Moving from management information to data driven intelligence: the impact on collection development

NAG seminar: November 2018

Ken Chad
Ken Chad Consulting Ltd
Twitter @kenchad
ken@kenchadconsulting.com
Tel: +44 (0)7788 727 845
www.kenchadconsulting.com
My contribution today should be treated as “food-for-thought”

I have a short time so I will limit my contribution to libraries in the context of HE and Teaching and Learning
Can collection development be done more effectively by algorithms (AI?) – i.e. without human (librarian) intervention?
Preamble
some context
“The world’s most valuable resource is no longer oil, but data. Smartphones and the internet have made data abundant, ubiquitous and far more valuable”

AI is responsible for many useful tools that have already become mainstream: speech and image recognition, search engines, spam filters, product and movie recommendations.

AI also has the potential to enable promising technologies like driverless cars, tools for rapid scientific discovery and digital assistants for medical image analysis……

[and library collection development?]

Do the benefits of artificial intelligence outweigh the risks? Frank L. Ruta The Economist. 10th September 2018
“Platforms are eating the world”

“Now, market upstarts are displacing market leaders faster than ever before as entire industries transform. We are in the midst of a seismic shift in business models, powered by the Internet and a generation of connected users.

Business leaders, today, develop platforms that connect diverse participants with one another and enable them to interact and transact”

Platforms are driven by data.....

Producer of content

Filter (the library)

Consumer of content

Information about users

Information about content

DATA

DATA

Kenchad consulting helping create more effective libraries.....
“the importance of ‘high quality teaching’ in higher education (HE) is becoming increasingly emphasised both in the United Kingdom (UK) and abroad.

Excellence in teaching has become entrenched in higher education policy and in the educational strategies of academic institutions, and increasingly linked to the performance and assessment of these institutions.”

https://www.heacademy.ac.uk/system/files/resources/defining_and_demonstrating_teaching_quality_and_impact.pdf
Why are libraries interested? - Trends

**Collection assessment trends**
There has been a remarkable shift to the incorporation and integration of more continuous, ongoing, flexible, and sustainable review of collections rather than ad-hoc project-based models. “Rightsizing” the collection has become a norm.

**Evidence of learning: Student success, learning analytics, credentialing**
Student success continues to be an important focus for higher education institutions, where the trend towards performance-based funding and accreditation criteria includes an emphasis on learning outcomes, retention, and matriculation.

http://crln.acrl.org/content/77/6/274.full
Why are libraries interested? - Trends

Trend 1: Rising interest in big data, data science and AI in general

Trend 2: Library systems are becoming more open and more capable at analytics

Trend 3: Assessment and increasing demand to show value are hot trends

Trend 4: Rising interest in learning analytics

Trend 5: Increasing academic focus on managing research data provides synergy

“the library has an integral role in the university’s mission of research and teaching, not just a supporting one.”

UK Scholarly Reading and the Value of Library Resources: library may have a correlation to the overall strength Summary Results of the Study Conducted Spring 2011. Carol Tenopir and Rachel Volentine. Jisc Collections. February 2012
Academic libraries are facing times of unprecedented challenge and unparalleled change. **Innovation has moved from a consideration to a necessity.**

http://www.libraryinnovation.org/article/view/420/625
Libraries and data

Data, analytics and collection development today
In challenging times, the requirement to make decisions (particularly in relation to resources spend) that are data-driven and evidence-based have become increasingly significant.

“Libraries want to make data-driven decisions about the management of their digital and print book collections but the data that is currently available does not allow them to do this with confidence”

“There are two main approaches to collection assessment:”

**Collection-centered**
Analyzes the contents of a collection for quantity and quality, makes comparisons to peer institutions, focuses on the collection’s condition, and measures against core subject titles.

**Use/user-centered**
The latter is focused on how materials are being used and by whom. This approach helps the library gain insight into the perceived needs of a library user, or perceived demand

Hunt & Gather: The Fundamentals of Collection Assessment, By Caroline Muglia ProQuest blog
Kinds of data

Vendor-provided, Institutionally generated, Peer comparison.

**Vendor-provided data:**
- (COUNTER) data, or “Codes of Practice” enables publishers and vendors to report usage **data in a standardized format**
- Altmetrics enables authors to see the impact of their publication (paper, book, or dataset) by monitoring references not only from scholarly journals, but also social media outlets, newspapers, and policy documents. Altmetrics data can be easily applied to assessment projects to **measure usage and assign value to costly resources.**

Kinds of data used

**Institutional**
- Print collection - e.g.
  - Circulation rates
  - Age or physical condition of the collection
  - Subjects that are most used
- Ebook use statistics, similar to data from the print collection
- Interlibrary loan (ILL). Lending data can provide information on the strength of the collection compared to neighboring institutions, and borrowing information can uncover potential gaps in the collection.
- Web …can provide valuable details on what users are accessing, from where, and for how long. Sometimes librarians pair this data with EZ Proxy or authentication data for a deeper understanding of the types of users accessing resources.

**Peer comparison data:**
Peer Analysis enables libraries to **compare unique and overlapping titles** from specific peer institutions, parsed by subject, category, and classification.

From management information to analytics
Management information – reports from the ILS

Out-of-the-Box Reports

<table>
<thead>
<tr>
<th>Report</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acquisitions (based on Funds Expenditures SA)</td>
<td></td>
</tr>
<tr>
<td>Detailed Expenditures</td>
<td>Displays fund, title, and price information for items.</td>
</tr>
<tr>
<td>Expenditure Per Acquisition Method</td>
<td>Displays annual expenditures per acquisition method.</td>
</tr>
<tr>
<td>Expenditure Per Acquisition Method – Annual Trend</td>
<td>Displays a line chart of annual expenditures per acquisition method.</td>
</tr>
<tr>
<td>Expenditure Per Acquisition Method - Top 10</td>
<td>Displays a bar chart of the top 10 expenditures per acquisition method.</td>
</tr>
<tr>
<td>Expenditure Per Classifications</td>
<td>Displays annual expenditure per classification.</td>
</tr>
<tr>
<td>Expenditure Per Classifications - Top 10</td>
<td>Displays a bar chart of the top 10 annual expenditures per classification.</td>
</tr>
<tr>
<td>Expenditure Per Fund Ledger Code</td>
<td>Displays annual expenditures per fund ledger code.</td>
</tr>
<tr>
<td>Expenditure Per Fund Ledger Code - Top 10</td>
<td>Displays a bar chart of the top 10 expenditures per fund ledger code.</td>
</tr>
</tbody>
</table>

https://knowledge.exlibrisgroup.com/Alma/Product_Documentation/010Alma_Online_Help_(English)/080Analytics/060Out-of-the-Box-Reports
Bringing library related data together –dashboards/visualisation

MAKE MORE DATA-DRIVEN DECISIONS

Integrate and organize data from dozens of sources covering journals, databases, eBooks, and bundles, all in one place so you and your staff can make more informed spending and collection decisions.

“...helps us to efficiently allocate resources to meet user needs and demands.” – Scott Anderson, Millersville University

https://redlink.com/library-dashboard/
Analysing library data-the institutional approach

The College of New Jersey Library

“The authors investigated quantitative methods of collection use analysis employing library data that are available in ILS and ILL systems to better understand library collection use and user needs.

For the purpose of the study, the authors extracted circulation and ILL records from the library’s systems using data-mining techniques. By comparing these data to records of books acquired in a four-year period, the study reveals generally good collection use as well as some unmet collection needs. The study also offers a method of compiling and sharing these multiple types of usage data among work groups to create feedback mechanisms to inform the work of selectors and suggest modifications to collection development practices.

Usage data on their own…give libraries and publishers very little insight into how content is being used or how much it is being looked at.

In spite of the huge amount of data that are now available to libraries, it feels as if little progress has been made in developing metrics that may give an indication of how resources are being used and the extent to which library users value the resources provided. These perceived shortcomings in conventional usage data led Nottingham Trent University and Alexander Street to partner in piloting an in-depth view of analytics, demonstrating user engagement and impact of use.

Project COUNTER …..provides consistency in reporting, but it does not reveal which individual titles or subjects are used or for what purpose.

https://insights.uksg.org/articles/10.1629/uksg.387/
“Academic Libraries of Indiana (ALI): ALI-PALNI Shared Print Project: In 2013, 36 Indiana academic libraries came together to take part in the ALI/PALNI Shared Print Project. By sharing their resources, the libraries were able to engage Sustainable Collection Services to analyze the circulating print monographs of each library individually and as a whole. The Project has both short-term and long-term goals. In the short-term, libraries are able to make data-driven decisions about weeding their collections and reclaim space for student use. As we look to the future, the Project can also be the foundation for a shared collection mindset and allow greater cooperative collection development.

http://papr.crl.edu/program/67/academic-libraries-of-indiana-ali-ali-palni-shared-print-project
In early 2016 the White Rose Libraries (at the universities of Leeds Sheffield and York) began work with GreenGlass to carry out an analysis of their collections in order to explore collaborative collection management between the 3 libraries. GreenGlass is a collection analysis tool developed by Sustainable Collection Services (SCS), who are now part of OCLC.

Catalogue records from the 3 White Rose libraries were loaded into GreenGlass in the summer of 2016. **SCS analysed this metadata in terms of a range of factors such as circulation history; publication date; holdings across certain pre-agreed groupings of peer libraries.** Classification was also ‘normalized’ across the three libraries’ differing schemes by a SCS methodology which awarded a DDC number to each work.

Journal Usage Statistics Portal

JUSP gives librarians a simple way of analysing the value and impact of their electronic journals, books and databases through accurate and comparable usage statistics. JUSP saves academic libraries time and duplicated effort by providing a single gateway for them to access their usage statistics from participating publishers.

https://jusp.jisc.ac.uk/
Shared initiatives: The NBK

During 2019 NBK will work to deliver improved collection analysis tools using Elastic Search:

• Faceted search options, such as format, date, material type: enabling better collection analysis
• More data visualisation and benchmarking tools
• Data quality indicators
• Institutional data analysis tools:
Hierarchy of analytics use in libraries

Level 1 - Any analysis done is library function specific. Typically ad-hoc analytics but there might be dashboard systems created for only one specific area (e.g. collection dashboard for Alma or web dashboard for Google analytics)

Level 2 - A centralised library wide dashboard is created covering most functional areas in the library

Level 3 - Library "shows value" runs correlation studies etc

Level 4 - Library ventures into predictive analytics or learning analytics

By the time you reach level 4, it would be almost impossible for library to go it alone.

Library related data only gets you so far
“Every time a student interacts with their university – be that going to the library, logging into their virtual learning environment or submitting assessments online – they leave behind a digital footprint. **Learning analytics is the process of using this data to improve learning and teaching**”
Effective learning analytics
Helping further and higher education organisations to analyse and understand their data

This project ended on 31 August 2018

We're working in collaboration to build a learning analytics service for the sector. There are over 50 universities and colleges signed up to the initial phases of the implementation.
We recommend that all institutions should consider introducing an appropriate learning analytics system to improve student support and performance.


Kenchad consulting helping create more effective libraries
The NTU Student Dashboard is a learning analytics resource for students and relevant staff at NTU. It has been developed to help students engage more effectively with their studies. The dashboard measures students’ interactions with various resources to present an overall picture about each student’s engagement with their course. These resources are:

- use of NOW
- course work submitted through NOW
- library use (count of resources used)
- door swipes (where applicable).
- attendance
- e-book usage

Each student then receives an engagement rating from high to low. These are criterion based and in theory every student could achieve a high engagement rating. We have tested student engagement against student academic outcomes and there is an association between average engagement and both progression from the first year and final year degree attainment. Students with a high average engagement do far better than those with a low average engagement in both progression and attainment. Importantly, having high engagement is a far more powerful predictor of academic success than any background characteristic or entry qualification.
illume® | INITIATE SUCCESS

Take precise actions that dramatically drive results across your institution.

As your command center for student success, illume® uses your institution’s data to develop personalized predictions that are timely, accurate, and actionable.

Pinpoint at-risk students hiding in plain sight, develop coordinated student success initiatives, and deploy targeted email interventions, all from one place.
So what to do?

Put your data to work

Your university or college already collects a variety of data about students and you can use it to:

- Transform their learning experience
- Support their wellbeing
- Help them to achieve more

Our learning analytics service helps you put your data to work to tackle some of the big strategic challenges – and we will support you every step of the way.

It is the world’s first national learning analytics service developed to address the key strategic goals of HE and FE organisations.
The question......

Can collection development be done more effectively by algorithms (AI?) – i.e. without human (librarian) intervention?

Yes (technically feasible) .............. But........
Who might do it? What capabilities might be required?

Who might do it?
Individual institutions?
Publishers?
Intermediaries?
Sector bodies?
Data companies?

Capabilities required?
Access to good, appropriate data
Machine intelligence – AI
Platform to deliver the service
Integration with the supply chain
A workable biz model
‘Whoever acquires and controls the data will have hegemony in the future

Indian Prime Minister Narendra Modi
World economic forum. January 2018

Moving from management information to data driven intelligence: the impact on collection development

NAG seminar: November 2018

Ken Chad
Ken Chad Consulting Ltd
Twitter @kenchad
ken@kenchadconsulting.com
Tel: +44 (0)7788 727 845
www.kenchadconsulting.com