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Innovation in Public and Academic North American Libraries: Examining White Literature and Website Applications

L'innovation dans les bibliothèques publiques et académiques en Amérique du Nord : examen de la littérature blanche (livres et périodiques) et des applications pour sites web

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Abstract: Though innovation is a popular theme of LIS literature, its specific meaning for libraries remains obscure. Clarifying the implicit definition of innovation in librarianship can facilitate a more meaningful use of the term. To do so, we employ a ground-up exploration of innovation through the white literature in conjunction with a detailed survey of website features, of 160 libraries across the United States and Canada.

Keywords: innovation discourse, library public documents, library website applications, content analysis, survey

Résumé : Bien que l'innovation soit un thème populaire dans la littérature en bibliothéconomie et sciences de l'information, le sens spécifique du terme dans le contexte d'une bibliothèque demeure obscur. Essayer de clarifier la définition implicite de l'innovation en bibliothéconomie peut permettre un usage plus prégnant du terme. Pour y parvenir, nous entreprenons une exploration à partir de la base de l'innovation dans la littérature blanche (livres et périodiques publiés), et nous y joignons une enquête détaillée des fonctionnalités de sites web dans 160 bibliothèques aux États-Unis et au Canada.

Mots-clés : discours sur l'innovation, documents publics de bibliothèques, fonctionnalités des sites web de bibliothèques, analyse de contenu, enquête

Introduction

The inability to conclusively define the term “innovation” with respect to libraries is best exemplified in the recent establishment of the *Journal of Library Innovation*.

In the editorial for the first issue, founder Sheryl Knab (2010) writes, “Not only does the journal fit a niche in the field, but also it may very well define what innovation is for libraries” (4). This concern—that is, the need to rescue “innovation” from widespread semantic satiation—is not particular to libraries. Crossan and Apaydin (2010), in their systematic review of the research on innovation over the past 27 years, lament the loose application of “innovation” across multiple disciplines of study. They claim that while “both researchers and practitioners realize the importance of innovation as witnessed by thousands of academic papers and numerous business rankings and indices . . . innovation research is fragmented, poorly grounded theoretically, and not fully tested in all areas” (Crossan and Apaydin 2010, 1,174).

This research project presents an articulation of what innovation means in librarianship. We aim to answer Knab’s question, “What does innovation really mean for libraries?” by

- examining how libraries themselves apply the term,
- articulating the contexts in which innovation is mentioned by libraries,
- examining library practices by surveying library website applications, and
- exploring whether there is a relationship between a library’s website application inventory and how libraries present innovation in their public documents.

In taking a descriptive approach, we necessarily cast a wide net, sampling libraries across North America. This sizeable set allows us to also explore how innovation and website technologies might vary across types of institutions or between Canada and the United States. Finally, to better understand the role it plays in library discourse, we consider the rhetorical use of the term “innovation” by comparing it to related terms.

Background

The first major treatment of the concept of innovation comes from the Austrian economist and political scientist, Joseph Schumpeter. In *Theory of Economic Development and Capitalism, Socialism, and Democracy* (1983 and 1976; first published in 1934 [in English] and 1942, respectively), Schumpeter outlines two different models of industrial innovation. Keklik (2003) notes “that in the former . . . the major source of innovative activity is small firms operating in highly competitive industries, whereas in the latter . . . this role is played by large firms operating in oligopolistic industries. The visionary entrepreneur as the driving force behind innovative activity in the former innovation pattern is replaced by the large R&D laboratories in the latter.” Despite the fact that Schumpeter’s treatment of innovation applies to two different market structures, the overarching “conclusion that can be drawn from empirical findings on these approaches is that the [two separate] patterns of innovation can coexist in the economy in different industries” (Keklik 2003, 9).

An important aspect in Schumpeter’s work is the distinction he draws between change and innovation. For Schumpeter, industry pioneers innovate; these inno-

vations, while risky, lead to competitive advantages for the pioneers. The ability of subsequent firms to adapt and change in response to an innovation, or a whole slew of innovations, determines whether they will survive and grow or be weeded out in the ongoing process of creative destruction that is inherent to capitalism. Schumpeterian innovation therefore is necessarily wedded to an effect or outcome that produces a competitive advantage. Change, on the other hand, is a survival mechanism; it is conceptually indifferent to rivalry or the jockeying of position.

Rogers' landmark, *Diffusion of Innovations* (1962), ushered in a significant change in innovation studies. Rogers drew on work from the 1950s in anthropology, sociology, rural sociology, medical sociology, and education to develop his innovation diffusion theory, which attempts to explain the process by which innovations spread over time and throughout a society. In their work, Rogers and Shoemaker (1971) describe an adoption process in which organizations display differing degrees of willingness to adopt a particular innovation. They argue that the adoption of an innovation is normally distributed over time and, further, that breaking the normal distribution into five discrete categories—innovators (2.5%), early adopters (13.5%), early majority (34%), late majority (34%) and laggards (16%)—presents a framework for understanding particular organizations' innovativeness vis-à-vis the other organizations in a particular population. Rogers' work also examined the decision-making process within an organization as a particular innovation is taken up and established.

What the work of Schumpeter and Rogers demonstrates is that the idea of innovation was diverse, even early in its inception (and doubly so for Schumpeter, who offered two approaches to innovation). For the economist Schumpeter, innovation emphasized competition. For Rogers, who was a sociologist, innovation was studied as a social pattern. Despite their differences, both seminal concepts of innovation rely on context (of markets or populations) as a deciding factor of what might be considered innovative.

A perusal of the LIS literature on innovation confirms both its wide usage (searching for the descriptors "innovation" and "libraries" in the Library and Information Science Abstracts database returns about 800 results) and its conceptual ambiguity within librarianship. Over the past 40 years, the discussion of library innovation has taken on various guises, including practical advice on the introduction of new technologies, new services, and new methods (Willard 1991; see, for instance the 1989 special edition of the *Journal of Library Administration*, entitled "Creativity, Innovation, and Entrepreneurship in Libraries"). These works typically draw on case studies (usually celebratory in nature), but several draw on large national surveys of the diffusion of innovation(s). For example, Liu (2008), without specifically using the term innovation, examined the uptake of Web 2.0 technologies across the 111 members of the American Research Libraries. Others have sought to determine the factors leading to innovative technologies, seeking to correlate institutional factors (population, size, funding, etc.) with the innovativeness of libraries (Damanpour and Evan 1992).

Damanpour, Szabat, and Evan's (1989) study of public libraries examined the relationship between different kinds of innovation, observing that "innovations of different types influence and often complement each other" (587). Their study highlighted the relationship between administrative innovations (new rules, roles, procedures, and structures of interaction by members) and technological innovations (new operations or equipment), noting that changes in organizational structure played a primary role in subsequent changes in technology. The idea of differentiating areas of innovation is similarly adopted here, though we seek to identify these areas from the ground up.

But while LIS literature chronicles the iterations of innovation over time, LIS researchers have spent less time developing the field's theoretical understanding of the term (Luquire 1976; Musmann 1982; Reynolds and Whitlatch 1985; Willard 1991). Definitions of innovation in the LIS literature, when defined at all, tend to be ill-formed usages adopted from outside the discipline, whether from economics, commercial practices, management sciences, the technology sector, marketing, or even popular culture (Willard 1991, 188). Associated concepts of risk, competition, and benefits, however, gradually disappeared in the 1980s as innovation came to mean (to borrow Bateson's definition of information) a "difference that makes a difference." This is perhaps because the incorporation of the idea of innovation into LIS presents some conceptual challenges. For example, as we have seen, innovation assumes the context of competition, which is largely inapplicable to librarianship. Some have suggested that innovation runs almost antithetical to the library's tendency to only provide makeshift remedies in response "to those changes in local conditions that they perceived would have a near-term adverse effect on the library" (Pungitore 1995, 6). Pungitore further argues that because libraries can be categorized as "relatively old, well established, bureaucratic organizations," it makes sense that they would value stability and tradition, only adopting necessary, "non-controversial or incremental changes . . . that often turn out to be extensions of traditional programs" (6). Likewise, Deiss draws on Cameron and Quinn (1998) to argue that "what is prized in a mature organization is not what is prized in a younger or developing organization" (Deiss 2004, 23). Since libraries are neither start-up organizations nor struggling to establish themselves, it makes sense that they would favour "stability and success through reliance on practices that have worked in the past" (Deiss 2004, 23).

Nevertheless, as noted above, the term remains ubiquitous in the LIS literature. Instead of addressing the embedded assumptions, inherent contradictions, and omissions, however, researchers in the field of LIS have diluted the significance of "innovation" by using it in a broad but shallow manner. Before a prescription can be developed for the proper use of the term in LIS, it is necessary to gain a thorough and contemporary understanding of how libraries themselves actually use the term. The current paper aims to do this by providing a descriptive analysis of the use of *innovation* in library white literature.

Methods

Data collection

Data from publicly accessible library resources were collected to empirically study what the term *innovation* currently means to libraries and to answer our research questions. First, we created a list of libraries to survey. The list draws from the *American Library Directory* (ALD 2011), a comprehensive directory profiling the over 35,000 libraries across the United States and Canada. From the ALD we obtained a random sample of 160 North American libraries,¹ stratified by library type (academic and public) and location (Canada and USA) (see Figure 1).

If the library hosted a website—and most did—the website was examined for the library's available resources. If the library or its website was nested within a larger library system (e.g., a department library that was part of the college libraries system), the wider library organization was substituted for the smaller library for study. Libraries without websites were noted in the survey but subject to no further examination.

Each website was inventoried for two key resources: the library's online features/technologies and the library's public documents. Given that websites and their content are often changing, our survey represents a cross-sectional study over the period November 2010 to April 2011. If any of the surveyed websites were modified after they had been surveyed, these updates would not have been included in our final data.

Our use of websites allowed us to sample a large population (all public and academic libraries in Canada and the USA) and to collect data conveniently and

Location	Library Type	
	Academic	Public
US	40 libraries, including Lawrence V. Johnson Library, Southern Polytechnic State University, GA Library and Resource Center, University of Hawaii Center, West Hawaii, HI Terteling Library, College of Idaho, ID Greenfield Community College, MA	40 libraries, including Clermont Public Library, IA Rigby City Library, ID Palatine Public Library District, IL Greenfield Public Library, MA Almont District Library, MI
Canada (excluding Quebec)	39 libraries, including Simon Fraser University Library, BC Canadian Mennonite University Library, MB Nova Scotia Community College Library, NS McMaster University Library, ON	41 libraries, including Hinton Municipal Library, AB Bowen Island Public Library, BC Elizabeth Morey Memorial Public Library, NL Perth East Public Library, ON

Figure 1: Data collection 2 × 2 design ($n = 160$) and sample libraries.

Figure 2: Sample applications collected from the library websites.

unobtrusively; however, this also confined the scope of the study to library technologies and documents which were front-end, publicly available, and web accessible. It therefore excluded offline or back-end technologies (e.g., staff intranet) or grey literature, which would no doubt be highly informative to this research and should be the focus for subsequent studies.

In the first stage of data collection, library websites were surveyed for the web applications they supported. We created a checklist of 41 types of website applications based on a pilot study (Gavin, Kamal, and Rubin 2011). The website-data collection procedures and database functionalities were adapted from previous work that surveyed language-related applications in Canadian libraries (Rubin, Chen, and Thorimbert 2010). In the current study, each website was examined for the presence of the applications on the checklist of 41 web applications (for example, see Figure 2).

The 41 types of applications on the checklist were sorted by purpose or media or both, which resulted in eight categories: interactive, reference, social media, feedback, help, audio, visual, and other distinct (uncategorized) application types (e.g., online public access catalogues [OPACs] or LibGuides) (see Table 2). Rare applications (those not already represented in the checklist) are recorded separately and categorized en masse in a ninth category, additional rare application types. The frequency data for application types across the sample

allow us to assess the relative distribution of online technologies, potentially distinguishing standard from non-standard applications in Canadian and American libraries between late 2010 and early 2011.

For the second stage of data collection, we inventoried the library websites for public documents (i.e., white literature). We surveyed websites for the following organizational documents: annual reports; mission, vision, and value statements; strategic plans; newsletters and other addresses; blogs; and various informational pages (e.g., welcome, history, and about pages). The length of this list tripled over the course of examining the sample, as we discovered new types of documents.

To develop a corpus for a qualitative analysis of how libraries use the term “innovation,” all these documents were examined for mentions referring directly (i.e., verbatim) or indirectly (i.e., associated terms) to the term. Direct references included the term “innovation” and its various word forms (e.g., “innovative,” “innovate”). For indirect references, we used 14 closely related terms that appeared in the documents and were identified (by Coder S) as related to the concept of innovation. These terms were “built in-house,” “creative,” “cutting-edge,” “develop,” “dynamic,” “evolution,” “experiment,” “initiative,” “leader,” “leading edge,” “new,” “ongoing transformation,” “risk-taking,” and “state of the art.” Both direct and indirect references were used as the selection criteria for extracting mentions from the white literature for qualitative analysis. These mentions consisted of a brief excerpt (a phrase, a clause, or a sentence) that included sufficient surrounding text to make the context in which innovation was used understandable. Examples of documents and mentions are provided in Figure 3.

The next section explains our analytical approach and procedures.

Data analysis

We used a combination of qualitative and quantitative methods to analyse the data set. We applied qualitative content analysis as “a research technique for making replicable and valid inferences from texts (or other meaningful matter) to the contexts of their use” (Krippendorff 2004, 18). Systematic inferences were made by examining all mentions of innovation (or related to innovation), along with surrounding text to answer seven open questions regarding the usage of “innovation,” its context, the subjects, and so on. For this paper, we largely draw on our responses (kept open in the first round of coding and subsequently standardized) to two of the seven questions:

- In what area or aspect of the library is the term “innovation” applied (e.g., services, technology)?
- What is the specific term that led us to or made us select this section of the text or mention?

To analyse quantitative differences within the sample, we have sorted our findings by library type and location. Three variables are used for statistical analyses: number of applications, number of documents, and number of mentions

Library White Literature**Mentions of Innovation****Mission Statement**

"...the development of new services, and continuously strives to exceed the expectations ..."

Strategic Plan

"...leading to innovative ways of leveraging knowledge sharing ..."

"...will be a leader in providing both the best library-as-place and the best place-as-library experience ..."

'About' Page

"A new approach to interlibrary loan delivery (ILL) will be tested."

Figure 3: Sample "white literature" and mentions of innovation.

per each library website. Combining and comparing the results from libraries mentioning (directly or indirectly) innovation and website practices, we ask whether there is a relationship between these variables.

Data quality assurance

The collected data set underwent several data reliability integrity procedures and checks. A research assistant (Coder S)² systematically collected the information regarding sample websites, applications, documents, and mentions of innovation according to preset selection criteria. Scanning websites and documents requires careful attention. To control for potential human error during data collection, the authors conducted spot checks, ensuring Coder S's coverage and precision in documenting website applications and content. The Natural Language Processing Tool Kit (Bird, Klein, and Loper 2009) and information-extraction Python scripts were used to verify the coverage of the extracted mentions semi-automatically, using the list of direct and indirect terms for innovation. The appropriateness of the extracted mentions was also verified manually by the authors, and Coders A and P reviewed each mention along with the surrounding text.

An inter-coder reliability test was conducted on 15% of the data—30 out of the 198 extracted mentions—to test the precision between coders in assigning areas of innovation. The pairwise inter-coder reliability is reported in Table 1 in

Table 1: Inter-coder reliability measures for content analysis

Coders measures	Coder A & P	Coder A & V	Coder V & P	Pairwise, average
Percent agreement	80%	57%	50%	62%
Cohen's κ	.79	.54	.44	.59

terms of percent agreement and Cohen's kappa, κ (Cohen 1960; the latter is a better measure than the former since it excludes agreement by pure chance).

On average, Coders A, P and V achieved a 62% agreement (Cohen's $\kappa = .59$) with some variation in pairwise agreement successes. According to Landis and Koch's (1977) interpretation scale,³ such overall agreement is borderline "moderate" to "substantial." Most variation, in fact, comes from the interpretation of the standardized abstract categories, such as "character" and "culture," and determining what they should or should not include. Another factor contributing to some disagreement was procedural. Coders A and P found 7 out of 30 (23%) mutually agreed-upon mentions that indirectly related to innovation and placed it in a separate category, while Coder V attempted to categorize all indirect references but 1 (3%). Identifying a term's referent is not a complicated annotation task in principle, and we expect to reach higher inter-coder reliability in the future with stricter procedural protocols and disambiguated abstract categories.

Results

Our resulting data set contains 160 libraries with 148 library websites, 1,319 instances of identified website applications, and 296 public documents. The 296 collected documents amount to 74,914 words (or over 306 Microsoft Word single-spaced pages). There are 198 extracted mentions of innovation amounting to 3,190 words (or over 17 Word pages) and constituting about 4% of the collected documents. This section now reports on the library web presence, website application practices, white literature availability, and innovation discourse practices.

Library website availability

Out of 160 randomly sampled North American libraries, 148 (or 92.5% of the random sample) have web presence in the form of a publicly available, stand-alone, or affiliated website. While this figure is indicative of the proliferation of public online resources and services in libraries, it also raises awareness of the fact that there are still rare cases (7.5% of the random sample) in which online electronic resources are totally lacking. Such libraries include the Ayamiscikawikamik Public Library, MB; the Norman McKee Lang Library at Lester B. Pearson College of the Pacific, BC; the Lawler Public Library, IA; and the Paier College of Art Library, CT. The 12 libraries without web presence (which are likely smaller than those with a web presence) are thus excluded from further analysis. Additional studies are needed to investigate constraints in these rare

situations deviating from the common web-presence practice in order to see whether these organizations desire changes in public-resource availability.

Ninety-eight libraries (61.25% of the data set) have a stand-alone library website with the name of the library or its acronym or abbreviation prominently mentioned in the URL (e.g., the Northwest Community College Library, BC [<http://library.nwcc.bc.ca>], and the Clermont Public Library, IA [<http://www.clermont.lib.ia.us>]). Another 50 libraries (10 public and 40 academic, 31.25% of the data set) do not have an independent library website but are rather part of another, often closely related, institution. The 10 public libraries have a presence on another administrative body's website (a city, a county, or a wider library system). For example, the Tualatin Public Library, OR, is on a county-wide community services website;⁴ and the Standard Municipal Library, AB, is on the Marigold Library System website.⁵ Most of the 40 academic library websites are hosted by a college or university, such as the R. C. Godwin Memorial Library at Craven Community College, NC,⁶ and the Sheridan College Library, ON.⁷ Further investigation is needed to determine whether stand-alone or affiliated website status leads to differences in prestige or website content management.

Website application practices

We inventoried 1,135 instances of website applications offered by the 148 libraries that have a web presence. Table 2 displays the 41 website application types classed into eight large conceptual categories and an additional category for unforeseen applications. This section describes some trends in library website practices and highlights the least commonly used applications (see low counts in Table 2, sections I–VIII and examples in section IX).

The first seven categories (I–VII) classify website applications either by their purpose (e.g., reference, help) or media (e.g., audio, visual) or both. In sections I–VII, each category is totalled and arranged from most to least frequent. Three categories—interactive, reference, and social media—in their various permutations, are by far the most prominent and commonplace website practices. More details are offered in Table 2. The number of instances gives an idea of the popularity of each type of application on North American library websites. For example, linking to Facebook from library web pages (III.10) is a more commonplace practice (found in 39 instances, or 26% of the library websites) than linking to Flickr (III.14) or Myspace (III.15) (only encountered in 6% and 2% of the libraries, respectively). Several categories are listed with a total of zero instances. Those are the types of applications that were originally found during the development of the checklist through pilot websites but, contrary to our expectations, were not present in our random-sample data set (e.g., interactive books, I.6).

The eighth category aggregates several distinct applications, each of which deserves a separate consideration, into one category in the interest of keeping the number of large categories manageable. Some applications in this category are unique in their purpose (e.g., OPAC); others combine several media (e.g.,

Table 2: Website applications inventory and distribution in the data set

	Application type (by category)	Application description	Number of times found
I	Interactive		
1	Site search-box	Library website search-box	70
2	OPAC search-box	OPAC searchable from website	54
3	Google Maps links	Embedded interactive Google Map or link to Google Maps	30
4	DB search-box	Databases (DBs) searchable from website	29
5	Interactive maps	Presence of other interactive maps (not Google Maps)	16
6	Interactive books	Presence of interactive books	0
	category subtotal		199
II	Reference		
7	Online reference by chat or IM	Reference chat or instant messaging (IM) service available, unique to library or as part of consortia	55
8	Online reference by e-mail	E-mail address given for direction of reference questions	45
9	Online reference by form	Fillable form made available for reference questions	39
	category subtotal		139
III	Social media		
10	Facebook	Link to library's Facebook page	39
11	Blog	Presence of blog, either specific to one aspect of library or for library as a whole	35
12	Twitter	Link to library's Twitter feed	20
13	Tagging	Tagging/bookmarking options available	18
14	Flickr	Link to library's Flickr account	9
15	Myspace	Link to library's Myspace page	3
	category subtotal		124
IV	Feedback		
16	Feedback via survey form	Fillable form made available for feedback regarding website or library services	46
17	Feedback via post comments	Option of posting feedback in the form of comments on specific items or entries	23
18	Feedback via e-mail	Email address given for direction of feedback regarding website or library services	10
19	Feedback via chat or IM	Chat or IM service available for feedback regarding website or library services	2
	category subtotal		81

Table 2: (continued)

	Application type (by category)	Application description	Number of times found
V	Help		
20	FAQ non-searchable	List of frequently asked questions (FAQs)	42
21	FAQ searchable	List of FAQs with an accompanying search-box	5
22	FAQ interactive	Interactive FAQ-specific search-box	4
	category subtotal		51
VI	Audio		
23	Audiobooks	Link to catalogue of audiobooks	45
24	Podcasts	Presence of audio podcasts	3
25	Audio web-hosting	Web-hosting of external audio files	1
26	Audio streaming	Presence of audio streaming	0
	category subtotal		49
VII	Visual		
27	YouTube	YouTube videos embedded within site	15
28	Movie files	Other video files embedded within site	9
29	3D tours	Video or picture 3D tour of library facilities	2
30	Word-clouds	Word-clouds displayed	1
31	Visual web-hosting	Web-hosting of external visual files	0
	category subtotal		27
VIII	Other distinct (uncategorized) applications		
32	DBs	Links to databases to which library subscribes	93
33	OPAC	Link to library's OPAC	90
34	Downloadable books	e-books downloadable from library's website	52
35	RSS feed	Option for RSS feed for website in part or in whole	45
36	LibGuide	Presence of library guides or subject guides	42
37	Distance item request form	Fillable form for interlibrary loans	37
38	Weather app	Weather application embedded within site	7
39	Pop-up descriptors	Presence of pop-up descriptors in part or entirety of website	6
40	Multimedia headline feed	Presence of headline feed(s) from external source(s)	3
41	Wiki	Presence of a wiki within the library's website	2
	Category subtotal		377
	Table subtotal		1047
IX	Additional rare application types		
	e.g., mobile catalogue, text-message reference, promotional slide show, book-a-librarian tool, iTunes app, weather app, smartphone app, wiki for comments and suggestions, online room booking, Adobe presentation tutorial, library floor maps with links to relevant services		88
	Total		1135

multimedia headline feed). The number of instances of OPACs (VIII.33), database linking, (VIII.32) and e-book download capabilities (VIII.34) are comparable to the entire categories of feedback (IV), help (V), and audio (VI).

The ninth category contains applications that were not foreseen in our fall 2010 pilot inventory (Gavin, Kamal, and Rubin 2011). For instance, the University Library at the University of Calgary, AB, and the McMaster University Library, ON, both offer mobile catalogues and the Chandler Public Library, AZ, offers the Library Anywhere mobile phone application.

White literature availability

We collected and analysed 296 publicly available website documents. Table 3 lists the document types and the number of times each type occurs in our data set, arranged in order of most to least frequent types. For instance, we list 59 mission statements identified within the sample 148 library websites. Forty per cent of the libraries (59 out of 148) make their mission statement publicly available. At the bottom of Table 3, rarer document types are listed, such as a programming philosophy (Inola Public Library, OK), a team-based service model (University of Guelph Library, ON), or a statement of financial information (Surrey Public Library, BC).

Most of the libraries (117 of 148, or 79%, of those with a web presence) have at least one publicly available document present on the website (max = 10, average = 2.7). Thirty-two libraries (22% of those with a website) do not make any of their documents publicly available, as per Table 3 list. Some such libraries are the Elkford Public Library, BC; the Westwood Free Public Library, NJ; the Luke Lindoe Library, Alberta College of Art and Design, AB; and the Gail Horton Library, Montana Bible College, MT. Further studies could investigate the reasons for the lack of online white literature. The ANOVA tests of the library type and location factors do not reveal any statistical significance for the number of documents offered.

Innovation discourse practices

Thirty-five libraries (or 24% of the libraries with a web presence) make 198 mentions of innovation (max = 24, min = 1, mean = 5.7 mentions per library) in the 151 documents made publicly available on their websites. Table 4 shows the 35 libraries arranged by number of mentions. Each library is listed with its library type and location (by country and state/province), and three calculated variables: the totals of the number of applications, documents, and mentions.

Contrary to what one might expect, the 35 libraries that discuss innovation are not exclusively academic: There are 15 public libraries on the list in addition to 20 academic ones. The list is nearly evenly split between Canadian and American libraries (16 and 14 respectively).

We further tested the significance of the library type and country location factors with the ANOVA within the data set (ANOVA, PASW 18.0, a new version of the SPSS). The ANOVA tests reveal that the number of applications and mentions (but not documents) differ significantly as a function of library

Table 3: “White literature” inventory and distribution (by document type)

Document type	Number of documents
Mission statement	59
About page	57
Library history page	39
Annual report	21
Library vision	21
Library blog (or librarian’s blog)	20
Strategic plan	17
Newsletter	18
Welcome pages	6
Letter from administrator	5
Letter from librarian	5
Other plans (library’s operational plan, long-range plan, work plan, facilities master plan)	4
Beliefs (belief statement)	2
Collection development policy	2
Goals and objectives	2
Library handbook	2
Values (or value statement)	2
Awards	1
By-laws	1
Core values/assumptions	1
Department pages	1
Library projects	1
Library services	1
Mission statement of library society	1
News releases	1
Organizational model	1
Policy manual	1
Programming philosophy	1
Statement of financial information	1
Strategic initiatives status report	1
Team-based service model	1
Total	296

Table 4: North American libraries with most mentions of innovation

Library	Country	State/ province	Library type	Applica- tions	Docu- ments	Men- tions
University of Guelph Library	Canada	ON	academic college and university	15	8	24
Kingston Frontenac Public Library	Canada	ON	public	13	8	24
McMaster University Library	Canada	ON	academic college and university	20	5	21
University of Manitoba Libraries	Canada	MB	academic college and university	9	2	21
Simon Fraser University Library	Canada	BC	academic college and university	14	9	19
Cornell University Library	United States	NY	academic college and university	16	9	16
Falvey Memorial Library, Villanova University	United States	PA	academic college and university	15	5	10
Rochester Institute of Technology Libraries	United States	NY	academic college and university	14	7	8
University of Western Ontario Libraries	Canada	ON	academic college and university	18	7	7
Mount Pleasant Public Library	United States	NY	public	10	4	5
University of Calgary Library	Canada	AB	academic college and university	22	4	4
Hinton Municipal Library	Canada	AB	public	12	6	3
Schmidt Library, York College of Pennsylvania	United States	PA	academic college and university	11	3	3
Stormont, Dundas, & Glengarry County Library	Canada	ON	public	6	4	3
Anna E. Kresge Memorial Library, Covenant College	United States	GA	academic religious college and university	3	4	3
Ambrose University College	Canada	AB	academic college and university	5	1	3
Mount Saint Vincent University Library	Canada	NS	academic college and university	15	5	2
Shasta College Library	United States	CA	academic community college	16	2	2
Parkland Regional Library	Canada	AB	public System	11	4	2
Georgian College Library	Canada	ON	academic community college	13	2	2
Langara College Library	Canada	BC	academic college and university	9	1	2
Surrey Public Library	Canada	BC	public	17	10	1
Palatine Public Library District	United States	IL	public	16	6	1
Humber College Library	Canada	ON	academic community college	16	5	1
University of Wisconsin-Stevens Point University Library	United States	WI	academic college and university	12	3	1
Newfoundland and Labrador Public Libraries	Canada	NL	public system	9	3	1
Sulphur Springs Public Library	United States	TX	public	7	4	1
Southeast Steuben County Library	United States	NY	public	7	4	1
Medfield Public Library	United States	MA	public	10	1	1
Nova Scotia Community College Library	Canada	NS	academic community college	8	2	1
Smith-Ennismore-Lakefield Public Library	Canada	ON	public	6	3	1
Peace Library System	Canada	AB	public system	3	5	1
Haston Free Public Library	United States	MA	public	4	3	1
Thomas F. Saffell Library, Garden City Community College	United States	KS	academic community college	4	1	1
Central Manitoulin Public Libraries	Canada	ON	public	1	1	1
Total				387	151	198

Table 5: ANOVA results (2 factors, 3 variables; DF = 1,144 for all tests)

Factors variables	Country	Library type	Country $\times$ library type
Applications	$F = 0.251, p = .617$	$F = 7.207, p = .008$	$F = 1.885, p = .172$
Documents	$F = 0.593, p = .443$	$F = 2.174, p = .143$	$F = 0.257, p = .613$
Mentions	$F = 2.965, p = .087$	$F = 4.127, p = .044$	$F = 0.522, p = .471$

Table 6: Data-set descriptive statistics: the number of applications, documents, and mentions of innovation per library type and country.

Library type	Country	<i>n</i>	Website content	Minimum	Maximum	Mean	Standard deviation
Academic	Canada	37	Applications	2	22	8.946	5.572
			Documents	0	8	1.811	2.093
			Mentions	0	24	2.892	6.662
	US	37	Applications	1	16	8.324	4.164
			Documents	0	8	1.730	1.742
			Mentions	0	16	1.189	3.298
Public	Canada	38	Applications	1	17	6.053	3.556
			Documents	0	9	2.421	2.126
			Mentions	0	24	0.974	3.915
	US	36	Applications	1	16	7.389	3.774
			Documents	0	6	2.028	1.424
			Mentions	0	5	0.278	0.882

type. On average, on academic libraries' websites there are significantly more applications ($F = 7.207$, $DF = 1,144$, $p = .008$) and more mentions ($F = 4.127$, $DF = 1,144$, $p = .044$) than on public libraries'. No statistical significance is found for the documents under the library type condition (see Table 5 for details). The country factor is not found to be significant for any of the three variables (the number of applications, documents, or mentions). Neither is there any interaction effect between the two factors (Table 5).

Table 6 provides a summary of descriptive statistics for the distribution of the three variables in two types of grouping (by library type or geographic location).

Furthermore, Figure 4 depicts a quadratic regression equation that demonstrates that the number of mentions in the library literature (x-axis) predicts the number of applications on the library website (y-axis). The regression model accounts for the 23.6% of the variance in the data set ($R^2_{adj} = .236$, $p < .001$). In fact, the top 30 libraries (in terms of most applications on their websites) account for 39% of all surveyed applications, 42% of all documents, and 74% of all the mentions. The top 50 libraries with most web applications account for 56% of all applications and 54% online documents as well as for 90% of all the mentions of innovation in the data set. The high density of zero points on the y-axis point to a high number of libraries without any mentions of innovation.

Figure 4: Quadratic relationship between applications and mentions of innovation.

Areas of innovation

To determine how libraries understand innovation, we turned to the white literature available through library websites. The creation of such documents was a common practice in the private sector before being adopted by public sector institutions like libraries in the 1980s. These organizational documents have been touted in organization studies for aligning institutional resources and endeavours. There is evidence that such literature has been engaged in the study of innovation (e.g., Bart 2004), but no studies of which we know have explicitly attempted to discover how innovation is understood and employed by libraries. Our efforts were not completely fruitless. For example, the University of Guelph Library listed innovation as one of its core values and explained it:

Innovation: The Library values and fosters innovation. We are always seeking *new and better ways* of serving and working with the University community. We think *creatively*, *embrace change* and *take risks* (University of Guelph, ID195, emphasis added).

This mention provides a definition for innovation in the second and third sentences, relating it to similar concepts such as *new*, *better*, *creativity*, *change*, and *risk*. Yet such elucidations were rare, as most mentions did not explicitly

define the term. (This fact reveals the extent to which the term is taken for granted, despite the conceptual challenges it poses for libraries.)

To determine from their documents what innovation means for and to libraries would therefore require an examination of how the term is used, what it refers to, in what context it is used, to what effect it is used, and so on. For instance, in the example above, innovation is presented not as something tangible but as an abstract ideal held by the institution. By contrast, several other library mentions of innovation were in reference to technologies. This is related to our first step of explicating how libraries conceive innovation: studying what areas of the library were stated as the subject of innovation. To this end, we examined all mentions of innovation in the documents along with surrounding text to develop a list of areas of innovation. Through an iterative examination, we developed a list of 10 areas of innovation. They are listed here in order of most to least occurrences in the pool of mentions in the data set.

1. Technology
2. Service
3. Culture
4. Vague
5. Character
6. Use
7. Program
8. Facility
9. Resource
10. Partnership

Many categories were developed by taking terms directly from the language in documents (known as *in vivo* coding; Saldaña 2009). Such mentions provided explicit reference—such as “innovative services” or “technological innovation”—that allowed for easy categorization. A single mention could also contain multiple areas of innovation, such as “innovative services and programs.” To accurately represent the content of the text in such situations, we enumerated all areas identified. But where one central area of innovation was mentioned, followed by multiple areas proceeding from that central innovation, only the central area was listed (for example, “Our innovative staff will explore new services and partnerships”). To keep the number of areas manageable without sacrificing accuracy, we did not rely exclusively on *in vivo* categories. Sometimes a category was expanded to include various aspects of the library (for example, we used “resource” as a more expansive term for library collections), while in other cases we create a term that is hardly used in documents yet reasonably encompasses aspects of the library (e.g., “character”). In the following sections, we explain each area and provide examples taken from the analysed documents.

Technology

Examining the mentions of innovation under this heading, we found that “technology” was sometimes mentioned in reference to a specific device, such as a

library website or a new portal (see Example 1a). In other instances, documents referred to technology in a general, non-specific fashion (See Example 1b). The role of libraries with respect to innovative technology varied; they alternatively positioned themselves as adopters, users, developers, and promulgators (see Example 1c).

Example 1a: “Other technological innovations, such as a new catalog from WorldCat Local that allows users to search the holdings of libraries around the world, also got started” (Cornell University Library, ID180).

Example 1b: “Our secondary belief is to make the fullest possible use of technological innovations within the library” (The High Prairie Municipal Library, ID102).

Example 1c: “The Library’s reputation as a technologically innovative organization continued to grow on a number of different fronts, especially around the development and/or adoption of open source software” (Simon Fraser University, ID62).

Service

Like “technology,” “service(s)” is usually the exact term used in text. The white literature occasionally referenced specific forms of services, such as reference or instruction services.

Example 2a: “The Southeast Steuben County Library provides free and open access to collections, electronic resources and innovative services which anticipate, support and respond to the ever-changing informational, cultural and leisure needs of all people within our community” (Southeast Steuben County Library, ID89).

Example 2b: “The Board is committed to ensuring continued innovation and excellence in public service” (Kingston Frontenac Public Library, ID114).

Culture

Instead of referring to innovation in terms of any particular aspect of the library, “culture” refers to the nature of the library overall, to the institution’s identity or brand. Example 3a illustrates a case of innovation as a description of the library overall, while example 3b illustrates this by abstracting innovation into an institutional value.

Example 3a: “McMaster University Library will be recognized as Canada’s most innovative, user-centred, academic library” (McMaster University Library, ID49).

Example 3b: “Values. Innovation: We will be aware of, and respond to, changes in our community and to the changing needs of our community.” (Mount Pleasant Public Library, ID125).

Character

“Character” describes specifically the human resources of the library. The term encompasses more than merely library staff but also includes, for instance, patrons, administration, and working groups. Innovative character is often presented in the literature as the staff’s capacity to implement innovative technologies or services (See example 4). More significant, however, is that by presenting innovation as character, libraries seem to treat innovation as a managed and manageable resource—something that could be cultivated through people. In some cases, it seems a delegated responsibility.

Example 4: “Members of all teams will draw on their individual and collective abilities to innovate and provide high quality service to our students, staff and faculty” (University of Guelph Library, ID204).

Use

Focusing on the language employed in the white literature, we make a categorical distinction between references to innovative items (e.g., technologies, services, resources, facilities) and to innovative methods. This latter category we call “use,” which implies that these mentions of innovation concern the ways in which users (whether staff or patrons) might interact with material objects. Therefore, while in many instances libraries attribute innovation to something provisioned by the library (e.g., a service), there were examples where the provision is meant to encourage innovation in or by the users (example 5a) or staff (example 5b).

Example 5a: “Create a leading-edge facility that supports and promotes the innovative and effective use of new and traditional media in teaching, learning and research.” (McMaster University Library, ID138).

Example 5b: “Collections through professional leadership and innovative use of technological applications, processes and vendor supplied services strives to enhance collection development and technical processing to support seamless access for the University of Calgary and its partners.” (University of Calgary Library, ID44).

Program

“Program” innovation is another term taken directly from the documents. For our purposes, we distinguish this area from “service” innovation by using it in reference to irregular, one-off, or special activities (e.g., a speaker series). “Service,” by contrast, means standard, and ongoing activities provided through the library (e.g., reference services).

Example 6: “The SLC [Student Learning Commons] will . . . deliver innovative/responsive programs, e.g., facilitating groups for thesis writing, creative writing, reading” (Simon Fraser University Library, ID143).

Facility

Like “technology” and “services,” the term “facility” is usually used in-text (see example 7), referring to the physical space of the library. This could include inno-

variations to the building—such as new study spaces or renovated infrastructure—or the technologies and services housed within the library. In either situation, the subject of the innovation remains the experience of the library as a place.

Example 7: “We gain added strength by sharing our knowledge and expertise with each other to create innovative facilities, resources, and services for our community” (University of Calgary Library, ID43).

Resource

“Resource” as a category is taken in vivo and often used in reference to the library’s collection, whether physical or digital. But given the inherent vagueness of the word “resources,” it may have been used by document creators to refer to various objects (technology, facilities, etc.). Again, we rely on the surrounding text to clarify this whenever possible.

Example 8: “Leader in the development of innovative information resources and services” (University of Calgary Library, ID42).

Partnership

“Partnership” refers to collaboration between different departments within a library system (see example 9a), across separate institutions (see example 9b) or, less frequently, with external private organizations (see example 9c).

Example 9a: “In this innovative partnership, the Veterinary Library extends its traditional role of gathering, storing, and providing access to print-based and audio-visual information including digital images, video clips, and audio files” (Cornell University Library, ID181).

Example 9b: “Parkland and Red Deer College collaborated in an innovative partnership” (Parkland Regional Library, ID116).

Example 9c: “Strive for financial health through alignment, accountability, innovative partnerships, improved business practices, and creative development initiatives” (McMaster University Library, ID133).

Vague

This final category is used for all mentions where the subject of innovation cannot be identified. Innovation is either referred to only abstractly or with insufficient detail (see example 10a). Alternatively, the context of some mentions of innovation presented detailed accounts of the ends of innovation while still leaving the means obscure (see example 10b).

Example 10a: “Innovation: We foster creative and innovative responses to meet client needs.” (University of Manitoba Libraries, ID253).

Example 10b: “Our staff engages with faculty and researchers in cutting-edge initiatives to develop infrastructure to support e-science and data curation and protect fair use and intellectual property rights.” (Cornell University Library, ID81).

Discussion

Returning to the four questions posited at the introduction, we can begin to clarify what innovation means for libraries.

How libraries apply the term "innovation"

The ways libraries apply the term "innovation" to various aspects of the library can be grouped in 10 categories. These vary from the diffuse and general (e.g., culture) to the tangible and particular (technology), and from objects (facility) to processes (use). Several libraries, both across documents and within the same document, would simultaneously refer to multiple areas of innovation. Innovation for libraries is a highly amorphous concept, potentially including every aspect of the library. Of course, there is an element of overlap between these areas. For example, it is common to see innovative service and technology presented simultaneously. This is logical, given that a novel technology often entails correspondingly novel services. Similarly, an innovative culture may be evinced through its facilities, technologies, or practices; and mentions of innovations in these three areas may be interpreted as demonstrating an innovative culture, even if such an association is left unstated. Therefore, while this study focused on the explicit subject of innovation as described in the documents rather than extrapolations (however logical), there are implicit overlaps across subjects. This invites us to ask why some areas of innovation are more commonly presented over other co-existing innovations, or conversely, why these areas of overlap may be under-represented. For example, consider a library that mentions its innovative technology yet that fails to mention its corresponding innovations in human resources that are prerequisite to supporting these technologies.

Innovation, as found in the documents, was expressed sometimes as an aspiration of the library. It was also mentioned to describe an accomplishment of the library. Again, these instances were sometimes observed side-by-side in a library's documents. Innovations as accomplishments were presented as evidence of the library's commitment to innovation as an aspiration. Innovation was, therefore, a thread connecting the different types of organizational documents: aspirational documents (e.g., mission statements) and reporting documents (e.g., annual reports).

The final area, "vague," presents an interesting perspective on exploring a library's definition of innovation. Despite the broad coverage of the other nine areas, derived from the corpus, there remained a need for this catch-all category for a sizable proportion of mentions. This suggests that innovation has, in many cases, become completely detached from any referent.

While there are intuitive overlaps between the direct (e.g., "innovations," "innovating") and indirect (e.g., "evolving," "cutting-edge") mentions of innovation, notable distinctions were also observed. For instance, a reference to installing a "new" library entrance does not necessarily imply an innovation. Nor is describing technology as "state-of-the-art" the same as describing it as innovative. Future work will explore these differences by drawing on the other questions of the qualitative analysis.

The context(s) in which innovation is mentioned

Change or the notion of a changing environment figures heavily in the documents mentioning innovation, whether through references to a changing economic environment, changing user needs, or the climate of constant technological change. Innovation and innovative services, technologies, partnerships, and so forth are presented as providing the solution to questions brought about by a climate of increasing uncertainty. While both Pungitore (1995) and Deiss (2004) discuss the irrelevance of the term “innovation” to libraries, it is, following their logic, conceivable that the rhetorical use of the term (a use that one might expect from documents such as mission statements, library values, and strategic plans) has the potential to function as a makeshift remedy to the “adverse effect” of wider social changes that threaten—or are perceived to threaten—to marginalize the institution. Libraries and the services that librarians provide, while long believed to be stable, relevant, and important in both Canada and the United States, are increasingly coming to be viewed as anachronistic, or—just as bad—a luxury in an environment of widespread budget cuts and an fiscal austerity that calls into question the stability of any publicly funded program or institution. Insofar as library innovation is *reactive* to a threat to libraries’ survival rather than a *proactive* effort to stand apart, it comes closer to Schumpeter’s definition of “change” than “innovation.” Again, this reiterates the need to explore the distinct definition of “innovation” for libraries, as the usage of the term throws in relief the particular position of the institution—the challenges they face and their strategies to succeed.

Evaluating library practices by surveying library website applications

Ninety-three per cent of the North American public and academic libraries we sampled had a web presence. Our inventory of websites revealed the trend of offering interactive, reference, and social-media tools as well as OPACs, links to databases, and e-book download capabilities. Examples of rarer applications (e.g., video tutorials, iTunes applications) were also found. According to Rogers’s diffusion theory, rare applications may suggest innovators or early adopters. Confirming or rejecting this hypothesis would require expanding the current study beyond a snapshot of contemporaneous libraries into a longitudinal study, which would trace the proliferation or obsolescence of technologies overtime. The methods and tools developed and presented here allow for successive surveys to chart such trends.

Relationship between website applications and white literature innovation discourse

The extent to which innovation was discussed in the documents of a library was shown to predict the number of library website applications. This significant relationship was independent of the number of documents. Academic libraries had more online applications and more mentions of innovation compared to public libraries, despite the fact that the total amount of online documentation

of the two library types was comparable. This relationship reveals a demonstrable difference between libraries that express innovation and those that do not in at least one aspect of the library (i.e., web applications), and invites further a study to test whether this trend is observed in other aspects of the library.

Conclusion

Tracing the origins of the term “innovation” to disciplines outside LIS, this research presents the beginning stages of a larger agenda of research into innovation and librarianship. The work ultimately seeks a descriptive rather than a prescriptive account of how libraries, as unique institutions, have cultivated a particular sense of innovation. For libraries, innovation is flexible and reactive, carrying both a rhetorical force while still indicative of real-world practices. Having examined our extensive random sample of the online library white literature from across the United States and Canada, we identified 10 areas of innovation as articulated by the sample libraries themselves: technology, service, culture, vague, character, use, program, facility, resource, and partnership.

This study also established broader facts regarding publicly accessible library resources and their relationship to innovation discourse. Ninety-three per cent of North American libraries had a web presence in late 2010 to early 2011. Of those, academic libraries offered more website applications and had more extensive innovation discourse in their white literature than public libraries, though the amount of online documentation remained comparable across the two library types. The extent of innovation discourse, as measured by the number of mentions of direct or indirect references to the term “innovation,” was found to be a significant predictor of the extent of the offered website applications. Neither the extent of innovation discourse nor the availability of resources differed between Canadian and US libraries. Drawing on the data collected during this research—of which only a portion was necessarily presented here—we will continue to build upon these findings and further explicate just what “innovation” means for libraries.

Notes

1. The complete list of the studied libraries with their library type and geographic location (country, state/province) is available at <http://www.publish.uwo.ca/~vrubin/InnovationProject.htm>.
2. Our special thanks to the MLIS work-study, Sarah Barriage, for her relentless data collection and data management efforts.
3. According to Landis and Koch (1977) agreement of the kappa rates are to be interpreted as:
 Below 0.00: Poor
 0.00–0.20: Slight
 0.21–0.40: Fair
 0.41–0.60: Moderate
 0.61–0.80: Substantial
 0.81–1.00: Almost perfect

4. http://www.ci.tualatin.or.us/departments/community_services/library/
5. <http://www.marigold.ab.ca/content/member-library-directory>
6. <http://www.cravenc.c.edu/educational/learningresources.cfm>
7. http://www.sheridancollege.ca/services/student_learning_services/library_services.aspx

References

- American Library Directory. 2010. "About ALD on the Web." American Library Directory. <http://www.americanlibrarydirectory.com/about.asp>. (accessed January 7, 2010).
- Bart, C. K. 2004. "Innovation, Mission Statements and Learning." *International Journal of Technology Management* 27 (6/7): 544–61.
- Bird, S., E. Klein, and E. Loper. 2009. *Natural Language Processing with Python*. 1st ed. Beijing: O'Reilly Media.
- Cohen, J. 1960. "A Coefficient of Agreement for Nominal Scales." *Educational and Psychological Measurement* 20 (1): 37–46.
- Crossan, M., and M. Apaydin. 2010. "A Multi-dimensional Framework of Organization Innovation: A Systematic Review of the Literature." *Journal of Management Studies* 47 (6): 1,154–91.
- Damanpour, F., and W. M. Evan. 1992. "The Adoption of Innovations over Time: Structural Determinants and Consequences in Library Organizations." *Library & Information Science Research* 14: 465–82.
- Damanpour, F., K. A. Szabat, and W. M. Evan. 1989. "The Relationship between Types of Innovation and Organizational Performance." *Journal of Management Studies* 26 (6): 587–602.
- Deiss, K. J. 2004. "Innovation and Strategy: Risk and Choice in Shaping User-Centered Libraries." *Library Trends* 53 (1): 17–32.
- Gavin, P. T., A. M. Kamal, and V. Rubin. 2011. "Understanding Innovation: What Libraries Say, What Libraries Do." Work-in-progress poster abstract in the proceedings of the Association for Library and Information Science Education Conference: Competitiveness and Innovation (ALISE 2011), San Diego, January 4–7, 2011.
- Keklik, M. 2003. *Schumpeter, Innovation and Growth: Long-Cycle Dynamics in the Post-WWII American Manufacturing Industries*. Burlington, VT: Ashgate Publishing.
- Knab, S. 2010. "Comments from the Editor-in-Chief." *Journal of Library Innovation* 1 (1): 3–5.
- Krippendorff, K. 2004. *Content Analysis: An Introduction to its Methodology*. 2nd ed. Beverly Hills, CA: SAGE.
- Landis, J.R. and G.G. Koch. 1977. "The measurement of observer agreement for categorical data." *Biometrics* 33 (1): 159–74.
- Liu, S. 2008. "Engaging Users: The Future of Academic Library Web Sites." *College & Research Libraries* 69: 6–27.
- Luquire, W. 1976. "Selected Factors Affecting Library Staff Perceptions of an Innovative System: A Study of ARL Libraries in OCLC." PhD diss., Indiana University.
- Musmann, K. 1982. "The Diffusion of Innovations in Libraries: A Review of the Literature on Organization Theory and Diffusion Research." *Libri* 32 (1): 257–77.
- Pungitore, V. L. 1995. *Innovation and the Library: The Adoption of New Ideas in Public Libraries*. Westport, CT: Greenwood Press.
- Quinn, R.E. and K.S. Cameron. 1998. *Diagnosing and Changing Organizational Culture: Based on the Competing Values Framework*. Reading, MA: Addison Wesley Longman.

- Reynolds, J., and J. B. Whitlatch. 1985. "Academic Library Services: The Literature of Innovation." *College & Research Libraries* 46: 402–17.
- Rogers, E. M. 1962. *Diffusion of Innovations*. Glencoe, IL: Free Press.
- Rogers, E. M., and F. F. Shoemaker. 1971. *Communication of Innovations: A Cross-Cultural Approach*. 2nd ed. New York: Free Press.
- Rubin, V. L., Y. Chen and L.M. Thorimbert, 2010. "Artificially Intelligent Conversational Agents in Libraries". *Library Hi Tech* 28 (4): 496–522.
- Saldaña, J. 2009. *The Coding Manual for Qualitative Researchers*. London: SAGE.
- Schumpeter, J. A. 1976. *Capitalism, Socialism, and Democracy*. 5th ed. London: Allen and Unwin.
- . (1934) 1983. *Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest, and the Business Cycle*. Trans. Redvers Opie. Reprint, New Brunswick, NJ: Transaction Books.
- Willard, P. 1991. "Innovation: Insights from the Literature." *Journal of Librarianship and Information Science* 23 (4): 183–89.