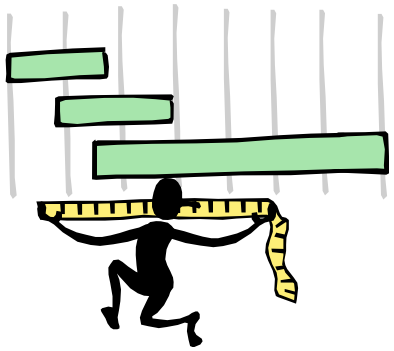
Models for Measuring & Evaluating Reference Costs

A Comparative Analysis of Traditional and Virtual Reference Services



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Measuring and Evaluating Reference Costs: A Selected Bibliography

Key Reference Sources

- ***Reference Assessment Manual .*** Evaluation of Reference and Adult Services Committee, Management and Operation of Public Services Section, Reference and Adult Services Division (RASD), American Library Association. Ann Arbor, Mich. : Pierian Press, 1995.

- ***Statistics, Measures, and Quality Standards for Assessing Digital Reference Library Services: Guidelines and Procedures.*** Information Institute of Syracuse, School of Information Studies; School of Information Studies, Information Use Management and Policy Institute, Florida State University, 2002.

Measuring the Cost of Reference

Caution

Reference services should not be judged by cost alone

- **Simple transaction costing is most widely used for reference cost analysis**.
  - Faced with demands for accountability in a world of imperfect data, managers often report reference costs based solely on simple cost per transaction, without regard for performance and value such as effectiveness and benefits.
- **Cost effectiveness studies must consider accuracy and service mission**.
  - Performance measures that evaluate accuracy and completeness of answers, question negotiation, sources used and referrals are critical to the determination of cost effectiveness.
  - Mission Factor: Traditional reference may be more cost effective than digital reference, yet a strong commitment to serve remote users may justify costs if remote users significantly benefit.

Measuring the Cost of Reference

Caution

Reference services should not be judged by cost alone (continued)

- **Cost benefit analysis must be based on proven outcomes and quality standards**.
  - Beneficial outcomes such as time saved, failures avoided, and life goals and satisfactions achieved as a result of reference service are difficult to measure.

- **All reference cost analyses must be based on local quality standards**.
  - Quality standards must clearly state measurable performance goals. Quality standards are locally determined based on individual library goals and objectives, resource availability and service priorities.

Traditional v. Digital Reference Cost Models

The Digital Advantage

Digital reference lends itself to greater and more precise analysis

- **Web-based Forms and Transaction Logs record**
  - user demographics
  - user network and system specs
  - collaboration
  - number of transactions
  - duration of individual transactions
  - transcripts of questions
    - types of questions
    - sources used
    - referrals made
- **System-generated Surveys, Reports, Databases**
  - post-session user satisfaction surveys
  - customized transaction and survey reports
  - searchable knowledge base / archive

Traditional v. Digital Reference Cost Models

Cost Per Transaction

- **Traditional Best Practice Measures**
  - Sample transaction counts
  - Estimate of staff time spent on transactions
  - Estimate of complex transactions answered successfully
  - Estimate of staff time spent developing reference skills
  - Estimate of collection and operating costs

- **Digital Advantage: Log & Transcript Analysis**
  - Actual transaction counts
  - Actual staff time spent on transactions
  - Evidence of complex transactions answered successfully
  - Evidence of collaborative contributions
  - Generates support tools – searchable knowledge base/archive

Traditional v. Digital Reference Cost Models

Cost Effectiveness

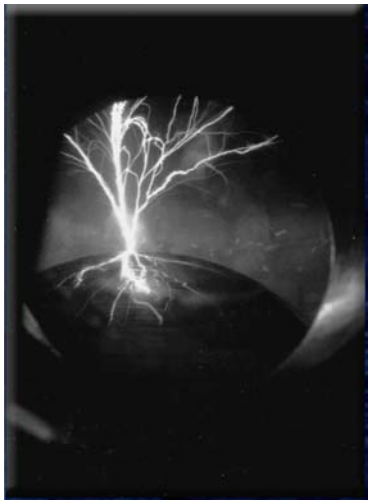
- **Traditional Best Practice Measures**
  - Per Transaction costs
  - Rate of accuracy
  - Outcome measure: Test questions asked unobtrusively or w/ permission
  - Outcome measure: Time spent answering question
  - Outcome measure: Librarian peer review of accuracy
  - Outcome measure: Patron reports of success on actual questions
- **Digital Advantage : Log & Transcript Analysis**
  - 💻 Outcome measure: Transaction time logs
  - 💻 Outcome measure: Actual question transcripts
  - 💻 Outcome measure: Patron exit survey responses

Traditional/Digital Reference Cost Models

Cost – Benefit Analysis

- **Traditional Best Practice Measure**
  - User satisfaction surveys
  - Focus Group interviews

- **Digital Advantage : Session Exit Surveys & Meeting Rooms**
  - Exit surveys pop up after every completed session
  - System records and tabulates survey responses
  - Webinar/Meeting Room forums facilitate focus group interviews
  - System stores complete transcripts of interviews



The “Spark”

Thesis of John Edward Evans

- Memphis State University, 1989
- 1995 *“abbreviated version”* in the Journal of Interlibrary Loan, Document Delivery & Information Supply
- Why cost studies aren’t done

Photo Courtesy of Oak Ridge National Laboratory/U.S. Department of Energy

Why Cost Studies Aren't Done

Evans summarizes the work of others:

- Mitchell, Tanis and Jaffe; Becker and Hayes; McClure; Buckland; Cronin; Mosey

The most frequently cited reason:

- Staff resistance

Why Cost Studies Aren't Done
(continued)

Staff resistance

- "the ease with which data could be manipulated to serve different purposes…"
- "the absence of subjective, qualitative criteria addressing ultimate values to library users and society at large"
- "political and procedural attributes of the decision-making process that unduly influence decisions while cost data is ignored"
- "…more trouble than it is worth"

Why Cost Studies Aren't Done

(continued)

The Specifics:

- "…cannot be accurately measured…"*
- "not enough time is available for the task"*
- "…required mathematical and statistical skills are too demanding"*
- "derived data would actually not affect the decision-making process"
- "… limited … to individual library applications"*

* items I chose to address

The Idea

- Witnessed an impressive spreadsheet of a fuel cell circa 1995 - some of the input parameters could be manipulated and changes in other parameters were observed
- Knew about recalculating web pages on the Internet - mortgage calculators, etc.
- Could I create one? With the help of a nifty Excel plug-in I could - “ExcelEverywhere” from framtidsforum i&m AB in Sweden

  http://www.exceleverywhere.com

The First Attempt

Straightforward Model using “Block of Time” Costing

- Honestly created before I read about how inaccurate this type of costing can be (Murfin, 1993 and Abels, 1996)
- The numbers given by the model were pretty ugly, so I’m glad I had to keep trying

http://www.contrib.andrew.cmu.edu/~matthewm/vrd2003/SLM.html

Block of Time Studies

(cost per reference transaction converted using the Inflation Calculator at http://www.bls.gov)

Study	*Year*	*Reported$*	*2003$*
Murphy	1969	3.41	17.21
Raffel & Shishko	1969	2.20	11.10
Palmour & Gray	1972	7.58	33.58
Kantor	78/ 79	10.80	30.68
Marsteller & Ware	2003	-----	37.43

“Beyond ‘Block of Time’ Costing”

Length of Reference Transaction

- **Known from transcripts**
  - Carnegie Mellon - 3 month study ~10 minutes
  - Sweet, Lisa, & Colston (Q and A NJ) 10-15 minutes on average
  - Belanger, Lankes, & Shostack (Ask ERIC Live) 16 minutes on average
- **Multiplied by mean salary of librarians per minute**

Further Problems

- **Original spreadsheet worked for low volume traffic only**
  - For an average 10 minute transaction, a single service point could only serve 520 reference transactions per month with a 20 hour service week
  - At that point, the labor cost would remain flat until a second service point was opened
- **Opted for a two-model solution**

The Models

Normal traffic

http://www.contrib.andrew.cmu.edu/~matthewm/vrd2003/DigRefCostModel.html

Heavy traffic

http://www.contrib.andrew.cmu.edu/~matthewm/vrd2003/HTDigRefCostModel.html

Second Model Comparison

Study	Year	Type	Rptd $	2003$
Murfin	1982	Full Cost (includes prorated collection cost)	4.33	8.31
Cochrane & Warmann	1989	Full Cost Directional (includes collection cost)	3.53	5.27
Cochrane & Warmann	1989	Full Cost Reference (includes collection cost)	9.22	13.77
Robinson & Robinson	1994	Average Total Cost per reference question handled	6.84	8.55
LSSI (reported by Lankes, et al)	2003	Outsourced Cost	12.00 to 15.00	12.00 to 15.00
Marsteller & Ware	2003	10 Minute Cost with Fringe Benefits and F&A Added	9.77	9.77

Possible Improvements

- Random alarm mechanisms to establish the extent of concurrent transactions - used in the past to produce a breakdown of reference work (Spencer, 1980)

- Transcript analysis by software vendors to provide cost data has been suggested (McClure, Lankes, Gross & Choltco-Devlin) - perhaps a better hope for concurrent transactions

Possible Improvements

(continued)

- Reference collection use and circulating collection use by the reference staff have proven difficult to measure
  - This must consider use of the same collections by other reference services and by the end-users directly
  - Sweep studies were used to measure this in the past - will we need to do virtual traffic sweeps - is that possible?

Possible Improvements

(continued)

- Displaying the cost of digital reference alone was a mistake
  - Show it as a percentage of the reference budget
  - Show it as a percentage of the library budget
- Doing so keeps things in perspective (McClure et al., 2003)

Possible Improvements
(continued)

- Add a failure penalty
  - Murfin used a $2.00 penalty in her 1993 article that came from the 1989 Wisconsin-Ohio Reference Evaluation Program
  - In 2003 dollars this would $2.99
  - Perhaps set it to zero failed transactions and use it as needed
- Breakdown of types of reference questions
  - Could this lead to a better idea of our impact?

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Thank You!

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