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Federated Research Information Management in R&D Organizations: Analysis of Indian Research Information Network System (IRINS)

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Abstract

Purpose: The present study sought to analyze the IRINS implemented Research & Development Organizations in India, their top departments, scientist's publications and citations of individual organization.

Methodology: The data were collected from the website of Indian Research Information Network System (IRINS) and the data were analyzed using Microsoft Excel and using simple calculations.

Findings: The analysis finds that the CSIR-NAL has the highest scientist/faculty members 386 (47.02%). The CSIR-NIIST has the highest Scopus citation 39180(26.96%) and cross ref citation 43238(32.60%). The CSIR-NIIST ranks first with 2223 scholarly resources. The Clinical Research Centre, ACTREC has the highest scholarly resources 1289(38.88%) with 41 h-Index. Dr. Harish Barshilia, CSIR – NAL has the highest contribution of 193(17.53%) scholarly publications with 5110 (22.98%) citations, 4455(23.44%) cross ref citations and 43 h-Index.

Originality/value: This paper investigates trends in the research information management in R&D organizations in the context of IRINS which will be unfamiliar to many LIS professionals, and puts them in the context of professional practice.

Key words: IRINS, R&D, RIM, INFLIBNET, CSIR, ORCID, ID, API.

1. Introduction

The research & development organizations are the hub where research takes place on day-to-day basis across spectrum of all subject categories and are dispersed across the globe. The ongoing research activities and their findings are made accessible at public domain to the research community for benefits across the world through different channels of publications. Moreover, information on research interest and output of scientists in terms of publications, citations and other intellectual output is highly scattered. It seems very difficult to keep the information flow about research capabilities of individual, departments and organizations. The Indian Research Information Network System (IRINS) eases and facilitates flow of information on research carried out and serve as common platform to project performance of individuals, departments, and organization on various Bibliometrics Parameters.

The IRINS paves the way for networking, collaboration and better funding opportunity for various research projects. Moreover, it can be used as better instrument for policy makers and the Government to identify available expertise, the thrust areas of research, research gaps and to define accordingly their policies on research funding. The IRINS could be used effectively for efficiently measuring and benchmarking research output of the organization.

1.1. About IRINS

The Indian Research Information Network System (IRINS) a web-based Research Information Management (RIM) service has been developed by the Information and Library Network (INFLIBNET) in collaboration with the Central University of Punjab¹. IRINS captures scholarly communication artifacts such as people who do research and their group (personal information and affiliation), their research activities (grants/projects), achievements (honours/awards) and their research output (publications and more). It could be integrated with existing campus management system such as faculty profile, institutional repository, grant management system, etc. It support data visualization and reporting on organization research, activity and output. It consumes and produces key information to institute's core research. The IRINS is available as free software-as-service to the academic and R&D organizations in India. It has integrated with academic identity such as ORCID ID, Scopus ID, Research ID, Microsoft Academic ID, and Google Scholar ID for ingesting the scholarly publication from various sources².

1.1.1. Benefits of IRINS

In essence, IRINS could be used effectively by the R&D organizations as on instrument to showcase their research output, expertise, skills, research experience, accomplishments, projects and other scholarly activity. Major benefits of IRINS for different stakeholders are briefed below:

Sr. No.	Stakeholders	Benefits
1.	Research Scholar	<ul style="list-style-type: none"> • It provides immense support to find mentors or advisors for their research in the respective domain; • It helps the scholars to locate courses in their subject interests and research focus of the department and organization; and • It provides scholarly metadata related to research interests of faculty members, research focus of the departments and schools.
2.	Faculty	<ul style="list-style-type: none"> • It supports the faculty members to showcase their research contributions to the peer group; • It provides more significant exposure for their research contributions to the international community and brings funding opportunities from the national and international agencies; and • Improve the research metadata quality and reduce the

		repetitive data entry for various assessment system.
3.	Research Administrators	<ul style="list-style-type: none"> • It enables the administrator to build research report, performance assessments and research impact analysis; • Strategically analyses the research progress for better decision making on funding, faculty assessment and resource allocation; • Help the Internal Quality Assurance Cell (IQSC) and National Institutional Ranking Framework Coordinator to generate report for various research assessment

1.1.2. Key Features of IRINS

IRINS provides a wide range of features using international standards with interoperable protocol. Unique features embedded in IRINS are as follows:

Sr. No.	Particulars	Features
1.	Discovery	<ul style="list-style-type: none"> • Key research area and research progress of schools, departments and faculty members; and • Faceted search facility with number of filters to find experts and their contribution.
2.	Research Impact	<ul style="list-style-type: none"> • Altmetric from social media such as Facebook, Twitter and Mendeley. • Citation from Scopus, CrossRef and link to Open Access article through ImpactStory.
3.	API	<ul style="list-style-type: none"> • Import publications from academic identities such as Microsoft Academic Search ID, Google Scholar ID, Researcher ID, Scopus ID; and • ORCID integration to ingest the profile information with publication.
4.	Visualization	<ul style="list-style-type: none"> • Networking of faculty through co-author network, map of science network; and • Graphical representation on productivity of the department and individual faculty member.

2. Review of literature

Balasubramani, et.al. (2019)³ has conducted a study on 15 academic and research organizations through IRINS with the objective to analyze the faculty members, department and their scholarly publications with citations and its impact. The finding indicates that KL University, Guntur has the highest 836 (17.22%) faculty members. The Indian Institute of Technology (IIT), Madras has received 278374 (26.28%) highest citations from Scopus and 227686 (22.30%) citations from Cross Reference.

Kannan, et.al. (2018)⁴ in a study elaborated that IRINS can be used as a common platform across all educational and research institutes in Indian higher education sector. The IRINS could

be used effectively for efficiently measuring and benchmarking research output of individual institute as well as across institutions.

Joachim, et.al. (2017)⁵ in a study provides an overview of recent research and publications on the integration of research data in Current Research Information Systems (CRIS) by addressing three related issues, i.e. the object of evaluation, identifier schemes and conservation with focusing on social sciences and humanities. The study contributes to the debate on the evaluation of research data, especially in the environment of open science and open data, and helpful in implementing CRIS and research data policies.

Javed, et.al. (2016)⁶ presented the VIZ-VIVO, an extension for the VIVO framework that enables end-user exploration of a scholarly knowledge-base through a configurable set of data-driven visualizations. The work explores the process for selection, design, and development of an initial set of visualizations as well as approach to the underlying technical architecture. The study evaluated the use of data-driven visualizations by multiple stakeholders, including faculty, students, librarians, administrators, and the public.

Joint Nicholas (2008)⁷ gives an overview of larger developments in the international research information environment, and outlines their impact on the open access movement within libraries. In findings, stated that developments in the research landscape have important effects on grass-roots LIS practice, and given a great boost to open access repositories while preserving the traditional role of commercial journal publications.

Devare, et.al. (2007)⁸ explain the implementation of VIVO profile management system of life science communities help to access for scholarly activity in the life sciences at Cornell –VIVO transcends campus, college and the department the study also provides the faculty profiles with affiliations to the departments, fields, or research units, research projects, courses, seminars, and facilities relevant to life scientists regardless of the campus, college, or department in which the entity resides.

3. Objectives of the Study

The main objective of the study is to analyze the IRINS implemented Research & Development Organizations in India. The major objectives are:

- i. To analyze the Resource Impact from scholarly resources;
- ii. To analyze the contributions of top department of individual R&D organization and h-index.
- iii. To analyze the top scientist/faculty of individual R&D organization and h-index.

4. Research Methodology

To analyze the IRINS implemented R&D Organizations with a view to study resource impacts from various databases, top departments, top faculty publication & citations of individual

organization, the data were collected from the website of Indian Research Information Network System (IRINS) (https://irins.org/irins/irins_instances.php). The Data were analyzed using Microsoft Excel and simple calculations. The present study confined to the following 09 numbers of R&D Organizations:

1. Advanced Centre for Treatment, Research and Education in Cancer (ACTREC), Navi Mumbai;
2. CSIR-Central Food Technological Research Institute (CFTRI), Mysuru;
3. CSIR - National Aerospace Laboratories (NAL), Bangalore;
4. CSIR-National Institute for Interdisciplinary Science and Technology (NIIST), Thiruvananthapuram;
5. ICAR-Indian Institute of Spices Research (IISR), Kozhikode;
6. Indian Institute of Food Processing Technology (IIFPT), Thanjavur;
7. Indira Gandhi Institute of Development Research (IGIDR), Mumbai;
8. National Brain Research Centre (NBRC), Gurgaon;
9. National Institute for Research in Tuberculosis (NIRT), Chennai.

5. Data Analysis and Interpretation

5.1. Demographic Representation

The demographic representation in IRINS implemented R&D Organizations shown in table-1. On analysis, it has been found that the CSIR - National Aerospace Laboratories (CSIR-NAL) has the highest scientist/faculty members 386 (47.02%) which is followed by CSIR-Central Food Technological Research Institute (CSIR-CFTRI) with 113(13.76%) and Advanced Centre for Treatment, Research and Education in Cancer (ACTREC) with 106(12.91%) respectively. The National Brain Research Centre (NBRC) has the lowest with 15(1.83%) scientist/faculty members.

Sr. No.	R&D Organizations	Demographic Representation	Percentage (%)
1.	Advanced Centre for Treatment, Research and Education in Cancer (ACTREC)	106	12.91%
2.	CSIR-Central Food Technological Research Institute (CSIR-CFTRI)	113	13.76%
3.	CSIR - National Aerospace Laboratories (CSIR-NAL)	386	47.02%
4.	CSIR-National Institute for Interdisciplinary Science and Technology (CSIR-NIIST)	76	9.26%
5.	ICAR-Indian Institute of Spices Research (ICAR-IISR)	35	4.26%
6.	Indian Institute of Food Processing Technology (IIFPT)	33	4.02%
7.	Indira Gandhi Institute of Development Research (IGIDR)	35	4.26%
8.	National Brain Research Centre (NBRC)	15	1.83%

9.	National Institute for Research in Tuberculosis (NIRT)	22	2.68%
Total		821	100%

Table-1: Demographic Representation

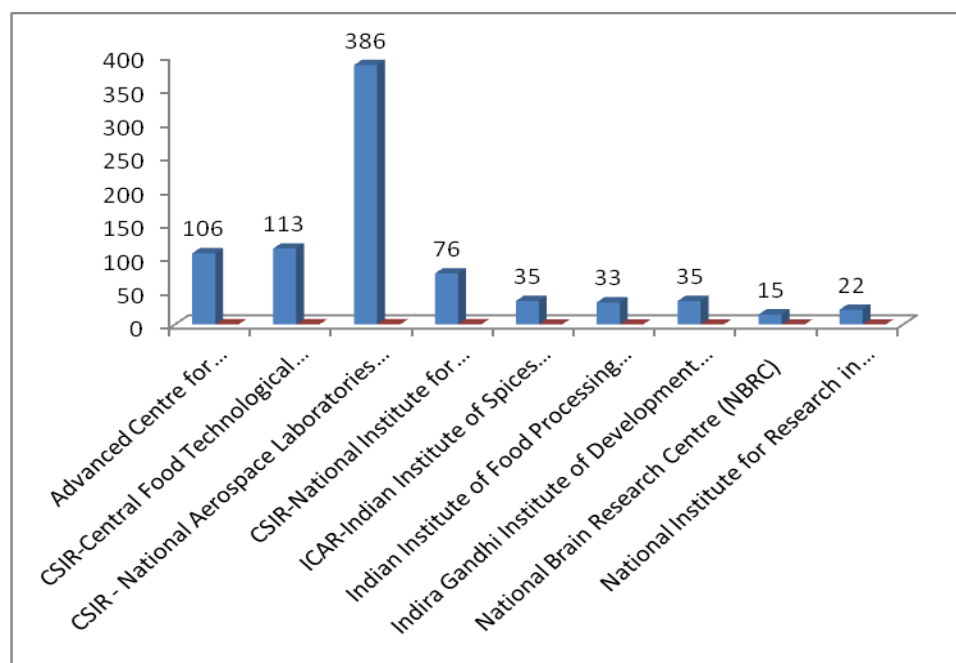


Fig.1: Demographic Representation

5.2. Scholarly Resources

Table-2 indicates the scholarly resources of individual IRINS implemented R&D organization. The analysis shows that CSIR-NIIST ranks first with 2223 (22.85%) publications followed by CSIR-NAL with 2042(21.00%) at rank second. The IIFPT is placed at last rank with only 107(1.10%) scholarly resources.

Sr. No.	R&D Organizations	Scholarly Resources	Percentage (%)	Rank
1.	ACTREC	1753	18.02%	3
2.	CSIR-CFTRI	1489	15.31%	4
3.	CSIR - NAL	2042	21.00%	2
4.	CSIR-NIIST	2223	22.85%	1
5.	ICAR-IISR	989	10.17%	5
6.	IIFPT	107	1.10%	9
7.	IGIDR	389	3.99%	7
8.	NBRC	404	4.15%	6
9.	NIRT	331	3.41%	8
Total		9727	100%	

Table-2: Scholarly Resources

5.3. Resource impact of scholarly resources

Table-3 indicates the resource impact the various scholarly resources of individual IRINS implemented R&D organization. The analysis shows that CSIR-NIIST has highest Scopus citation 39180 (26.96%) and CrossRef citation 43238 (32.60%) followed by CSIR-NAL with 36583 (25.18%) Scopus Citation and 29591 (22.31%) CrossRef citation. It has been observed that IIFPT has the lowest Scopus 10 (0.01%) and Cross Ref citation 0(0.00%).

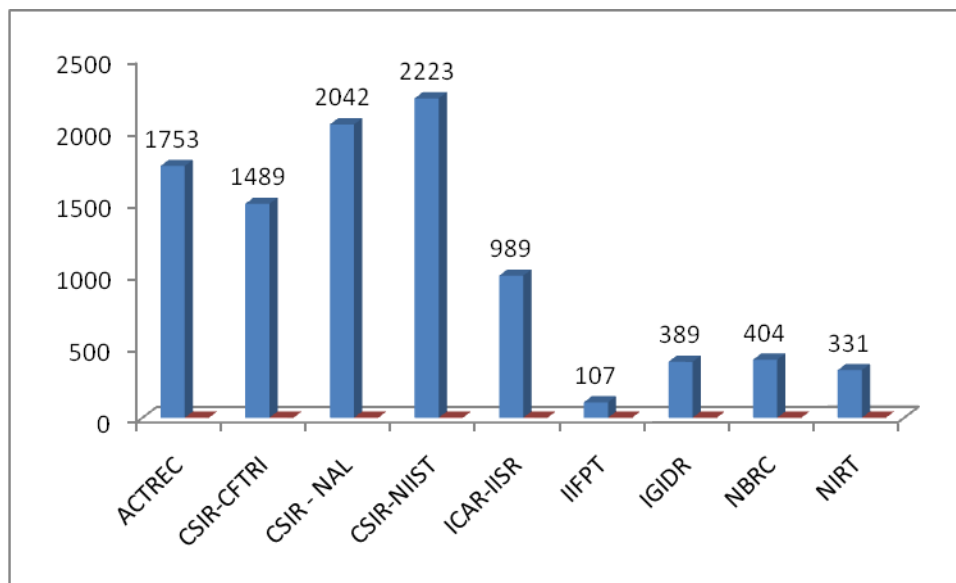


Fig.-2: Scholarly Resources

Sr. No.	R&D Organizations	Scopus Citation	Percentage (%)	CrossRef Citation	Percentage (%)	Rank
1.	ACTREC	18205	12.53%	16053	12.10%	4
2.	CSIR-CFTRI	30966	21.32%	27614	20.82%	3
3.	CSIR - NAL	36583	25.18%	29591	22.31%	2
4.	CSIR-NIIST	39180	26.96%	43238	32.60%	1
5.	ICAR-IISR	2720	1.88%	1600	1.21%	8
6.	IIFPT	10	0.01%	0	00%	9
7.	IGIDR	3311	2.27%	2503	1.89%	7
8.	NBRC	10275	7.07%	8858	6.68%	5
9.	NIRT	4050	2.78%	3167	2.39%	6
Total		145300	100%	132624	100%	

Table-3: Resource impact of scholarly resources

5.4. Types of scholarly resources

Table-4 shows the types of scholarly resources including journal's articles, conference proceedings, books/chapters or other resources of different IRINS implemented R&D organizations. The analysis shows that the CSIR-NIIST ranks first with 2223 scholarly resources

which followed by CSIR-NAL with 2042 resources. The IIFPT is placed at last with only 107 scholarly resources.

Sr. No.	R&D Organizations	Total Scholarly Resources	Journal Articles	Conference/ In Proceedings	Books / Chapters	Others	Rank
1.	ACTREC	1753	1353	55	33	312	3
2.	CSIR-CFTRI	1489	1345	05	61	78	4
3.	CSIR - NAL	2042	1524	393	46	79	2
4.	CSIR-NIIST	2223	1978	56	61	128	1
5.	ICAR-IISR	989	639	113	58	179	5
6.	IIFPT	107	82	1	1	23	9
7.	IGIDR	389	281	11	34	63	7
8.	NBRC	404	313	8	12	71	6
9.	NIRT	331	289	4	5	33	8
Total		9727	7804	646	311	966	

Table-4: Types of scholarly resources

5.5. Contribution of top department of R&D organizations and h- index

The table-5 indicates the contribution of top department of IRINS implemented R&D organizations and h- index. The analysis shows that the Clinical Research Centre, ACTREC has the highest scholarly resources 1289(38.88%) with 41 h-Index. The Division of Crop Improvement, ICAR-IISR has the second highest scholarly resources 590(17.79%) with 18 h-Index. It shows that the Cells and Molecules Department, NBRC has the highest 43 h-Index.

Sr. No.	Top Department of R&D Organizations	Scholarly Resources	Percentage (%)	h-Index	Rank
1.	Clinical Research Centre, ACTREC	1289	38.88%	41	1
2.	Division of Crop Improvement, ICAR-IISR	590	17.79%	18	2
3.	Materials Science and Technology Division, CSIR-NIIST	473	14.27%	20	3
4.	IGIDR Department	380	11.46%	24	4
5.	Cells and Molecules, NBRC	217	6.55%	43	5
6.	Structural Technologies Division, CSIR - NAL	150	4.52%	21	6
7.	Department of Biotechnology, CSIR-CFTRI	127	3.83%	24	7
8.	Department of Clinical Research, NIRT	89	2.69%	15	8
9.	Department of Academics and Human Resource Development, IIFPT	00	00%	00	9
Total		3315	100%		

Table-5: Contribution of top department of R&D organizations and h- index

5.6. Contribution of top scientist/faculty of R&D organizations and h- index

The table-6 indicates the contribution of top scientist/faculty of IRINS implemented R&D organizations and h- index. The analysis shows that Dr. Harish Barshilia, CSIR – NAL has the highest 193(17.53%) scholarly publications with 5110 (22.98%) citations, 4455(23.44%) cross ref citations and 43 h-Index. Dr. Suresh C.H., CSIR-NIIST is placed at second rank with 191(17.34%) scholarly publications, 2906(13.07%) citation, 2648(13.93%) cross ref citations and 28 h-Index.

Sr. No.	Top scientist/faculty of R&D organizations	Scholarly Resources	Citation	CrossRef Citation	h-Index	Rank
1.	Dr. Harish Barshilia, CSIR - NAL	193 (17.53%)	5110 (22.98%)	4455 (23.44%)	43	1
2.	Dr. Suresh C.H., CSIR-NIIST	191 (17.34%)	2906 (13.07%)	2648 (13.93%)	28	2
3.	Dr. Sudeep Gupta, ACTREC	155 (14.08%)	1962 (8.82%)	1595 (8.39%)	23	3
4.	Dr. Navin Kumar Rastogi, CSIR-CFTRI	121 (10.99%)	5087 (22.88%)	4573 (24.06%)	43	4
5.	Dr. Anirban Basu, NBRC	112 (10.17%)	4018 (18.07%)	3362 (17.69%)	38	5
6.	Dr. Srikanth Prasad Tripathy, NIRT	105 (9.53%)	2502 (11.25%)	1958 (10.30%)	25	6
7.	Dr. Nirmal Babu K, ICAR-IISR	92 (8.35%)	403 (1.81%)	206 (1.08%)	11	7
8.	Dr. J.A. Moses, IIFPT	87 (7.90%)	89 (0.40%)	84 (0.44%)	1	8
9.	Dr. Ashima Goyal, IGIDR	45 (4.08%)	155 (0.69%)	121 (0.64%)	7	9
Total		1101	22232	19002		

Table-6: Contribution of top scientist/faculty of R&D organizations and h- index

6. Findings

The major findings of the study are as given below:-

- CSIR - National Aerospace Laboratories (CSIR-NAL) has the highest scientist/faculty members 386 (47.02%);
- CSIR-NIIST has highest Scopus citation 39180 (26.96%) and CrossRef citation 43238 (32.60%);
- CSIR-NIIST ranks first with 2223 scholarly resources;
- Clinical Research Centre, ACTREC has the highest scholarly resources 1289(38.88%) with 41 h-Index;

- Dr. Harish Barshilia, CSIR – NAL has the highest 193(17.53%) scholarly publications with 5110 (22.98%) citations, 4455(23.44%) cross ref citations and 43 h-Index.

7. Conclusion

The Indian Research Information Network System (IRINS) could effectively be used as a platform to make the data visible at public domain and more discoverable. IRINS can also be used for various research data analysis, project proposals and for policy decisions making.

In India, the IRINS is currently available as ‘Software as Service (SAS)’ to all the academic institutions and most of the R&D organizations. Intervention of Ministry of Education, Government of India and University Grants Commission (UGC) may require for full-fledged implementation across all the centrally funded R&D organizations towards greater visibility to research output and impact in all major subject domains and subject expertise.

References:

1. <https://irins.org/irins/> (Retrieved on 11th, November, 2020).
2. Kannan, P., Kimidi, S., & Arora, J. (2018). Federated Research Profile Management for Researchers in India: Indian Research Information Network System. *INFLIBNET Newsletter*, 25(3), pp.14-21.
3. Balasubramani, J., Anbalagan, M., & Palavesam, K. (2019). An analysis of Indian Research Information Network System (IRINS). *Library Philosophy and Practice (e-journal)*. <https://digitalcommons.unl.edu/libphilprac/2990>
4. Kannan, P., Kimidi, S., & Arora, J. (2018). Federated Research Profile Management for Researchers in India: Indian Research Information Network System. *INFLIBNET Newsletter*, 25(3), pp.14-21.
5. Joachim, S., Hélène, P., & Violane, R. (2017). Research Data in Current Research Information Systems. *Procedia Computer Science*, 106, pp. 305-320.
6. Javed, M., Payette, S., Blake, J., & Worrall, T. (2016). VIZ-VIVO: Towards Visualizations-driven Linked Data Navigation. *VOILA@ISWC*.
7. Joint, N. (2008), Current research information systems, open access repositories and libraries: ANTAEUS, *Library Review*, 57(8), pp. 570-575.
8. Devare, M., Rikert, J.C., McCue, J., Chiang, K., Lowe, B., & Caruso, B. (2007). VIVO: Connecting People, Creating a Virtual Life Sciences Community. *D-Lib Magazine*, 13 (7/8). <http://www.dlib.org/dlib/july07/devare/07devare.html>