

Usage Level of Electronic Journals Published By Three Leading Publishers in the Discipline of Physics: A Study of Guru Jambheshwar University of Science & Technology, Hisar

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Abstract

The electronic journals have become the indispensable information sources for university library. No library can afford to even think for quality research in university without electronic journals. The Ministry of Human Resource Development, Government of India is providing the financial assistance, through many channels, to universities and other Institutes of Higher Learning. UGC- INFONET, AICTE-INDEST and many more Consortiums have been formed with the primary aim to subscribe the electronic information resources. Guru Jambheshwar University of Science & Technology (GJUST) has also been provided with the access of electronic journals from 18 publishers form INFLIBNET. The present paper describes the use of electronic journals published by American Institute of Physics, American Physical Society and Institute of Physics by the users of GJUST, Hisar.

Keywords: Electronic Journals; Library Consortium; UGC-INFONET.

Introduction

Guru Jambheshwar University of Science & Technology, Hisar is a State Technical University in Haryana having a dedicated team of well qualified faculty members engaged in teaching and research activities. The faculty published total 1935 papers in various peer reviewed journals of national and international repute since 2009-10 is 1935. Out of these publications, 1219 publications are listed on Scopus till 2013-14, and more so, 755 publications were listed since 2009-10. As per Scopus database, the Citation Index and H-Index of the faculty range up to 466 and 28, respectively, while the Impact Factor of the papers is up to 6.05. The department of physics, since its inception of the University in the year 1995 has awarded about 40 Ph.D. and about 30 scholars are registered for Ph.D. The department has 12 faculty members-5 Professors, 1 Associate Professor and 6 Assistant Professors and offers M.Sc. Physics and M. Tech. (Optical Engineering) courses.

Electronic Journals

Periodicals, serials, serial publications are

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synonyms to a Journal. In AACR2 (1978) "a serial is a publication in any medium issued in successive parts bearing numerical or chronological designation and intended to be continued indefinitely". Journals are generally published by a professional association, society, foundation, trust, commercial publishers, institute, group of people etc., in the form of articles on a particular subject or may be interdisciplinary, written by different authors, and contain scholarly information.

The electronic journals are considered the journals having the research oriented information and are accessible over internet. All the universities and Institutes of Higher Learning are engaged in teaching and research activities and to continue them and further research these require the results and processes of new research available in serial publications.

As per the definition of Wikipedia, the "electronic journals are scholarly journals or intellectual magazines that can be accessed via electronic transmission. In practice, this means that they are usually published on the Web. They are a specialized form of electronic document: they have the purpose of providing material for academic research and study, and they are formatted approximately like journal articles in traditional printed journals".

In higher education electronic resources become part and parcel of the academic process (Mutula and Makando, 2003).

UGC Infonet Consortia

Journals are most valuable information sources for the academicians and researchers and with the help of information communication technology, its production, distribution, dissemination, quality, searching etc. have become very easy, quick and efficient. Libraries are accepting the consortia approach to cater to the informational requirements as no single library can purchase or subscribe all the reading material. Libraries cannot satisfy the thrust of knowledge of all its readers from its assets alone. Long back libraries started cooperation in the form of Inter-library loan, document delivery, library networks etc. but recently Consortia approach has become most important form of library cooperation.

A library Consortia is an association of a group of libraries that agree to share their resources to satisfy the needs of users. Consortia may be formed on a local, regional, national, or international basis; on a functional or format basis; or on a subject basis (Rahman, Nahar and Akhter, 2006).

For obtaining the benefits of higher sale, many publishers sale their databases to consortia at much lesser price and consortia management purchases these databases for the collective benefits of its members. Thus both the parties remain in win-win situation. If you want to search databases of e-journals from many publishers at a single platform, there are aggregators in the market who offer this service by providing link to journal site for its full text retrieval.

UGC-Infonet

The INFLIBNET Centre, Gandhinagar (Earlier in Ahmadabad), an autonomous centre of University Grants Commission, had been given the responsibility to initiate E-Journals consortium to facilitate free access to electronic journals and databases. The INFLIBNET Centre is providing the infrastructural facilities & training to libraries and subscribing electronic journals and databases for providing free access to research scholars and faculty members in the universities and other institutes of higher learning. Current as well as archival access to more than 7500+

core and peer-reviewed journals and 10 bibliographic databases from 26 publishers and aggregators is being provided in to meet the informational requirements of the researchers.

The other important library consortia in India are:-

Forum for Resource Sharing in Astronomy and Astrophysics (FORSA)

Indian National Digital Library in Science & Technology (INDEST)

Health Sciences Library & Information Network (HELINET)

CSIR E-Journal Consortium

DAE Library Consortium

IIM Library Consortium

Objectives

This study is basically concerned with the use of electronic journals published by three publishers in the field of Physics and to find out electronic journals in great demand. The study may help the decision makers of the university to ponder the use and reputation of journals. The objectives of the study are:-

- To know and compare the month-wise usage of 3 databases
- To know the 5 highly used journals in each database
- To give an overall picture of usage level to the researchers and faculty of Physics.
- To give possible suggestions, if required.

Methodology

The present study is carried out by taking the month-wise downloaded data related to 3 publishers in the discipline of physics namely- American Institute of Physics, American Physical Society and Institute of Physics. The data has been obtained from the UGC-INFONET Consortium. The period and number of journals covered in the study is as under:-

Year	American Institute of Physics	American Physical Society	Institute of Physics	Total No. of Journals
2012	22	8	111	141
2013	15	9	117	141
2014	17	9	120	146

Review of Literature

Many studies have been carried out to know the

information seeking behaviour and usage pattern of the researchers. Jamali and Nicholas (2008) examined two aspects of information seeking

behaviour of physicists and astronomers including methods applied for keeping up-to-date and methods used for finding articles and finally investigated the relationship between academic status and research field of users with their information seeking behaviour. Nicholas et. al (2009) evaluated the use of the ScienceDirect journals database with regard to Life Sciences, Economics, Chemistry, Earth & Environmental Sciences and Physics by ten major UK research institutions with the aim to study researchers' behaviour. Nicholas et. al (2009) in another study 'student digital information-seeking behaviour in context' compared student information seeking behaviour with that of other academic communities, and, in some cases, for practitioners. Tripathi and Jeevan (2013) highlighted the importance of qualitative and quantitative analysis of the usage of e-resources in academic libraries. Fourie, Ina (2013) undertook a study to find a balance between ICT, information retrieval systems and the users of these systems.

Some more relevant studies should be discussed related to know the usage level of electronic journals by its users. Shearer, Klatt and Nagy (2009) carried out a study of electronic journal usage data and analysed the journals used as 0-24 times, 25-49 times, 50 to 99 times, 100-199 times and 200+ times. Chowdhury (2012) analyzed the usage trend of e-journals in Independent University, Bangladesh (IUB) and observed that use of Emerald database is more rational as compared to other three databases. He highlighted the list of 25 journals each of Oxford University Press, JSTOR, ABI/Inform and Emerald databases. It is further stressed that more consortia may be formed for exploring more electronic resources at an affordable price and higher education libraries,

at least, will then find more users. Moorthy and Pant (2012) observed that the download statistics and its usage analysis has shown that the scientists of DRDO is utilizing the resources in a positive way and in some cases, where usage of e-journals is low, training programmes are conducted from time to time. To analyze the usability of DRDO E-journals Consortium, the usage statistics for the period from 2009 to 2011 was collected for all the DRDO Labs from the websites of 8 publishers. They further stated that each library of DRDO labs has accessibility of DESIDOC resources through a well and dedicated intranet. DRDO e-journals Consortium has strengthened the resource sharing and provided information on 24X7 bases with improved quality and quantity.

Analysis

The data has been collected related to the articles downloaded from the 3 databases i.e.-American Institute of Physics, American Physical Society and Institute of Physics. The data is presented in the form of Tables and Figures and described first by taking individual database and finally compared with each other.

American Institute of Physics

The access of 22, 15 and 17 electronic journals from American Institute of Physics was provided to Guru Jambheshwar University by the INFLIBNET for the years 2012, 2013 and 2014 respectively. Total 1249, 1210 and 1307 full text articles have been downloaded during the years 2012, 2013 and 2014 respectively. The month-wise details of downloaded article during 3 years have been shown in Figure 1 and Table 1.

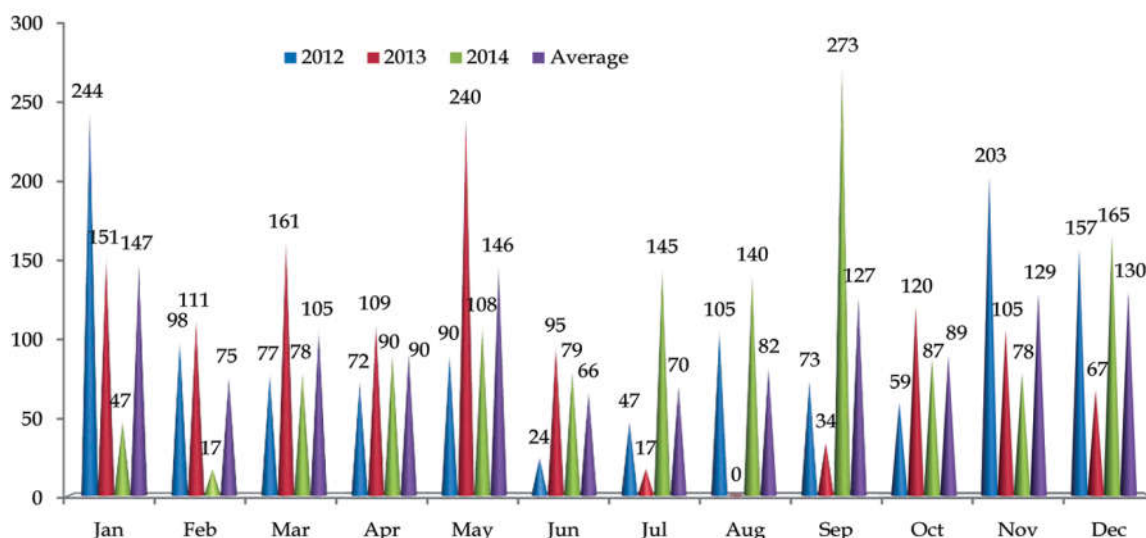


Fig. 1: American Institute of Physics: Month-wise detail of downloaded articles during 2012-2014

Total 1249 articles at an average of 104 articles per month, have been downloaded in the year 2012. In this year maximum 244 and minimum 24 articles have been downloaded in January and June 2012 respectively. During 2013, maximum 240 and minimum 0 articles have been downloaded in the month of May and August respectively and total 1210

articles, at an average of 101 articles have been downloaded. Likewise in the year 2014 total 1307 articles have been downloaded and maximum 273 and minimum 17 articles have been downloaded in the months of September and February respectively against the average of 109 articles per month.

Table 1: Month-wise detail of downloaded articles during 2012-2014

Years	American Institute of Physics													Average	Total
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec			
2012	244	98	77	72	90	24	47	105	73	59	203	157	104	1249	
2013	151	111	161	109	240	95	17	0	34	120	105	67	101	1210	
2014	47	17	78	90	108	79	145	140	273	87	78	165	109	1307	
Average	147	75	105	90	146	66	70	82	127	89	129	130	105	1255	
Total	442	226	316	271	438	198	209	245	380	266	386	389	314	3766	

A peep on the Fig. 2 and Table 1 shows that total maximum 442 and minimum 198 articles have been downloaded in the months of January and June respectively for the period of 2012-2014, against the overall total of 3766 articles and at an average of 314

articles per year. Average 1255 articles per year and 105 articles per month have been observed. The overall 3 years' maximum average 147 and minimum 66 articles has been observed in the January and June respectively.

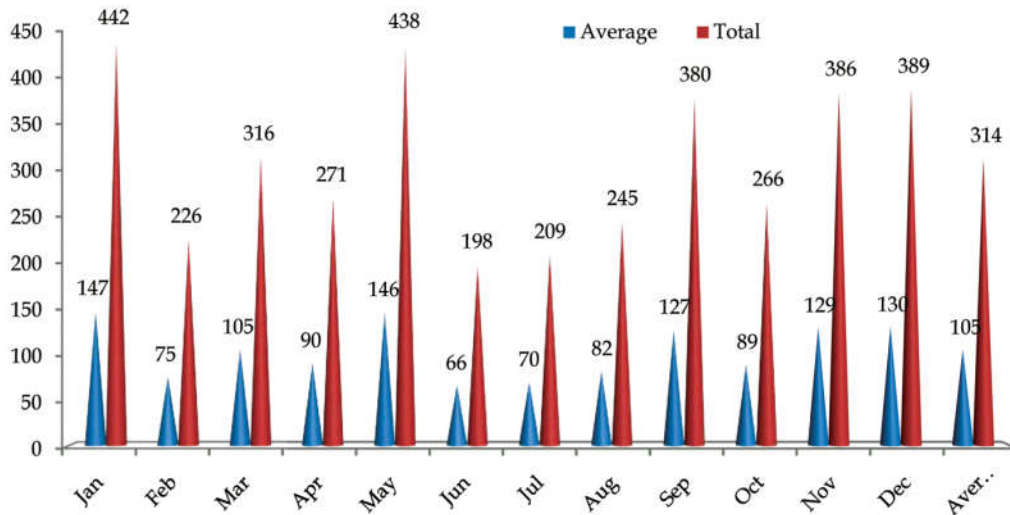


Fig. 2: American Institute of Physics: Month-wise Total and Average Downloads -2012-2014

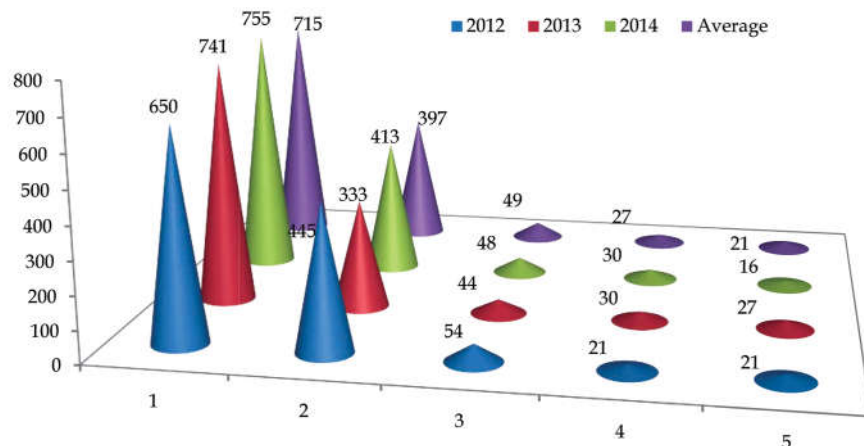


Fig. 3: American Institute of Physics: Downloads of Articles from Five Highly Used Journals in 3 Years

Table 2 and Figure 3 highlight the top five highest used journals in three years. It is also observed that ‘Journal of Applied Physics’ and ‘Applied Physics Letters’ remained at number 1 and 2 highly used journals respectively in all the 3 years whereas ‘The Journal of Chemical Physics’ kept at number 3 during 2012 and 2013 and number 4 in the year 2014. Hence these three journals remained in first 4 highly used

journals in all the 3 years. Among the five highly used journals maximum 2145 articles have been downloaded from ‘Journal of Applied Physics’ in all three year at an average of 715 articles per year whereas 1191 articles have been downloaded from ‘Applied Physics Letters’ at an average of 397 articles per year.

Table 2: American Institute of Physics: List of 5 Highly Used Journals: 2012-2014

2012		
Sr. No.	Journals Name	Total
1	Journal of Applied Physics	650
2	Applied Physics Letters	445
3	The Journal of Chemical Physics	54
4	Physics Today	21
4	Review of Scientific Instruments	21
4	The Journal of the Acoustical Society of America	21
5	Journal of Vacuum Science & Technology A	10
2013		
Sr. No.	Journals Name	Total
1	Journal of Applied Physics	741
2	Applied Physics Letters	333
3	The Journal of Chemical Physics	44
4	AIP Conference Proceedings	30
5	Review of Scientific Instruments	27
2014		
Sr. No.	Journals Name	Total
1	Journal of Applied Physics	755
2	Applied Physics Letters	413
3	AIP Advances	48
4	The Journal of Chemical Physics	30
5	Applied Physics Reviews	16

It is to mention here that “Journal of Applied Physics” remained highest used journal not only in American

Institute of Physics database but it remained at top amongst all the 7100+ e- journals available in the university under consortia arrangement.

American Physical Society

The 2nd publisher covered under the study is ‘American Physical Society’ vide which the access of 8 journals in 2012 and 9 journals each for the years 2013 and 2014 was provided to university. The month-wise details of downloaded articles have been shown in Figure 4 and Table 3. It is evident that total 467, 642

and 340 full text articles have been downloaded during the years 2012, 2013 and 2014 respectively at an average of 483 articles per year.

The month-wise details show that maximum 65 articles and minimum 1 article have been downloaded during April and June, 2012 respectively against the overall average of 39 articles per month. During 2013, the monthly average was 54 articles which is observed as highest amongst the three years, whereas the maximum 119 and minimum 16 articles have been downloaded in the month of January and November respectively. Likewise, maximum 86 and minimum 0 articles have been observed in May and August, 2014 respectively against the overall average of 28 articles per month which is observed as lowest amongst three years.

Table 3: Month-wise detail of downloaded articles during 2012-2014

Years	American Physical Society												Average	Total
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
2012	46	23	41	65	48	1	19	34	49	41	48	52	39	467
2013	119	54	30	45	74	100	75	41	41	28	16	19	54	642
2014	26	62	13	73	86	7	10	0	25	10	14	14	28	340
Average	64	46	28	61	69	36	35	25	38	26	26	28	40	483
Total	191	139	84	183	208	108	104	75	115	79	78	85	121	1449

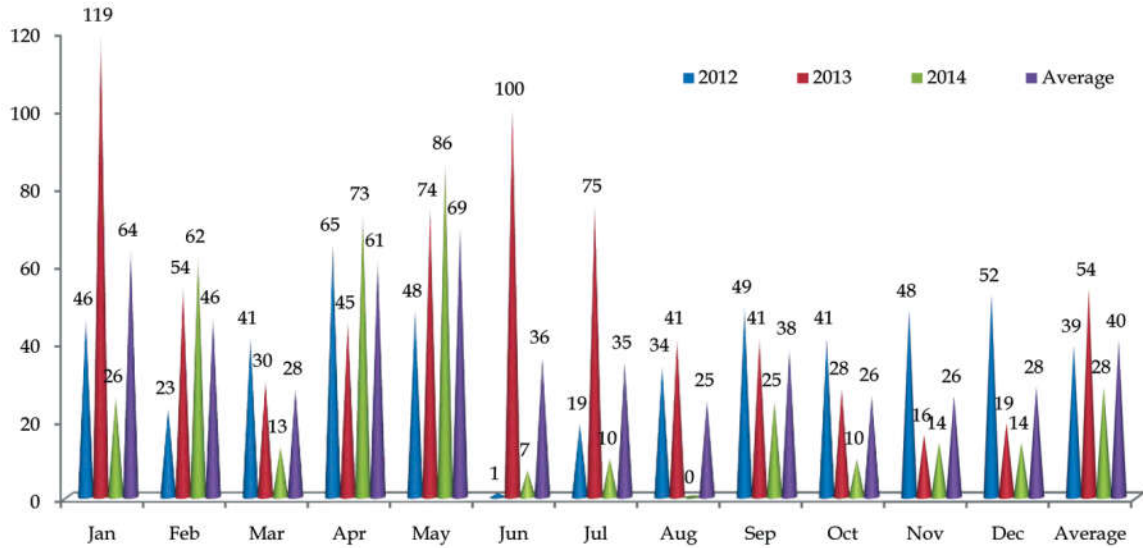


Fig. 4: American Physical Society: Month-wise detail of downloaded articles during 2012-2014

It is further observed that sum total of May month for three year is 208 journals, is highest and its corresponding average is 69 articles per May month whereas the lowest use is observed in August Month where only 75 articles have been downloaded during three years and its corresponding average per month is 25 articles.

Table 3 and Figure 5 show that in total 1449 articles have been downloaded at an average of 121 articles per year and 40 articles per month. It remains summer break in July & August in the university and June is the examination period because of which the downloads have been observed less than the overall monthly and yearly average.

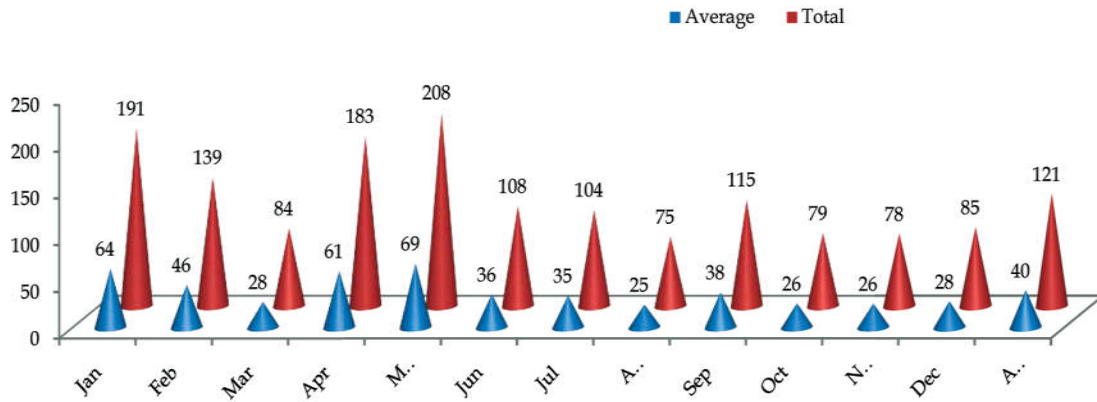


Fig. 5: American Physical Society: Month-wise Total and Average Downloads -2012-2014

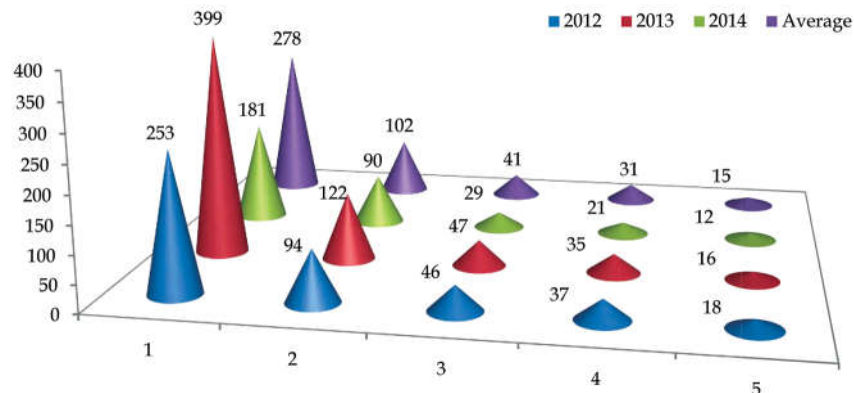


Fig. 6: American physical society: downloads of articles from five highly used journals in 3 years

Table 4: American Physical Society: List of 5 Best Used Journals during 2012-14

2012		
No.	Journals Name	Total
1	Physical Review B	253
2	Physical Review Letters	94
3	Physical Review Online Archive (PROLA)	46
4	Physical Review C	37
5	Reviews of Modern Physics	18
2013		
No.	Journals Name	Total
1	Physical Review B	399
2	Physical Review Letters	122
3	Physical Review Online Archive (PROLA)	47
4	Physical Review A	35
5	Physical Review C	16
2014		
No.	Journals Name	Total
1	Physical Review B	181
2	Physical Review Letters	90
3	Physical Review Online Archive (PROLA)	29
4	Physical Review A	21
5	Physical Review E	12

Fig. 6 and Table 4 show that out of top 5 highly used journals, the Journals -‘Physical Review B’, ‘Physical Review Letters’ and ‘Physical Review Online Archive (PROLA)’ have occupied 1st, 2nd and 3rd position in all the 3 years. Out of total downloaded articles of 467, 642 and 340 in the year 2012, 2013 and 2014, total 393, 568 and 300 articles have been downloaded from these 3 journals respectively. Out of total 1449, maximum articles 833 have been downloaded from the single Journal- ‘Physical Review B’ i.e. 253, 399 and 181 in the years 2012, 2013 and 2014 respectively.

Institute of Physics

The 3rd publisher covered under the study is ‘Institute of Physics’ vide which the access of 111, 117 and 120 journals was provided for the years 2012, 2013 and 2014 respectively. The month-wise details of downloaded articles have been shown in Fig. 7. and Table 5. It is evident from the figure that maximum articles have been downloaded in the month of October, 2012 whereas not even a single article was downloaded in the months of April, May and June 2012, May 2013, June and July 2014.

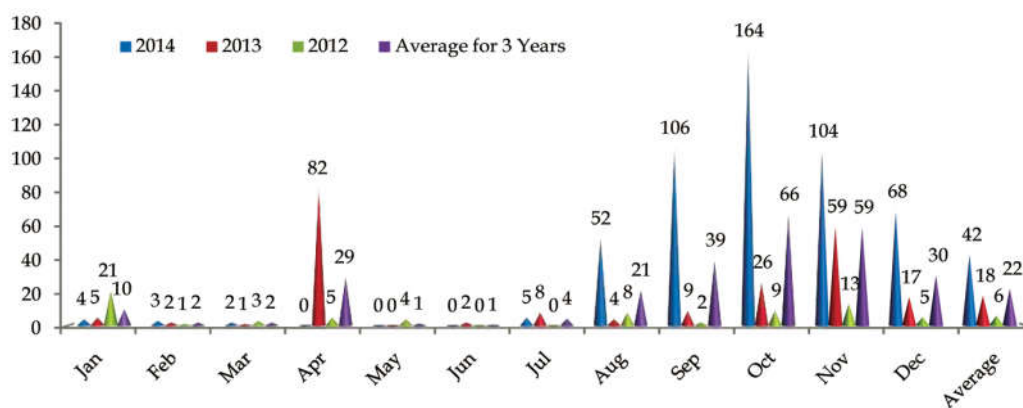


Fig. 7: Institute of Physics: Month-wise detail of downloaded articles during 2012-2014

A peep on the table shows that total 794 articles have been downloaded in 3 years at an average of 22 articles per month and 265 articles per annum. During 2012, maximum 21 articles have been downloaded in January whereas no article has been downloaded in the months of June and July. In total 71 articles have been downloaded with a monthly

average of 6 articles, which is observed as lowest one amongst all the three years. Total 215 articles have been downloaded in the year 2013 with an average of 18 articles per month, which is three times more than the last year. During this year maximum 82 articles have been downloaded in the month of April and no article was downloaded in May.

Table 5: Month-wise detail of downloaded articles during 2012-2014

Year	Institute of Physics												Average	Total
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
2014	4	3	2	0	0	0	5	52	106	164	104	68	42	508
2013	5	2	1	82	0	2	8	4	9	26	59	17	18	215
2012	21	1	3	5	4	0	0	8	2	9	13	5	6	71
Average	10	2	2	29	1	1	4	21	39	66	59	30	22	265
Total	30	6	6	87	4	2	13	64	117	199	176	90	66	794

The use of this database is increased drastically in the year 2014, particularly after the month of August. A peep on the Table 5 shows that out of total 794 articles downloaded in three years, 508 articles i.e. about 64% have been downloaded in this year. Out of

these 508 articles, only 14 articles have been downloaded from Jan to July 2014 and 494 articles i.e. more than 97 % have been downloaded in last five months of the year.

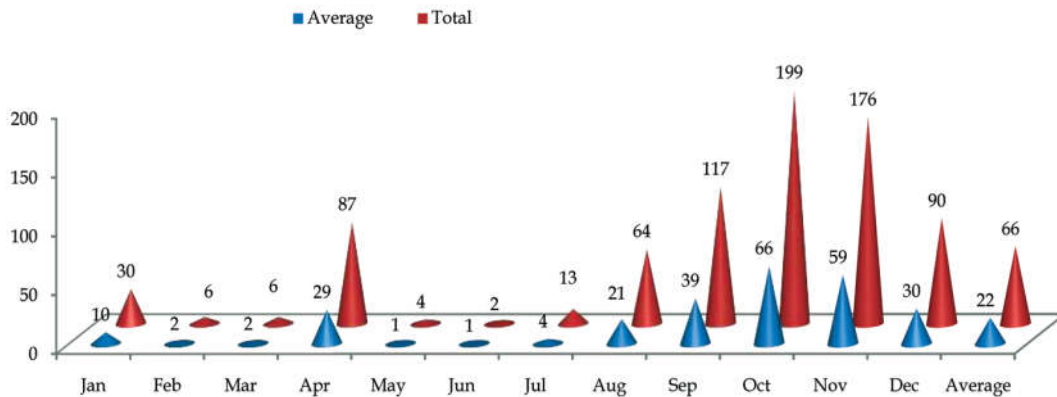


Fig. 8: Institute of physics- month-wise average and total downloads: 2012-2014

The Figure 8 depicts that out of total 794 articles; highest number of 199 articles have been downloaded in the month of October with an average of 66 articles against the overall average of 22 articles. Likewise, lowest 2 articles have been downloaded in three years

in the month of June. Thus out of total 794 articles downloaded in 3 years, 148 articles have been downloaded in first 7 months-Jan to July whereas 646 i.e. more than 81% articles have been downloaded from August to December.

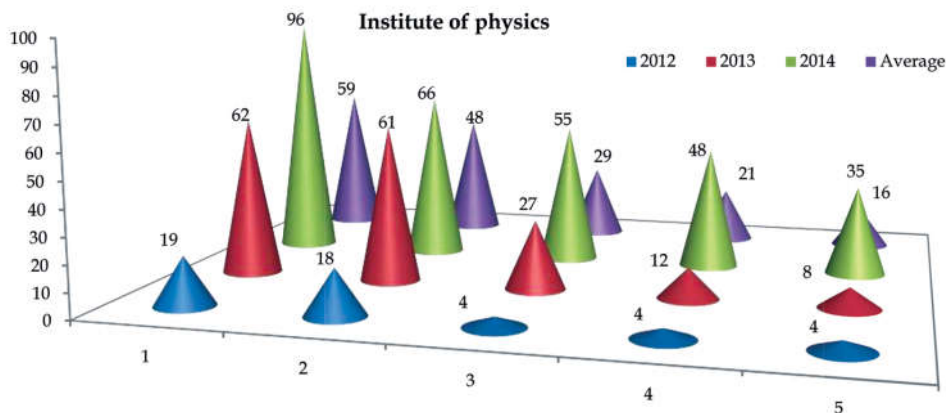


Fig. 9: Institute of physics: downloads of articles from five highly used journals in 3 years

Table 6 and Figure 9 are the witness that the highly used journals among the top five journals during 3 years of 2012-14 is 'Nanotechnology' and number of total downloads have been increased consistently over the years from 19, 62 and 96

respectively. This is the only journal which remained not only at top among the highly used five journals but no other journal remained in this list for all the 3 years. The highest number of 177 articles have been downloaded from this journal at

an average of 59 articles per year against the overall average of 16 articles per year from this database. Table shows that out of 794 articles downloaded

during 3 years from the database- Institute of Physics, 300 hundred articles were amongst the top five journals in 2014 only.

Table 6: Institute of physics: list of 5 best used journals during 2012-14

No.	Journals Name 2012	Total
1	Nanotechnology	19
2	Journal of Physics: Conference Series	18
3	Journal of Physics E: Scientific Instruments	4
4	Nuclear Fusion	4
5	The Astrophysical Journal Letters	4
	Total	49
No.	Journals Name 2013	Total
1	Nanotechnology	62
2	Journal of Semiconductors	61
3	Advances in Natural Sciences: Nanoscience and Nanotechnology	27
4	Semiconductor Science and Technology	12
5	Journal of Physics: Conference Series	8
	Total	170
No.	Journals Name (2014)	Total
1	Nanotechnology	96
2	Journal of Physics D: Applied Physics	66
3	Journal of Physics: Condensed Matter	55
4	Journal of Physics: Conference Series	48
5	Advances in Natural Sciences: Nanoscience and Nanotechnology	35

Table 7: Average of downloaded articles from all 3 databases during 2012-2014

Database	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Overall Average	Yearly Total
AIP	147	75	105	90	146	66	70	82	127	89	129	130	105	1255
APS	64	46	28	61	69	36	35	25	38	26	26	28	40	483
IOP	10	2	2	29	1	1	4	21	39	66	59	30	22	265
Monthly Average	74	41	45	60	72	34	36	43	68	60	71	63	56	668
Grand Total	221	123	135	180	216	103	109	128	204	181	214	188	167	2003

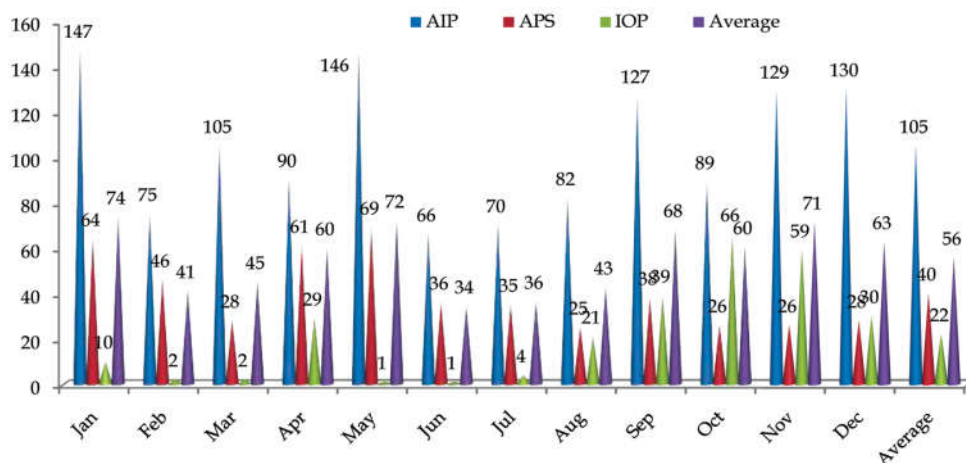


Fig. 10: All Databases: average of downloaded articles during 2012-2014

Figure 10 and Table 7 highlight the monthly and annually average of downloaded articles from three databases. Amongst all databases, maximum average of 147 articles is observed from American Institute of Physics in the month of January against the overall average of 105 articles per month. The minimum

average of 22 articles has been observed from Institute of Physics against the overall annual average of 56 articles. Further, the minimum monthly average of 34 articles in June month and maximum of 74 in the month of January have been observed against the overall monthly average of 56 articles.

During the period of 2012-14, total 6009 articles have been downloaded from three databases with an average of 2003 articles per annum. Maximum 3766 articles were downloaded from AIP and minimum 794 articles were downloaded from IOP. It has become evident from Figure 11 and Table 8 that amongst all

databases, 442 articles were downloaded from AIP in the month of January and minimum 2 articles from IOP in the month of June. While checking month-wise total downloads, maximum 663 articles were downloaded in the month of January followed by 650 in May against the overall average of 501 articles per month.

Table 8: Total articles downloaded from 3 databases during 2012-2014

Database	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Overall Average	Overall Total
AIP	442	226	316	271	438	198	209	245	380	266	386	389	314	3766
APS	191	139	84	183	208	108	104	75	115	79	78	85	121	1449
IOP	30	6	6	87	4	2	13	64	117	199	176	90	66	794
Monthly Average	221	124	135	180	217	103	109	128	204	181	213	188	167	2003
Grand Total	663	371	406	541	650	308	326	384	612	544	640	564	501	6009

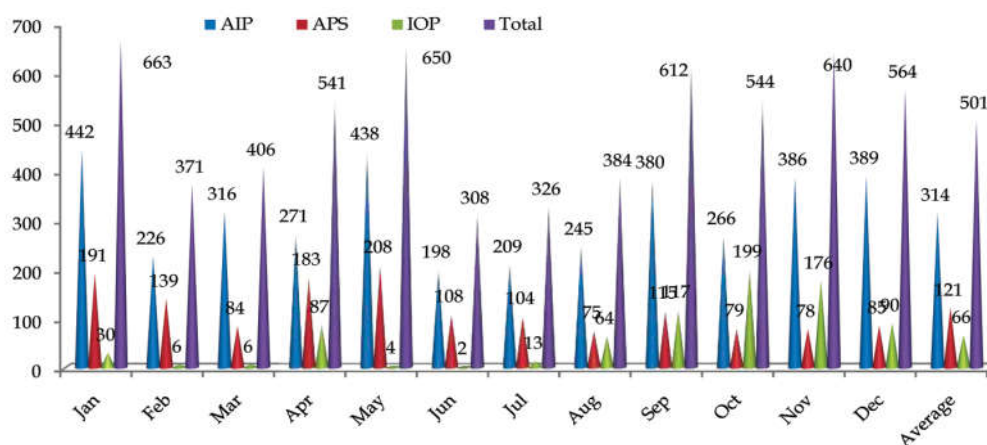


Fig. 11: All Databases: Total Articles Downloaded During 2012-2014

Suggestions

The university has the access of more than 7500 e-journals, prowess and JGateplus databases to meet the informational requirement of the users. The faculty members of the university have been provided computer systems/ laptops with internet connection in their respective rooms in the teaching departments. University has more than 1000 nodes with internet connections and 2 leased lines of IGBPS and 16 MBPS respectively and has Wi-Fi connectivity but there is need to give attention on some points such as:-

- More access point should be made available for the research scholars equipped with latest facility in the respective departments.
- The Wi-Fi connectivity available in the campus need to be strengthened.
- Centralized internet labs need to be strengthened.
- More e-journals databases, including the Science Direct, should be provided in the university.
- There is urgent need for conducting the user awareness program to train the users in searching

and downloading the required article. Since good infrastructural facilities are available in the university, there is dire need to motivate the users to use these resources. Such user awareness programs shall be helpful in imparting training and motivating the scholars for using electronic resources.

Conclusion

The use of American Institute of Physics database is slightly considerable but the use of other two databases is very poor, particularly Institute of Physics database. Only 794 articles had been downloaded during a span of 3 years i.e. at an average of 265 articles per year or 22 articles per month. The use of electronic journals should be enhanced by the faculty and research scholars and the library professionals should support them in providing technical skills by conducting user awareness programs.

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