

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

---

Library Philosophy and Practice (e-journal)

Libraries at University of Nebraska-Lincoln

---

Spring 6-17-2021

## Innovation Management in the Library: A Bibliometric Analysis

Budi Harsanto

harsanto.id@gmail.com

Follow this and additional works at: <https://digitalcommons.unl.edu/libphilprac>



Part of the [Library and Information Science Commons](#), and the [Technology and Innovation Commons](#)

---

Harsanto, Budi, "Innovation Management in the Library: A Bibliometric Analysis" (2021). *Library Philosophy and Practice (e-journal)*. 5908.

<https://digitalcommons.unl.edu/libphilprac/5908>

# **Innovation Management in the Library: A Bibliometric Analysis**

**Budi Harsanto**

Department of Management and Business, Universitas Padjadjaran, Indonesia

Email: harsanto.id@gmail.com

## **Abstract**

The library plays a central role in facilitating access to knowledge and being a center in what is currently known as knowledge management. Libraries that are culturally subject to rigid rules and identic with a bureaucratic atmosphere face a high challenge in innovating. The purpose of this paper is to explore the publication development on innovation management in the library. The method used is a bibliometric analysis of publications on innovation in a library context, which is then analyzed using the innovation management perspective. The analysis results identified five clusters: innovation culture, technological innovation, innovative human resources, knowledge management, and e-learning. These clusters are a representation of some of the elements of innovation management. This study contributes to the systematic mapping of innovation management in the library context that has not been closely studied before.

**Keywords:** innovation management, knowledge management, library, bibliometric

## INTRODUCTION

Innovation management in the library recently received attention because of the awareness from the professional librarians and their stakeholders regarding the external environment that is constantly changing from time to time, including rapid technological developments and changes in behavior (Rowley 2011). Innovation seems to be a necessity for libraries to keep adaptive in dealing with these changes. Library orientation towards service quality and adherence to rules sometimes limits their ability to innovate (Jantz, 2017). Improvements made to libraries are usually incremental and minor (Conner 2014). Innovation in libraries is challenging for several reasons, such as a very tied culture to rigid professional norms and traditions as well as bureaucracy, especially for libraries that are part of the public organizations (Jantz, 2017; Rowley, 2011).

In a public organization or other types of organization, culture cannot change easily and sometimes create resistance. Maloney et al. (2010) revealed that the library culture is primarily hierarchical with a stability orientation for executing a series of procedures. Future library leaders see that a more innovative culture is highly needed to be adaptive to various developments and ongoing disruptions (Maloney et al., 2010). In addition to external factors, internal factors can also encourage the development of innovation, such as internal dissatisfaction with existing performance (Jantz, 2017). For this reason, innovation is considered important for libraries, especially in the face of significant disruption in the form of advances in information technology or the recent global challenge in the form of a pandemic.

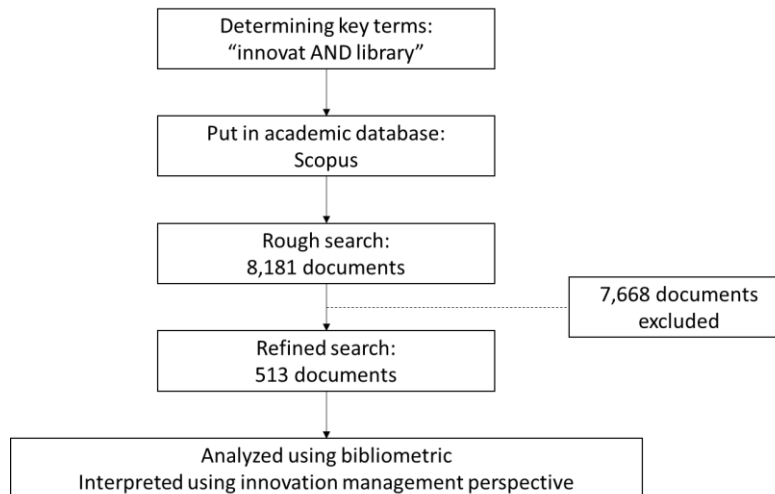
Even though considered important, previous studies found that innovation in libraries, especially those that are major or significant, has its obstacles (Conner, 2014). In addition to the professional traditions challenge, from the point of view of human resources management, very few professional librarians' have received formal training to innovate in their work (Jantz, 2017). Innovative organizations, including libraries, need a conducive environment for them to maximize their creativity while collaborating to produce innovations (Rowley, 2011). There are several types of innovation in the innovation management literature, including product innovation, process innovation, and organizational innovation (Baregheh et al., 2009; Harsanto et al., 2020).

While most studies about innovation in the library context are fragmented, the present study tries to consolidate these various studies and identify important themes. It is hoped that the present study can contribute to a complete understanding of innovation in libraries, more specifically from an innovation management perspective. Innovation management is a series of activities to build effective routines to be able to commercialize or implement new or improvement ideas (Tidd & Bessant, 2009). The results of this study are expected to be useful for library leaders, librarian professionals, and other library stakeholders in understanding the development of research on innovation management in libraries. This paper is divided into four sections. The first section provides background on the importance of consolidating knowledge about innovation in libraries. The second section deals with the methodology. The third section presents the findings as well as a discussion of the themes identified. The conclusion is presented in the final section.

## METHOD

The method used in this study is bibliometric as an approach to analyzing the development of knowledge in a particular field of science (Garfield, 1955; Repanovici, 2010). The main step taken is a structured search for publications followed then by analysis and interpretation. The search for publications is carried out using main keywords that focus on the topic under study, namely: "innovat" AND "library" to be able to capture publications discussing innovation in the library.

After determining the key terms for searching, the process of data collection is done by placing it in a particular database. The database used in this study is Scopus considering its wide coverage and relatively good quality maintenance (Sagar et al., 2010). This is common in the bibliometric study (e.g., Harsanto, 2020a, 2020b). Search results using keywords in title, abstract, and keywords (TITLE-ABS-KEY) yielded more than 8000 articles. Refining is then carried out by sharpening the search for the title of the article that contains the main keyword in the title (TITLE) and giving results of 513 articles. Refining in the form of language is not done because the main analysis will be the keywords of the article, not the entire article. Documents types were also not specifically refined to obtain a general and overall overview of publications in this area.



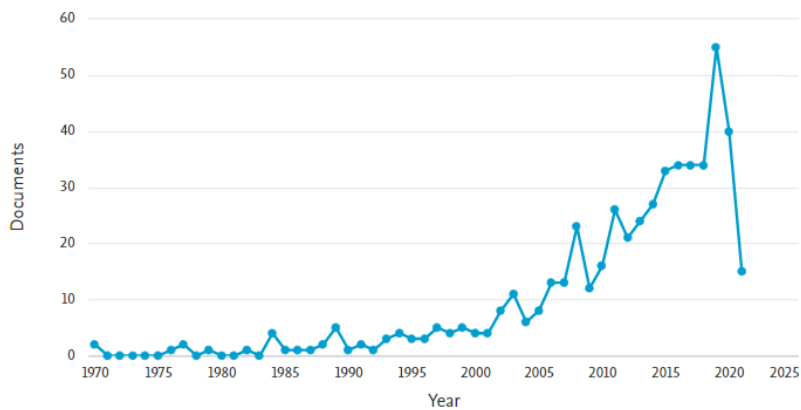
**Figure 1:** Data collection and analysis process

The process of data analysis begins with analyzing descriptive statistics from data in the form of the year of publication, document type, and affiliation of the authors. Furthermore, bibliometric analysis was carried out using VOSViewer software on the publication metadata, which focused on the co-occurrence of keywords, both from the author and from the database. The minimum occurrence is set according to the default of five times; from this process, it was found that there were 57 keywords spread into five different clusters. These five clusters are labeled with certain themes, and then in the interpretation process, they are linked to an innovation management perspective consisting of strategy, process, organization, linkage, and learning (Tidd & Bessant, 2009).

## RESULTS AND DISCUSSION

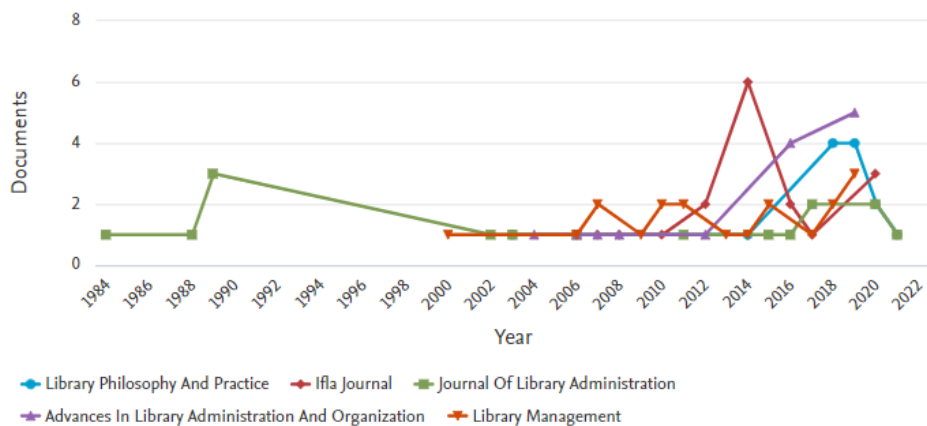
### *Publication attributes*

Academic publications related to innovation management in libraries have been around since the 1970s. However, the increasing trend has continued since the 2000s until now (Figure 2). This seems to be related to information technology and digitization, which began at that time and continues to grow today. The year 2020 has so far been the culmination that seems inseparable from the Covid-19 pandemic, which forces libraries to innovate in the face of this unexpected disruption that affects various areas of life, including libraries.



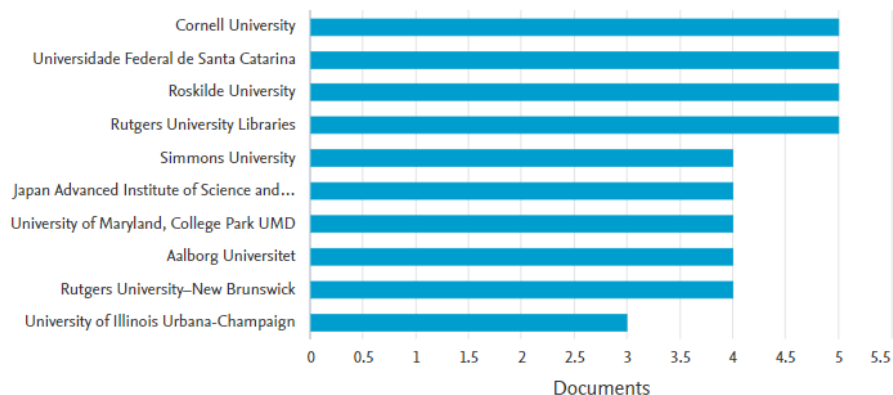
**Figure 2:** Documents by year (Data source: Scopus, 2021)

Five journals are the main outlets for publications related to innovation management in libraries: Library Philosophy and Practice (LPP), IFLA Journal, Journal of Library Administration, Advances in Library Administration and Organization, and Library Management (Figure 3). There are more than 70 articles published in these five main outlets. The next outlets are Library hi Tech, Electronic Library, Library Hi Tech News, New Review of Academic Librarianship, and Professional De La Informacion. These journals mainly come from the subject area of Social Sciences and Computer Sciences.



**Figure 3:** Documents per year by the journal (Data source: Scopus, 2021)

Affiliates with the highest number of publications came from Cornell University, Universidade Federal de Santa Catarina, Roskilde University, Rutgers University Libraries, Simmons University, Japan Advanced Institute of Science and Technology, University of Maryland College Park, Aalborg Universitet, Rutgers University-New Brunswick, and University of Illinois Urbana-Champaign (Figure 4). Look deeper into the authors with the most publications, those affiliations include Ronald C. Jantz from Rutgers University Libraries, whose works highlight the innovative library culture in the middle (Jantz, 2017), Naresh Kumar Agarwal from Simmons University, and Mitsuru Ikeda from the Japan Advanced Institute of Science and Technology.



**Figure 4:** Documents by affiliation (Data source: Scopus, 2021)

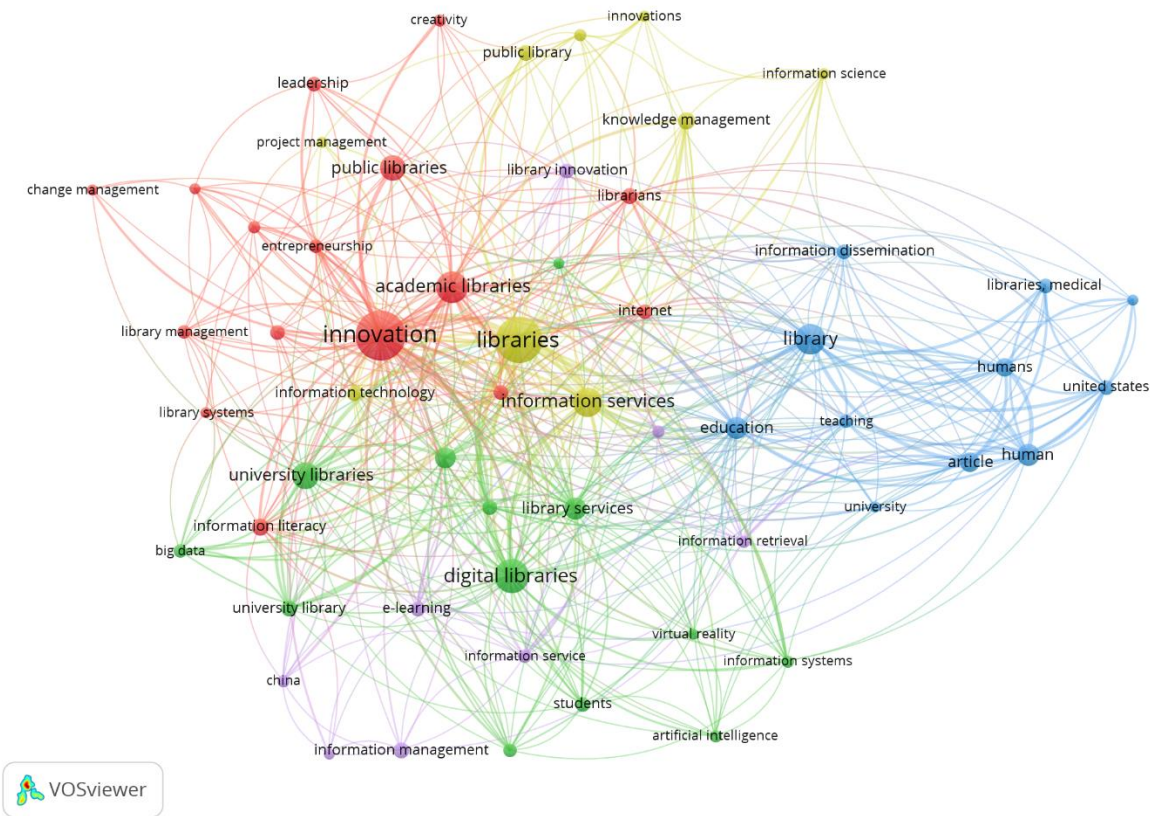
### ***Bibliometric mapping***

The results of the bibliometric mapping show that there are five clusters formed from the calculation of co-occurrence keywords, both from authors and from Scopus with the full counting method (Figure 5).

#### ***Cluster 1: innovation culture***

The first cluster includes keywords such as innovation, change management, creativity, entrepreneurship, and collaboration. These keywords reflect the culture of innovation developed in the context of the library. For example, the 2015 study from Sabolović-Krajina (2015) examined the public library in Croatia, namely “Fran Galovic” in Koprivnica. This library won various awards from home and abroad for having various innovative projects due to an innovative organizational culture, including the ability to manage change and encourage creativity. Other studies that highlight change management, for example, are Awais & Ameen (2018) in the context of Pakistan or Gifford (2014) in the context of Australia.

Creativity and collaboration are important elements in building an organizational culture that is conducive to innovation, as shown by the study of Duarte & Spudeit (2018) in the context of school libraries in Brazil. Examples of creativity can vary, including for example, the creation of a CID (creativity, innovation and design) studio in the library to support creativity in learning as well as collaboration (Zaugg & Warr, 2018). Creativity in this form does not always run smoothly because of the emergence of challenges such as noise, equipment requirements, or space requirements. An interesting study conducted by Ibegbulam et al. (2017) surveyed more than 100 libraries in Nigeria to find out their perception of an organizational climate that supports creativity and innovation.



**Figure 5:** Bibliometric mapping (Data source: Scopus, 2021; Visualization: VOSViewer)

*Cluster 2: technological innovation*

The second cluster includes many keywords related to technology such as digital libraries, library services, artificial intelligence, big data, information systems, technological innovation, and virtual reality. This cluster highlights the role of libraries that are changing along with the digital transformation. Several digital projects have been carried out, for example, BIBLIO in Europe or BIDYA 2 in Latin America, to facilitate the transformation of the role of libraries and librarians to support increasingly digital user activities (Barbuti et al., 2019; Rodés-Paragarino et al., 2019). Quantitatively, among the variables that have attracted the attention of researchers in the digital era is innovative seeking behavior.

Specifically, the technological development discussed is artificial intelligence which plays a role in the implementation of smart libraries (Chu & Yang, 2012; Gul & Bano, 2019). This result is in line with the evolution of information technology which has transformed the management and service of the library. Another development is big data which is known to have a significant positive effect on the innovative performance of librarians and develop libraries that are more up to date following the progress of the big data environment (Zhao, 2020; Zotoo et al., 2021). With such development, it is expected that better library services can be provided (Kong, 2020). It was found that most of the studies concerning information technology, especially AI and big data, were carried out at university libraries (e.g., Fu, 2020; Gong et al., 2018).

### *Cluster 3: innovative human resources*

The third cluster includes keywords such as human, education, procedures, teaching. This cluster seems to highlight the role of human resources in innovation. Humans are the key to generating ideas and realizing innovations in the library (Kumar, 2018). So far, very few human resource libraries have formal education or training to be able to innovate (Jantz, 2017). Human resources for innovation in the library include professional librarians, library leaders, and other stakeholder elements. Studies from (Koloniari et al., 2018) found that visionary leadership can foster cultures that support innovation such as collaboration, opportunity to take the initiative and experiment with new technologies. This is in line with the characteristics of transformational leadership in studies in management science (Harsanto & Roelfsema, 2015; Widiyanto & Harsanto, 2017).

Human resources will then interact with technology in the increasingly advanced library sector to help carry out harmonious human-computer interactions that impact library innovation (Culén & Gasparini, 2015). To be able to develop an innovative culture, human resources need to continuously carry out self-renewal and be equipped with equipment that supports its development, accompanied by an HR system that motivates personnel to be able to innovate and excel.

### *Cluster 4: knowledge management*

The fourth cluster covers topics related to knowledge management, information science, information services, project management. The library is a knowledge institution that is expected to play a role in knowledge management for their institution in particular or for other stakeholders in general (Qvortrup, 2007). The library is an essential element in the knowledge society (Qvortrup, 2007). Knowledge management and innovation are success factors for the library (Koloniari et al., 2018). Interestingly, a study from Roughen & Swain (2020) shows that knowledge management combined with a branding strategy can innovatively expand the services offered by the library.

The traditional library, which collection-centered now changing to the knowledge-centered one. In the same way, library management is currently shifting to knowledge management (Xiao, 2020). Knowledge management accompanied by innovation is complementary and is found to support library transformation in the midst of recent great digital disruption (Limwichitr, 2019). Another study shows that knowledge management is an important determinant of innovation in libraries. A study from Ugwu & Ekere (2018) involving 250 librarians in Nigeria shows that knowledge management, which consists of knowledge creation, knowledge sharing, and knowledge use, positively influences library service innovation.

### *Cluster 5: e-learning*

The fifth cluster includes keywords such as e-learning, information management, and digitization. Even though the library is very rich in collections, newcomers usually face challenges in the form of 'spatial awareness, which can be a barrier to optimizing the use and learning process of users. An effective information system and management can help with such problems as well as enhance the learning process so that the library can become a people-centered place (Huang et al., 2016). The development of these new effective approaches is part of the innovation that will make the library continue to be dynamic in the era of digitization and remain become an important part of the organization (Lukasiewicz, 2007).



From the concept of innovation management, referring to the five clusters from the bibliometric analysis, it can be seen that the most prominent elements are an organization (cluster 1 of innovation culture and cluster 3 of innovative human resources), process (cluster 2 of technological innovation), and learning (cluster 4 of knowledge management and cluster 5 of e-learning). This is an encouraging finding considering that these three elements are essential in supporting the development of an innovative library. Nevertheless, two other crucial elements that seem to receive little attention that is strategy and linkage. Strategy, among others, is reflected by the unique competencies that differentiate one library from another and the full commitment of top management to create an atmosphere for innovation (Tidd & Bessant, 2009). Linkage is the relationship between the organization and stakeholders outside the organization to be able to grow and accelerate various innovative ideas so that they can be realized (Tidd & Bessant, 2009).

## **CONCLUSION**

This study has identified five clusters of innovation in the library from the bibliometric analysis consisting of innovation culture, technological innovation, innovative human resources, knowledge management, and e-learning. The five clusters reflect topics with high co-occurrence in the literature. These five clusters, referring to the innovation management concept, represent the elements of organization, process, and learning that are crucial for the development of innovation within the library.

The limitation of this study is that the approach focuses on quantitative calculations of the co-occurrence of the keywords used in previous studies. Therefore, a further insight that is usually qualitative has not been elaborated in-depth. Another limitation is that the review is carried out covering all types of documents in the database, which on the one hand, provides the advantage of being able to capture the overall picture of the publications in the database. But on the other hand, it becomes mixed in terms of scientific rigorousness. Besides, two essential elements of innovation management found still rarely studied, namely strategy and linkages, which are also crucial for the development of innovation management in the library.

Thus, in the future, it is recommended to conduct a more in-depth analysis with a qualitative approach to explore more thoroughly the content of the publications being analyzed. In addition, future reviews can also be undertaken by narrowing the search to certain types of documents, such as journal articles only. Considering this type of document is deemed to have the highest level of rigorousness because it has passed a selective peer-review process. Further studies also needed to investigate two innovation management elements -strategy and linkage- overlooked in recent literature.

## REFERENCES

- Awais, S., & Ameen, K. (2018). The current status of innovation in the university libraries of Pakistan. *Library Management*.
- Barbuti, N., Di Giorgio, S., & Valentini, A. (2019). The Project BIBLIO—Boosting Digital Skills and Competencies for Librarians in Europe: An Innovative Training Model for Creating Digital Librarian. *International Information & Library Review*, 51(4), 300–304.
- Baregheh, A., Rowley, J., & Sambrook, S. (2009). Towards a multidisciplinary definition of innovation. *Management Decision*, 47(8), 1323–1339.
- Chu, H.-C., & Yang, S.-W. (2012). Innovative semantic web services for next generation academic electronic library via web 3.0 via distributed artificial intelligence. *Asian Conference on Intelligent Information and Database Systems*, 118–124.
- Conner, M. (2014). *The new university library: Four case studies*. ALA Editions.
- Culén, A. L., & Gasparini, A. A. (2015). *HCI and design thinking: Effects on innovation in the academic library*.
- Duarte, T., & Spudeit, D. (2018). Innovative practices in school libraries in Florianopolis: cultural entrepreneurship in focus. *Perspectivas Em Ciencia Da Informacao*, 23(3), 104–123.
- Fu, X. (2020). Research on the accurate service and management innovation of University Library Based on the big data of readers' behavior. *IOP Conference Series: Materials Science and Engineering*, 750(1), 12033.
- Garfield, E. (1955). Citation Indexes for Science. *Science*, 122(3159), 108–111.
- Gifford, A. (2014). Deconstructing for change: Innovation for smaller libraries. *The Australian Library Journal*, 63(4), 313–319.
- Gong, R., Yu, K., & Tang, H. (2018). Based on Statistical Education to Study Innovative Service and Relationship Quality of University Library under Big Data. *EURASIA Journal of Mathematics, Science and Technology Education*, 14(6), 2419–2425.
- Gul, S., & Bano, S. (2019). Smart libraries: an emerging and innovative technological habitat of 21st century. *The Electronic Library*.
- Harsanto, B. (2020a). Inovasi Internet of Things Pada Sektor Pertanian: Pendekatan Analisis Scientometrics. *Informatika Pertanian*, 29(2), 111. <https://doi.org/10.21082/ip.v29n2.2020.p111-122>
- Harsanto, B. (2020b). The First-Three-Month Review of Research on Covid-19: A Scientometrics Analysis. *IEEE International Conference on Engineering, Technology and Innovation (ICE/ITMC)*.
- Harsanto, B., Kumar, N., Zhan, Y., & Michaelides, R. (2020). Firms' ICT and Innovation in Jakarta Metropolitan Area. *2020 International Conference on Technology and Entrepreneurship - Virtual*, 1–4.
- Harsanto, B., & Roelfsema, H. (2015). Asian leadership styles, entrepreneurial firm orientation and business performance. *International Journal of Entrepreneurship and Small Business*, 26(4), 490. <https://doi.org/10.1504/ijesb.2015.072759>
- Huang, T.-C., Shu, Y., Yeh, T.-C., & Zeng, P.-Y. (2016). Get lost in the library? *The Electronic Library*.
- Ibegbulam, I., Eze, J. U., & Akpom, C. C. (2017). Investigating the organizational climate for creativity/innovation among librarians in Academic libraries in South East Nigeria. *Libri*, 67(1), 65–74.
- Jantz, R. C. (2017). Creating the Innovative Library Culture: Escaping the Iron Cage Through Management Innovation. *New Review of Academic Librarianship*, 23(4), 323–328. <https://doi.org/10.1080/13614533.2017.1388055>
- Koloniari, M., Vraimaki, E., & Fassoulis, K. (2018). Fostering innovation in academic libraries through knowledge creation. *The Journal of Academic Librarianship*, 44(6), 793–804.
- Kong, X. (2020). Research on Library Knowledge Service Innovation in Big Data Environment. *2020*

- International Conference on Big Data and Informatization Education (ICBDIE)*, 64–68.
- Kumar, I. R. (2018). Skillwell to Innovate Human Library is a Storehouse of Wisdom. *2018 5th International Symposium on Emerging Trends and Technologies in Libraries and Information Services (ETTLIS)*, 280–282.
- Limwichitr, S. (2019). From Knowledge to Innovation: Transformation of Thai Academic Libraries in Times of Digital Disruption. *Proceedings of the 2019 2nd International Conference on Data Storage and Data Engineering*, 15–21.
- Lukasiewicz, A. (2007). Exploring the role of digital academic libraries: Changing student needs demand innovative service approach. *Library Review*, 56(9), 821–827.
- Maloney, K., Antelman, K., Arlitsch, K., & Butler, J. (2010). Future leaders' views on organizational culture. *College & Research Libraries*, 71(4), 322–347.
- Qvortrup, L. (2007). The Public Library: From Information Access to Knowledge Management - a Theory of Knowledge and Knowledge Categories. *Proceedings of the Sixth International Conference on Conceptions of Library and Information Science—"Featuring the Future"*.
- Repanovici, A. (2010). Measuring the visibility of the University's scientific production using GoogleScholar, "Publish or Perish" software and Scientometrics. *World Library and Information Congress: 76th IFLA General Conference and Assembly*, 1–14.
- Rodés-Paragarino, V., Díaz, P., Patrón, C., Díaz-Costoff, A., Podetti, M., de Souza, A., Motz-Carrano, R., & García, C. (2019). Digital and Accessible Library: inclusive innovation for the digitization of educational materials and libraries. *2019 XIV Latin American Conference on Learning Technologies (LACLO)*, 314–317.
- Roughen, P. F., & Swain, D. E. (2020). Building Innovative Brands: Cases of Tacit and Explicit Knowledge Conversions in Children's Libraries. *Public Library Quarterly*, 39(6), 537–557.
- Rowley, J. (2011). Should your library have an innovation strategy? *Library Management*, 32(4), 251–265. <https://doi.org/10.1108/01435121111132266>
- Sabolović-Krajina, D. (2015). Innovations in libraries—case study of the Public Library "Fran Galović" Koprivnica. *Vjesnik Bibliotekara Hrvatske*, 58(1–2), 305–319.
- Sagar, A., Kademani, B. S., Garg, R. G., & Kumar, V. (2010). Scientometric mapping of Tsunami publications: A citation based study. *Malaysian Journal of Library and Information Science*, 15(1), 23–40.
- Tidd, J., & Bessant, J. (2009). *Managing Innovation: Integrating technological, market and organizational change*. John Wiley & Sons, Ltd.
- Ugwu, C. I., & Ekere, J. N. (2018). The role of knowledge management in providing innovative services in university libraries in Nigeria. *Global Knowledge, Memory and Communication*.
- Widianto, S., & Harsanto, B. (2017). The Impact of Transformational Leadership and Organizational Culture on Firm Performance in Indonesia SMEs. In N. Muenjohn & A. McMurray (Eds.), *The Palgrave Handbook of Leadership in Transforming Asia* (pp. 503–517). Palgrave Macmillan UK. [https://doi.org/10.1057/978-1-137-57940-9\\_27](https://doi.org/10.1057/978-1-137-57940-9_27)
- Xiao, L. (2020). Innovative application of knowledge management in organizational restructuring of academic libraries: A case study of Peking University Library. *IFLA Journal*, 46(1), 15–24.
- Zaugg, H., & Warr, M. C. (2018). Integrating a creativity, innovation, and design studio within an academic library. *Library Management*.
- Zhao, D. (2020). Probe into the Subject Service Innovation of University Library under the Background of Big Data. *2020 2nd International Conference on Machine Learning, Big Data and Business Intelligence (MLBDBI)*, 415–418.
- Zotoo, I. K., Lu, Z., & Liu, G. (2021). Big data management capabilities and librarians' innovative performance: The role of value perception using the theory of knowledge-based dynamic capability. *The Journal of Academic Librarianship*, 47(2), 102272.

