing IT** to support online discovery of locations, community events calendars, reservation abilities, and other ways to show what takes place inside and motivate visits)

Staff

Helpful and at their best as “community impresarios”

- Patient and people-oriented
- 16,000 full-time equivalent staff in England (CIPFA 2014)
- Also 32,000 volunteers in part-time work (CIPFA 2014)

Challenges

- Increasingly seen as “stern” or “unapproachable” by library users, and as less professional with recommendations (**missing IT** to provide staff profiles to humanise them online before patrons meet them offline, and to allow them to showcase and share expertise)
- Often feel overwhelmed by range and complexity of questions asked (**missing IT** to provide community co-production so staff can connect users to others who know the answer, rather than always having to provide it themselves)

Library card and identity

Easy to get, holds people accountable, lets people explore -- even kids

- Civic and Universal
 - No commercial use
 - No cost barrier
 - Independent
 - Shielded from probing government use
 - Can maintain privacy
 - Accountable
 - Not anonymous
 - Tied to a real name
 - Checked by staff
 - Anonymity of other online IDs like emails linked with rise in abuse online (Dugan 2014)
 - Exploratory
- ~30M estimated library card holders in England (based on US ratios & CIPFA data)
 - v. ~20M credit card holders (UK Cards Association 2014)

- Can be pseudonymous
- Can hide from others as barcode or username
- Pseudonymity linked with moving beyond stereotypes and stigma (Kaste 2011)
- Linked between parent and child
 - In-branch process to monitor use of material

Challenges

- Can require several steps to obtain, not nationally scaled and not accepted elsewhere, so value is reduced (**missing IT** to ease and scale library card)

Online library catalogue

The seeds of something good: It holds many users, who express their intentions through search, while logged into an ID -- potentially allowing services to make dynamic connections and personalisations

- Where users express intentions
 - Searching for books indicates a need
- Where users express ID
 - Logged-in state indicates a history of interests or other details that can be used to develop services with user permission
- Where users express location
 - Looking to place requests at select locations
- Search is basic and contemporary to web world
 - Google search results and Amazon search results are fundamentally similar
- ~70%+ of time online at library is in catalogue (based on comparing local pageviews across website and catalogues)

Challenges

- The user experience of most catalogues today not only fails to take advantage of these assets -- for instance it does not use search intentions to promote events or partner services related to the search -- but it also often fails at the fundamentals: with confusing interfaces, small fonts, and an antiquated look and feel (**missing IT** underlying this interface to improve it and leverage value in various ways)

4.1.2 An Achilles' heel: poor library IT

Holding back the full use of these assets, and a response to the emerging challenges of digital divides, is the library IT.

Here, we will provide an overview of what this legacy IT entails. The digital foundation of each library is the Library Management System (the “LMS”) -- a system architected 30+ years ago as a tool to track print materials. Like other software designed at that time, the LMS is a single integrated code-base (monolithic), rather than a set of loosely joined components (modular). Because none of its features can be unplugged or replaced, it is difficult to change, integrate, or enhance.

Today's Library IT

	What it is	How it is used (by admin or by library users)
Library Management System (LMS)	<ul style="list-style-type: none"> ● An enterprise resource planning system 	<p>Primary functions include:</p> <ul style="list-style-type: none"> ● Acquisitions ● Cataloguing ● Issues or circulation ● The OPAC (see below)
Online Public Access Catalogue (OPAC)	<ul style="list-style-type: none"> ● Public online catalogue 	<ul style="list-style-type: none"> ● Search and request books ● 70% user web activity, or about 40M visits annually ● About $\frac{1}{3}$ of resulting pageviews are account pages where items a user has requested or is borrowing can be seen
EBook and other digital content silos	<ul style="list-style-type: none"> ● Catalogue for ebooks (or other content) 	<ul style="list-style-type: none"> ● Often a separate environment to search and request content - little or no visibility of library's other offers ● Often a separate user ID and separate lending rules
Mobile App	<ul style="list-style-type: none"> ● App for catalogue 	<ul style="list-style-type: none"> ● Though mobile access will exceed desktop, apps provide only a subset of the OPAC features
Library landing pages	<ul style="list-style-type: none"> ● Library website - points to catalogue 	<ul style="list-style-type: none"> ● Often complicated CMS rules and approvals from Council IT ● Library users sometimes find location information, event calendars, and info
Council landing pages	<ul style="list-style-type: none"> ● Council's public website - points to 	<ul style="list-style-type: none"> ● Library admin has little control over site ● Library users have little to do here -- click through

	library website
National partner and application silos (like Bookmark Your Library, or sites of Reading Agency)	<ul style="list-style-type: none"> ● Partner-controlled public website ● Refers to content but does not contain it ● No live connection to local LMS
UnityUK National Catalogue	<ul style="list-style-type: none"> ● Partner-controlled public website ● Refers to inventory of separate libraries yet does not contain it ● No live connection to local LMS <ul style="list-style-type: none"> ● Users can participate in programming created by partner ● Limited interaction with library ● Subset of users active

4.2 Libraries cannot respond to channel shift because of the monolithic nature of legacy IT

In retail, digital platforms with modular design have enabled quickly-evolving omnichannel user experiences. In libraries, however, the reliance on monolithic, locally-installed library IT has deadened innovation.

In response to declines in use outlined above, libraries have tried to improve their websites, to share best practices, and to partner nationally on programs related to health and literacy. Yet they have often been unable to coordinate and share these efforts. And they have been unable to feature national offers in their catalogues -- where an estimated 70%+ of online traffic occurs¹⁸ and where the search box and transactions provide rich signals of users' needs and interests.

4.2.1 Unable to make themselves findable

Libraries struggle to make their offerings visible despite having two key ingredients for successful marketing:

- Compelling content, and
- Committed community.

What is missing is a shared strategy and tools for leveraging those assets online.

Legacy IT has limited the visibility of libraries by curtailing these key ingredients:

- **Search engine optimisation (SEO)** -- with ~50% of reads originating in the library (see above chart), libraries should be a

¹⁸ Based on comparing local catalogue pageviews to local website pageviews for several libraries.

dominant presence in search-engine results on the Internet for any book title. Yet they are virtually invisible. At a high level, search engines promote pages that are referenced by the greatest number of other pages -- and users. Among the many factors that impact SEO, then, current LMS interfaces prevent:

- Other sites from creating inbound links to the library and catalogue - many catalogue pages do not support static links (the links are generated on each user session)
- Multiple library silos and multiple library sites from counting as the same entity for purposes of referencing, which can be achieved technically even without merging them from the user experience point of view
- Link sharing on social media

- **Social discovery** -- more library users are discovering content through social media today than through search engines. And yet catalogues, account pages and e-readers lack the most rudimentary social-sharing tools.
- **Shareable content** - more content is being shared across the web, providing value to other websites while providing marketing for the originator of the content. YouTube, for example, enables videos to be embedded across the web. The library does not now act as an originator for any dynamic, shareable content around books, such as:
 - Embeddable book widget with title and author information, a jacket image, as well as ratings and reviews (as might be used by bloggers or reviewers)
 - Book lists (as might be used by other organisations creating lists, journalists, teachers, bloggers, and others)

Other organisations are building these kinds of digital tools, while libraries fall behind:

- *Envisioning the Library of the Future* found libraries “fall behind many other user-facing organisations (like leisure centres, cinemas or high street retailers) in exploiting the [digital] tools now available to generate visibility, attract new users and maintain relationships with the public” (2013, 16)

4.2.2 Unable to make themselves usable

The LMS is still the base for the public library’s current digital presence. An online catalogue was added on top of this inventory

system by vendors in the 1990s, enabling users to place requests for books from home. Over 70% of library pageviews are now in this online public access catalogue (OPAC). The Reading Agency has found that “online library catalogues are the gateway to users’ digital engagement” (2011). Yet in most cases the user-experience is at least a decade out of date in comparison to the retail sites that library users are familiar with.

The centrality of the catalogue to library services, and yet the severe limits of the catalogue’s current functionality and extensibility (the ability to plug in new applications), make it a constant breaking point for new applications. An example below shows a new website and a new app that both break for usability as soon as the reader actually wants to acquire the book.

New experiences cannot succeed without connections and changes to underlying catalogue

An otherwise excellent mobile app... ➤ ... relies on and fails to fix the catalog

- Can modify UX
- Piques curiosity
- Raises expectations
- Cannot tie new UX to old functions
- Cannot improve core functions
- Loses audience attention
- Fails to deliver on expectations
- Cannot scale across libraries

Source: Screenshots of Dozens & Trails app

New experiences cannot succeed without connections and changes to underlying catalogue



An otherwise excellent website...

- Usually ~20% of traffic
- Can modify UX
- Piques curiosity
- Raises expectations

Source: Screenshots of Birmingham Public Library

... relies on and fails to fix the catalog

- Usually ~80% of traffic
- Cannot tie new UX to old functions
- Cannot improve core functions
- Loses audience attention
- Fails to deliver on expectations

4.3 Libraries are unable to make other improvements and save other costs across their services for lack of shared IT

4.3.1 Unable to manage operations effectively

Libraries waste time and resources compensating for poor IT. They are also unable to leverage IT to monitor and optimise their other resources across the library system broadly, for example in managing collections.

Managing a legacy IT environment consumes almost as much time for libraries as does creating library programming and events that could potentially distinguish libraries from commercial alternatives:

- 800 full-time equivalents in English libraries work with legacy IT
- 1200 full-time equivalents in English libraries work on programming and events

What takes so much time?

Inefficient staff workflows consume time and impose costs. While this expense is hard to measure, it comes across in common complaints:

- Staff complained of “extra windows” and “clicks,” often resulting from the way systems are cobbled together
- One manager said changing vendors was “no longer a serious option due to staff and volunteer retraining costs”

Data extraction is also time-consuming, and it prevents libraries from measuring progress and improving

- 150 FTEs are used in data extraction across England’s library authorities.
- 20% of library IT staff cite this burden as a primary shortcoming of their existing tools

Even once data is extracted and manipulated, it is not easy to compare to data from other libraries, and is not timely enough for decision-making.

Integrating new technology offerings with the legacy IT is time-consuming as well. This relates, as described above, to the challenge of integrating an LMS-based environment with local offerings like ebook catalogues and national offerings like partner resources. For example:

- 140 FTEs are dedicated to manually updating catalogue information to UnityUK and OCLC for interlibrary loan.

In addition to consuming staff time directly, the bad IT also consumes it indirectly. In program development, for instance, staff may need to create lists of books that they then work to post online.

If libraries are to use data to improve organisational effectiveness and impact, a national standards-based platform is essential. From performance management to best practice sharing, partnerships to marketing, little can be done without it. Once implemented, a platform for national data collection and sharing will be a basis for enhancing staff skills and developing higher value-added analytics work. It will also create value for partner agencies, and the publishing¹⁹ and education sectors.

¹⁹ See discussion of value creation for the publishing sector in Section 5.3.

Findings

5 Library Partners

Fragmented IT stifles mutual support

Libraries cannot respond to the shift in needs because they lack the digital foundations to enhance their sites in partnership with each other, national organisations, and publishers.

5.1 Limited Collaboration between libraries

The divergent data models and business logic of five LMS systems (along with divergent versions and configurations) confound the sharing of content, practices and innovation across libraries. It is as though each library speaks a different language.

As a result, for example, libraries cannot easily:

- Share catalogue-embedded²⁰ materials such as lists, tweets, public conversations and reviews, crowd-sourced metadata, advertisements for upcoming “National Moments” or other campaigns, omnichannel events, partner and publisher²¹ content;
- Exchange programming ideas around a shareable list of resources;
- Share their readers’ advisory work;
- Share best practices for the use of a common CMS; or
- Share mobile apps and website applications.

²⁰ Catalogue-embedded because the catalogue receives an estimated 70%+ of online traffic. The Reading Agency has found that “online library catalogues are the gateway to users’ digital engagement” (2011).

²¹ See for example quote from Stephen Page of Faber and Faber in Section 5.3.1: “If publishing were to partner with the library service to create certain kinds of technological solutions or best practices, it’s much heavier lifting....”

For best practice sharing, it is:

- Easy to share general ideas,
- But hard to share actionable specifications and completed work, such as a finished software application or even digital lists of books.

As a case in point, a dissertation written in review of the SCL & The Reading Agency's well-conceived "Books on Prescription" scheme said that inconsistency across library websites limited the program's effectiveness:

The "results of the desk research demonstrated the need for consistency and standardisation in the contents and procedures of BOP schemes across different library authorities," as this "might be affecting wider promotion." A better web presence in general would "make the scheme more accessible for both casual and referred users" (Furness 2012, 336).

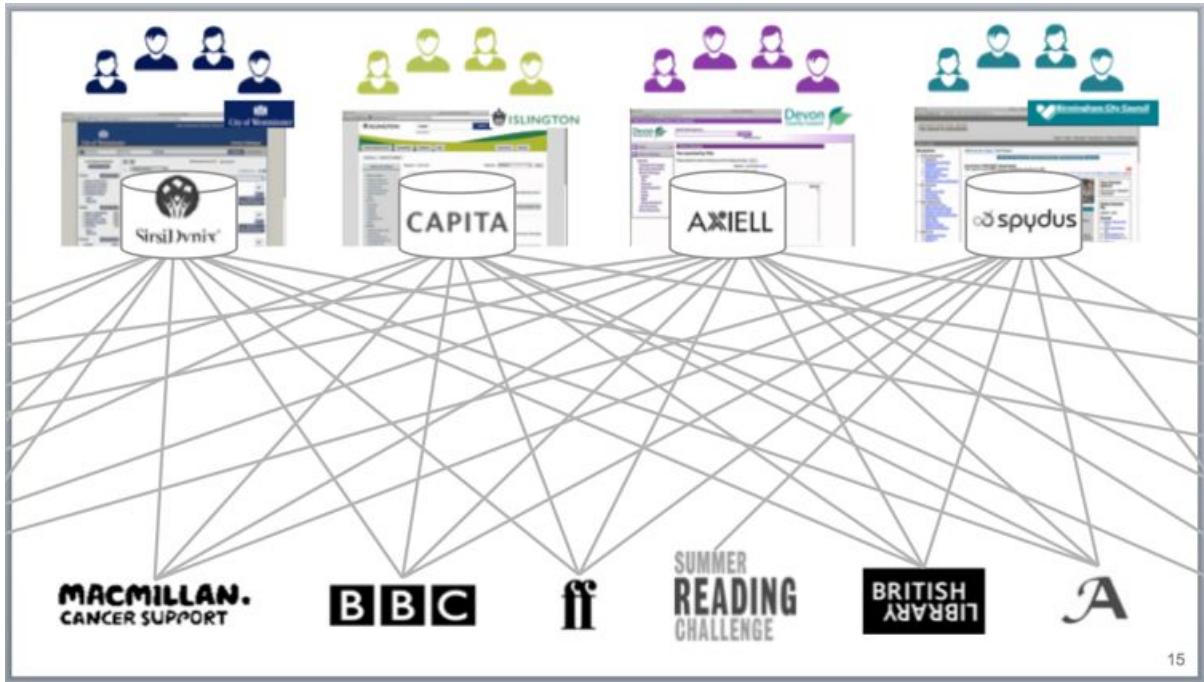
As for creating new national programs, it is:

- Easy to build separate applications and content silos,
- But hard to build national content that is integrated systematically into the local catalogues, where existing users already come in droves.

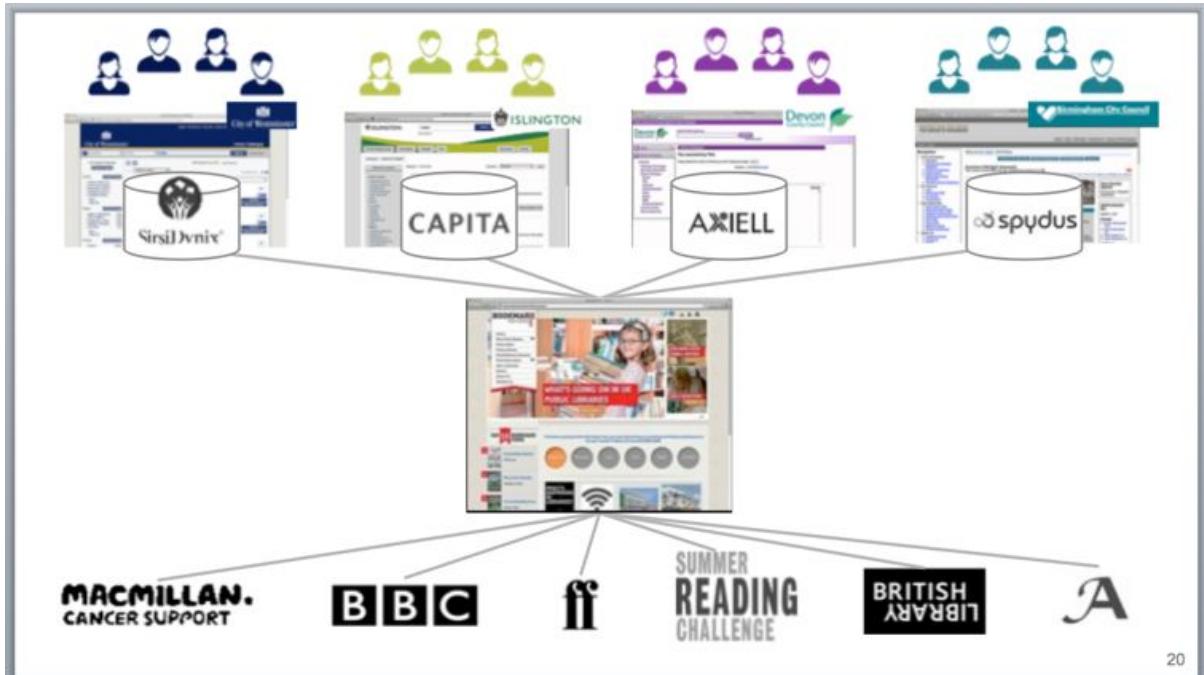
These silos weaken the uptake and usefulness of the national resource. The Bookmark Your Library site, for instance, had one tenth as many visits in a year (~30,000 in 12 months) as a typical library does in a single month (~300,000 in 1 month), in part because of its isolation from the traffic of the catalogue. As John Usher of Islington Library noted, there were no connections:

- For audiences -- from where users and staff are in library sites today -- to the new site, limiting user and staff awareness and use of the site
- For resources -- to the real-time availability of books in the local catalogue -- to the new site, limiting the usefulness of the site

These links to current user journeys and live collections would have made the site more successful, but are not possible without shared digital infrastructure connecting all libraries.



Connecting partner resources to the library's resources and users is not feasible today.



A national website solves one problem but creates another: it reaches almost none of the 3.3M active monthly users across England's public library catalogues.



A national standards-based platform would allow libraries and their partners to innovate, collaborate and share in ways they cannot now do - and allow partners to connect with library users on their home turf -- in the catalogue, and other library digital spaces.

5.2 Limited digital collaboration with national partners

Libraries also struggle to collaborate efficiently and effectively with national organisations because of their monolithic legacy IT. National stakeholders are eager to collaborate with public libraries given their overlapping audiences and missions. But there are few means by which to do so.

As a consequence, partners invest extra money in distributing print materials, and in digital programs that share neither infrastructure with nor links to the library's digital services. For example:

- The Reading Agency's online literacy offers are well-designed, but are not visible from the library's online environment, while the physical branches contain more expensive (and labour-intensive) printed posters and pamphlets. While print materials are preferred by some, and have achieved solid results, there are no notices or links visible to the sizeable audience in the library catalogue to any of the following -- each exists in a silo:

- The “Reading Group” tool for adults -- no link to the audience of libraries;
- The “Reading Ahead” tool for finding a next read -- no link to checking out the book in a library;
- The “Summer Reading Challenge” site and tools for children -- no links to the branches and spaces where young children and their parents might meet to read books together; and no links from the bibliographic record pages of children’s books nor their personal library-account pages.
- The BBC’s online literacy and learning resources are also as yet not linked, though in 2015 a broad range of literacy and cultural partners have held a series off meetings with the BBC to explore better integration. BBC resources that remain unlinked to the library catalogues that millions use include:
 - Open Book, Radio 2, Radio 4, and World Book Club pages -- no link to checking out the books, or adding to a library-based for-later list;
 - Books at the BBC pages -- no link to the library;
 - iWonder pages -- no link to resources to learn further in the library, to peers from local branches to study with, or to spaces to meet in local branches: and no links from related titles in the library to the iWonder pages.
- QuickReads resources are not leveraged effectively
 - Registration page -- no way to log in with an existing library card or library ID
 - Book pages -- no link back to the library to request the book

These are just a few examples.

Partnerships cannot be cost-effective and complementary online without connections and improvement to underlying catalogue



Isolated tool to reserve a book

- ~3M+ visits across England
- Does not help find new books
- Library card login, no profile
- No visible community of readers

Isolated tool to find a book

- ~0.01M visits across England
- Does not help get the book
- Separate login, basic profile
- Visible community of readers

Source: Screenshots and SimilarWeb estimates

These connections could not be made using today's library IT because the cost of integration from each partner to each local library would be too great; there is not sufficient standardisation to make this practical.

Each of the above organisations has varied programs that are assembled from similar elements:

- Audiences,
- Books (with title, author, image),
- User-generated content (reviews, tags, and so on),
- And actions.

These elements are made anew on each site, rather than borrowed from the library environment. Rather than put up their posters on the walls of the virtual library, these organisations are in a sense building their own library walls and their own library posters online. This means that in addition to the sites not mutually reinforcing one another, they are also costing more money to build in aggregate. It would improve the user experience and reduce cost if the library instead could

support these organisations by providing digitally extensible resources like APIs and widgets that would allow those partner websites to:

- “Pull” resources and audiences from the library -- for example to bring book titles into their pages as a listing in a blog or program, or to validate registered users against the list of library card holders;
- “Push” new value created back to the library -- like the book lists, new registrations, videos, and so forth.

Without that kind of shared infrastructure, however, as one senior manager for the BBC told us:

“We get together quarterly, all with the best of intentions. We leave with lots of great ideas. And nothing ever gets done. Or at least, not at anywhere close to the scale we’d all hoped for.”

5.3 Limited digital collaboration with publishers

The increasing concentration of consumer data and engagement channels in the hands of one retailer presents a unique opportunity for libraries to create a valuable partnership with publishers. Publishers need reliable, scalable channels through which they can establish and extend their relationships with readers.

5.3.1 Publishers want to collaborate yet have limited means

Helping reader to discover the right book is a fundamental challenge for publishers:

- Joanna Prior of Penguin Random House explains, “Authors are still the beating heart of what we do... What has changed... is how we make the connection between that talent and the reader. This is what we are all grappling with on a daily basis.... The challenge is cracking the code of discoverability” (2014).

Libraries can play a more central and measureable role in connecting readers with the books produced by publishers:

- “[P]ublishers need a better way to capture consumers’ attention” (Harvey 2015)
- Libraries are seen by publishers as key to “monetising the

backlist” (Aydt 2014).²² The belief is that libraries can generate buzz for old titles, and some who pick up on the buzz will buy the book -- not just borrow it. While libraries lack the data to robustly validate that this is possible, publishers believe it can be, and in limited cases where data is available it has been born out.

And libraries can help to deepen readers’ relationships to books and authors:

- “We want to build up the [fiction] author’s personality and create a relationship between the reader and the author as a person....”²³
- “Key to marketing and selling books direct is seeking out platforms where readers are having meaningful conversations around relevant topics and joining in. And that’s quite often not an ecommerce site.... Whatever the vehicle, the interaction should be based around a content area that people are passionate about.... Simply putting a catalogue online is not enough.”²⁴

Publishers also want insights from reading data, a commodity that is increasingly controlled by one company:

- “[T]raditional publishing is using trend information discovered through data collection and reader feedback to make informed decisions on their publishing program” (Donovan 2015)

However, for publishers, partnering with libraries to gain this value is difficult:

- “There is no single place to go and have a conversation with libraries. If publishing were to partner with the library service to create certain kinds of technological solutions or best practices, it’s much heavier lifting than my consumer marketing department engaging through social media on our behalf... There is an impediment here that is structural. We needed to be able to engage singularly.”²⁵

²² “Rekindle your romance with libraries.... They’re not your enemy; they’re your friends.” is the advice from a panel of publishing executives (Aydt 2014).

²³ Heather Fain, SVP, director of marketing strategy at Hachette (Harvey 2015)

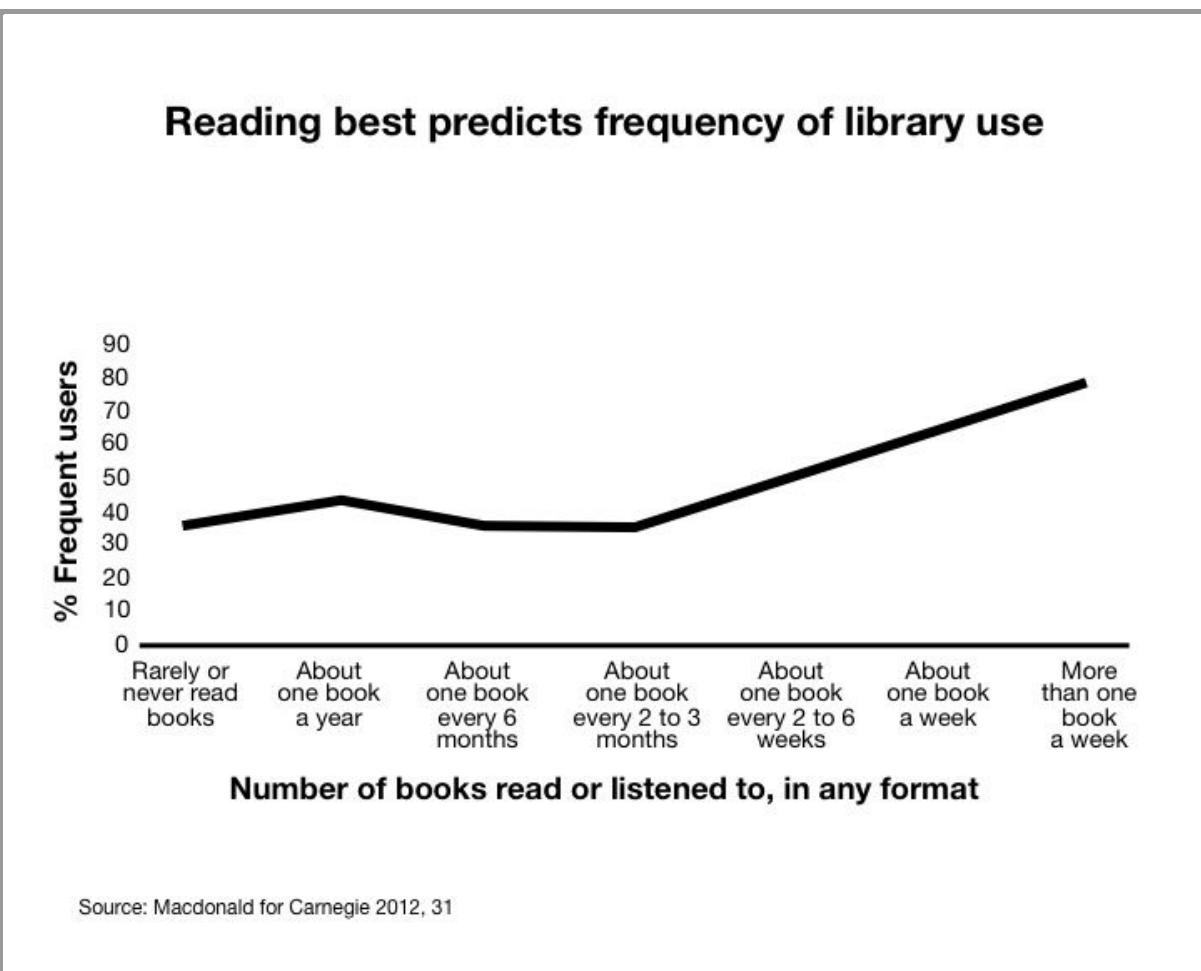
²⁴ Rick Joyce, CMO of The Perseus Books Grou (Harvey 2015)

²⁵ Stephen Page in a panel discussion with Nick Stopforth, Head of Doncaster Libraries; Liz McGettigan, Libraries and Information Services Manager at The City of

5.3.2 Libraries have strong assets to offer publishers

Libraries have many readers:

- Today nearly 50% of reads originate in public libraries²⁶
- Heavy readers are over-represented among library users compared to the general population, as reading frequency predicts library use (Macdonald 2012)



These readers are already online with libraries, despite poor websites:

- While publishers dream of building online communities independently, libraries already have those audiences:

Edinburgh Council and Bill Thompson, journalist and commentator and Miranda McKearney, CEO of The Reading Agency (Reading Agency 2013)

²⁶ 44% is the 2013 share of CIPFA issues in an overall book market that also includes offline- and online-sourced print purchases (Nielsen Books & Consumers) and online ebooks purchases from major- and self-publishers (Nielsen Books & Consumers).

Birmingham Library's website alone has more monthly pageviews than the UK's Penguin-Random House site (per SimilarWeb)

And they are open to new choices:

- Book borrowers bring more open minds to their selections than do book buyers -- they are willing to try something new.²⁷
- Library staff still handsell books and host book-groups and readings even as independent bookstores disappear from the High Street. Indeed, "Librarians are the word-of-mouth gurus" (Aydt 2014)

If libraries are to consolidate and enhance their role in the publishing ecosystem, and win the ear of publishers in discussing licensing models, they must provide an efficient, nation-wide platform for information sharing with their (eager) audiences; and for capturing and aggregating anonymized reader data. See strategy recommendations in Section 9.2.1 below.

5.4 Unable to support authors

5.4.1 Authors are struggling because of a lack of balance in the industry

Fewer authors are able to make a living in the midlist, or those books below the bestseller list.

- The typical income in 2013 for a professional author was £11,000, £5,000 less than the an acceptable standard of living (Flood 2014)
- Only 11.5% of professional authors in the UK—defined as those who dedicate the majority of their time to writing—earned their income solely from writing, down from 40% in 2005 (Flood 2014)
- Roly Keating reflected on this phenomenon in his remarks at the the 2015 Hay Festival.

The impact of digital technologies on the book market has contributed to this situation in two ways:

²⁷ This finding emerged in our interviews and in the 2015 e-lending pilot.

- Content has proliferated with the increasing ease of production
- There has been a net loss of discovery pathways for readers as digital retail (now accounting for roughly two-thirds of all sales) has supplanted the traditional.
 - “Even Amazon’s algorithms are just not good enough to make new books as discoverable as they once were in a bookstore. And Amazon doesn’t have anyone who knows you or your kids and can recommend books you’ll like”
(Rasenberger 2015)

A blockbuster economy has resulted, in which "[t]he mid-list, publishing's experimental laboratory, is being abandoned" (Robinson 2014).

5.4.2 Libraries have much to offer

Because libraries account for nearly half of the reads in the UK, they could help develop reader attention for new authors. Readers at the library both borrow books and buy them (Reading Partnership [Reading Agency] 2000), and they also tend to be among the major trendsetters for reading: in one focus group we held in Islington, the heaviest library user was also be a columnist who reviews books for a major newspaper. The library can help draw the attention of these readers to authors, whose books they may borrow, buy, and promote to other buyers.

At present, however, for all of the reasons described, libraries lack the ability to build compelling user experiences and cultivate relationships with authors at scale. See strategy recommendations in Section 9.2.2 below.

6 Library IT

An ineffective ecosystem

The development of a robust IT infrastructure is blocked by architectural inefficiencies and underinvestment.

The deficiencies of current library IT in England have been well documented:

- Reports over several decades show consensus on what is missing -- chief among these is user-generated content and user-led experiences and activities
- IT vendors interviewed cite the difficulty of integrating new products with the many flavours of LMS in England's public libraries
- IT staff in libraries have made remarkable progress despite this difficult environment.

Yet this shared insight about legacy IT systems has not resulted in changes at scale. The poorly developed ecosystem for library IT has two causes:

- Insufficient investment on the part of libraries in their digital services as compared their physical plant
- Structural inefficiencies that limit the impact of the spending that libraries do incur

6.1 IT Spending

Libraries spend too little on their digital environments -- totalling about £15M per year including LMS expenditures (based on our survey of heads of library services). Consumer expectations for digital experiences are set on the web at large, by companies that spend

much more than libraries, even on select areas of the library service offering such as information and education:²⁸

- Information-seeking:
 - Wikipedia: £50M
- Learning tools:
 - Kahn Academy: £133M
- Writing and publishing tools to support amateur authors:
 - Wattpad: £46M
- Events information
 - Eventbrite: £133M
- Meeting tools to join people with similar interests in an offline location:
 - MeetUp: £12M

6.2 A fragmented market for library IT

The structural inefficiencies of the ecosystem for library IT has several causes. Because of the LMS fragmentation noted above, libraries are not able to focus spending to promote focused, broadly-compatible products. In the absence of a modular ecosystem, vendors must use the revenues they receive from libraries replicating technical capabilities that are often the same from one vendor to the next, instead of focusing on more specialised innovation²⁹

Furthermore, much of the library IT budget is spent on “brownfield” work maintaining old foundations and integrating new functionality on top of them -- whereas the above commercial comparisons are for “greenfield” work building contemporary applications on modern foundations. We propose below a middleware solution to refresh the library IT with similar modern foundations.

In addition, buyers of library IT are often unable to affect supply because of their own fragmentation. Uncoordinated procurement introduces two problems:

²⁸ All per CrunchBase for the lifetime of the products.

²⁹ If the market were modular, vendors would be more free to focus on any one module and develop extraordinary capabilities there, while the library could buy the other module from another vendor. This would shift the market from vertical and closed architecture to horizontal and open architecture.

- More costs for vendors in sales, legal, and administrative tasks, which takes away from the resources that could be put into building better products; and
- Less leverage for libraries to demand better products.

Where libraries have come together to coordinate priorities and purchases in other service areas, like the Oxford University database framework agreement (where over 90% of libraries purchased the services after having agreed to a common set of terms; there was no greater technical integration), they have saved upwards of 50% (Taplin 2015).

The monolithic nature of existing library IT and the lack of interoperability is also a key factor, forcing vendors to replicate and maintain comprehensive services, rather than focusing investment on unique functionality. This means that the money spent by libraries does not go as far as it might; there are many gains to be made through specialisation and collaboration.

Recommendations: Strategies

7 Library Users

The affordances of the social web are key to making libraries relevant and visible online

What libraries can best offer users today in response to digital disruption is similar to what they have historically offered: support for literacy, lifelong learning, and community inclusion. Digital technologies have only deepened these needs. But they also provide solutions -- key among these are the affordances of the social web.

7.1 Address the new divides by building from the library's collections

As access to books and information is no longer the greatest obstacle to meeting the goals of literacy, learning, and community, the library must turn to address new divides. Many of these are digital divides.³⁰ The library's collections -- activated by a national social catalogue and digital platform -- are a way to bridge these divides in new ways.

7.1.1 Literacy

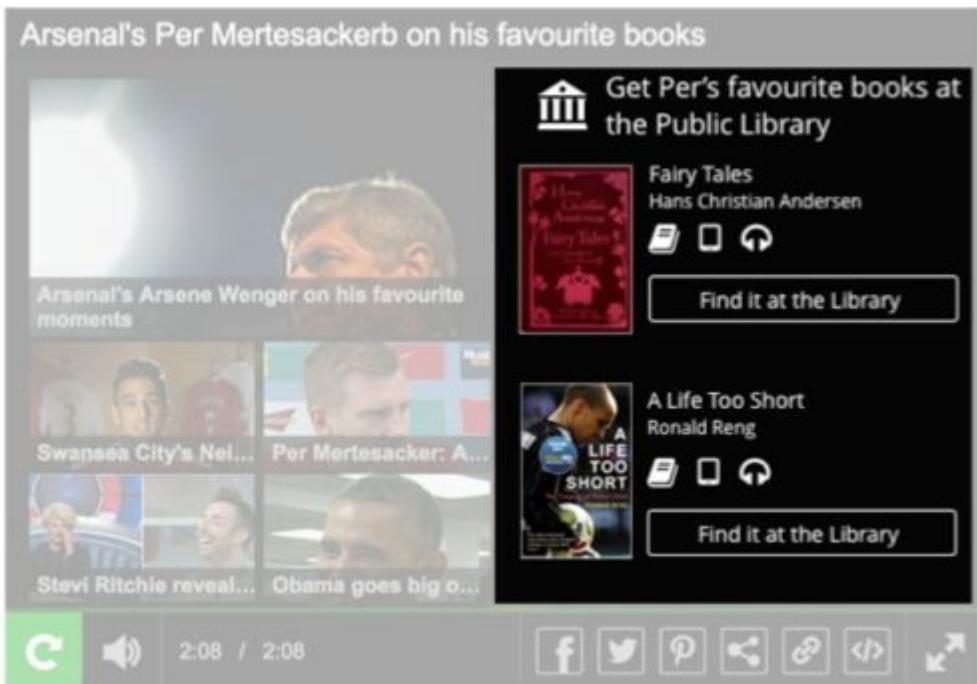
The inspiration, support, focus, and time to read remain as barriers to literacy. Many sites on the Internet have done more to distract than they have to help (Richtel 2012). Because sustained reading is in their

³⁰ See Introduction and Section 3.3.2.

blood, libraries are uniquely positioned to develop an alternative to the distraction economy that dominates much of the Internet (Chamorro-Premuzic 2014).

The library's online services can help address barriers to reading by:

- **Featuring peer voices in the catalogue.** It is essential that reluctant readers hear voices like their own in the library.
- **Creating new pathways into reading**, such as by building links to celebrity reading programs like that of the Premier League. This program and others like it must be featured on every appearance of the featured titles in the library's catalogue, websites and apps. And England's libraries should provide to these partners book- and list-widgets, linked through the national digital platform, that guide potential readers to accessing and discussing those titles in the digital environments of each library authority.
- **Recommending books for the choice-overwhelmed**, as does The Reading Agency's Book Sorter. Free from commercial imperatives, libraries have a unique value proposition to bring to book discovery tools. The number and goodwill of readers in the library can also be tapped to provide a unique source of human-created evaluative data, which alongside the bibliographic metadata that is native to libraries, provides the raw material to build a unique and valuable discovery environment. But as with the other digital offers discussed in this report, if this service is to be usable and robust, it must be designed, built and maintained with the economies of scale that come from concerted effort.



Links to the library

Links in the library

7.1.2 Learning

Digital technologies provide England's public libraries an opportunity to become the hub for informal learning in their communities.

Motivation and social context remain key constraints to learning. While

many may borrow a textbook, buy it on Amazon or sign up for a course on Coursera, few find peers or a community to carry them forward in their project. Many do not continue with goals that are set with the best of intentions, as demonstrated by the high attrition rates in online learning sites (Farr 2013).

The books in the library's collection are an ideal point of connection for building social support for learning. Support from one's library community can be triggered, for example, by:

- Allowing library users to record what they have read and learned. A badging service, for example, like the Open Badging Initiative developed by the Mozilla Foundation, would find a strong anchor in the authenticated user ID of the library's digital space. Badging can be motivating for children; but can also serve as a kind of informal credential for adults who are trying to upgrade their skills or employability.
- Allowing library users to connect with like-minded readers (on an opt-in basis) -- or indeed with those of a differing perspective.
- Allowing community members to opt in and be screened and trained as learning mentors, matched to learners on the basis of an interests profile or a mentor's "Books Completed" shelf.

Finally, every library authority should have an online events calendar in order to make their learning programmes visible to the web; and linked and discoverable in their catalogues. Once established, the library's events service, in combination with its existing volume of users -- many of whom declare their interests in the catalogue's search box, becomes a natural hub for educational events throughout the community.³¹

7.1.3 Community inclusion

The library's digital public space should enable groups within a community to connect both online and off.

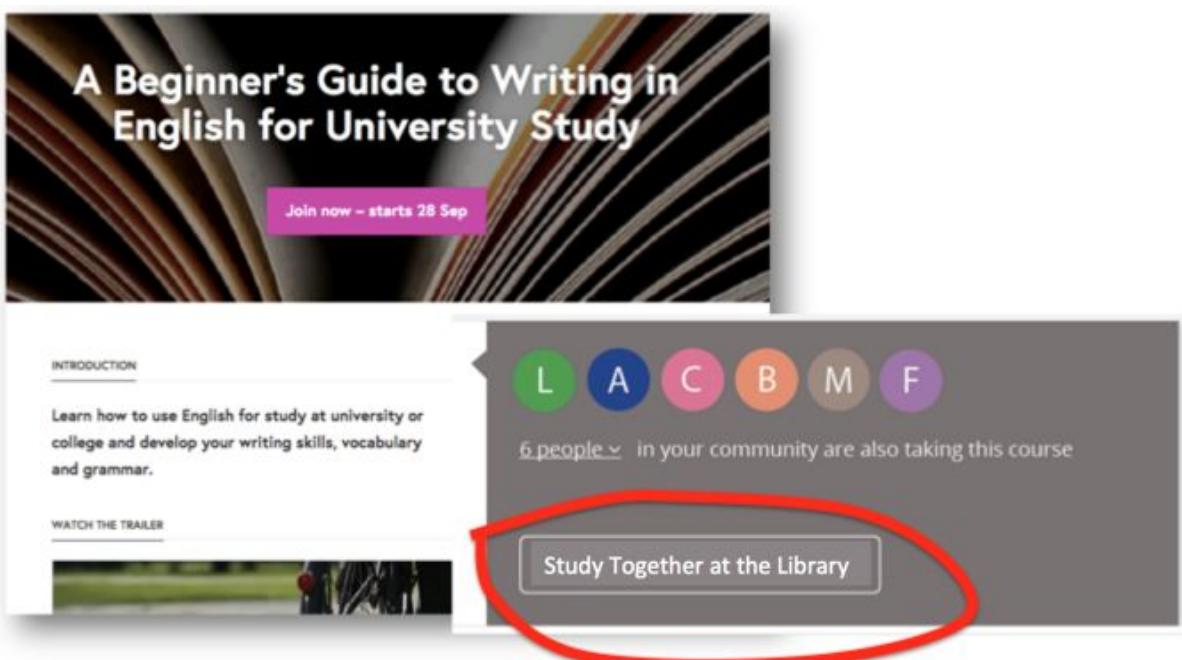
For example, the library's digital service should:

- Enable people who share learning goals (perhaps indicated by a shared interest in a book) to form peer learning groups,

³¹ This model was adopted, for example, by [Learning City](#) in Vancouver, whose educational offerings from many participating agencies can be discovered in the library's events service, or filtered by proximity to library branches.

organised online but supported in the physical realm with online booking and invitation tools;

- Encourage and invite volunteerism by providing tools to organise and recognise their efforts;
- Give exposure to local authors and cultural institutions by promoting their content digitally in the context of relevant searches and bibliographic record pages.
- Making it easy for people with a book in common on their “For Later” shelves to form a reading group, building on the ideas of reading group development recommended by The Reading Agency (2004).



There are other good reasons to build social functionality into the very foundations of the digital library:

- Social content such as reviews is one of only two reasons to visit a library online, as cited by users, that has seen growth year over year. (Pew Research Center)
- Social functionality is what all young and many middle-aged users expect of the web -- and of their library if it is to be on the web.
- Social functionality provides an onramp to the wider social web for reluctant and older digital citizens. In the hands of the library, the resulting connections can play an important role in addressing loneliness, a key health issue affecting the elderly.

7.2 Allow the library's digital public spaces to reflect the unique value of libraries

7.2.1 Create new digital spaces, distinct from commercial environments, as neutral ground for literacy, learning, and community

The safe, non-commercial nature of the public library was cited in interviews as a key point of appeal. Libraries were described as spaces where:

- People are citizens first and consumers second, which can be supported online with:
 - Recommendations and displays that are not shaped by commercial interest
 - Agreed upon principles of privacy
 - Digital spaces for reviews and conversation, to which users bring the civility and goodwill that the library uniquely inspires.
- People are connected by shared interests or sensibilities, which can be supported online with:
 - Following, viewing a profile, or other connection with others with similar interests -- particularly successful where these connections reach beyond our traditional “bonding capital” (Putnam 2000) -- linking us to people and communities beyond our circles of family and friends.
 - A digital space for conversation around every book
 - Collaborative lists -- for titles in the same micro-genre, for further reading, or for an opposing point of view
 - The opportunity to learn with and from people facing the same challenges
 - The opportunity to give back in new ways -- that draw on professional and personal expertise
 - The opportunity for a user to share what she or he enjoys.
- People are encouraged to linger for discovery, reflection, or discussion, and be challenged; which can be supported online with:
 - User-driven affirmations including a ‘like’ of someone else’s contribution
 - Nudges or shared work space that help people stick to goals they have defined or challenges other users have

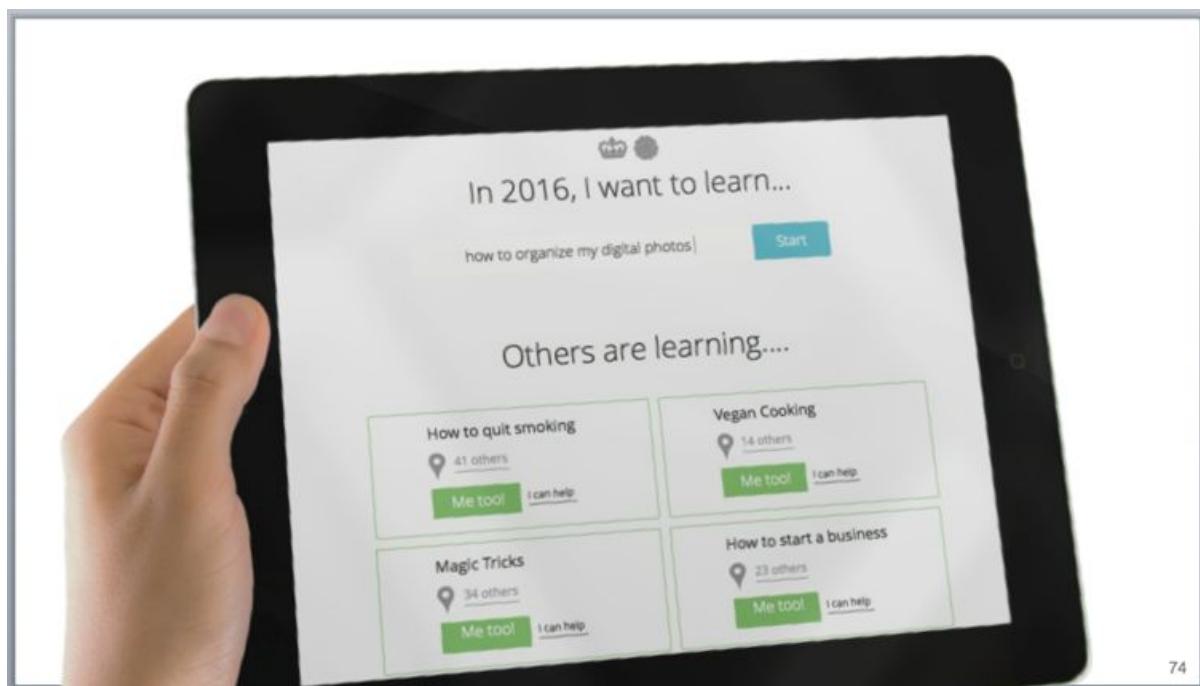
recommended for them³²

- People share physical community, which can be supported online by providing:
 - Online connections that resolve to meetups or events in physical library spaces.

Digital public space in the library would be a welcome alternative to existing websites that, by contrast often:

- Grant access only in exchange
 - For a fee, or
 - For targeted advertising (and about half of users cannot discern from unpaid content even in Google search results ("Google Ads and the War on Free Clicks" 2012), or
 - For personal information that can be sold to advertisers.
- Connect people only by
 - Existing social networks
 - Existing political or ideological viewpoints.
- Do not encourage lingering and instead
 - Drive people towards quick transactions
 - Drive people towards average and easy choices.

Digital public space in the library can also be extended across the web for use by partners in literacy, learning, and community inclusion.



Libraries should be the hub for informal learning

³² See more in Section 7.1.2 above on social scaffolding in the library for learning.

7.2.2 Energise library spaces through digital co-production -- bringing together national and local users, and bringing together those who need and those who choose the library

In addition to the individual motivations to participate that are described above, there are three key structural ingredients for co-produced community to succeed in the spirit of the public library:

- Bring national and local communities together to create a critical mass while preserving responsiveness to local needs
- Bring those who need and those who choose the library together to enable social-capital exchange
- Bring staff and users together to moderate and energise the community while enabling diversity and unpredictability

7.2.2a Bring together national and local users

The library's digital spaces must be at-once:

- National in scale for success online
 - To populate the space with activity, even around obscure titles, and encourage others. Heavy contributors and niche contributors are a small portion of the overall population yet will provide most of the benefit to the rest of the users (for example, Wikipedia's contributors represent less than 1% of their viewers).
 - To amass data needed to improve a service to the level users now expect -- online social networks and search sites are improved by insights from millions of users.
- Locally rooted to the physical locations the library serves:
 - To continue to serve local needs and local taxpayers
 - To differentiate the library online space from the rest of the web.

7.2.2b Bring together those who choose and those who need the library

In diversity, library communities need at once to engage those who can choose in order to serve those who need, because:

- To co-produce literacy requires people who are literate and people who are not
- To co-produce learning requires experts and novices
- To co-produce community inclusion requires people “in” and “out” of various cultural and ethnic communities, especially so no space becomes stigmatising

Those who choose to use the library are more volatile than those who need the library: they are the segment that is leaving the library most quickly.³³ Yet as we argue here, they are essential to creating digital services for those who need the library. Our interviews with users indicated that the following activities are among the most appealing to those who choose:

- Parents and Children:
 - People from all socioeconomic statuses tend to come to the library when they have children -- a visit can be an event in itself. Issues of children’s books have remained flat even as adult issues have declined. Shared digital spaces will offer many opportunities to engage parents, as well as their children as they start to gain autonomy
- Readers:
 - Heavy readers are social readers. The Reading Agency research found that these readers enjoy sharing recommendations with others and discussing books (e.g. Reading Agency 2004). In our research, we found this group had an appetite for digital, non-commercial ways to find books and talk with others about them.
- Volunteers:
 - A desire for the opportunity to give back was raised by people who said they otherwise would not visit the library. An online service could help match volunteers, for instance, by building on common interests in books.

7.2.2c Bring together staff and regular users

William Sieghart’s research commission wrote that “The 21st century librarian will need to be more of a community impresario ... who can champion their communities’ needs and generate new business and audiences for the library” (UK DCMS 2014).

³³ See user-segmentation analysis in Section 3.1.5

Online, library staff should strive to be first-among-equals in a community that exemplifies the norms that define libraries offline. They can:

- Create reusable readers' advisory lists or topic guides in an environment in which those guides will be instantly visible to those users who view related titles or search results
- Share an authentic voice on titles in which they have a genuine interest
- Welcome new users upon registration
- Curate content for low-literacy individuals

Digital services can also help empower staff in the branch. Staff should be able to:

- Use online tools to help coordinate offline groups with shared interests, in some cases shifting the staff person from the giver of help to the facilitator
- Create a profile to share nationally a unique passion for a subject, with staff thereby freeing one another across England from being, at times, unwilling generalists
- Create a profile that helps library users approach staff in branch. Said one immigrant student in his 20s in Islington, "You should show their names in the branch or online so you know how to reach out to them."

In short, online and offline, the digital library can enable library staff to be stewards of a space that solves "second order divides" that are the focus of UK Government digital inclusion strategy: motivation, skill, and trust (Hargittai 2008; Cabinet Office and Government Digital Services 2013).

7.2.3 Leverage national partners to be major co-producers as well

Library partners could integrate their materials into this new digital space.

To add value to the library site, and to add visibility to the partner resources, library partners should be able to post information within the library's digital public space just as they do offline. For example:

- If offline library staff place Books on Prescription posters next to displays of the dementia-related books on those lists, then online the reading lists should also be co-located next to these books

in the library's digital space, such as by intelligently highlighting the list whenever such a book comes up in search results, or on the bibliographic-record page

- If offline library staff place partner information on career guidance next to books on professional development, again the same should be true in the library's digital space.

7.3 Make libraries visible and usable

7.3.1 Make physical library spaces and resources visible online, and reactivate them with online engagement before, during, and after use

Libraries must immediately adopt tested strategies for visibility online:

7.3.1a Search engine optimisation (SEO)

With 50% of reads originating in the library and massive existing web traffic, libraries together should be a prominent presence in Google search. A search for any given book title should produce an entry for England's public libraries on the first page of results. But this is not the case today. To achieve a greater presence, libraries require a digital infrastructure that enables:

- Inbound links to static URLs;
- Traffic aggregation across editions and formats within the library using FRBR³⁴;
- Traffic aggregation across library authorities, using for example canonical URLs that enable a reference to one book in one library and a reference to the same book in another library to count together for SEO purposes;
- The capability to share to social media from any library catalogue links that can be resolved to the holdings of any English public library;

³⁴ FRBR is an entity relationship model, developed by the International Federation of Library Associations and Institutions, that can be used to associate various editions and formats of a title ("manifestations") to the concept of a single work.

- Many, many inbound links from social media to the catalogue. Their volume is an important key to the ranking algorithms that search engines use to sort results.

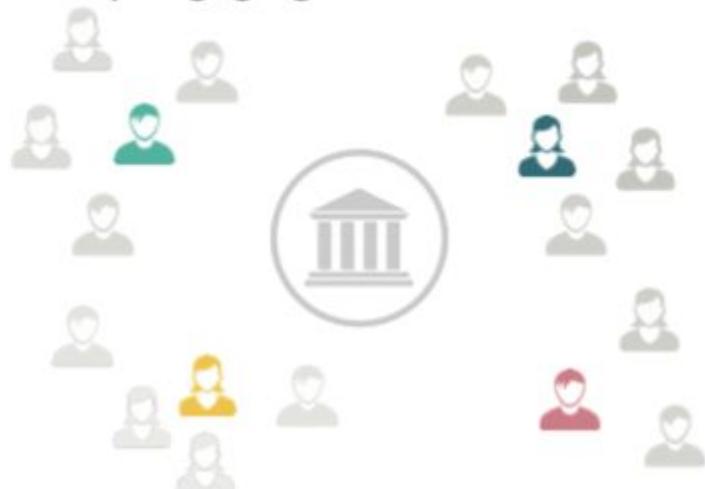
However while the measures listed above will help libraries appear as an option in Google, SEO is in some ways yesterday's game.

7.3.1b Social discovery

Social media now drives one third of all referral traffic, and continues to grow in importance (DeMers 2015). More Internet users are now discovering content through social media than through search engines. If England's libraries are to build visibility and participation in their communities, they must develop strong strategies and tools for social-media-based discovery.

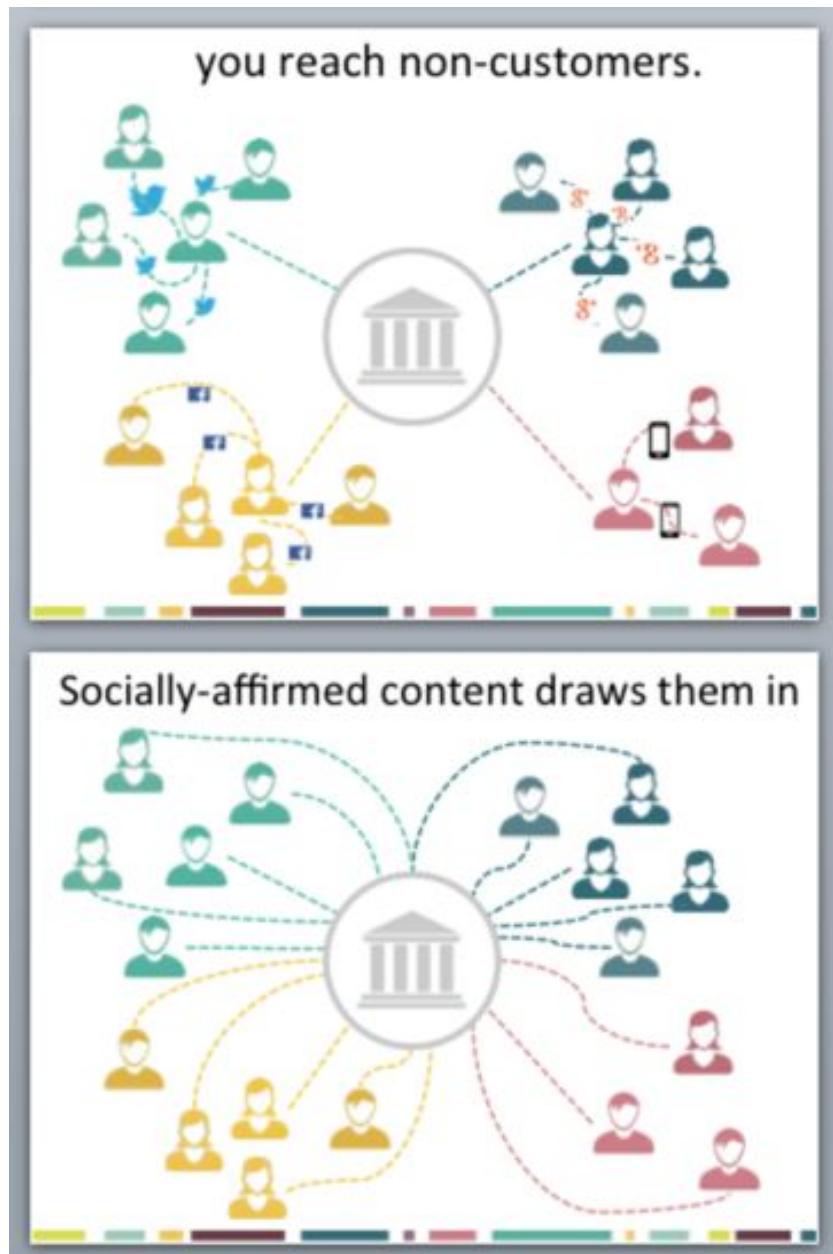
Many make the mistake of assuming that social-media strategy for libraries should focus on a library Facebook page or Twitter account. However those tactics preach to the converted. Far more valuable to libraries is tapping into the activity, networks and loyalty of their existing users -- as a springboard to non-users.

By engaging current customers...



to share with their networks ...





Libraries must ensure that they provide:

- Tools that make it easy for library users to create commonly shared content that is related to books and other library content, such as lists, quizzes and quotations.
- Tools that allow library staff and partners to create shareable content of a similar nature.
- Tools that make it easy for library users to share content out to their own networks with hashtags and links that point new users back to the library.

Libraries can increase social sharing and social referrals by offering dynamic, relevant content that brings existing users back to the library's digital spaces. Staff could never manage this challenge alone. But by enabling their users, and local and national partners as co-producers of content that points back to the library site, and sharing content among libraries, they can achieve the necessary impact.

Sharing to social networks from within the library's digital spaces should be supported at scale across all of England's libraries by combining two ingredients:

- A national social catalogue service (built on the digital platform)
- The work of a few content strategists, either embedded within some of the local library authorities, or co-ordinated on behalf of England's libraries by the national library digital services agency.

³⁵

for example:

- Allowing users to tweet a quotation to friends from within a library-centric ebook reader.
- Prompting a person who just returned a book to write a 140-character review that is shared simultaneously in the catalogue and via Twitter.
- Enabling the sharing of “likes” and ratings to social media streams, using a universal bibliographic record that can be easily resolved to any English library.
- Ensuring that people who view any shared content can click back to the library.
- A global book widget supplied by England's public libraries (like Amazon's) could allow users to blog or post a title with jacket image that links back to a local English library.
- Build digital tools that are social for groups of people who both use the library and social media heavily, especially young parents (who are among the heaviest users of both), such as by:
 - Book club features: lists, voting, discussion.
 - “What are you reading with your kids?” -- enabling parents to post a book + activity in a way that can be shared on social channels and in the library online.

³⁵ See Sections 10.2 and 13.1 for discussion of the agency.

7.3.1c Content-as-marketing across the web

A third major way successful sites and companies market today is to let their content and offerings speak for themselves by extending out across the web, often with the proviso that this reference create a link back to the site.

Libraries can increase content-as-marketing across the web by:

- Enabling the library as the reference point for all mentions of books across the web, such as by:
 - Providing tools for other sites to embed lists of books or titles of books that bring the value of user reviews or images as well as links back to the library.
- Enabling the library card as the ID for literacy, culture and learning across the web, such as by:
 - Creating “social login” functionality - so a person can join third-party learning sites with an alternative to commercial IDs like those of Google, Facebook, or LinkedIn



*The library ID should be
a key to culture and learning in England*

7.3.1d Direct online users to the branch intelligently

As the library becomes more visible online, the pathway and motivation to visit the branch must also be clear. Just as retailers move users between “channels” -- their online presence, for example, and bricks-and-mortar locations -- public libraries must allow their users to move nimbly from digital to physical and back. Local public library instances on a national standards-based platform are key to bridging these worlds -- and to remaining responsive to local need.

Intelligent personalisation is an excellent vehicle with which to develop omnichannel experiences.

- Use online behaviour to recommend offline events and resources. For example:
 - A user searches for children’s DVDs and learns that there’s a kids’ movie matinee at a local library branch every Saturday;
 - A user who searches for materials related to diabetes can view a notice of an upcoming session on managing diabetes at their nearest library location or health agency;
 - A user browses for job search self-help books and learns that they can reserve one-on-one resume and cover letter help.
- Provide online tools to find library locations by services and facilities available, such as:
 - Search by geography, open hours, facility services (wifi, parking, computer lab).
- Connect a user’s online transaction to the physical space by introducing additional resources to explore in the physical library. For example:
 - A search for a title reveals special collections or exhibits related to the materials.
- Connect a user’s expected journey back to a preferred library branch with event announcements, such as:
 - A parent checking due dates sees in the account window a notice of a children’s reading group the same day the book is due and at her preferred branch.

7.3.2 Make the online library usable

Libraries serve a range of demographics including low-digital-literacy individuals -- children, adults and seniors -- and low-income individuals with access to the Internet mostly through mobile phones. Strong user-experience design is essential. Yet because good user-experience design is research based and iterative, it can be prohibitively expensive without economies of scale. England's public libraries should invest together in engaging, pleasing user experience design that can be configured from a central code base and branded for use at every library authority.

Strong usability design will:

- Reduce barriers for first-time and casual users
- Reduce what must be read with strong visual design
- Reduce what must be learned by adopting web conventions and user-centered design
- Adopt responsive design principles to deliver excellent user experiences on smartphones and tablets

Libraries can play a large role in driving forward digital literacy in their communities. Go ON UK and Government Digital Services have identified additional “usability” concerns that libraries can uniquely address, such as (UK Gov 2014):

- Motivation
 - Provide experience pathways that build from personal interests toward larger goals and engagement
 - Cultivate diverse, authenticate peer voices to encourage those who may not have seen themselves reflected the library.
 - Give staff tools to curate, feature and encourage the activity and communities that evolve in their online environments
- Trust
 - Allow the library's digital spaces to serve as a safe onramp for new users of the web
 - Provide terms of use that, as compared to commercial sites, place more control in the hands of users

Recommendations: Strategies

8 Library Managers

Enabling best practices with IT

8.1 To respond to the channel shift

To realise the strategic opportunities highlighted above will require a more sophisticated IT.

8.1.1 Make libraries easier to find online

As outlined in Section 7 above, if libraries are to attract new users and build a community of co-producers, they must include new criteria in their IT procurement. Library managers must include requirements such as:

- Enhance search-engine optimisation (SEO);
- Increase social sharing and referrals.

8.1.2 Make libraries easier to use online

To overcome the barriers to ease of use across the library experience, and to integrating and managing legacy IT, libraries must move:

- Away from monolithic stacks of software
- Towards modular and interoperable software.

The strategy allows libraries to choose the best component for each function, and at a later date, swap in any better version of that

component that should be on offer in the market. Modularity should reduce dependencies that prevent libraries from switching vendors, and should reduce the costs of integrating new modules.

In Section 12 we recommend that England's libraries, in order to give this new platform ecosystem strong start, acquire on a national scale a suite of core components for an initial period of three to five years.

8.2 To improve other services and value for money

8.2.1 Overview of tools

A number of tools are needed to improve operational effectiveness for libraries. These are described throughout, and in Appendixes V and VI, yet will be summarised to highlight their relevance here. They include:

- Tools to broaden and deepen the use of the library:
 - Marketing tools, particularly those related to findability above in SEO optimisation and social referrals
- Tools to reactivate the use of library buildings:
 - Location and room reservation systems, in conjunction with learning and reading group applications, to help draw people into the space
 - Event calendar tools
- Tools to leverage staff time:
 - Tools that enable staff to share programming across all libraries in their system and across all libraries nationally -- such as sharing book lists and associated activities
- Tools to leverage library community time:
 - Tools to facilitate volunteer management, such as registration and volunteer matching software
 - Tools to enable co-production

In addition to the above overview (see also Appendixes V and VI), two opportunity areas are worth exploring in detail:

- Tools for data aggregation and performance management
- Tools for collection management, which can be enabled particularly through merging e- and print book catalogues.

8.2.1 Data aggregation and performance management

To validate the library's expenditures and help make improvements will require data that is

- Comprehensive
- Comparable
- Actionable.

Aggregating this kind of data requires the building of a data warehouse, which again raises a number of features about the overall library IT environment that must be changed:

- To be comprehensive:
 - Data from multiple services must be able to be abstracted and then brought together in a common data warehouse, implying that separate service modules will be interoperable
- To be comparable:
 - Data must be able to be linked by user or user attributes, implying an ID module and ID standards (while respecting the principles of user privacy)
 - Data about books or activities must have common identifiers, implying a canonical (FRBR-based) work ID
 - Data across libraries must be comparable and brought together, implying data standards
 - Data must be stored across time and comparable across time
- To be actionable:
 - Data must be collected without manual effort, implying standard APIs and machine-driven rather than manual data management
 - Data must be live-streamed or synchronized on a short cycle
 - Data must be able to be quickly reported on, implying the development of reporting modules that are easy to use and evolved for library needs
 - Data must be acted upon without manual effort where possible, implying that data inputs help drive what is, for instance, presented in the catalogue to a particular user

To achieve the above will require moving away from monolithic architectures where data is not comprehensive, comparable, or

actionable to modular architectures where it can be leveraged at a national scale.

8.2.2 Implement an ebook service that optimises collections budgets and intensifies use of the library's physical and digital spaces

The emergence of ebook lending in England's public libraries presents two opportunities: the optimisation of collections budgets and the intensification of use of the library's physical and digital spaces.

To ensure the best use of collection budgets, especially as ebooks are adopted by libraries, will require tools that help manage demand and inform acquisition decisions. A key strategy for achieving this is unifying ebook and print discovery in one catalogue.

Ebook lending has been slow to start in the UK, yet publishers now seem poised to expand ebook lending through libraries with the proviso that licenses be sold to individual authorities or consortia, rather than nationally.

As they prepare for growth in ebook lending, English libraries should learn from mistakes in North America. North American libraries often have separate ebook and print lending environments, which causes two problems:

- Readers may queue for a more expensive ebook edition even if a cheaper print edition is available and they would be willing to take it.
- eBook readers lose touch with other library offers, which are not visible in an ebook silo. Discovery, account pages, and the e-reader are all touch points with the library user. They should not be ceded to the branding and business models of third parties. This point becomes more evident when one considers that ebook borrowing removes any need to visit the library's physical spaces -- and the notices, encounters and chance discoveries that those spaces offer.

Publishers have already begun to charge more for ebooks. For example, the largest publisher selling to libraries charges for an ebook license three to four times the price of a hardcover edition. At the same time the great majority of ebook borrowers are happy to take books in any format available. To the extent that users are directed to

ebooks instead of their print counterparts, library budgets will suffer needlessly. Libraries should think of ebooks as a complement to, rather than a substitute for print, and should design interfaces that deflect users to available editions, e or p, rather than building up queues and invoices for ebooks.

Siloed lending and reading environments tend to pull users away from the library community.

- With print books, the journey to the library exposes customers to events, to serendipitous decisions to borrow another book or enroll in a community class or even volunteer. The local library's branding also builds loyalty to the library.
- With ebooks, there is a risk that users may become more isolated from the library and develop a much more consumptive relationship.

As a result, libraries need to actively work to engage ebook readers in their communities.

But to manage costs and engage readers, they need an interface that combines ebook and print. In England, libraries could achieve this by situating all ebook discovery in the local library's catalogue -- with no silos:

- Demand for the more expensive ebook format can be diverted to print, which users are just as willing to read (evidence includes Amazon's demonstration in recent disputes with publishers that it can change algorithmic and UX elements to shift demand for certain items; Barrett 2014)³⁶; and
- Ebook users will always be exposed to the full range of the library's offerings and community (as presented in part through catalogue-embedded search engine marketing).

In addition to the unified ebook and print discovery, and for similar reasons, libraries need to have library-branded, library-centric e-readers, to:

- Draw users into conversations around books

³⁶ In the library, this might take the form of pairing a search result for a bestseller that has no available copies with a list of recommended alternatives and, if desired, a note calling users to enjoy the full breadth of the collection to help the library make its budget go furthest.

- Integrate these conversations about ebooks into conversations around print books and the library community
- Develop data insights for better serving their customers.

Users would be willing and often grateful for multi-format discovery and library-branded e-readers:

- Among readers generally,
 - The vast majority of readers of ebooks are also readers of print books, and are willing to accept both formats (per a study conducted by BiblioCommons and Chicago Public Library)
 - E-book sales are continuing to level off, and were even down last year (Alter 2015)
- Among library borrowers,
 - Even more open to accepting different formats,
 - More open to trying new authors and content: the attitude is “Let’s see what they’ve got” (as highlighted in the results of the Publisher Association’s 2014-15 ebook lending pilot)

This points to a larger strategy for sustainable and distinct collections development in libraries. Libraries need to offer choices they can afford to provide, and choices that distinguish their value proposition from commercial options.

Libraries will be best positioned to sustainably contribute to England's book culture, then, with discovery interfaces that allow:

- Nudging users toward available titles

While many elements of a discovery interface can help accomplish those goals, all of these will depend on some common capabilities outlined below:

- Capacity to index availability across all formats on a near-time basis
- A FRBR edition-matching service to ensure that libraries can always direct attention to either print or physical editions in their search and discovery interfaces
- A single publisher interface for the distribution of metadata and extended content (author videos and interviews, sneak previews) to readers
- A social layer that crowd-sources discovery data that go beyond traditional metadata, such as tags for topics and micro-genres

- A search service that combines and indexes publisher, crowd-sourced and MARC metadata to create discovery pathways; and that provide near-real-time availability across all formats and content silos
- A library-centric e-reader service that extends the library offer and brand, and focuses and reflects dialogue and engagement around a title back into the library's digital space
- An ebook lending service with the capacity for experimentation with flexible licensing models and full reporting capabilities to enable the assessment of the results of experiments in collaboration with publishers.

9 Library Partners

A standards-based platform enables shared content, programming and metrics

9.1 Allow third-sector partners to share resources, reach audience

The public library serves audiences that many cultural institutions and agencies find difficult to reach. Many see the power of libraries to reach new audiences, including migrants and lower-income households.

Past reports have indicated the need to join resources across the disparate institutions supporting culture and the arts in England. The public libraries of England are uniquely positioned to provide this infrastructure, enabling:

- Greater visibility of all offers and programming to millions of library users
- Cross-agency offers -- and the resulting data for research purposes to support the Shared Framework which the Reading Agency has advanced
- The cost efficiencies of easy access to book metadata provided by a centralised library data service.

A standards-based digital platform would allow libraries to collaborate more efficiently with partner organisations.

- “Pull” resources and audiences from the library -- for example to bring book titles into their pages as a listing in a blog or program using a platform-based book widget or list widget, or to validate registered users against the list of library card holders;
- “Push” new value created back to the library -- such as the book lists, new registrations, videos.



25

A platform that serves as a single point of integration between England's public libraries and its partners

9.2 Enable contributions to publishers, retailers, authors, and England's book culture as a whole

9.2.1 Provide new channels to publishers, and engagement and enriched content to readers

The potential for libraries to collaborate with publishers depends on the perception that libraries are net contributors to the publishing ecosystem. There are three ways in which libraries create value for publishers:

- Provide discovery channels for new authors and titles
- Generate reader engagement around a known author or series
- Gather data

A standards-based digital platform would help to make the value of libraries more clear to publishers.

England's libraries must work together to:

- Provide a single interface through which publishers can share book-related assets and offers with library users
- Provide to library users content and points of connection through

which they can discuss and more deeply engage with books, authors, series, imprints and publishers

- Provide a discovery system that allows libraries to shape demand, distributing users' attention across frontlist, midlist and backlist works
- Provide digital tools at a national scale for curating and merchandising books in library digital spaces, allowing libraries "to do for books what BBC did for music" (Ellison 2015)
- Allow users to opt in to the sharing of their reading profiles with publishers in exchange for recommendations, previews/galleys, event notices, etc.
- Enable a national data repository of transactions (issues) and reading data that will allow publishers to identify consumer trends (including a user-permission and data-aggregation system that protects the reader's right to privacy)
- Explore economic models that would allow libraries to recover some of the value they create for publishers through these means

If these tools are to be effective and efficient they must be implemented using digital systems on a national scale. By allowing publishers to gain insight and cultivate potential customers, libraries will create value for their users, publishers and themselves.

9.2.2 Build a national system for the discovery of authors

England's authors play a vital role in her creative economy. In order to enhance the discovery of authors at scale, libraries must give their users and staff tools that:

- Give exposure to new authors and works in the mid- and back-lists, especially through curation that is supported by the personal voice of library staff and users
- Add to traditional descriptive metadata on all works
- Create relational metadata - qualified linkages between works to aid discovery
- Allow users to explore the long tail of indie content.

Like many of our recommendations, if these tools are to be effective and efficient they must be implemented using digital technologies on a national scale. Only a standards-based digital platform could bring

together the libraries, audiences, content, authors, and user-interfaces necessary for success.

10 IT Ecosystem

From monoliths to modules

Libraries will need to respond to the challenges listed above by:

- Investing more
- Focusing buyers through library leadership
- Focusing builders through partnerships and standards
- Moving towards a modular, standards-based ecosystem by way of middleware

In the following section, we will describe the strategic pathway to the desired innovation through modular standards-based IT. The most pragmatic transitional step is through middleware -- a way to translate from diverse proprietary standards of monolithic LMS to a common layer of data standards and business logic.

10.1 Invest more

To improve the library digital infrastructure will require more funding. This funding will support:

- Creating user experiences online of comparable quality to commercial experiences that customers are used to
- Developing performance management capabilities that can increase outputs (e.g. deepen customer use of other library assets, as measured traditionally by increasing visits to branches and increasing book issues, and through new metrics such as community participation rates, partner engagement and “clicks”)

- Develop better architectures to reduce costs (as by reducing ongoing maintenance and integration costs in the future, and ensuring competitive markets).

Other observers have called for governments in general to spend more on their IT given its crucial importance today:

“ICT spending accounts for just 3–6% of a typical local authority’s budget. Instead of focusing on making their IT cheaper, the priority for local authorities should be to procure the right technology (and the right technical advice via consultants and other external experts) that enables them to deliver savings in the other 94–97% of their budgets.” (Copeland 2015, 25)

English public libraries spend even less than authorities on digital infrastructure: between 1-3% of their resources based on a survey of heads of library services.

By contrast, the New York Public Library currently spends ~4% of its operating budget on digital development every year. And among higher education institutions, the common benchmark is 4.5% of operating revenues (although this is not necessarily the desired target for libraries) (Higher Ed CIO 2012).

Other benchmarks come from the private sector. While “retailers tend to hold their IT budget spend close to the vest because they don’t like rivals knowing how much they spend” (Boulton 2013), companies have made occasional public announcements to reassure investors they are covering this critical area:

- To play catch-up on the capital side:
 - A survey of CEOs suggested an average of 29% of their capital budgets would be devoted to continued omnichannel improvements (Murphy 2015)
 - For example, Kohl’s announced in 2015 they would spend \$350M of their \$800M capital budget on “initiatives that integrate its brick-and-mortar stores” with its online business (Ramakrishnan 2015)
- And to continue investing every year on the operating side:
 - A survey of over 150 CIOs suggested an average of 5% of their operating budgets devoted to IT (for retail and consumer products companies) (Corporate Executive Board Company 2013)

Based on the 29% number for capital infrastructure infusions and the 4%-5% number for operating expenditures at NYPL, educational institutions, and commercial retail; public libraries in England should contemplate:

- A near-term large infusion of spending on their user-facing digital infrastructure
- An ongoing increase of two times or more to reach 5% of their operating budgets dedicated to digital expenditures.

10.2 Focus buyers through library leadership

To ensure that whatever money is spent goes as far as it can, libraries will need to focus their priorities and their spending as a group. This can reduce costs and make the library-IT marketplace more capable of delivering high-quality products.

Coordinated procurement will likely require the formation of an autonomous, national, library digital services agency. This digital services agency would set consistent priorities for key vendors and, over time, help guide the marketplace towards a new structure -- one that is open in its standards and modular in its architecture.

The framework agreement for the Oxford English Dictionary database provides an example of concerted procurement. The agreement for all libraries in England reduced costs to sell and manage the product, and this savings was passed on to libraries at an overall savings of 50% (Taplin 2015). However the economy of scale required for a standards-based digital platform and core applications for England's public libraries indicate a different model: we recommend procurement at full scale of services that would be available to each of 151 library authorities in England.

A number of voices have begun to note the problem with current IT procurement models in libraries. For example:

- On the need to centralise decision-making to improve the quality of what is asked for, Oskar Laurin, coordinator of national library infrastructure in Sweden, pointed out that “Not every library can be a good IT buyer”
- On the barriers to improving products, Ben Lee (2014) noted that libraries also need to put pressure on vendors by coordinating their ITTs.

10.3 Focus builders by moving IT from monolithic to modular, by way of middleware

England's libraries need to take a bold step in reframing their IT environment as a digital ecosystem that supports innovation, sustained enhancement and interoperability, by:

- Focusing their collective buying power on fewer bigger bets with vendors, choosing at the outset one best-in-class supplier for each component of a core suite of user-facing applications -- we list the proposed components of this core suite in the next section;
- Requiring that all new products conform to modular architecture and the open standards and APIs of a platform, thereby reducing barriers to innovation and switching costs (a.k.a “vendor lock-in”) for all;
- Encouraging vendors of existing products to cooperate with middleware integration;
- Forming a multi-year agreement with a single provider that can deliver middleware, aggregation services and an initial complement of modular applications as a foundation for the ecosystem, to provide a viable pathway from the status quo towards open alternatives.

The result will be an ecosystem that allows innovation, wherever it occurs, to be supported with the right inputs and integrated easily with other systems in 151 library authorities.

10.3.1 What is a modular standards-based platform?

A modular platform is a coherent service made of multiple parts that are complementary and where any of those parts can be readily replaced with a similar service from another supplier. Coherence is established through the standard way in which the components interact -- through standards-based APIs. The standards define a common language for data and business logic. The platform is defined by the standards -- embodied in the APIs -- along with the principle of

modularity. Flexibility and innovation are enabled by the relative independence of each component.

Traditionally, a platform evolves around a centralised service layer that does the heavy-lifting of managing common tasks and utilities, and coordinating the access of users of various types. Around that service layer is a constellation of applications that, unencumbered by underlying infrastructure, can be nimble, innovative, and highly user-centric. It is important to note that the platform need not be tied to any one service provider. Rather, the platform is embodied by the standards. And if the standards are open, the principle of modularity ensures that any one service provider can be unplugged and replaced as required.

The popular app stores for Android and iOS provide a good illustration of the distributed creativity enabled by platform ecosystems. An underlying operating system provides common functionality and coherence, and countless innovators then build apps on top that add invention and utility, releasing countless new apps every month that amuse, entertain and service millions of users.

Such platform ecosystems are developing in other areas of software, including for enterprise software. A number of authors³⁷ have suggested the need for governments to move towards platform architectures in their work as well; in many ways the work of Government Digital Service has focused on this goal for national government services in the UK.

What is essential is the stability of the APIs, the interfaces that allow applications to take advantage of information or services held within the aggregation service or other applications. The completeness of the APIs, their adherence to open standards, and the modularity of the services and applications will require leadership and vigilance from the library digital services agency.³⁸

10.3.2 How would a modular standards-based platform benefit libraries and IT builders and buyers?

³⁷ E.g. Dunleavy et al. 2005, Fishenden and Thompson 2012, Copeland 2015.

³⁸ See also Section 13.1 for discussion of the proposed library digital services agency.

If they are to serve efficiently and evolve, England's libraries require a modular IT ecosystem that sits on a standards-based platform. This means that the core functions of the library system must be built on common APIs as discrete interoperable components.

For libraries and IT buyers, standardised APIs between the modules would provide standard data and business logic across all library authorities, resolving the current integration challenge across the many flavours of LMS in England's public libraries. This new architecture would also reduce barriers to switching from an inferior component to an improved component.

For IT builders and innovators, adherence to these standards would enable interoperation with any other component supplied by any vendor. The barrier to entry for innovators would also be reduced; APIs and modularity will allow them to build applications with the kind of narrowly-focused, lightweight innovation that we see in app stores.

A library app store, benefiting all parties, could also be created -- a place where library buyers can discover and rate compatible modules and apps. The store might be managed by the national library digital services agency. Common standards in the store would reduce costs and elevate the level of service. These would include:

- The API standards discussed in this report
- Standard contracts and terms for sale to libraries, reducing transaction costs
- User-facing standards for privacy, the protection of children, and the intellectual property rights of users and publishers, which would be an outgrowth of the standards implemented in the social-catalogue application.

The library sector lacks such a marketplace today.

10.4 Bring a new platform ecosystem to life by procuring middleware, aggregation service and core applications

Modular platform ecosystems require a number of players to come together around a common set of open standards, modular architecture and foundational applications. To seed this ecosystem, we recommend that an agency representing England's public libraries procure from a private sector partner a foundational system of middleware, an aggregation service, and an initial set of core modules³⁹ - all built using open standards that others can build into and upon. User-facing services could be live in less than eighteen months. By this time robust APIs will start to be available so that a second phase of applications from any supplier can be implemented. At the end of the three-year period, as the APIs at each interface in the foundational system are hardened, any component in the system will replaceable individually, such that this initial keystone supplier becomes one supplier among the many.

The modular standards-based platform we propose requires deep integration into existing library management systems (the "LMSs", which will be unaffected by this initial phase of work) using middleware. This middleware could in theory be replaced by APIs built individually to common standards by each existing LMS supplier. However eighteen months would be an extremely challenging delivery date for every LMS vendor, and failure or delay on this mission-critical component would be catastrophic.⁴⁰ Thus in September, 2015 the task force convened a group of technical advisors who agreed with our recommendation to seek a middleware solution across all LMSs from a single supplier.

Nonetheless in the long run, the middleware itself will define de facto a new LMS API standard for England's libraries, which will eventually remove the need for the middleware. The digital services agency, working closely with the library authorities and using standardized

³⁹ All described in Section 12.

⁴⁰ See Section 11.1 for further discussion of a standards-based approach to creating LMS interoperability

procurement criteria as a means, must play a role in ensuring that this LMS API standard for England's libraries is universally adopted over time.

Recommendations: Tactics

11 Software design principles

In order to add visibility, usability, and value to the library’s offerings, and create an agile and sustainable IT environment for England’s public libraries as outlined above, we recommend the following design principles:

- Use middleware to quickly create standards-based interoperability
- Focus change on the local catalogue, where at least 70% of online library traffic is today
- Create a modern social catalogue module funded nationally and deployed and configured locally in each library authority
- Complement this enhanced catalogue with a new, library-specific, public-facing website module (a “CMS”) funded nationally yet configured and populated with content locally
- Invite communities to co-produce the experience of the catalogue and website
- Aggregate and connect community contributions across all libraries in the catalogue and CMS
- Invite partners to build on top of and into this modular platform

11.1 Add middleware to enable timely change at scale

Add middleware to enable timely change at scale, in order to:

- Enable building new modules that benefit from national investment and nationally aggregated data
- Enable new modules to stand on top of existing local LMSs, to preserve staff workflows and tailor to local community and collections.

Of the five approaches we considered, this was the only approach to improving the library digital experience that met all criteria. Our analysis of these approaches is summarised in this table, and detailed in Appendix VII.

	Deploy in and improve local user experience		Enable national modules & other sharing		Support IT ecosystem for ongoing innovation	Near-term achievable
	UX	Utility	UX	Utility		
1 Lightweight Apps (local website)	✓					✓
2 Extension of Bookmark Your Library (national website)			✓			✓
3 Middleware-based Inter-operability with applications	✓	✓	✓	✓	✓	✓
4 LMS-based Inter-operability with standard APIs	✓	✓	✓	✓	✓	
5 National LMS		✓		✓		

Lightweight Apps and the Extension of Bookmark Your Library (FAB Libraries) fail to meet the digital strategy requirements outlined in above sections. In particular, each one fails to implement foundational infrastructure that would make libraries more:

- Findable
- Useful
- Valuable.

In other words, they provide new paint, but no new plumbing.

A standards-based approach to creating LMS interoperability would work on all counts except timeliness. The LMS systems are in most cases two “generations” away from being able to support standard APIs:

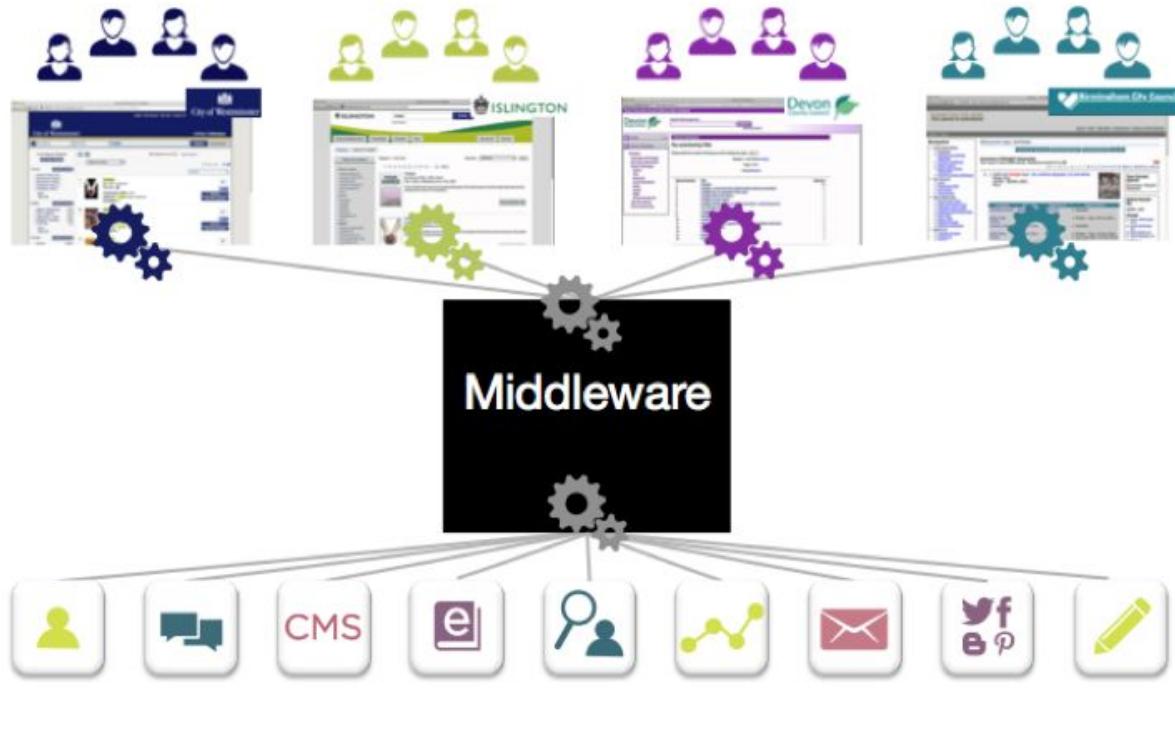
- A modular architecture would need to be implemented in each LMS
- The standardised APIs would need to be implemented for each module.

These steps could take years to implement.

A national LMS fails to solve almost every problem except aligning the back-end utilities. Defining a single LMS and moving all libraries to it would be a disruptive and slow process for staff. One library authority, for example, reported, "In the current financial circumstances migration is no longer a serious option due to staff and volunteer retraining costs." And, even once complete, this step would still leave libraries just "ready" for changes to the user experience -- without having undertaken those changes.

Middleware therefore has the best likelihood of enabling transformation at scale in the near term. And, in the long term, it can also enable the standardisation of the LMS in England.

Create middleware to enable national investment in modules that can be deployed in local environments to reach local audiences



11.2 Focus change on the local catalogue

Focus change on the local catalogue in order to:

- Connect with the large existing audiences in the local catalogues, and access user ID, search intentions, and other in-context information that users provide
- Preserve the staff workflows in the LMS.

Audience is the most important factor for success on the web, and the hardest factor to control. The greatest risk in a new project is not that the technology will fail, but that no one will come to use it. Past strategies for a national digital presence for libraries created national websites apart from local catalogues and hoped local users would follow. But they did not.

Large audiences already exist in local catalogues (OPACs). Despite difficult user experiences, England's catalogues already enjoy 3+ million unique users each month. We must embed national offerings

and national conversations within the local catalogue to serve and build upon this existing audience.

Leaving alone the back office systems of the library (the LMSs) will allow libraries to focus on the changes that matter most: their user-facing services. At the same time, preserving the back-end of the local catalogue can benefit change management. The LMSs have many existing dependencies in libraries that would be implicated with change.

11.3 Create a modern catalogue module funded nationally and deployed and configured locally in each library authority

Create a new, exceptional catalogue module (OPAC) funded nationally and deployed locally, in order to:

- Conform to modern web conventions to better serve those who need the library -- and leverage the library's unique assets to serve those who choose the library
- Supplement today's catalogue-search results and customer account views with pathways that, building on search intention or customer personalisation, lead to new recommendations, partner resources, events and opportunities in-branch
- Sustain the library's operating model by combining ebook and print editions in the catalogue (using FRBR) and directing users to available formats.

11.4 Invite communities to co-produce the experience of the catalogue and website

In Section 7 we enumerated the ways in which the affordances of the social web are key to making libraries relevant and visible online. Libraries must invite their communities to co-produce the experience of the catalogue, enabling the library to realise its mission of literacy, learning and community-building by:

- Addressing new divides
- Reflecting the unique assets and values of libraries
- Making libraries visible and usable online.

11.5 Aggregate and connect community contributions across all libraries in the social catalogue

Aggregate and connect community contributions across all libraries in the catalogue and CMS, in order to achieve the above strategies:

- To create breadth on the web outside the library, maximising pathways into it
- To add depth when displayed within each locally configured environment
- To aggregate data from all libraries to lead management insights in each one.

11.6 Invite partners to build on top of and into the modular standards-based platform

Invite partners to build on top of and into this modular platform, in order to achieve the above strategies:

- To pull content, community, and utilities from the library for use across the web
- To push content into the library for use by library audiences
- To build complementary national modules.

12 Architecture and components

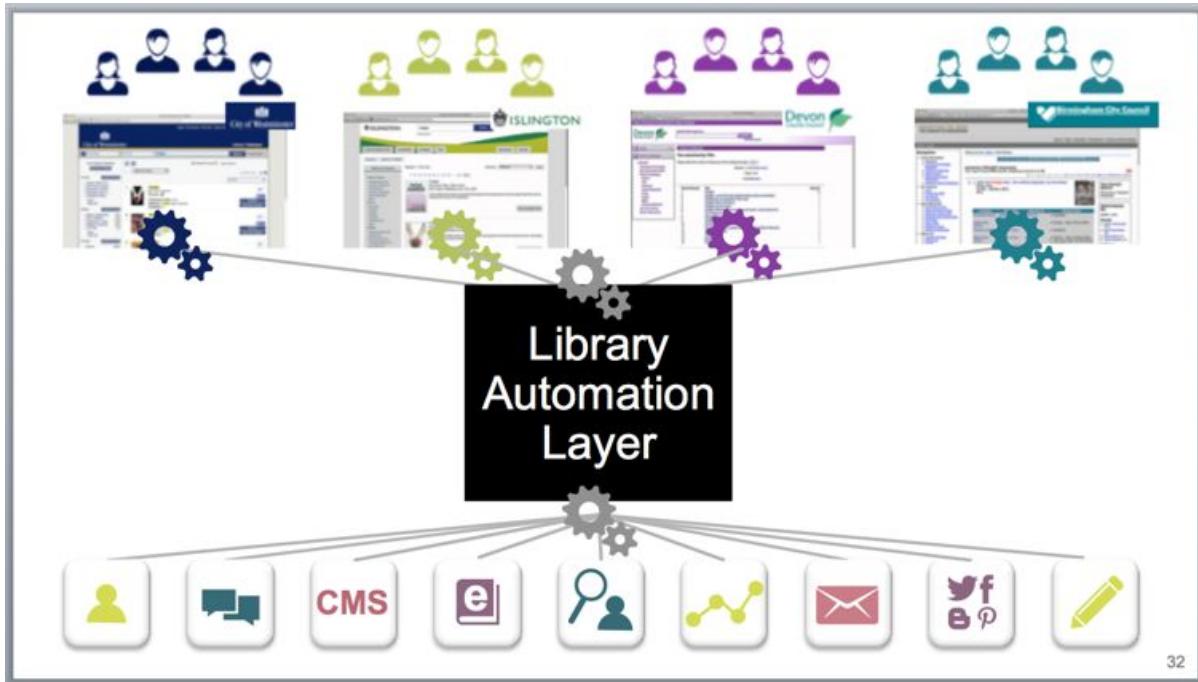
12.1 Overview of a modular platform architecture for libraries

We recommend for England's public libraries a software ecosystem to be comprised of modular components that allow them to achieve the strategic goals outlined above. To move the ecosystem forward requires new middleware -- mostly invisible infrastructure -- and new core modules that serve public library users, partners and staff with services that are staples in the retail IT sector. All staff-facing LMS functionality would remain in place unchanged for the foreseeable future until it is itself modularised.

The minimum viable suite is as follows:

1. Existing Library Management Systems (LMS) - to remain in place unchanged initially
2. Library Automation Layer - to be supplied by one vendor.
Includes:
 - Library Automation Middleware with APIs
 - Aggregation Service
3. Suite of Core Modules - to be supplied by one vendor for each module (with some grouping of modules at the outset based on the required competencies, as outlined in the section entitled Procurement). The modules are as follows:
 - Identity service
 - Branding service
 - Social Catalogue
 - Content management system (CMS)
 - Library ereader
 - Events and bookings service
 - Marketing automation service
 - Customer or constituent relationship manager (CRM)

- Centralised analytics service and data warehouse



Each of these components is described in greater detail below.

12.2.1 Library Automation Layer

"One thing I've learned about the tech side of libraries is to build services not websites."

Nick Poole, Chief Executive Officer at CILIP

Strategic Purpose: The library automation layer provides a unified, comprehensive set of APIs for all patron-facing data and transactions at all libraries, regardless of underlying limitations or variations of each LMS, or custom configurations at each local library.

12.2.1 Middleware

Provided by LMS vendors in the form of APIs that conform to a single standard or through standards-based middleware.

12.2.2 Data Aggregation Service

A central index of bibliographic and crowd-sourced data that can be normalised and enhanced for use across other modules.

12.3 Suite of core modules

A full discussion of the proposed components is presented in the Appendix VIII. What follows is an overview of the strategic purpose of each component.

12.3.1 Identity service

Strategic Purpose: As device and channel fragmentation increases, it's important to identify customers across devices, build rich customer profiles and provide more personal experiences across channels. The identity service must provide APIs to deploy a secure, standardised registration, authentication, and profile management experience across all web properties, mobile applications and partner and community integrations.

This identity service could be a council-picked commodity solution so long as it meets these requirements. However, in the first three years of the digital service we have recommended that provision of the identity service be bundled and procured with the middleware and aggregation service in a library-automation layer.

12.3.2 Branding service

"I can't remember the last time I borrowed a book. But I often go to a library - it is an institution, civic and enlightening - that I want to be a part of."

User interview

Strategic Purpose: If libraries are to nurture an ecosystem of interoperable service providers to deliver best-in-class functionality for each component, a branding service is required to allow libraries to configure their branding assets once, and have those assets rendered in every user-facing module on all devices.

The local face of the community library was identified in user research as an asset with the potential to draw lapsed users back to the library. This point was underscored in conversations with representatives of local government, who emphasised the importance of local identity in service delivery.

12.3.3 Social Catalogue

“The knowledge was in the community, not in the books. Staff became librarians of the knowledge in the community.”

Tim Ahrensbach, coordinator of Library Lab on Williston Green

Strategic Purpose: The catalogue is the foundation of an online services provider in any sector that manages an inventory of objects, whether goods or media, whether for loan or for sale. In the ecommerce world the catalogue component consists of two basic components: the product database and Order Management. The same is true for the library.

Social functionality encompasses a spectrum of user engagement. A small but significant percentage of users will fully engage in creating written content or content lists. Many more will rate content, “like,” or engage in personal record-keeping on virtual bookshelves. Nearly all users will passively benefit from reading reviews, or discovering new content through lists and read-alike recommendations.

12.3.4 Content management system

Strategic Purpose: A Content Management System allows multiple people to create, publish, and edit content using a centralised web-based user interface. Using a content management system, content creators can publish not only documents, such as articles, blogs, or pages, but also assemble chunks or fragments of content in different ways that are pushed out across multiple channels and instances to ensure that content is kept timely and relevant to visitors. Content management systems provide content creation tools that do not require specific technical expertise to use.

This CMS will not likely be successful if the same commodity solution used for other services in the local council is also used here. In contrast to the transactional and didactic needs of a council site, the needs of a library site are experiential and social.

12.3.5 Library ereader application

“Libraries must be able to choose content, devices and apps from any provider or from multiple providers, without bundling that limits a library’s ability to serve content they purchase on platforms of their choice.”

ReadersFirst

Strategic Purpose: Control of ebook workflows should be a part of a library’s digital strategy. Both discovery and reading experiences should be optimised for ease-of-use, response and engagement, and providing discovery pathways to a customer’s next read. The e-reader is an important extension of the library brand. The configuration of both the e-reading and e-discovery experiences determine the degree to which e-borrowers are exposed to the full scope of the library’s offer.

12.3.6 Events and bookings service

Strategic Purpose: Libraries in England run thousands of events every month, yet they are hard to find on the Internet. An Events module would expose events on the web and display them intelligently in the catalogue alongside related searches and books. The module could also be used for discovery of events hosted by community partners or cultural agencies, making the library a hub for the discovery of local events.

This component could be a local council’s choice for other services as well, provided standardised APIs are available that the CMS and catalogue can read and write back into.

12.3.7 Marketing automation service

Strategic Purpose: Marketing automation software enables organisations and marketers to more effectively promote products and services across multiple online channels, including email, social media properties, websites, and mobile applications. Marketing automation aims to provide prospects with personalised, useful content to help move prospects to customers or customers to engaged customers. Marketing automation combines tools to automate repetitive tasks and also to analyse the efficacy of different campaigns. Marketing

automation tools can be used for both inbound and outbound marketing strategies.

This component requires specific functionality not found in off-the-shelf services, yet these functionalities could likely be built on top of a standardised API-enabled service used council-wide.

12.3.9 *Customer/Constituent relationship management (CRM)*

Strategic Purpose: Customer/Constituent Relationship Management (CRM) software is used to help an organisation create a “360 view” of its customers or constituents. The organization can then use this information to connect with current and future constituents in order to acquire, retain, and engage those customers and constituents. CRM tools enable organisations to gather information about individual prospects or existing constituents across multiple touchpoints, and in turn provide those customers with tailored communications, services, and products.

In the library context, CRM tools enable:

- Library members to specify content and programs of interest and receive automated updates on those interests
- Library members to opt in to library personalisation services made possible through the tracking of activities such as events attended or items borrowed
- Library staff to add constituent information during telephone, in-person, and online interactions
- Libraries to seek out specific groups of constituents or individuals for input on specific services
- Analysis of trends in constituent behaviour and target initiatives to encourage or discourage those trends
- Provision of additional opportunities to capture constituent activity and sentiment from multiple touch points (social media, in-library interactions, telephone interactions, online feedback)
- Libraries to feed this data into marketing and communication programs to cross-promote content, programs and services.

A library CRM would therefore require specific functionality not found in off-the-shelf CRMs, yet these functionalities could likely be built on top of a standardised API-enabled CRM used council-wide.

12.3.10 Centralised analytics service and data warehouse

Strategic Purpose: Online service providers must track detailed transactional data about their products and customers, and use that data to inform business decisions, and to optimise customer experience and ROI. This is only possible if transactional data can be normalised, aggregated and accessed by business intelligence and data analytics tools. A unified analytics and data warehouse provides these functions, and enables integration with a broad range of BI and data analytics solutions.

A further description of these components is available in Appendix VIII.

12.4 A Thousand Flowers

In addition to the library automation layer and core application modules, we encourage libraries to plan for a series of innovative, low-cost apps and products, scaled nationally, that take advantage of the new platform API. Providers might offer specialised reporting analytic capabilities, for example, or mobile apps that replace the need for self- check machines, or that allow users to browse shelves virtually on the basis of nearby near-frequency geolocation transmitters (such as ibeacons) and in so doing, to explore the full range of related library materials -- ebooks, events, items that are currently on loan, but available soon -- as they wander the stacks. These apps and products could be built by vendors, library staff, partners, and the general public.

13 Project and Ecosystem Leadership

to complete the project and to enable continued innovation

13.1 Establish an agency to coordinate partner and vendor relationships -- and shareable content

We recommend that an autonomous agency be established in England, with a budget of £1.5M over the first three years, to provide strategic leadership for the standards-based digital platform.

The agency would:

- Provide the specialised skills required to oversee the implementation of the platform
- Develop more streamlined, forward-looking relationships with national vendors and partners
- Coordinate shared programming and shareable digital content on the platform among libraries around national offers
- Curate and highlight the stream of co-produced content from users and partners.

To accomplish this, the agency should engage a team of experts that spans many areas. This agency must draw upon insights from the consumer sector, which like libraries must create engaging user experiences that go beyond the transactional and didactic requirements of most government websites. At the same time, this agency must stay close to the mission of *public* libraries and librarians (as distinct, for example, from academic libraries, which deal with substantially different user stories).

It would therefore be wise to have the proposed agency report to an independent board that provides for a mix of voices. These voices are

recommended to be in 13 in number, with the following distribution:

- Libraries (3)
- Funding bodies that work with libraries (2)
- Unaffiliated experts in consumer digital experience:
 - Technology (1)
 - Product (1)
 - Content strategy (1)
- Stakeholders building on top of and into the public library platform:
 - Technology partners (1)
 - National cultural organisations (1)
 - National literacy organisations (1)
 - Community partners (1), and
 - Publishers (1)

There are several existing agencies that might step into the lead role -- whether the SCL (which initiated this project), the Reading Agency, the Arts Council or a new group within the British Library. Regardless, that lead agency should convene a diverse board such as the above to be successful.

13.2 Procurement - Finding Technology Partners

England's libraries need a partner as they prepare to establish a standards-based platform and build a core set of modular components. At the outset, we recommend that both of these briefs be assigned to a single supplier for a period of at least three years. The supplier would build and maintain a middleware foundations, aggregation services and APIs -- establishing a platform on which an ecosystem can be built -- i.e. a system of systems supplied by vendors, local and national partners, libraries and their staff, and the public.

13.2.1 Pre-project development

Because of the uncertainty of funding, the best basis for such a partnership may be an agreement that is conceived in two phases, but awarded to a single supplier. The first phase of work, with a smaller fee, would focus on researching, preparing materials for, and participation in fundraising. The deliverables and payment for a

second phase of work would be contingent on success in the first, and focus on building and maintaining both the library-automation layer and a bundle of core modular components (bundle “A” below) over 3-5 years.

13.2.2 Bundling components

A modular interoperable architecture means that all of the components could in theory be supplied by separate vendors at the outset. However the cost and time to market will be faster if some core components are bundled for delivery, to modular interoperable standards, by a single supplier in the first 3-5 years. In subsequent periods the contracts for every module could be awarded separately to the most compelling supplier.

13.2.3 Phasing, Sourcing, and Cost of Components

The first phase of proposed work encompasses a suite of components that comprise a minimum viable digital presence for libraries. Subsequent phases of work enumerated here are essential in the medium term if libraries are to benefit fully from a digital platform. However work could be delayed a year or two if the agency feels that a phased approach is desirable. Our recommendation for bundling and phasing are as follows.

Components	Procurement details				Can this be procured off-the-shelf?
	Bundle	Phase	Cost / yr (£M)	Cost / 3yr build (£M)	
Library automation layer - Middleware - Data aggregation - Identity - Branding	A	1	1.6	4.9	LS
Social Catalogue	A	1	1.6	4.8	LS
CMS	B	1	1.2	3.6	LS

Library e-reader	C	1	0.5	1.5	LS or C
Events and bookings	D	1	0.4	1.2	C
Marketing automation	E	2	?	?	C
CRM	F	2	?	?	C
Centralised analytics	G	2	?	?	C
					£16M
<i>Other project costs</i>					
Agency Budget	A	1	0.66	1.5	[NA]
Implementation Fee	A	1	0.83	2.5	[NA]
					£4M

13.2.4 Selecting a vendor and mitigating project risk

The basis for procurement should be the problems and opportunities outlined in the findings of the report. Because of the complexity of the project and the degree of innovation required, we recommend a competitive dialogue procurement procedure.

The selection criteria should be framed with a relationship of 3-5 years in mind. We do not imagine a turn-key solution. Rather, libraries would invest in a hosted service that would be delivered over a period of time, starting with an initial build and implementation of 1-1.5 years followed by ongoing maintenance and iterative enhancement, including extensive user testing and consultation with stakeholders on the platform on the implementation of mature APIs. Libraries should expect continuous iteration and innovation in the user-facing services, ensuring that England's libraries lead, rather than follow, in setting a standard for usability and engagement in the cultural sector -- both public and commercial.

The design of the library-automation layer and catalogue modules described here poses risks that can be addressed in a competitive dialogue process. These risks include:

- Ensuring a balance between the efficiencies and innovation of a centralized, agile code-base and the need for local configurability and content in each library authority
- Vendor lock-in
- The risk of project delays - England's libraries must act quickly to establish a convincing presence online.

The design and implementation of the middleware in particular will require domain-specific expertise and tooling:

- To deliver integrations that are complete, efficient and correct
- To work with local staff to understand local cataloguing rules and map them to a normalised schema.

LMS products lack comprehensive APIs, making integration difficult; while some of this can be overcome by interfacing with lower-level interfaces such as the relational database management system (RDBMS) and legacy online public access catalogue (OPAC), existing expertise in this effort limits project risks.

To manage a resilient cloud architecture and deploy code into heterogeneous hardware, software and networking environments requires:

- A dedicated deployment team
- Code which interfaces with on-premise systems that is as lightweight as possible
- Primary data storage and business logic residing in a shared cloud service
- Comprehensive data-center planning to scale the service, as well as load testing with live data sets.

To ensure future modularity without dependence on the middleware/aggregation service or any one module, requires:

- Interoperable data formats and APIs between the middleware/aggregation service and each module
- Leadership to progressively build APIs from the LMS services to meet those same endpoints
- Leadership to build a partner ecosystem with many active contributors

A sampling of more specific criteria that should be used to procure such a partner is presented in Appendix IX.

Conclusion

Conclusion

14 Costs and benefits of going forward

14.1 Costs

Our goal here is to outline costs by order of magnitude in anticipation of a tendering process in which they can be specified more precisely.

The expected range for work outlined here over the first *three years* is ~£20M. These cost can be broken down roughly as follows:

- Library Automation Layer: ~£5M
- Social Catalogue: ~£5M
- Other Components: ~£6M
- Agency Costs: ~£1.5M
- Implementation Costs: ~£2.5M

To put these costs in perspective, per library this is equivalent to:

- Less than £45K per library authority per year
- Less than 1% of library expenditures per year
- Less than the cost of renovating a single large library branch

While the digital platform presents an “invest to save” opportunity, not all costs will be cashable to libraries. A portion of the costs must therefore be seen as an “invest to transform” opportunity; an opportunity not to reduce inputs but to regain relevance and to produce enhanced outputs in all other areas of service, and against public policy objectives in the fields of literacy, digital and social inclusion, health, education, and economic participation. .

In this light, looking at the costs of IT alone provides an incomplete picture. As one policy analyst suggests,

“ICT spending accounts for just 3–6% of a typical local authority’s budget. Instead of focusing on making their IT cheaper, the priority for local authorities should be to procure the right technology (and the right technical advice via consultants and other external experts) that enables them to deliver savings

in the other 94–97% of their budgets.” (also quoted above in Section 10.1. Copeland 2015, 25)

Today, libraries spend even less than authorities overall: between 1-3% of their resources based on a survey of heads of library services. Meanwhile, as a point of comparison, many retailers are investing about 30% of capital budgets on improvements to omnichannel digital offerings, and are spending 5% of annual operating expenditures on IT (Corporate Executive Board Company 2013; Murphy 2015).

And among users, 97% of Britons say they can afford home Internet and 73% are online every day -- and most have the Internet in their pockets, as well (UK ONS 2014). The prevalence of digital affects their lives on the ground, too: more than 80% of in-person retail purchases begin by browsing on the Internet first (Rueter 2012).

Without investment in the digital branch and the digital pathway to the physical branch, libraries will continue to be nearly invisible.

14.2 Benefits

A standards-based digital platform for libraries in England will have far-reaching benefits, both for libraries’ coffers and for the community.

While this investment is foundational, it will not by itself be fully transformative. The suite of components prioritised with these recommendations will advance libraries towards the present by two decades; it won’t necessarily propel them to the future. These are the basic foundations that any retailer, online or offline, would require just to survive.

But the transformative power -- the power that allows libraries not just to catch up, but to leap-frog -- will come from the capacity the platform creates for others to innovate in years ahead. Costs to future development will be reduced by the investments in this common digital foundation - enabling rapid lightweight innovation, iterative

improvement, and the sharing across all library authorities (made possible by platform interoperability).

For the purposes of this report, benefits for this foundation have been sketched to provide an order-of-magnitude estimate.

Financially, over £100 M+ in annual benefits are anticipated across two categories:

- £2 M in reduced annual financial inputs (£2 M in cashable technology and content savings)
- £111 M+ in increased annual non-financial outputs (£61 M in avoided capital and programming costs for libraries, £6M in staff time liberated to refocus on other tasks, £18 M in avoided costs for partners)
- Other public benefits such as for literacy, economic participation, social inclusion, and health that have not been monetised in this model.

More thematically, the benefits emerge by:

1. Increasing how many people use the library (£80 M+)
2. Increasing how much each individual uses the library (£67 M+)
3. Reducing wasted staff time messing with bad IT, enabling that time to be spent on other IT tasks or elsewhere (£6 M+)
4. Reducing technical and contract costs given national scale (£2 M+)
5. Providing partners with access to audience, infrastructure (£18 M+)
6. And providing lifelong benefits to the individuals and communities who access library services (not quantified).

A more detailed explanation of these estimates is provided in Appendix X. What follows is a summary.

The first benefit is increasing how many people use the library. The digital platform can change perceptions, and make libraries easier to find and use online -- and these make libraries more likely to be used offline as well. As the *Independent Library Report for England* found (2014), “Libraries often present a negative image of being old-fashioned places that have little relevance in today’s society.” Changing this is possible online:

- As noted above, more than 80% of retail customers today go online to look at items before going into physical stores to buy them (Rueter 2012)
- The online look and feel is the leading factor in judging an organisation's credibility, with nearly 50% of those surveyed mentioning this in free response (Fogg et al 2002).

The digital platform will also help make libraries easier to find and use, online and then offline, by:

- Focusing on search engine optimisation (SEO) and social referrals nationally to bring traffic to the websites
- Making websites and catalogues attractive and easy to use
- And making library locations and event calendars easy to find online.

These elements of an improved web presence can generate the equivalent web traffic and foot traffic of £53M in marketing annually.⁴¹ £53M would also be the approximate annual cost to generate the same increase in foot traffic through renovations.⁴²

The second benefit area is in deepening the use of library assets by each person. Getting more people in the door is only as useful as their ability to take advantage of the services the libraries offer.

Encouraging better use also means finding ways to increase the efficiency of the provision of those services. For example, £1.4M in annual acquisition of new books can be avoided by redirecting only 10% of demand for bestsellers (which are bought at great expense and then discarded shortly thereafter), in favour of alternative titles suggested through improved discovery and staff and user recommendations.⁴³

The third benefit area is redirected staff time. With the technology systems in place at library branches, many staff members spend significant time on tasks that would be eliminated with a

⁴¹ Equivalence is from a combination of pay-per-click and direct mail costs; see Appendix X for full method of estimation and sourcing.

⁴² Equivalence is based on industry standards from retail; see Appendix X for full method of estimation and sourcing.

⁴³ General evidence of being able to divert attention away from bestsellers comes from Amazon's efforts to suppress key titles sold by Hachette during their dispute (Barrett 2013). This might take the form of pairing a search result of a bestseller that has no available copies with a list of recommended alternatives and, if desired, a note calling users to enjoy the full breadth of the collection to help the library make its budget go furthest. For more sourcing, see Appendix X.

standards-based digital platform, freeing them to focus on more value-adding and enjoyable projects, such as service design and analytics, and the role of “community impresario.” (Seighart 2014) Improving the ability for customers to use self-service features and allowing for the prepopulation of fields, for example, have the combined potential to free up £1.7M in staff time now spent doing these routine tasks.⁴⁴ By implementing a national set of records, national reporting tools and nationally comparable data, an additional £2M in staff time may be saved, while creating and improving access to actionable insights.

Fourth, a standards-based digital platform can also reduce direct costs, given that it will allow libraries nationwide to be served in the same way, increasing their bargaining power with vendors and reducing the vendor cost of providing software and e-content. This gives libraries both the leverage and the rationale to reduce cost of service, as occurred with the national agreement for Oxford University digital offerings (Taplin 2015). Existing, smaller contracts for things like data reporting can be eliminated, with those functions absorbed by the platform instead, for an estimated saving of over £3M.⁴⁵ Additional cost savings are likely over time as libraries can use apples-to-apples data to manage their performance and cut services that do not return value.

A fifth and crucial benefit is that a standards-based digital platform will provide partner organisations a link to an audience they desire to serve. Increasingly, growing audience online is too expensive and too difficult; after all, it can be said that Google, Facebook, Twitter, and Instagram are all in one business -- advertising -- and to extract value they have imposed pay walls for even nonprofits to put messages in front of their followers (Leonard and Taylor 2014). The library’s key value proposition to partners, then, is audience. On a standards-based digital platform with a partners’ interface, trusted partners should be able to log onto the platform to manage partner pages and identify content that would be featured with relevant title-record pages and

⁴⁴ Staff time based on survey of libraries by BiblioCommons; see Appendix X for more on methods and sourcing.

⁴⁵ Based on survey of libraries by BiblioCommons; see Appendix X for more on methods and sourcing.

search results. We estimate the value of this in-kind advertising in a library-centric digital public space at £10M+.⁴⁶

Sixth, a standards-based digital platform will be able to support the national goals libraries are founded to serve. One of the platform's greatest contributions will be its ability to support scalable applications that foster literacy, a lifelong good that stands to increase an individual's personal fulfillment and employment prospects.

Also important in a rapidly changing economy, the platform will support lifelong learning, especially through connecting peer groups and connecting mentors to protégés (this need is discussed in Young 2013, 25, and UK Dept. Innovation & Skills 2009, 4-6). Finally, literacy is a precondition for digital literacy and social inclusion (Macdonald 2013). The core applications should be designed to provide the motivation, trust, and support⁴⁷ needed for reluctant web users to explore and experiment on a web application. Bridging digital divides should be a key objective of the core applications.

All told, a standards-based digital platform can be expected to have direct annual IT cost savings in the £1M range, and annual liberated staff time equivalent to £5-10M, as well as added use value in the range of £100Ms annually.

Benefits will also accrue by positioning libraries for a more agile response to future developments in the digital landscape. A standards-based digital platform is the only via means to enable libraries to respond nimbly, inexpensively and quickly to new needs and opportunities.

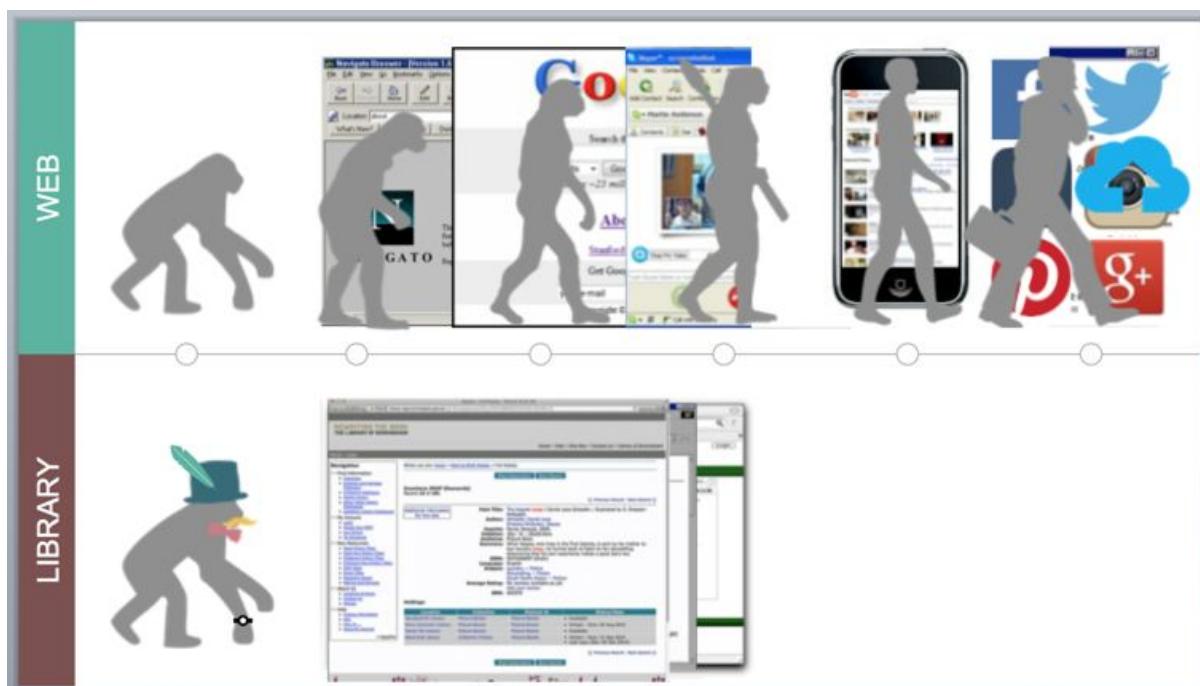
⁴⁶ Based on industry standards; see Appendix X for more on estimation methods and sourcing.

⁴⁷ Identified as greater barriers to use of the Internet than affordability, per Go ON UK 2012

Conclusion

15 Costs of standing still

Our field research, evaluation of past reports and technical analysis indicates that the causes of decline in public library usage over the last three decades are digital transformations outside of libraries, and digital stagnation within libraries. There is clear evidence that this imbalance cannot be addressed by innovation at the margins -- the cost would be too great, and the pace of change too slow.



Libraries, of course, are not alone in facing dramatic change brought on by digital disruption. Other industries and sectors that are now transitioning have been forced to simultaneously reduce traditional expenditures and invest massively in digital -- both digital in its own right, and digital as a complement to their offline businesses. Those that have not made these transitions -- Borders, Blockbuster, HMV -- are visible reminders of the potential peril of under-investing in digital, or of doing so too late. Again, the solution is not as simple as replacing print books with ebooks, or creating a standalone website and standalone branches. Only a platform ecosystem, can enable the

critical mass of users, staff, partners and vendors, collaborating at a national scale, that is required to allow England's libraries to survive -- and thrive -- through the next decade.

An investment in a standards-based digital platform is the only affordable path to engaging lapsed users and even non-users in a revitalised, contemporary service; and to realise the insights of so many past reports. To date there has been fervent agreement on the path forward, just no capacity to execute at scale. But today there is no need for wishful thinking. Libraries have tremendous assets to build upon. These include enviable existing traffic and an army of virtual volunteers waiting to be called upon. Perhaps most importantly, the leaders of England's library authorities and those responsible for funding libraries in England have shown a will to collaborate that, in our experience in North America, is unprecedented.

Appendices
