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Usage of e-Journals in University of North Bengal under INFLIBNET (2012-2018): Analysis with INFISTATS

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ABSTRACT

INFLIBNET under its e-Shodhsindhu consortium scheme has introduced the users of University of North Bengal with the e-Journal facility. The e-journal facility provided under INFLIBNET has brought another opportunity for university libraries to serve their users with high-quality content. This change needs to be further evaluated to identify the actual usage picture. The paper identifies the trend in the use of e-journal facilities during 2012-2018 with the help of INFISTATS (usage statistics portal for e-Resource). This has determined the period of optimal use of e-journal, which shows the popularity of e-Journals in the university. It identifies the year in which the maximum and minimum use of e-Journals is found, and J-STOR & Science Direct has the maximum use percentage (55 percent). The study also found that seven e-Journals had the highest percentage of use (91 percent) indicating the extensive use of e-journal facilities by the user community of the University of North Bengal.

Keywords: INFLIBNET; e-Resources; J-STOR; Science direct; e-ShodhSindhu; e-Journal..

1. INTRODUCTION

In 2003, UGC (University Grants Commission) and INFLIBNET jointly launched UGC-Infonet Digital Library Consortium for providing standard quality e-resources. The consortium became very popular because it linked all the universities in the country with state-of the-art technology with differential access to 5,790 journals for 160 universities covered by UGC's 12B Act. Based on an expert committee's recommendation, MHRD merged UGC-Infonet Digital Library Consortium, N-LIST and INDEST-AICTE Consortium and changed its name to E-ShodhSindhu Consortium for Higher Education. The e-ShodhSindhu will continue to provide current and archival access to more than 15,000 core and peer-reviewed journals and a number of bibliographic citations in different disciplines. Currently, 139 State Universities, 40 Central Universities, 22 Deemed Universities, 15 law schools, 6 UGC IUCs, 72–Technical Institutions funded by AICTE and 60 CFIIs are members of this e-ShodhSindhu.

2. UNIVERSITY OF NORTH BENGAL LIBRARY

Established in 1962, North Bengal University is one of The West Bengal-India's oldest universities. The University Library is the knowledge hub for the entire university-related academic community. INFLIBNET has played an important role in introducing the University of North Bengal library users to the e-journal facility. The "University Library" was established in 1962 along with the establishment of the University to meet the academic and research needs of teachers, research scholars, and students. The library has served the varied needs of the university community since the University's inception. The library plays an important role in the North Bengal region, by providing teachers, research scholars, and students with books, journals, and other documents. The list of services are as follows.

- University Library has built up a rich collection in all branches of Science, Arts, Commerce, Law and Management.
- Member of the e-shodsindhu Consortium for on-line subscription of journals.
- The library is a member of British Library Council's library and Delnet.
- Library LAN has become a wide network on the university campus, enabling the academic community of various departments to access online documents and information from their adobe.

The library serves as a resource station for all scholars and has a print collection of around 3,00,000 textbooks including, back volumes of journals, theses/dissertations.

3. OBJECTIVE OF THE STUDY

- To know the platform wise usage of e-journal of University of North Bengal under INFLIBNET during last seven years (Jan 2012-Dec2018).
- To know the year wise total usage of e-Journals of University of North Bengal under INFLIBNET

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during last seven years.
- To know maximum and minimum download period during last seven years.
- To know the top two maximum e-resources used by the University of North Bengal's respective user community.

4. LITERATURE REVIEW

Different people and groups of people have studied e-resource works. The review of the literature gives a broader outlook. Some of the works that have been done will be reviewed and given below.

The purpose of this research article of Kavithanjali[1] effectively revealed the importance, types, issues and challenges of E- Resources, out and out ruling over the modern digital library system which is successfully holding a grip and control over library users enjoying broadest liberty in terms of accessibility and adoptability through the types and uses of e-resources. Trimukhe[2] conducted a research study on today's era of information bang, the resources of data have also developed in the form of e-resources like publisher's database, e-Journals, e-books, consortia of special libraries etc. In order to promote the e-resources there are different agencies of the Government of India who provide funds and subsidies to the educational institutes to increase their collection of digital books and to develop the digital form of education. Soni,& Shrivastava[3] made the survey was an attempt to regulate and determine the current status of awareness, accessibility and use of electronic resources among library and information science research scholars at Jiwaji University Gwalior. The study was conducted to identify the challenges, benefits, and progress that research scholars gained while accessing e-resources.

Pandey[4], his paper presented in research study, the impact of INFLIBNET on the development of university libraries in a study conducted by researcher in select university libraries in U.P. The impact of INFLIBNET is measured by conducting surveys in select university libraries in Uttar Pradesh in northern India. The study reveals that most libraries have used INFLIBNET's services to meet their automation and e-resource requirements. In another article written by Khandare & Sonwane[5] focused on library and information science e-Journals available under the N-LIST Consortium. It explains the frequency of LIS e-Journals available under N-LIST Consortium, language wise distribution, city / state wise distribution, country wise distribution, source publisher and publisher under N-LIST Consortium of LIS e-Journals and beginning and end year status of LIS e-Journals. Anjaiah[6] described about the use of UGC-Infonet e-Journals by research scholars in Maulana Azad National Urdu University, Hyderabad. It highlighted the objectives, scope and methodology of the study. It revealed respondents are aware about UGC-Infonet e-journals.

Imsong[7] in his article described electronic resources have become very popular in today's world and libraries are no exemption. Golwal and Sonwan[8] in their study signifies e-Journal titles are rising three bends every fifteen years and cost, 2.5 times every ten years. Undoubtedly, no single library can afford to acquire all journals even of a single discipline. Kumar[9], in his research article discussed this new electronic environment; needy information is difficult to search. Because, day today vast of information is increasing and coming out. User must know searching techniques and a good command over it to get needy information. Libraries have a special look on providing e-resources to the users and their usage. Chand, & Arora[10], in their findings, explored that access to e-journals has brought a noticeably stimulating change in India's university libraries. There are more steps are needed to improve the use of e-journals. Sinha[11], *et al.* showed that the use of the internet and electronic resources has had a major impact on the research and development work of Assam University. The rapid progresses in ICT have facilitated the convergence of new electronic devices and formats. Information has been embedded into various types of electronic resources in a variety of ways and forms.

5. METHODOLOGY

5.1 Data Collection

Until 2018, data has been collected directly from the infiStats website (usage statistics portal for e-resource) and few data collected from the INFLIBNET staff, INFLIBNET Annual Reports and INFLIBNET website.

5.2 Data Analysis

Data in the study shows the order of e-journal's usage statistics over the seven-year period. In order to know the specific period of maximum / minimum use of e-journals. The data collected were analysed (repackaged) using the "Excel" statistical analysis tool. Further Bar Diagram, line diagram, Pie diagram is also used as a graphical representation for the tabulated data.

6. RESULT AND ANALYSIS

6.1 Platform Wise Usage

Data shows the Platform's wise usage statistics over the seven-year period, data reveals that e-journals were subscribed from 17 platforms in 2012. Similarly, it was available from 15 platforms in 2013, available from 15 platforms in 2014, available from 15 platforms and from 15 platforms in 2015. It was available from 17 in 2016, and it was 16 in 2017. It was available from 18 platforms in 2018.

6.2 Top Ranking of Platforms

The data reveals that the content of J-STOR, Science Direct, ACS, Springer link, Wiley- Blackwell, RSC, Taylor & Francis were the most influential among the user community of the University of North Bengal during the last seven years (2012-18).

6.3 Seven Years Total Usage

The data reveals that e-journal's total highest use from 2012 to 2018 was from the J-STOR platform followed by Science Direct. Comparing the usage statistics of these two platforms over the seven-year period (2012-18), the average annual difference in J-STOR and Science Direct usage statistics is 2113 numbers, which is quite close to each other. This reflects the importance of both platforms across the different disciplines (Humanities, Social Sciences and Sciences, which

includes Scientific, Technical Research) for the University of North Bengal user community.

Here select top downloads seven e-journals for data analysis. Other e-journals, apart from J-STOR & Science direct, are ACS, Springer link, Wiley-blackwell, RSC, Taylor & Francis.

Table 1. Downloads from JSTOR and SCIENCE DIRECT

Year	PD_N J-STOR	PD_N SCIENCE DIRECT
2012	14.52% (24213)	14.71% (22360)
2013	20.80% (34689)	16.50% (25082)
2014	18.16% (30293)	18.10% (27509)
2015	17.62% (29395)	16.74% (25441)
2016	11.87% (19806)	15.05% (22881)
2017	7.46% (12442)	8.91% (13551)
2018	9.54% (15908)	9.95% (15129)
Total	100% (166746)	100% (151953)

PD_N = Percentage of download along with numbers

Table 2. Downloads from ACS, SPRINGER LINK and WILEY BLACKWELL

Year	PD_N ACS	PD_N SPRINGER LINK	PD_N WILEY BLACKWELL
2012	15.00% (9558)	14.90% (6174)	19.22% (7437)
2013	18.09% (11526)	27.01% (1188)	18.09% (6999)
2014	21.09% (13434)	18.38% (7613)	20.40% (7894)
2015	17.21% (10968)	12.82% (5311)	15.86% (6135)
2016	13.02% (8293)	13.87% (5748)	13.06% (5054)
2017	7.42% (4732)	6.35% (2632)	6.88% (2664)
2018	8.13% (5183)	6.63% (2749)	6.45% (2495)
Total	100% (63694)	100% (41415)	100% (38678)

PD_N = Percentage of download along with numbers

Table 1 shows a total of 166746 downloads for J-STOR during 2012-2018 and an average of 23821 downloads per year. Considering this fact as compared to J-STOR, J-STOR's use was very high, and this journal was used by a large number of users. There was an increase in usage in 2013 and a very low download percentage was in 2017.

Similarly for Science Direct, as shown in Table 1, 151953 downloads during 2012-2018 and an average of 21708 downloads per year. Considering this fact as compared to Science Direct, the use of Science Direct was very high, and this journal was used by a large number of users. There was an increase in usage in 2014 and a very low download percentage was in 2017.

As shown in Table 2 for the e-journals of ACS, Springer Link and Wiley Blackwell, 63694 downloads during 2012-2018 and an average of 9099 downloads per year. There was an increase in usage in 2014 and a very low download percentage was in 2017.

Total showed a total of 41415 downloads during 2012-2018 and an average of 5916 downloads per year for Springer Link. There has been an increase in usage in 2013 and the lowest in 2017 and total of 38678 downloads during 2012-2018 and an average of 5525 downloads per year for Wiley Blackwell. There has been an increase in usage in 2014 and the lowest in 2018.

Table 3 shows a total of 33,228 downloads during 2012-2018 and an average of 4,747 downloads per year for RSC. There has been an increase in usage in 2015 and a minimum in 2018.

Total of 28100 downloads during 2012-2018 and an average of 4014 downloads per year for Taylor & Francis. There has been an increase in usage in 2013 and a minimum in 2017. Table 1 to 3 shows the hierarchy (highest to lowest) of maximum e-journal use over the seven years. It shows maximum and minimum download period over the seven years.

Table 3. Downloads from RSC and TAYLOR & FRANCIS

Year	PD_N RSC	PD_N TAYLOR & FRANCIS
2012	12.60% (4189)	10.00% (2812)
2013	17.22% (5723)	46.28% (13007)
2014	19.16% (6369)	10.39% (2920)
2015	20.52% (6821)	8.99% (2527)
2016	15.52% (5159)	10.50% (2952)
2017	9.49% (3156)	6.32% (1776)
2018	5.45% (1811)	7.49% (2106)
Total	100% (33228)	100% (28100)

PD_N = Percentage of download along with numbers

Table 4 shows the download percentage in e-resource-wise. From the table, this has been observed that nearly 55 percentage of e-journals accessed by the users of J-STOR and Science direct and total of 36-percentage e-journals download made by the remaining five e-resources. Here, Science direct and J-STOR are the university user's maximum downloads and the lowest is taylor and francis.

From Fig. 1, it represents that both the platform J-STOR and Science Direct are used equally by the University of North Bengal's respective user community.

Table 4. E-Resource- wise download percentage

Resource	PD_N
Jstor	28.82% (166746)
Science Direct	26.26% (151953)
ACS	11.00% (63694)
Springer Link	7.15% (41415)
Wiley Blackwell	6.68% (38678)
RSC	5.74% (33228)
Taylor & Francis	4.85% (28100)
Total	90.54% (578542)

PD_N = Percentage of download along with numbers

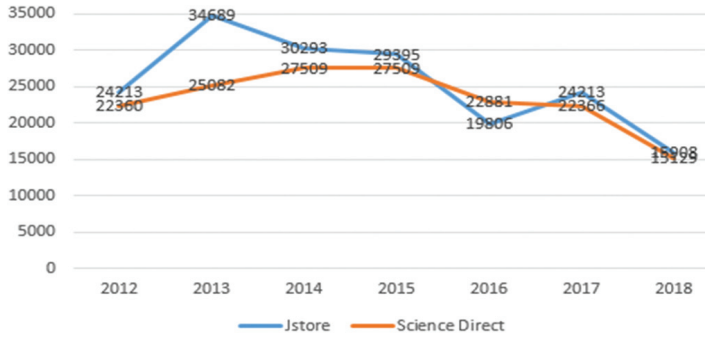

Figure1. Comparative analysis between Jstore & Science direct.

Data analysis from 2012-2018

Count	6
Sum	501274
Mean (Average)	83545.666666667
Median	89861
Mode	All values appeared just once.
Largest	120289
Smallest	44824
Range	75465
Geometric Mean	78446.163084277
Standard Deviation	27480.27806547
Variance	755165682.55556
Sample Standard Deviation	30103.136365945
Sample Variance	906198819.06667

6.4 Year wise Total Usage

Data shows an average growth in the use of e-journals. It shows that from 2012, total usage is 85,403, it is analysed that after the introduction of 1 Gbps high bandwidth connectivity under the National Knowledge Network. There was an improvement in the use of e-journals at the University of North Bengal. In 2013 the total usage is 1,20,289, in 2014 the total usage is 1,05,654, in 2015 the total usage is 94,319, in 2016 the total usage is 77,268 and in 2017 the total usage is 44824 and in 2018 the total usage is 50785. From 2014 to 2017, usage decreases due to unavailability of data in specific resources and lack of user awareness program and another factor. In 2018, the usage is increasing.

From Fig. 2, the average downloads during 2012-2018 are 82649 per year and from table 1 to table 7, the average usage from the top seven e-journals is 75022. The average percentage, therefore, is 91 percent of the top seven journals. Likewise, the average of the top two e-journals, i.e. J-STOR and Science direct, is 45529. Therefore, the average percentage is 55 percent of total use.

6.5 Year Wise Download of E-resource(s)

From year wise total downloads data i.e. in the year 2012 was 85403, in 2013 was 120289, in 2014 was 105654, in 2015 was 94319, in 2016 was 77268, in 2017 was 44824, in 2018 was 50785.

Sorted data: 44824, 50785, 85403, 94319, 105654, 120289

Standard Deviation, σ : **27480.27806547**
Count, N : 6
Sum, Σx : 501274
Mean, μ : 83545.666666667
Variance, σ^2 : 755165682.55556

Steps

$$\sigma = \sqrt{\frac{1}{N}\sum_{i=1}^{N}(x_i - m)^2}$$

$$\sigma^2 = \frac{\sum (x_i - m)^2}{N}$$

$$= \frac{(44824 - 83545.666666667)^2 + \ldots + (120289 - 83545.666666667)^2}{6}$$

$$= \frac{4530994095.3333}{6}$$

$$= 755165682.55556$$

$$\sigma = \sqrt{755165682.55556}$$

$$= 27480.27806547$$

6.6 Top two Usage Statistics

From Fig. 1, it is found that the use of J-STOR is number one in 2012-2015, but in 2016, the use of Science Direct is highest again in 2017 and maximum in 2018.

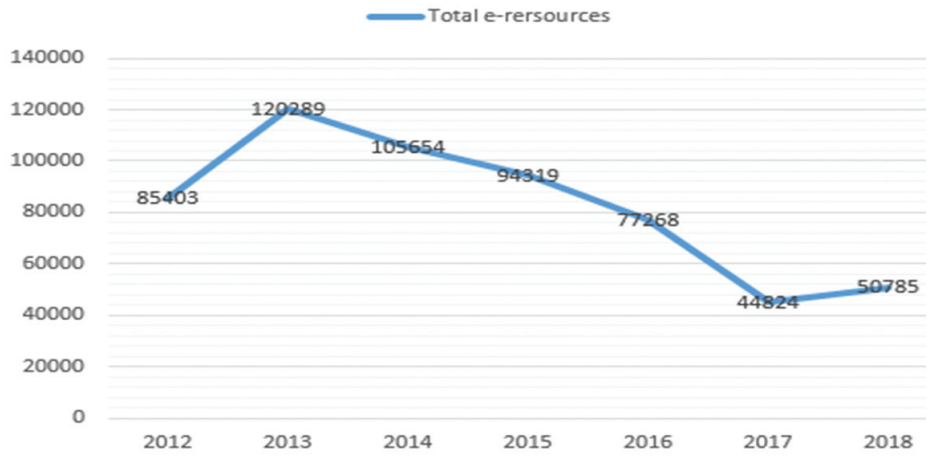

Figure 2. Year-wise total e-resource download.

6. FINDINGS OF THE STUDY

- The study found that seven e-journals, i.e. J-STOR and Science Direct, ACS, Springer link, Wiley-Blackwell, RSC, Taylor & Franc is have the highest usage percentage (91 %) indicating the extensive use of e-journal facilities by the University of North Bengal's user community.
- The study found two big e-journal platforms, i.e. J-STOR and Science Direct have the maximum usage percentage (55 %) indicating the extensive use of e-journal facilities by the University of North Bengal user community.
- The study found that maximum growth in the use of the University of North Bengal's e-journal facility was observed in 2013.
- The study found that there was a minimum increase in the use of the University of North Bengal's e-journal facility in 2017.
- The study found that the e-journal facility of the University of North Bengal was used on average from 2012 to 2018.
- The study found that the e-journal usage trend of the University of North Bengal was not conventional.

7. SUGGESTIONS

- User awareness programs are needed to encourage the use of low-used resources. Certain incentive policies should be framed by the University Library to recognise the best user in using the e-journal facility.
- The University of North Bengal should try to acquiree-journals from another significant platform not available under INFLIBNET consortium schemes.
- Introduce feedback systems for monitoring the proper use of e-journals facilities.
- User study should be conducted to identify the user's problem and the user's needs.
- Need more trained & expert staffs to help users access, download and print journal articles.
- To introduce bulletin board services to inform users of new e-journal database and consortium.

8. CONCLUSIONS

The study concludes that although the use of e-journals at the University of North Bengal began early the study reflects that 2012 is the period from which the trend of e-journal use has increased tremendously. NKN's network connectivity has brought great momentum to the use of e-journals. The two large e-journal platforms J-STOR and Science Direct are found to be maximally used by the University of North Bengal users and therefore the requirement of these two platforms is very important that needs to be met at any cost. Using the users ' e-journals will have its definite output in the form of research publications, academic assignments, etc.

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