

Determinants of Service Innovation in Academic Libraries through the Lens of Disruptive Innovation

Shea-Tinn Yeh and Zhiping Walter

With the development of digital technologies, various disruptive innovations have emerged that are gradually replacing academic libraries in the information-seeking process. As academic libraries become less relevant to their users, it is imperative that they develop strategies to respond to disruption. We highlight the fact that the service mission of academic libraries is in alignment with service innovation and propose that academic libraries respond to disruption by accelerating service innovation. Applying the Resources-Processes-Values framework, we recommend that, to facilitate service innovation, high-level administrators become innovation leaders, foster an innovation-supportive culture, tie performance evaluations and rewards to innovation outcomes, and create dedicated innovation teams with high levels of decision-making autonomy. We also recommend that academic libraries involve their users and build partnerships with other libraries and with commercial communities to bring about service innovation necessary to respond to disruption.



Academic libraries have long enjoyed the reputation as the “heart of the university.” Library users traditionally visited a library building to conduct research, locate and retrieve items from the collection, or consult a librarian at the reference desk. With the advent of the Internet, more and more library services are delivered digitally. In recent years, with the emergence of various Internet-related innovations such as Google Scholar, faculty and students have been gradually moving away from their libraries altogether: instead of walking up to a reference desk or using the chat program to seek help from a reference librarian, they rely on various free web resources as the first step in information seeking; instead of using library materials, they rely on Google Scholar to locate resources; instead of using library-subscribed journals, they peruse open journals and repositories. As this trend continues, academic libraries are under mounting pressure to demonstrate their value.¹

Shea-Tinn Yeh is an Assistant Professor and Library Digital Infrastructure and Technology Coordinator in the University of Denver Libraries; e-mail: sheila.yeh@du.edu. Zhiping Walter is an Associate Professor, Information Systems, in the Business School at the University of Colorado Denver; e-mail: zhiping.walter@ucdenver.edu. The authors thank Prof. Jahangir Karimi of University of Colorado Denver for his many contributions during early stages of theoretical development of this paper. The authors also thank the two anonymous reviewers and the C&RL editor for their constructive critique and suggestions, which helped us improve this paper greatly. © 2016 Shea-Tinn Yeh and Zhiping Walter.

Library professionals as a whole are increasingly concerned that academic libraries may one day become largely irrelevant to their users.²

The erosion of the dominance of academic libraries in the realm of academic information seeking follows the familiar pattern of dominance erosion due to outside innovations that has happened to many firms. This phenomenon has been termed *disruption*, and the innovation that brings about this disruption has been termed *disruptive innovation* by Clayton Christensen.³ For example, print newspapers used to dominate the news dissemination business. In the last two decades, their dominance has been relentlessly eroded by digital technologies. Disruption in the newspaper industry has caused the loss of tens of thousands of jobs and has returned the revenue level of that industry to what it was in the 1950s.⁴ Not all firms succumb to disruption, however; some are able to regain their dominance. Why and how do some incumbent firms successfully respond to disruptive innovation and maintain their dominance, whereas others fail to respond effectively and so see their businesses decline? This question has been studied intensely in the management literature. In particular, Christensen proposed the Resources-Processes-Values (RPV) framework to answer this question. The framework states that the tangible and intangible resources an organization possesses, the processes that employees use to transform resources into products and services of greater worth, and the values by which the organization and employees set priorities together determine whether an incumbent firm will succeed or fail to respond to disruptive innovations.⁵

In this paper, we apply Christensen's RPV framework and theories from the field of disruptive innovation to study how academic libraries can respond to disruption brought about by the web and other digital technologies. We propose that, to survive disruption, academic libraries need to engage in service innovation. Furthermore, we identify resources, processes, and values that academic libraries need to possess or deploy to facilitate service innovation. The rest of the paper is organized in the following manner: The next section presents theoretical foundations of disruptive innovation and of responses to disruptive innovation, followed by a discussion of the response strategy of academic libraries to disruption. After that, we discuss the RPV framework and offer a number of propositions concerning the resources, processes, and values needed for service innovation. The paper concludes with a reflection.

Disruptive Innovation and Response to Disruptive Innovation

A disruptive innovation is one that creates an entirely new market by introducing new products and services and that eventually disrupts an existing market by drawing away customers from that market.⁶ Google Scholar is an innovation that can be considered disruptive to academic libraries, because users search in Google Scholar as opposed to using library databases to find references and citations. Although the term *disruptive innovation* was popularized by Christensen in 1997, disruptive innovation and the phenomenon of disruption had been studied using different terminologies for decades prior to Christensen's introduction.⁷ As noted by John Howells, Joseph Schumpeter called the process of disrupting existing businesses "creative destruction."⁸ Innovations that enable creative destruction had been known variously as competence-destroying innovations, radical innovations, and architectural innovations.⁹ From this literature, five generic strategies for responding to disruptive innovation have been identified: exit, ignore the new innovation, switch to the new innovation completely, extend the existing business so it both maintains the traditional market and enters the new market, and accelerate innovation in the current business. Which strategy is most likely to lead to a successful response depends on the nature of the disruption and the characteristics of the firm.¹⁰ The strategy of exiting the market is preferred when the product, service,

or technology is so outdated that shareholder value would be maximized if assets were liquidated. The strategy of ignoring the new innovation is usually adopted when the new innovation serves a different market and does not encroach on the incumbent's market. Switching to the new innovation completely is usually accomplished through acquisitions when the revenue streams from the new market will grow to eventually replace lost revenue streams from the existing business. The strategy of extending existing business to serve both the old and the new markets is executed when a firm aims to preserve profits in the existing market and to generate new profit streams by entering a new market.

What response strategy makes sense for academic libraries? Clearly, exiting the field of academic information seeking is not an option because libraries are still tasked with that overarching mission. Ignoring disruptive innovations is not an option either, because libraries are clearly disrupted. Extending existing business to the new competitive market to generate new revenue is not applicable to academic libraries, because the mission of academic libraries is not to maximize profits but to serve the information needs that support research, teaching, and learning. If some of those needs are already served, there is no rationale for academic libraries to compete to serve the same needs. It follows that the value of academic libraries is to fulfill users' information needs in teaching and research that are not met elsewhere. Since those unfulfilled information needs have changed and are still changing due to disruptive digital innovations, academic libraries must adopt the response strategy of accelerating innovations that serve the information needs of university users that are unmet elsewhere. Their focus, therefore, must be on service innovation.

Service Innovation in Academic Libraries

What counts as service innovation for academic libraries? Here, we adopt the view of Scott Walter and David Lankes that innovation in academic libraries should be broadly defined to include changes in existing library service programs according to the changing needs of users, new service programs that are enabled by new digital technologies, and new services that support new paradigms of teaching and research.¹¹ For example, the development of social media generates volumes of data that could be used for teaching and research. However, efficient access to those data requires commercial tools that are currently, for the most part, not supported by academic libraries. Academic libraries can support research needs for social media data by redefining their services to include access to tools that are needed for data collection. As another example, myriad public and private secondary data sets are available for teaching and research. Identifying those secondary data sources or obtaining them is a service innovation that will fill a gaping hole in users' information needs.

RPV Framework and Determinants of Service Innovation in Academic Libraries

While there is consensus that service innovation should be an academic library's response to digital disruption, how to achieve service innovation remains a question. In this section, we apply Christensen's RPV framework and management theories on organizational resources to identify determinants of service innovation.

The RPV framework was developed by Christensen to explain an incumbent firm's response to disruptive innovation. Resources are tangible and intangible assets, knowledge, and relationships that are owned and controlled by the firm; they are what a firm currently possesses.¹² Processes are "patterns of interaction, coordination, communication, and decision making employees use to transform resources into products and services of greater worth"; they reflect how a firm functions.¹³ Values are standards by which employees set priorities that enable them to judge what is at-

tractive or important and should be pursued; they determine what a firm desires to accomplish.¹⁴ According to the RPV framework, values determine how resources are allocated, and processes determine whether a firm can transform resources into the desired outcome effectively and efficiently. Resources, processes, and values together define a firm's capabilities and disabilities.¹⁵ Christensen used the RPV framework to develop his disruptive innovation theory, which describes how new entrants with disruptive innovations gradually overtake incumbent firms.¹⁶ There is considerable controversy surrounding the disruptive innovation theory concerning how incumbent firms are overtaken by new entrants armed with disruptive innovations, and even whether and under what circumstances incumbents are overtaken.¹⁷ However, there is no controversy over the RPV framework. The framework has been used to study the newspaper industry's response to digital disruption and to develop a heuristic model for implementing government-to-government digital projects.¹⁸ Moreover, it is consistent with and developed from organization capabilities theory and the resource-based view of the firm, both being well-established theories about how firms obtain and maintain competitive advantage.¹⁹ Since both foundational theories are geared toward how for-profit firms extract economic rents, whereas the RPV framework focuses on why firms do what they do, we conclude that the RPV framework is more directly applicable to the library context. Therefore, we will propose a list of determinants based on the RPV framework.

Determinants Related to Resources

Dedicating a small team of engineers to work on innovation projects with its own financial resources has resulted in an empowered and agile organizational structure that supports innovation on an ongoing basis for firms such as Google.²⁰ Dedicated human resources are also prevalent in customer-facing firms as evidenced by a Forrester Research survey on customer experience, in which 69 percent of respondents reported that their customer-facing companies have dedicated personnel for innovation and have achieved success.²¹ These dedicated personnel form innovation teams (so called "innovation cells") that consist of teams of volunteers across existing divisions or departments who are dedicated to high-risk projects.²²

Library resources are generally fully committed to established priorities, so dedicating personnel to innovation projects requires creating and identifying slack human and financial resources. Slack resources often occur because of automation (such as collection development automation) or resource underutilization (example: electronic reserves underutilization). It also requires identifying employees that are best suited for innovation projects. Afterward, the library can redeploy slack personnel to free up innovation team members and to transfer slack financial resources for innovation. The innovation team created by resource reallocation should retool and acquire new knowledge to meet the challenges of service innovation. For example, a service innovation might be to help students find resources and guidance on effectively using social media (such as using it for self-marketing, studying social media marketing strategies of firms, and collecting social media data for research) as seen in the Queensland University of Technology Library.²³ This service innovation requires the innovation team to acquire social media skills needed to support students' information needs for social media.

Dedicating personnel and financial resources to innovation has resulted in some significant successful outcomes in libraries around the United States. For example, the University of North Carolina Chapel Hill's Research Hub in the Davis Library is dedicated to service innovation. It is funded by the library budget largely through a reorganization of library services.²⁴ The hub provides software for compiling large data sets and for researching census information. In addition, the hub focuses on geo-

graphic services, data management, and data visualization. Library funds also support the successful Makerspace at the University of Nevada Reno.²⁵ The space provides new technology and tools that enable users to design, prototype, and create innovative objects. Both examples are testaments to how dedicating personnel and financial resources for innovation can lead to innovation success. We propose the following:

Proposition 1: Dedicating personnel and financial resources for innovation is positively related to service innovation in an academic library.

In addition to dedicating internal resources for innovation, libraries can also reach out to users for innovation ideas. After all, users are the best at informing libraries about what their unmet information needs are and what services they would like libraries to provide for them. This means that the traditional one-way flow service model from libraries to users is no longer sufficient.²⁶ Instead, opportunities will occur and innovative services will take root when library employees and users cocreate value and draw on each other's inputs.²⁷ In other words, an innovation community model of library service provision involving both library employees and users is called for to stimulate service innovation.²⁸ Similar practices have seen great success in the business world. For example, Starbucks' customers have been submitting product ideas and participating in product decisions via Starbucks' website for many years.²⁹ Such cocreation with customers is one of the main reasons Starbucks is able to continuously reinvent itself by introducing new products that adapt to customers' changing preferences and tastes.

Customer participation is not the only source of service innovation in the business world. Large firms increasingly coinvent not only with customers but also with other actors outside the firms' boundaries, such as suppliers, peer firms, and competitors.³⁰ This is because an innovation is often a result of complex networks involving multiple actors and institutions that develop, diffuse, and use the innovation.³¹ Successful coinvention examples abound in the business world from pharmaceutical giants to technology titans.³²

Libraries have traditionally formed alliances or consortia to successfully share library collections. This type of partnership among libraries is ideal for sharing innovations. In addition, libraries would benefit from collaborating with vendors who may be developing disruptive innovations that target faculty and students directly. For example, collaboration with textbook vendors who are developing teaching platforms would ensure that libraries play a central role in this new teaching paradigm. We propose the following:

Proposition 2: User participation is positively related to service innovation in an academic library.

Proposition 3: Building partnerships with other libraries is positively related to service innovation in an academic library.

Proposition 4: Building partnerships with vendor and commercial communities is positively related to service innovation in an academic library.

Determinants Related to Processes

Innovation involves trial and error, which is risky. The extent to which the innovation team has the autonomy and freedom to make decisions concerning this trial-and-error process greatly affects the innovation outcome.³³ When the outside environment changes rapidly and the desired innovation has a high level of novelty compared to the

existing business practice, a high degree of autonomy has been found to be positively associated with the innovation outcome.³⁴ This is because a higher level of autonomy gives the innovation team higher authority over its limited resources, which fends off competition for those resources from other parts of the organization.³⁵ It also allows the innovation team to respond to the environment quickly without being constrained by existing inefficiencies and bureaucracies.³⁶

Some libraries are large enough to create a whole autonomous unit for innovation. For example, the Online Computer Library Center (OCLC) has long dedicated a highly autonomous Research and Development unit to innovative library services. OCLC's initiatives from this unit often bear hallmarks of innovation. Its Virtual International Authority File links disparate names across multiple authority files to form a "super" authority record, enabling the collaborative knowledge investment for efficiency and reuse.³⁷ Its Cookbook Finder applies principles of Functional Requirements for Bibliographic Records model to aggregate bibliographic information, allowing users to explore cookbooks around the world.³⁸ For libraries that are not large enough to create a spinoff unit to contemplate innovative new projects, innovation teams or committees with high levels of decision-making autonomy should be created. We propose the following:

Proposition 5: Autonomy granted to the innovation team is positively related to service innovation in an academic library.

A high level of decision-making autonomy with dedicated personnel and other resources may not be sufficient to produce high innovation outcomes without triggers and guided actions through innovation-conducive performance measurement.³⁹ On the other hand, inappropriate performance measurement for the innovation team can often become an obstacle to creativity as well as a source of resentment.⁴⁰

Academic libraries are in a unique position to stimulate radical innovation through performance measurement because of their service mission. In the business world, the goal of maximizing shareholder value or maximizing profits, though compatible with innovations that improve upon a firm's current products and services, often stymies innovations when firms are faced with disruptive innovation. This is because disruptive innovation usually initially targets the lower end of the market, where profit margin is slim compared with the established market. As a result, since employees of for-profit firms are mostly evaluated based on how they contribute to a firm's profit motive, performance measurements often impede radical innovations. Such dynamics have led to the conclusion that, to successfully innovate to counter disruption, a firm needs to switch its business goal from maximizing profits to delighting customers.⁴¹ This conflict between innovation and the business goal is not present for an academic library because innovation is aligned with its mission of serving users' information needs. As such, an academic library should take advantage of this congruence between innovation and its mission and tie performance evaluations and rewards to innovation outcomes. We propose the following:

Proposition 6: Tying performance evaluations and rewards to innovation outcomes is positively related to service innovation in an academic library.

Determinants Related to Values

An organization's values permeate the entire organization and affect how resources will be allocated, what processes will be developed, and how employees will set priorities. An organization's values that prioritize innovation require a pro-innovation leadership

and an innovation-supportive culture.⁴² A pro-innovation leadership provides support and guidance from the initial creative stage to final implementation of innovative ideas.⁴³ In an innovation-supportive culture, employees feel encouraged by senior management to be proactive, to take risks, and to experiment and have the flexibility, freedom, and resources to do so. Following through on innovation values is also critical for a leader who can do so by modeling the behavior that he or she promotes. For example, to foster a risk-taking culture, the leader should take calculated risks himself or herself, which would speak volumes to the employees.⁴⁴ Both pro-innovation leadership and innovation-supportive culture have been demonstrated to positively influence innovation outcome.⁴⁵

A pro-innovation leadership and an innovation-supportive culture are particularly relevant to academic libraries because their senior management largely establishes strategy and determines organizational culture.⁴⁶ Although the mission of academic libraries is to serve users' information needs, which is aligned with innovation, the pace of innovation has not kept up with technological changes or users' preference changes, as evidenced in the declining use of libraries.⁴⁷ As library budgets reflect the dwindling university budgets, it is becoming increasingly difficult for libraries to overcome their resource rigidity and organizational inertia when faced with disruptive innovation. This makes it even more crucial that library leaders set their eyes firmly on innovation and on fostering trial-and-error experimentation. Therefore, we propose the following:

Proposition 7: A pro-innovation leadership is positively related to service innovation in an academic library.

Proposition 8: An innovation-supportive culture is positively related to service innovation in an academic library.

Discussions and Conclusions

Digital content and Internet access have dislodged academic libraries from their historical role as the first step in the information-seeking process.⁴⁸ Libraries are surrounded on all sides by disruptive technological innovations that are serving much of undergraduate students' information needs once traditionally served by academic libraries. Over time, more outside alternatives will surely emerge to attract more undergraduate students, graduate students, and faculty alike. How should academic libraries respond to these seismic changes in the landscape of information seeking?

This study looks outside the library walls and through the lens of disruptive innovation to identify response strategies for libraries. Using academic libraries' service mission as our guiding principle, we propose that academic libraries respond to disruption by engaging in service innovation. Libraries' resources and services exist to serve users' information-seeking needs. When those needs are met by outside alternatives, resources and services can be reallocated, reconfigured, and reimagined to serve users' new information needs that are not met elsewhere. The academic libraries' service mission dictates that continuous service innovation should be programmed into our DNA. We should always be attuned to users' ever-changing information needs and continuously reexamine the relevance of current service offerings.

How do libraries achieve service innovation? Applying the RPV framework, we recommend that, when a library's offerings decline in relevance and create a call for changes, library leadership advocate service innovation and encourage library employees to take risks and experiment. A dedicated innovation team with a high level of decision-making autonomy and dedicated resources should be created. Performance evaluations and rewards need to be tied to innovation outcomes, and innovation pro-

cesses should involve users. Moreover, increased partnerships with other libraries and with the broader community are also essential to service innovation.

This article advocates the notion that disruption to current library services in fact represents opportunities rather than threats to academic libraries. This is because the service mission of academic libraries implies that outside innovations are means to free libraries from some of the current services, allowing them to reconfigure existing resources for innovative new services. Viewing innovation as a distraction or citing lack of resources as excuses for not engaging in innovation projects both run counter to libraries' service mission. This is because, without innovation, users' changing information needs will render academic libraries increasingly irrelevant. We hope that this article contributes to library leadership's understanding of the importance and benefits of innovation in academic libraries. We encourage an academic library to consider appointing a senior manager to oversee the resource allocation process, to create a team of "movers and shakers," and to train employees to identify "forward-thinking innovations." For future research, we will operationalize the proposed factors and empirically validate them to solidify our theoretical propositions.

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