DATA COLLECTION AND ANALYSIS

Data analysis and the link to operational effectiveness

JLMS

Approach

- Challenge the status quo

- Draw on personal experience

- Ignore constraints to good practice (e.g. LMS limitations

- Focus on internal measures rather than industry benchmarking measures

JLMS

Is there a need for improved data analysis?

- Anecdotal evidence suggests YES.

- Confirmed by the Strategic Asset Audit where:
  - Only 50% of library services were able to comply with survey timing of two weeks.

  - Even after a four week extension, submissions highlighted major gaps in services' knowledge.

Gaps Identified from Strategic Asset Audit

Combined impact of:
(a) non-submitted data;
(b) data unsuitable for inclusion;
(c) data submitted with major exclusions.

Data Element	% of Services
Loans	18%
Collection age	21%
Date last borrowed	30%
Collection related expenditure	21%

Characteristics of Data Analysis

- Combines elements of art and science
- Triggers questions & an enquiring approach
- Supports objective decision-making
- Helps maintain operational control
- Enhances advocacy efforts
- Facilitates change
- Means to test "conventional wisdoms"
- Strengthens the "preparedness" element in the success equation: i.e.:

Success = Opportunity + Preparedness

Insights from Data Analysis

Allows questions to be explored. For example:

- How good an indicator is circulation?
- How well does the collection perform?
- How well do we know our library users?

Each library service must form its own judgment on these and other relevant questions. However, data analysis can inform such judgments.

How good an indicator is circulation?

Base Case:

Consider two library services with comparable catchment populations and circulation. (Alternatively, view A & B as a time series measuring trend data.)

Library Service	Population	Circulation
A	50,000	250,000
B	50,000	250,000

At face value, there is no discernable difference between library services A and B.

JLMS

How good an indicator is circulation?

Scenario A:

Capture the number of borrowers as a means to link market penetration to circulation.

Library Service	Population	Number of Borrowers	Circulation
A	50,000	25,000	250,000
B	50,000	40,000	250,000

The services are now clearly differentiated by penetration rate.
- Which service is performing best?
- Would higher penetration rates have implications on, e.g., collection size, lending limits, infrastructure etc?
- Would it be useful to capture this statistic?

JLMS

How good an indicator is circulation?

Scenario B (view as a time series):

Monitor the trend in renewals in order to better understand circulation trends.

Period	Population	Renewals	Circulation
Base year	50,000	12,500	250,000
Base + 5yrs	50,000	50,000	250,000

Circulation has stayed the same, but usage patterns have changed.
- Is this desirable?
- What is driving this trend?
- Renewals are trending upwards, but are not currently monitored.
- What are the long-term implications? When combined with the growth in reservations, there is a good argument to reduce infrastructure and/or opening hours.
- Would it be useful to capture this statistic?

JLMS

How good an indicator is circulation?

- Circulation must be considered a prime indicator.

- Scenarios A and B demonstrate that the indicator is enhanced by understanding the component parts.

- Reliance on the base measure alone highlights the limitation of relying on absolute measures.

- Insight is generally enhanced by adopting segmented and/or relative measures.

JLMS

How well does the collection perform?

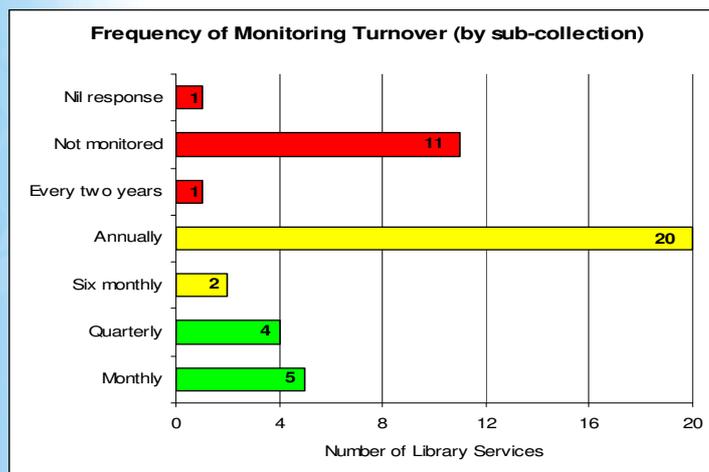Based on the findings from the Strategic Asset Audit, a typical response could be:

"We really don't know".

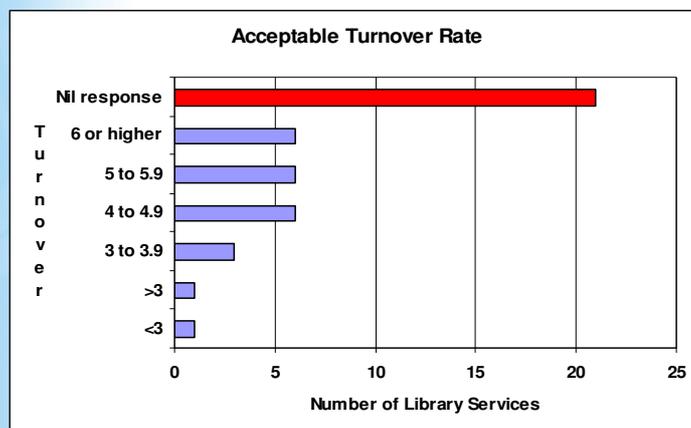Supported by the findings in relation to the most fundamental of measures – collection turnover.

Turnover = Circulation / # Collection Items

How well does the collection perform?

Frequency of Monitoring Turnover (by sub-collection)

Category	Number of Library Services
Nil response	1
Not monitored	11
Every two years	1
Annually	20
Six monthly	2
Quarterly	4
Monthly	5

Number of Library Services

How well does the collection perform?

Acceptable Turnover Rate

Turnover (categories, top to bottom): Nil response, 6 or higher, 5 to 5.9, 4 to 4.9, 3 to 3.9, >3, <3

X-axis: Number of Library Services (0, 5, 10, 15, 20, 25)

- Nil response: ~21
- 6 or higher: ~6
- 5 to 5.9: ~6
- 4 to 4.9: ~6
- 3 to 3.9: ~3
- >3: ~1
- <3: ~1

JLMS

How well does the collection perform?

Other key areas worth monitoring are:

- Collection mix

- Obsolescence

- Sensitivity to key variables

- Technical services effectiveness

JLMS

Collection Mix

- Is there a role for data analysis in determining collection mix?
- If you were running a "for profit" operation, would you place most emphasis on customer demand or having a balanced product mix?
- Is it responsible management practice to at least consider customer demand?
- Data analysis can provide this information through the most basic measures of loans, collection size and turnover.
- Strategic Asset Audit provided these measures at the statewide & library service level.

JLMS

Collection Mix

Sub-Collection	Loans	Items	Turnover
Adult fiction	6,880,871	1,231,761	5.6
Adult non-fiction	6,348,560	2,126,951	3.0
Primary school fiction	2,581,337	563,558	4.6
Primary school non-fiction	1,167,934	630,477	1.9
Pre-school picture books	4,505,070	544,049	8.3
Pre-school early readers	784,488	94,922	8.3

Key questions raised by the analysis include:

- Is the disproportionate investment in non-fiction justified given the higher demand for fiction materials?
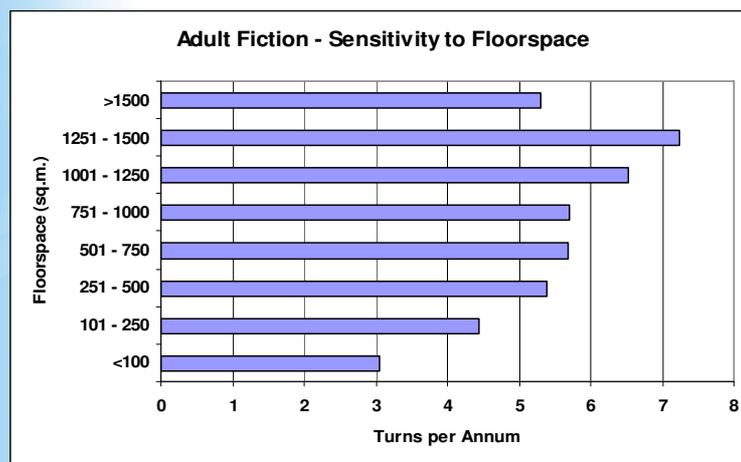- Should holdings of pre-school early readers increase?
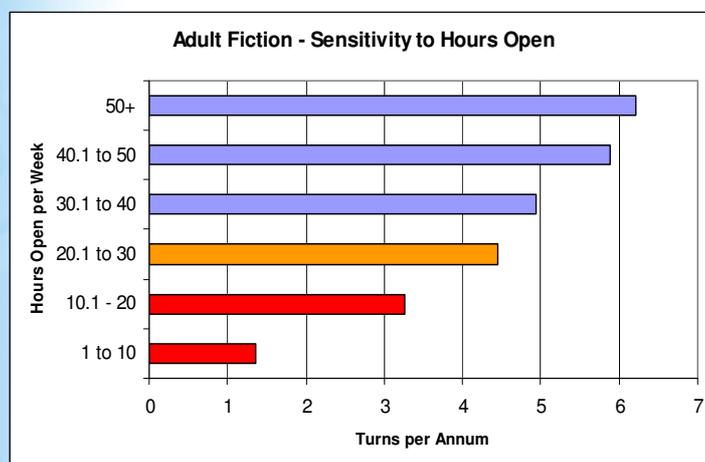
JLMS

Collection (Obsolescence)

- 16.7% not borrowed for >24 months.

- 1.44 million items.

- Replacement value of $29.1 million.

- Indicates a need for:
  - Regular analysis to identify potentially obsolete items.
  - Collections to be viewed & managed as inventories.
  - More structured and objective weeding.

Sensitivity Analysis (Floorspace)

Adult Fiction - Sensitivity to Floorspace

Floorspace (sq.m.) categories: >1500, 1251 - 1500, 1001 - 1250, 751 - 1000, 501 - 750, 251 - 500, 101 - 250, <100

X-axis: Turns per Annum (0 to 8)

Sensitivity Analysis (Hours Open)

Adult Fiction - Sensitivity to Hours Open

JLMS

Technical Services Effectiveness

Data analysis could lead to improvements in:

- Cost per item added to collection – found to be equivalent to 56% of average cost per item.

- Processing time from receipt to on-shelf availability – found to be greater than four working weeks for 55% of library services.

- The selection process by monitoring demand for newly acquired materials at quarterly intervals for the first twelve months.

JLMS

How well do we know our library users?

In my experience, typical knowledge gaps include:

- Members' geographic distribution. (LMS database records suburb or town by member.)

- Membership by age versus Census distribution. (LMS usually records date of birth.)

- Borrowing frequency profile. (LMS records date when member last borrowed.)

- Percentage of visits that result in loans. (Not measured, but when compared to visitation statistics would yield valuable insights.)

- Cross-matching user groups (e.g. by age) with sub-collection groups to profile demand patterns. (LMS has the relevant data to enable such profiling.)

Conclusion

- Data analysis has the potential to improve operational effectiveness.

- Initial improvements can be achieved through the use of fundamental data already captured.

- Subsequent applications are limited only by imagination.

- The key to success is to remember that the primary purpose of data analysis is to pose the right questions.