

ANALYSIS OF PRODUCTIVITY PATTERNS AUTHORS OF LIBRARY SCIENCE IN THE JOURNAL OF LIBRARY AND INFORMATION SCIENCE Q1 2018–2022 WITH THE LOTKA'S LAW APPROACH

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INTRODUCTION

- **INTRODUCTION :**

Bibliometric studies in information science and library research use bibliography as research objects using Lotka's law. The productivity of writers, especially in the library sector, can be measured through bibliometrics. The purpose of research on the productivity of a writer is to find out how much the frequency of research results is used and utilized by the community.

- **Research Objective**

This study aims to identify the productivity pattern of authors in the field of library science using the Lotka's Law method in the Q1 Journal of Library and Information Science. Lotka's Law is a bibliometric law commonly used to measure productivity across various fields. This research focuses on the Q1 Scopus-indexed journals in library and information science, distinguishing it from previous studies..

LITERATURE REVIEW

Definition of Bibliometrics :

- **Bibliometrics** comes from the words "biblio" meaning book and "metrics" meaning measurement (Sulistyo-Basuki, 2016).
- **Bibliometric methods often use descriptive approaches to identify author gender, collaboration levels, and article topics (Pattah, 2013)**

Types of Bibliometric :

- **Lotka's Law measures author productivity, describing the frequency of scientific publications in a specific field. (Lotka et al., 2018)**
- **Bradford's Law explains the distribution of literature across journals, while**
- **Zipf's Law studies the frequency of word occurrences in texts.**

Lotka's Theorem, a mathematical method, helps estimate population and future growth, aiding in managing author resources effectively.

RESEARCH METHODS

This study employs a quantitative descriptive method with a bibliometric approach. Scientific papers from library science journals in the Q1 category are analyzed using the Lotka's Law approach, utilizing data from the Scopus database. Secondary data from Scopus and the Scimago Journal Rank website are collected, categorized, and processed using Microsoft Excel and CSV formats. Parameters and tests, such as the Kolmogorov-Smirnov test, are conducted to calculate author productivity.

RESEARCH METHODS

LOTKA'S LAW ANALYSIS

- Calculating the value of b using the equation $b = \frac{\sum XY - N\bar{X}\bar{Y}}{\sum X^2 - N\bar{X}^2}$ where $b = -n$
- Calculating the value of C using the equation $C = \frac{1}{\sum \frac{1}{X^n}}$
- Calculating the theoretical distribution of Lotka's law using the equation $y_{x=C} \frac{1}{X^n}$
- Performing the Kolmogorov-Smirnov test to test the distribution of observations against Lotka's law.

RESULT AND DISCUSSION

Kolmogorov Smirnov Test

| Table 3 Authors Productivity Analysis (Kolmogorov-Smirnov Test) | | | | | | |
|---|-----------------------|--------------------------|-------------------------|--|--|-------------------|
| Number of Articles (x) | Number of Authors (y) | % number of authors [y'] | cumulative sum y[Sn(x)] | Lotka's Law Theoretical Frequency [Yx] | cumulative sum of theoretical frequencies y[F0(x)] | D max F0(x)-Sn(x) |
| 1 | 16320 | 0.798629802 | 0.798629802 | 0.518486003 | 0.518486003 | -0.280143799 |
| 2 | 2374 | 0.116173232 | 0.914803034 | 0.157662609 | 0.676148612 | -0.238654422 |
| 3 | 792 | 0.038757034 | 0.953560069 | 0.078577503 | 0.754726115 | -0.198833954 |
| 4 | 335 | 0.016393443 | 0.969953511 | 0.047942467 | 0.802668582 | -0.167284929 |
| 5 | 183 | 0.008955224 | 0.978908735 | 0.032679912 | 0.835348494 | -0.143560241 |
| 6 | 104 | 0.005089308 | 0.983998043 | 0.023894057 | 0.859242551 | -0.124755492 |
| 7 | 58 | 0.002838268 | 0.98683631 | 0.018336277 | 0.877578828 | -0.109257482 |
| 8 | 40 | 0.001957426 | 0.988793736 | 0.014578474 | 0.892157301 | -0.096636435 |
| 9 | 33 | 0.001614876 | 0.990408613 | 0.011908564 | 0.904065866 | -0.086342747 |
| 10 | 21 | 0.001027649 | 0.991436261 | 0.009937395 | 0.914003261 | -0.077433001 |
| 11 | 28 | 0.001370198 | 0.99280646 | 0.008436884 | 0.922440145 | -0.070366315 |
| 12 | 21 | 0.001027649 | 0.993834108 | 0.007265769 | 0.929705913 | -0.064128195 |
| 13 | 16 | 0.00078297 | 0.994617079 | 0.006332554 | 0.936038467 | -0.058578611 |
| 14 | 10 | 0.000489356 | 0.995106435 | 0.005575744 | 0.941614211 | -0.053492224 |
| 15 | 7 | 0.00034255 | 0.995448985 | 0.0049527 | 0.946566912 | -0.048882073 |
| 16 | 6 | 0.000293614 | 0.995742598 | 0.004433061 | 0.950999973 | -0.044742626 |
| 17 | 4 | 0.000195743 | 0.995938341 | 0.003994705 | 0.954994678 | -0.040943663 |
| 18 | 11 | 0.000538292 | 0.996476633 | 0.003621188 | 0.958615866 | -0.037860767 |
| 19 | 4 | 0.000195743 | 0.996672376 | 0.00330007 | 0.961915936 | -0.03475644 |
| 20 | 8 | 0.000391485 | 0.997063861 | 0.00302179 | 0.964937725 | -0.032126136 |

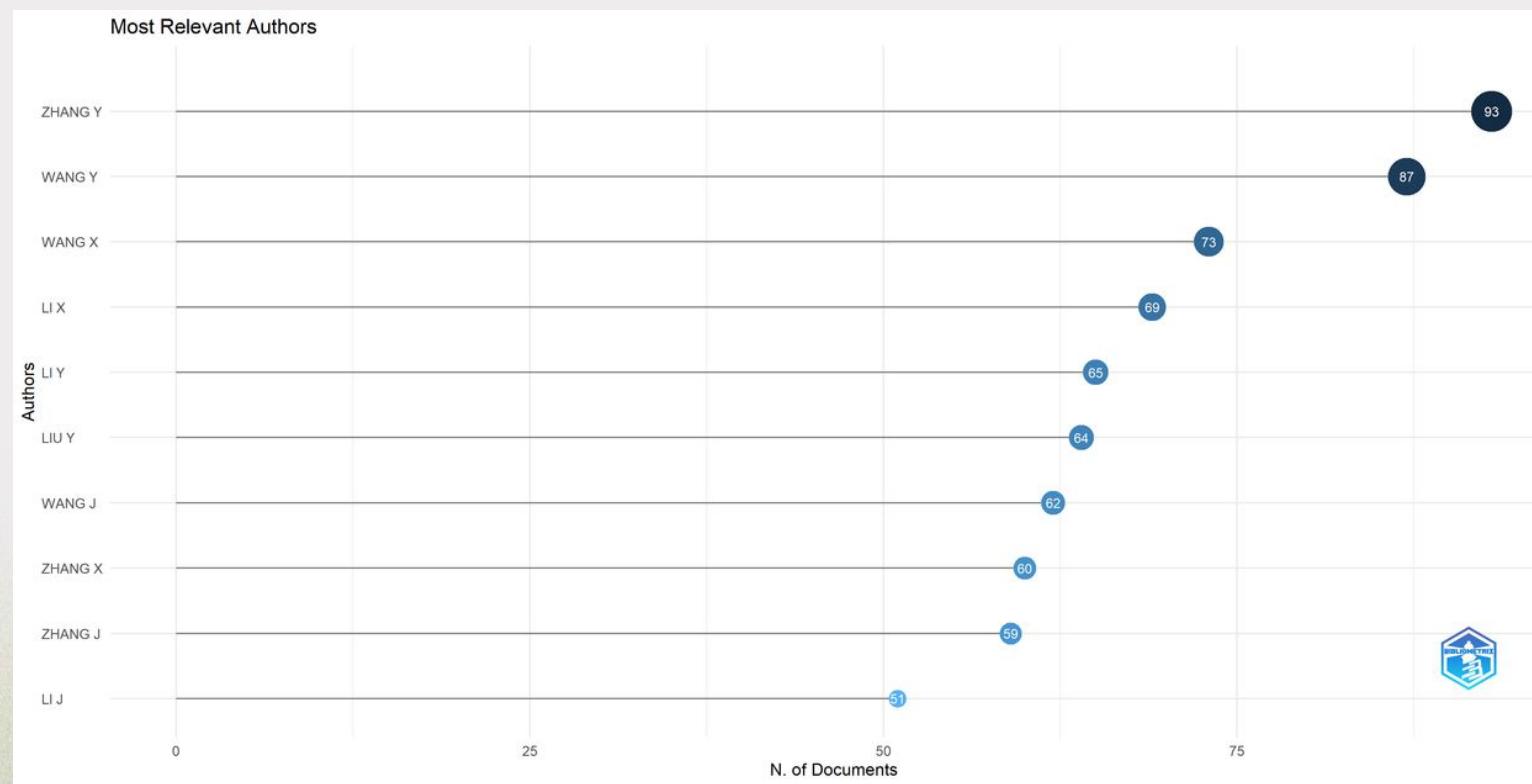
We obtained the parameter values $n = 1.71746449$ and $C = 0.518486$. These values allowed us to formulate the productivity equation for SCOPUS-indexed authors in Library and Information Science journals from 2018 to 2022 as $Y_x \cdot X^{1,717464496} = 0.518486$.

Notably, this equation indicates that approximately 51.84% of contributing authors during this period published a single article.

Analyzing the results of the Kolmogorov-Smirnov test, as presented in table 3, we observed that $D_{\max}= 0.28014379880972$. The Kolmogorov-Smirnov test employs a critical value, resulting in a critical value of 0.009513747. Hence, it was determined that the maximum deviation value exceeds the critical value. Consequently, the null hypothesis(ies) was rejected, indicating that the distribution of writers' productivity in described science from 2018 to 2022 does not conform to Lotka's law.

Science. It implies that there are substantial variations in the output produced by writers within this domain.

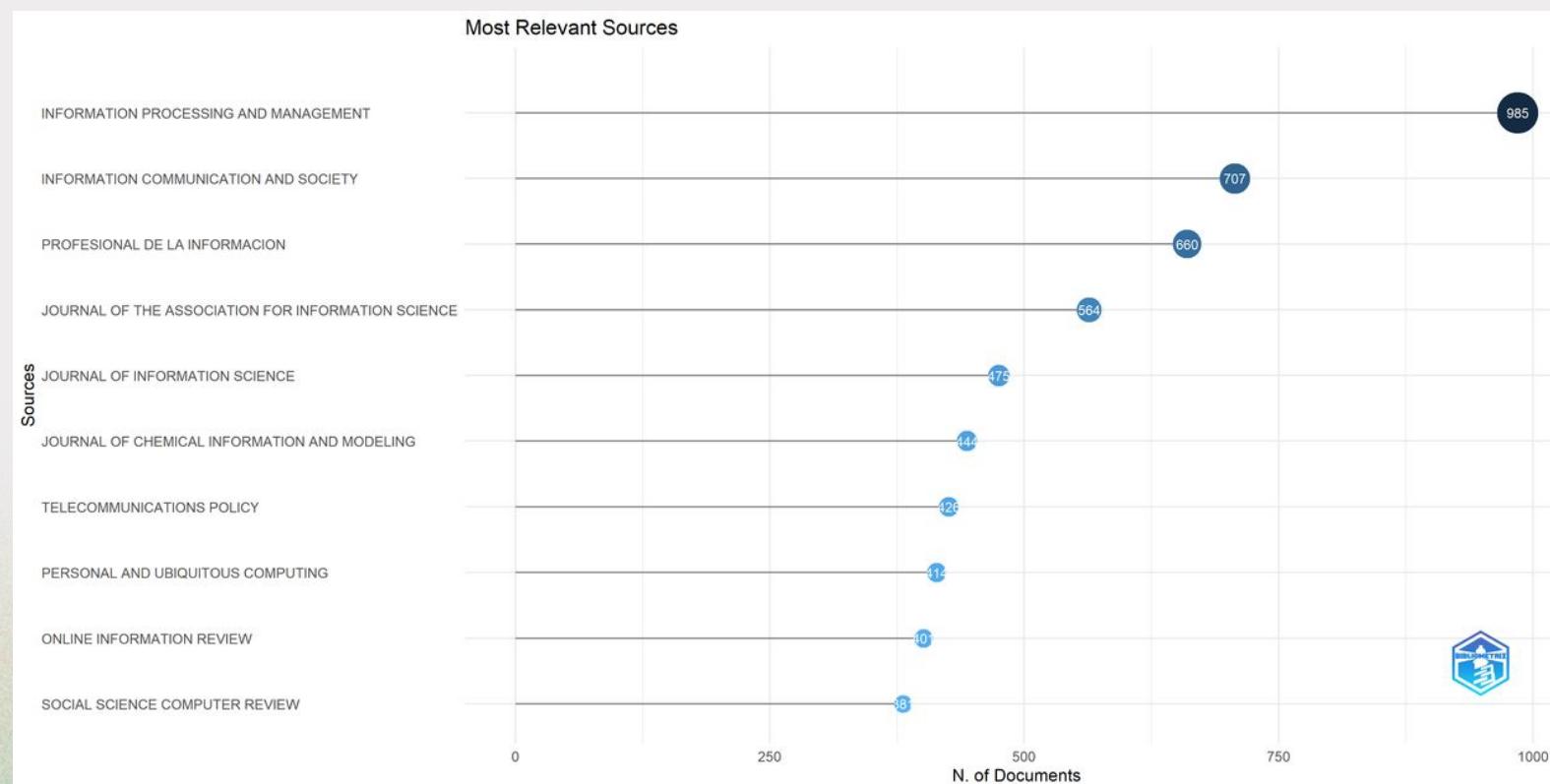
RESULT AND DISCUSSION



Productivity Patterns Author and Sources in Libraru and Information Science in 2018–2022

Based on the calculation data for the distribution of writers in the Library and Information field for the period 20018–2022 it can also be seen that the most productive writers. The prolific writer category in this study is the writer who made the most contributions during that time span. There are 10 authors who fall into this category. Based on figure 1. productive writers are occupied by Zhang-Y, followed by Wang Y and also Wang X. The publications of prolific authors with more than 50 publications. The first author is Zhang-Y with 93 publications, followed by Wang Y with 87 publications, Wang X with 73 publications, Li X with 69 publications, as well as Li Y 65 publications.

RESULT AND DISCUSSION



Productivity Patterns Author and Sources in Libraru and Information Science in 2018–2022

Based on figure 2. shows the journals that have published the most articles with top rankings of 985 in the Information Processing and Management journal , followed by the Information Communication and Society journal with 707 articles, then the Profesional De La Informacion journal with 660 articles, then continued by the Journal of the Association for Information Science with 564 articles, and 475 articles by the Journal of Information Science.

CONCLUSION

Most Productive Authors:

- **Zhang-Y** come up as the most productive author, with more than **50 publications** to their name.
- **Wang-Y** demonstrated significant productivity with **87 publications**.
- **Wang-X** contributed **73 publications**.

Most Productive Sources:

- **Information Processing and Management**, which published 985 articles during the specified period.
- **Information Communication and Society journal**, with 707 articles,
- **The Professional De La Information journal**, with 660 articles.

CONCLUSION

In conclusion, our research provides new insights into the productivity patterns in the field of Library and Information Science. By highlighting the most productive authors and journals, we aim to assist researchers and writers in this field to optimize their research output. We hope that our findings will contribute to the growth and advancement of Library and Information Science, bringing it on par with other fields of study.

THANK YOU!
OUR TEAM IS PLEASED TO MEET YOU.