Supplement to *Data-Driven Decision-Making: Using Bibliometrics for Collection Analysis*
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Study	Collection Impact Study	Journal Usage Study	Archive Journal Holdings Study
Summary	Computes the percentage of citations from recent, highly-cited NIST publications that are covered by the Library's subscriptions for collection evaluation and for reporting to NIST management	Evaluates and recommends subscription drop/adds based on usage statistics and NIST publications and citations for regularly evaluating and optimizing subscription funds	Evaluates print archive journal holdings for relevance to NIST research based on citations and circulations to recommend priorities for procurement in electronic form or weeding
Study Frequency	Annually	Every two years	One-time
Bibliometrics Coverage	50 most-cited NIST articles from a single year, with one-year delay	Prior five years of NIST journal articles	Prior 20 years of NIST journal articles
Tools and Resources Used	Citation Database ERMS Relational database Spreadsheet program	Citation Database ERMS COUNTER reports Relational database Spreadsheet program	Citation Database ERMS OPAC Relational database Spreadsheet program
Output	For each article: -Is source title in collection -Percentage of journal citations in collection -Operating Unit of lead and contributing authors Basic statistics of percentage of journal citations in collection	- Cost, usage, cost/usage, and number of NIST publications and citations for each subscription - Prioritization of subscriptions in three categories	- Number of NIST citations, circulations, current subscription status, and electronic backfile cost for each print journal holding - Prioritization of holdings in three categories

Annual Collection Impact Study
Purpose: Computes the percentage of citations from recent, highly-cited NIST publications that are covered by the Library's subscriptions for collection evaluation and for reporting to NIST management.

Methodology
1. Using citation database, find NIST's 50 most-cited journal articles from a single year, with a one-year delay to allow citations to accrue (e.g., articles published in 2013 for a study performed in 2015). Download all bibliometric data, including cited references.
2. While in citation database, identify organizations and divisions of all NIST authors for each article; separate by first author and collaborating authors.
3. For each article, parse and count cited references; maintain link between article and cited references. Relational database recommended.
4. For cited references and publication venues, normalize journal titles and add associated ISSN.
5. Using ERMS, output list of current journal subscriptions with title and ISSN.
6. Use ISSN to connect current journal subscriptions to cited references and publication venues. Use journal titles where ISSN does not match. Calculate percentage of cited references with matched journal subscriptions. Relational database recommended.
7. Tabulate findings in spreadsheet (see Table 1 for excerpt of output table). [Optional: add Impact Factor data.]
8. For articles with <85% cited references in the collection, manually review all references not in the collection. Summarize these references' subject categories in the notes field and journal titles of note.

Biannual Journal Usage Study
Purpose: Evaluates and recommends subscription drop/adds based on usage statistics and NIST publications and citations for regularly evaluating and optimizing subscription funds.

Methodology

1. Using citation database, find all of NIST's indexed journal articles from past five years. Download all bibliometric data, including cited references.
2. Parse all cited references; no need to maintain link between parent article and cited references.
3. For cited references and publication venues, normalize journal titles and add associated ISSN. Calculate total NIST publications and total citations per journal title.
4. Using ERMS, output list of current journal subscriptions with title, ISSN, subscription cost, publisher/provider information, and any journal package combinations.
5. Using ERMS or publishers' COUNTER reports, create list of usage statistics by journal title (with ISSN).
6. Use ISSN to connect current journal subscriptions, cited references, publication venues, and usage statistics. Use journal titles where ISSN does not match. Combine cited references, publication venues, and usage statistics of journal packages and big deals into one record. Relational database recommended to link different data sources.
7. Tabulate findings in spreadsheet (see Table 2 for excerpt of output table). Limit table to: subscribed titles, titles with ≥100 downloads, ≥5 publications, or ≥30 citations. Add contract information. [Optional: add Impact Factor data.]
8. Filter findings into three categories:

Core – journals considered core to the research of NIST	More ROI– journals with demonstrated relevance to the research of NIST	Less ROI – journals included in the study that do not have strongly demonstrated relevance to the research of NIST.
Meets two of these criteria: • Downloads ≥100 • NIST Publications ≥15 • Citations ≥50	Meets all of these criteria: • Downloads ≥100 • Citations ≥25 Or meets all of these criteria: • Downloads ≥100 • NIST Publications ≥5 Or meets any of these criteria: • Downloads ≥150 • NIST Publications ≥10 • Citations ≥40	Does not meet the criteria of the other two categories

9. Use study findings as a part of collection development decision making, with close analysis of those categorized as Less ROI and as Core.

Archive Journal Holdings Study

Purpose: Evaluates print archive journal holdings for relevance to NIST research based on citations and circulations to recommend priorities for procurement in electronic form or weeding.

Methodology

1. Using citation database, find all of NIST's indexed journal articles from past 20 years. Download all bibliometric data, including cited references.
2. Split all cited references; no need to maintain link between parent article and cited references.
3. For cited references and publication venues, normalize journal titles and add associated ISSN. Calculate total NIST publications and total citations per journal title.
4. Using OPAC, output listing of print journal holdings and circulation statistics with title and ISSN.
5. Using ERMS, output list of current journal subscriptions with title and ISSN.
6. Use ISSN to connect print journal holdings with circulation statistics, current journal subscriptions, cited references, and publication venues. Use journal titles where ISSN does not match. Relational database recommended to link different data sources.
7. Tabulate findings in spreadsheet. Use study findings to focus manual research, such as quantity of holdings and holdings uniqueness, to then prioritize archive holdings.

Table 1. Annual Collection Impact Study Output Table

Authors	Title	Publication Source	Publication Source in Collection?	Journal Impact Factor	# of Cited Refs	# of Journal Cited Refs	# of J. Refs in Coll.	% of J. Refs in Coll.	# of Times Cited	Lead Author OU (Div)	Collab. Author OU	Outside Authors Orgs.	Notes on References Not in Collection
Bloch, ED; Queen, WL; et al.	Hydrocarbon Separations in a Metal-Organic Framework with Open Iron(II) Coordination Sites	Science	Yes	31.027	32	30	29	97%	120	Outside	NCNR	US & Int'l Univ	
Saha, SR; Butch, NP; et al.	Structural collapse and superconductivity in rare-earth-doped CaFe2As2	Physical Review B	Yes	3.767	37	35	35	100%	37	Outside	NCNR	UMD	
Tonry, JL; Stubbs, CW; et al.	THE Pan-STARRS1 PHOTOMETRIC SYSTEM	Astrophysical Journal	Yes	6.733	41	32	24	75%	33	Outside	PML	Astrophys Univ	Astronomical journal
Takekoshi, T; Debatin, M; et al.	Towards the production of ultracold ground-state RbCs molecules: Feshbach resonances, weakly bound states, and the coupled-channel model	Physical Review A	Yes	3.042	67	64	61	95%	30	Outside	PML	US & Euro. Univ	
He, YB; Zhang, ZJ; et al.	High Separation Capacity and Selectivity of C2 Hydrocarbons over Methane within a Microporous Metal-Organic Framework at Room Temperature	Chemistry-a European Journal	Yes	5.831	56	54	51	94%	30	Outside	NCNR	US Univ	
Han, TH; Helton, JS; et al.	Fractionalized excitations in the spin-liquid state of a kagome-lattice antiferromagnet	Nature	Yes	38.597	30	29	29	100%	25	Outside	NCNR	US Univ	
Kuribara, K; Wang, H; et al.	Organic transistors with high thermal stability for medical applications	Nature Communications	No	10.015	31	30	29	97%	24	Outside	MML	Asian Inst & US Univ	NC to be subscribed 2014
Bose, R; Sridharan, D; et al.	Low-Photon-Number Optical Switching with a Single Quantum Dot Coupled to a Photonic Crystal Cavity	Physical Review Letters	Yes	7.943	30	29	29	100%	23	Outside	PML	UMD	
Cygan, A; Lisak, D; et al.	High-signal-to-noise-ratio laser technique for accurate measurements of spectral line parameters	Physical Review A	Yes	3.042	91	89	85	96%	22	Outside	MML	US Univ & Labs	
Atha, DH; Wang, HH; et al.	Copper Oxide Nanoparticle Mediated DNA Damage in Terrestrial Plant Models	Environmental Science & Technology	Yes	5.257	37	33	21	64%	22	Outside	MML	Euro. Univ	Botanical and biomedical journals
Quemener, G; Julienne, PS	Ultracold Molecules under Control!	Chemical Reviews	Yes	41.298	312	289	287	99%	21	Outside	PML	JILA	
Schaeublin, NM; Braydich-Stolle, LK; et a.	Does Shape Matter? Bioeffects of Gold Nanomaterials in a Human Skin Cell Model	Langmuir	Yes	4.187	75	72	62	86%	20	Outside	MML	USAF & US Univ	
Hoarfrost, ML; Tyagi, MS; et al.	Effect of Confinement on Proton Transport Mechanisms in Block Copolymer/Ionic Liquid Membranes	Macromolecules	Yes	5.521	52	50	47	94%	17	Outside	NCNR	US Univ	
Snellenburg, JJ; Laptenok, SP; et al.	Glotaran: A Java-Based Graphical User Interface for the R Package TIMP	Journal Of Statistical Software	Yes	4.910	22	12	9	75%	16	Outside	NCNR	Euro. Univ	Primarily biomedical journals

Table 2. Biannual Journal Usage Study Output Table

Contract	Provider	Title	ISSN	Subscribed	Cost	Downloads	Cost/Use	NIST Pubs	Citations	Impact Factor	Notes
Bundle	American Institute of Physics	American Institute of Physics (AIP) Publications		Yes	$------------	18289	$--.--	641	9519		Package
Bundle	American Physical Society	Physical Review A-E		Yes	$------------	13072	$--.--	632	11672		Package
Bundle	IEEE	IEEE Xplore		Yes	$------------	9311	$--.--	416	3436		Package
Springer	Springer-Verlag	SpringerLink Contemporary (1997 - Present)		Yes	$------------	9279	$--.--	382	5507		Package
Bundle	American Physical Society	Physical Review Letters	0031-9007	Yes	$------------	12095	$--.--	292	10905	7.943	
Bundle	Royal Society of Chemistry	Royal Society of Chemistry Package		Yes	$------------	9708	$--.--	242	3211		Package
Bundle	Optical Society of America	OpticsInfoBase		Yes	$------------	6447	$--.--	202	3236		Package
Bundle	American Chemical Society	Journal of Physical Chemistry Package		Yes	$------------	6710	$--.--	174	3244		Package
Bundle	IOP Publishing	Metrologia	0026-1394	Yes	$------------	1478	$--.--	133	1028	1.902	
OA	NIST	Journal Of Research of the National Institute of Standards and Technology	1044-677X	Free, in holdings		NA	$0.00	122	336	0.81	
Bundle	IOP Publishing	Astrophysical journal and supplements		Yes	$------------	290	$--.--	118	3361		Package
Elsevier	Elsevier	Biophysical Journal	0006-3495	Yes	$------------	1209	$--.--	85	656		
Bundle	American Chemical Society	Analytical Chemistry	0003-2700	Yes	$------------	3477	$--.--	82	1085	5.695	
Bundle	American Chemical Society	Langmuir	0743-7463	Yes	$------------	3362	$--.--	82	1813	4.187	
Bundle	American Chemical Society	Macromolecules	0024-9297	Yes	$------------	3741	$--.--	68	1359		
Bundle	American Chemical Society	Journal Of The American Chemical Society	0002-7863	Yes	$------------	4507	$--.--	62	2672	10.677	
Bundle	American Chemical Society	Energy & Fuels	0887-0624	Yes	$------------	223	$--.--	58	1045	2.853	
Bundle	American Chemical Society	ACS Nano	1936-0851	Yes	$------------	2417	$--.--	55	602	12.062	
Bundle	IOP Publishing	New Journal Of Physics	1367-2630	Free, in holdings		1256	$0.00	55	834	4.063	
Bundle	American Chemical Society	Nano Letters	1530-6984	Yes	$------------	3658	$--.--	53	1804	13.025	