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Research Article

The Intersection of Data Science and Library Science: A 25-Year Analysis of Social Science Research in India (2001–2025)

Sheuli Hazra
PhD Research Scholar, RKDF University. Ranchi, Jharkhand, India

Corresponding Author: *Sheuli Hazra

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Abstract

Purpose: This study interrogates the transformative impact of Library Carpentry and data-intensive methodologies on the field of Library and Information Science (LIS). By bridging the gap between traditional librarianship and modern data science, the research explores how open-source tools like OpenRefine can optimise data management, streamline discovery services, and uphold the fundamental tenets of Ranganathan's Five Laws of Library Science.

Methodology: The research employs a data carpentry-based approach to analyse trends in social science research, specifically within the Indian context from 2001 to 2025. It evaluates the utility of OpenRefine as a discovery tool for fetching, extracting, and reconciling datasets. Furthermore, the study explores a novel interdisciplinary recruitment framework for LIS professionals by integrating psychological personality traits with statistical performance metrics.

Findings: The findings indicate that the adoption of library carpentry significantly enhances the efficiency and accuracy of library services, particularly in the domain of Open Access (OA) resource harvesting. While the research demonstrates that these tools effectively "save the time of the reader," it also identifies critical barriers, including a lack of specialised technical expertise, inadequate internet infrastructure, and high energy consumption required for large-scale data processing.

Originality/ Value: This research pioneers a unique territory by connecting LIS with data science and psychology. It provides a strategic roadmap for libraries transitioning from legacy OPAC systems to sophisticated, centralised discovery interfaces. The study concludes that the future of LIS lies in the evolution of "librarian-as-coder," where technical data skills become essential for navigating the changing global information landscape.

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INTRODUCTION

A decision is the final note in a song. It brings the feeling that the work is concluded. The conclusion is the point where the researcher looks back at the objectives, hypotheses and research questions, and finally summarises the salient points of evidence. This chapter deals with the findings of the whole research work. It helps to review whether or not the research hypotheses and research questions are answered properly. The novelty of the research project is addressed on the basis of certain criteria. Finally, it raises some issues to point out the possibilities of further research in the area of library carpentry services. It also tries to establish library discovery domains of academic endeavour through the novelty of this research work.

However, insightful research works are outcomes. A recent study has examined dynamics and disparities within various fields of study. The concept of library carpentry, a growing field in library and Information Science, shows great promise for future progress. In focus on solving real challenges for LIS professionals. This research looks at these opportunities, highlighting the diverse possibilities in library carpentry. The technological innovations obtainable in the field of LIS are based on Ranganathan's five laws system, and the five laws are predominant in the Library and Information Science empire. (Illangarathne & Yingming, 2015a). As this field advances, it will improve how LIS professional data management making library services more efficient. This large-scale study to assess the OA friendliness of a set of selected necessitated three major components are OpenRefine is a powerful tool to fetch, extract, and manage the values, volume, and variety of the datasets as gathered by following the study simply could not be possible. The data carpentry methods, tools, and sources are all set to change the way LIS professionals conduct data-intensive research studies like scientometrics, informatics and bibliometrics studies. The performance of educational or research data carpentry is based on this. The domain of library and information science is always on the move, and LIS professionals are ardent users of emerging technologies. Promote real-life problem-solving in the processional sphere by applying library carpentry methods and playing an essential role in the library world. This study emphasises the significance of open data in libraries and the need for library professionals to acquire expertise in managing and analysing data. It can help libraries evolve in response to the changing information landscape and better serve their communities.

Description of the work

In this perspective, venture into unexpected research territory, pioneering a novel domain related to recruitment policy for LIS professionals based on personality traits, integrating psychology and statistics. This is remarkably hard work and also unwavering support. Slightly reduce the error of the research work. This is the future with software. This would surely open opportunities for future developments in the field of Library and Information Science. This is a great initiative. It is developing day by day only due to devoted dedication and determined nature. This is overwhelming work. There is a huge consumption of electricity, etc., which are the reasons that compelled the reinforcement learning; the LIS people are sure to come up with such kind of innovative work. The imagining of a massive transformation in the way systems used by libraries work, in terms of speed of work, accuracy, connecting digital and physical resources, personalisation, and much more. The researcher is really looking forward to AI helping to collect information from multiple domains like management, library science, and human psychology, and come up with results that would have taken much longer if done manually. Furthermore, it is an exciting time to come into this era. It is incredibly handy. Every time it introduces a new concept, it empowers valuable knowledge and a deeper understanding. In our profession, excellent work is done by librarians. Presently, we are new in the domain. Particularly, countries like India are not that much of efficient in this new field to employ in our library. The highlight was definitely catching up with long-time work. Here we give a few really productive sessions with special work on them within LIS education. It was great to learn from them again.

Novelties Of the Study

The library carpentry and data carpentry are playing a seeking behaviour, something that would work with the existing integrated library system. The researchers are exploring everything from catalogue enhancements provided by innovative interfaces to a completely separate discussion. For the past year, they worked to implement OpenRefine as an open-source data carpentry tool. They provide customisation and enhancement based on user feedback and a stress-free claim process. At the same time, the researchers, staff and users are recommended to use a discovery tool for their better work. The university and colleges give a new shape and direction to their association. The project work details their evaluation process and reflects the research work. Nowadays, many libraries are considering library carpentry products in their academic interface. Web site redesigns, incorporating user feedback, and consortia needs are easily available here. It is a proud moment of spirit shining through in thought, word, and action. Moments like these remind us of how deeply we remain bound as library carpentry. The discussion starts with the essential concepts of library carpentry and methodically reveals the apparatus and methods of library carpentry, with the help of some case studies. (Mukhopadhyay *et al.,* 2021).

Achievements

Library carpentry, a growing discipline in Library and Information Science, acts as a great improvement for the future growth. It has become one of the most important tools in library services. Presently, it is getting wide acceptance from users as well as library staff and daily users. But OpenRefine is the most important discovery tool because it is free and open-source software. The OpenRefine reconciliation API, comparing their design to the state of the art in record linkage and design of the API, the matching scores returned by the services are of little help to guide matching decisions (Delpeuch, 2019). The good things are library carpentry and data carpentry, a vast range of searching content quickly, effortlessly and seamlessly. Whatever, the purpose of developing a comprehensive local search for open access resources in the domain of LIS is very

easy. Hopefully, the usefulness of open-source discovery tools like OpenRefine software is increasing through the library carpentry day by day in the library environment.

Benefits of the Study

As this field advances, it will improve how LIS manage data and make library service more competently & Open-access journals across the globe. The main benefit of getting rid of the problem of moving randomly from journal to journal, from repository to repository. The users are typical of a large university library, including faculty, staff, graduate and undergraduate students, to perform a variety of searches in each interface and to let me know what they thought. The significant contribution towards understanding the value of entity recognition and disambiguation for the Digital Humanities (Van Hooland *et al.,* 2015). Generally, it is developed skills among LIS professionals towards facing the challenges of the 21st century for data science applications in all libraries. It is accustomed professionals to new generation tools for data wrangling, data reconciliation and named-entity recognition (NER) using open-source tools. Library carpentry is a global effort to provide training to librarians in technical areas that have traditionally been seen as the preserve of researchers, IT support and systems librarians. (Cope & Baker, 2018). The train participants are real-life applications of the open-source data wrangling tools and techniques. They appreciated the new interfaces, which are easier to read and more graphical and constructive in nature. Data Carpentry focuses on data literacy in a particular way with the objective of teaching skills to researchers that allow retrieving, view, manipulate, analyse, and store their data in an open and reproducible way to extract concise knowledge from the data set. (Teal *et al.,* 2015).

Limitations of the study

Limitations of this research work, more specifically, 25 years means long (2001-2025), the study puts emphasis mainly on unreliable data sources. It does not cover other databases. It takes some time to process. There is never any data accessible in the field of social science. A reliable Internet connection is required for processing. There is a complete lack of documentation that is deceptive. No one provided the awareness in an appropriate manner, and no one demonstrated expertise. There is still no polish available at this time. The employees do not have adequate training. Not a single person who makes policy is always helping.

Scope of Further Research

Indian social science research from 2001 to 2025 using a data carpentry-based approach. This study is significant as it seeks to run a thorough analysis of these trends, patterns, and the impact of social science research in India over a quarter-century. By employing a Data Carpentry-based approach, the research will leverage the power of data science techniques to extract, clean, analyse, and visualise large volumes of research publications related to various social science research conducted in India. The findings of this study are expected to provide valuable insights for representatives, funding agencies, and researchers towards make informed decisions, coupled with identifying potential areas for the present research focus, and future researchers. The integration of OpenAlex (open database), Scopus and Web of Science (commercial database) single search interface through OpenRefine software. This search is much more comprehensive. Here, Open Access journals and International Access resources, etc., are harvested in one place in the system easily. In the future, a wide variety of pre-harvested and indexed information will be swiftly and easily created by centralised search engines. This study examines these disparities in beliefs and experiences with information sharing, as well as obstacles to sharing with the researchers (Federer *et al.,* 2015).

CONCLUSION

Library carpentry services are continuing to rise by replacing old technologies. It is evolving and closely related to other services such as federated searching, OPAC etc provided long before in the library environment. Due to its easy access and fast retrieval, like many open and commercial databases. These innovative technologies have changed the concept of the library by transforming the nature of library systems also. Recently, studies have said that data carpentry has become an innovation in the domain of online information retrieval systems. Open-source tools are free from licensing and free from multiple data providers outside the library. Many libraries are planning to provide this type of service to their users, keeping in mind their needs with modern expectations for search and presentation of information resources.

This is a great and original idea. In this instance, Dr S. R. Ranganathan, the founder of library and information science and the fourth law of the renewable person, stated, "Save the time of the reader" (Ali, 2021; Illangarathne & Yingming, 2015b; Nalinakshi, 2019). This implies that library patrons always save time. This 4th legislation easily satisfies all the requirements for data carpentry and library carpentry.

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About the corresponding author

Sheuli Hazra is a PhD Research Scholar at RKDF University, Ranchi, Jharkhand, India. Her research interests lie in interdisciplinary studies, focusing on social development, education, and emerging societal challenges. She is committed to academic excellence and contributes to scholarly research through critical analysis and innovative perspectives in her field.