A Study of Institutional Contributions to Computer Science Research in India

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ABSTRACT

The study is based on 1408 scientific papers published in international computer science journals between 1991 and 2000 contributed by Indian scientists. We examined the institutional distribution of studies. Literature dissemination is a two-way process governed by the number of institutions providing the literature and the number of journals publishing that material. However, essential component of those contributions, as in keeping with the analysis, comes from some institutions, like IITs (positioned at Kharagpur, Kanpur, Delhi, Chennai and Mumbai), Indian Statistical Institute at Kolkata and Indian Institute of Science (IISc) at Bangalore. They have a look at indicates that India has capability of sporting out pc technological know-how studies of worldwide standard

INTRODUCTION

The overall performance of an organization can usually be measured thru the variety of studies papers within side the peer-reviewed journals emanating from that organization. The organization, that's producing an awesome variety of studies papers in a specific field, can be taken into consideration as a frontier organization in that field. Four stages of establishments behaviour laptop technology studies in India: (I) Institutions of countrywide importance, e.g. IITs, Isis and ISI; (ii) Academic establishments, like, universities, colleges, deemed universities (iii) Government-backed R&D establishments and (iv) Industry-backed R&D laboratories The establishments belonging to first levels are contributing maximum studies papers within side the peer-reviewed journals within side the worried field. These levels of establishments are engaged in educational studies in addition to result-orientated carried out studies.

OBJECTIVES

The objectives of the study are to find out:

• Most productive research institutions

• Rank of the institutions in this field

SCOPE

This study covers 1408 research articles published in Science Citation Index (SCI) - covered international journals in computer science from 1991 to 2000. Only research papers have been considered for the study. SCI covers about 150 to 200 journals in the field of computer science, Which varies year to year? SCI covers most significant research

METHODOLOGY

Data concerning 1991 to 2000 became downloaded from the once a year CD variations of the Science Citations Index (SCI). The seek from SCI became completed thru Boolean looking procedure that is defined below: ♦ at first, cope with seek became done via way of means of the time period India. (Set 1) ♦ Then the searches via way of means of the magazine names had been done. For example, Fuzzy Sets and Systems. ♦ Then all of the magazine names had been blended via way of means of the operator OR. Limited magazine names may be taken for an unmarried set. For example, Fuzzy Sets and Systems OR Computers & Mathematics OR ……. (Set 2) ♦ Then cope with and magazine names were blended into a brand new set thru the operator AND, like, Set 1 AND Set 2.In this way all the research papers contributed by Indian scientists in the last ten years were downloaded and saved in custom format with the following fields: authors, title, source, doc-type, cited reference and address, in comma delimited form and saved in report files. Then data was converted into database files in MS-FoxPro. For extracting data, a number of FoxPro programmes were written and executed to get the summarised and cumulative data. The data were next rearranged from MS-FoxPro database files into MS-Excel worksheets to analyse, to compare and to collate the results.

RESULTS AND ANALYSIS

In the prevailing observe its miles located that some of establishments had been worried in pc technology studies in India for the duration of Nineteen Nineties. Table 1 indicates the pinnacle fifteen establishments from 1991 to 1995. Table 2

indicates the pinnacle fifteen establishments from 1996 to 2000. In the primary 1/2 of of Nineteen Nineties Indian Institute of Science secured first rank and contributed 11.96% of overall studies output. Indian Statistical Institute and Indian Institute of Technology, Kharagpur secured 2d rank and every one contributed 11.64% of overall studies output. University of Delhi secured 0.33 rank contributing 7.81% of overall studies output. Other establishments according with their descending order of rank are IIT Madras, IIT Delhi, IIT Kanpur, University of Calcutta, IIT Bombay, Visva Bharati, Jadavpur University, Harcourt Butler Technological Institute (HBTI) Kanpur, TIFR, Tripura University and Banaras Hindu University. These fifteen establishments contributed 75.1% of overall studies output.

Table 1: Top Fifteen Institutions in 1991 to 1995

Sl. No.	Rank	Univ./ Institute	1991	1992	1993	1994	1995	Total	%
1	1	IISc	7	14	12	20	22	75	11.96
2	2	ISI	3	22	8	21	19	73	11.64
3	2	IIT Kharagpur	6	25	14	13	15	73	11.64
4	3	Univ. of Delhi	7	19	11	7	5	49	7.81
5	4	IIT Madras	6	5	3	10	17	41	6.54
6	5	IIT Delhi	3	7	6	6	5	27	4.31
7	6	IIT Kanpur	4	4	5	5	4	22	3.51
8	6	Univ. of Calcutta	7	5	4	3	3	22	3.51
9	7	IIT Bombay	3	4	4	4	4	19	3.03
10	8	Visva Bharati	1	6	5	4	2	18	2.87
11	9	Jadavpur Univ.	3	3	2	2	3	13	2.07
12	10	HBTI Kanpur	4	3	1	3	0	11	1.75
13	11	TIFR	1	0	2	1	6	10	1.59
14	11	Tripura Univ.	1	4	5	0	0	10	1.59
15	12	BHU	1	1	0	3	3	8	1.28

Table 2: Top Fifteen Institutions in 1996 to 2000

Sl. No.	Rank	Univ./ Institute	1996	1997	1998	1999	2000	Total	%
1	1	ISI	16	17	30	15	18	96	12.29
2	2	IISc	13	13	13	19	25	83	10.63
3	3	IIT Kharagpur	10	15	17	14	16	72	9.22
4	4	IIT Madras	13	13	8	8	17	59	7.55
5	5	IIT Delhi	8	12	10	10	9	49	6.27
6	6	IIT Bombay	6	6	14	11	8	45	5.76
7	7	IIT Kanpur	9	5	10	4	13	41	5.25
8	8	IMSc	3	7	1	2	4	17	2.18
9	9	TIFR	2	5	3	1	5	16	2.05
10	10	Univ. of Delhi	3	1	4	3	4	15	1.92
11	11	Jadavpur Univ.	3	2	5	1	3	14	1.79
12	12	Univ. of Calcutta	2	2	2	3	1	10	1.28
13	13	Visva Bharati	3	1	0	3	1	8	1.02
14	13	JNU	2	2	2	2	0	8	1.02
15	14	BHU	0	0	4	0	3	7	0.90

Table 2 shows the top fifteen institutions from 1995 to 2000. In the second half of 1990s Indian Statistical Institute secured first rank and contributed 12.29% of total research output. Indian Institute of Science secured second rank and contributed 10.63% of total research output. Indian Institute of Technology, Kharagpur secured third rank and contributed 9.22% of total research output. Other institutions in accordance with their descending order of rank are IIT Madras, IIT Delhi, IIT Bombay, IIT Kanpur, Institute of Mathematical Sciences (IMSc), TIFR, University of Delhi, Jabalpur University, University of Calcutta, Visa Bahrain, Jawaharlal Nehru University (JNU) and Banaras Hindu University. These fifteen institutions contributed 69.13% of total research output.

Table 3: Top Twenty Institutions in 1991 to 2000

Sl. No.	Rank	Univ./ Institute	Total	%
1	1	ISI	169	12.00
2	2	IISc	158	11.22
3	3	IIT Kharagpur	145	10.30
4	4	IIT Madras	100	7.10
5	5	IIT Delhi	76	5.40
6	6	Univ. of Delhi	64	4.55
7	6	IIT Bombay	64	4.55
8	7	IIT Kanpur	63	4.47
9	8	Univ. of Calcutta	32	2.27
10	9	Jadavpur Univ.	27	1.92
11	10	Visva Bharati	26	1.85
12	10	TIFR	26	1.85
13	11	IMSc	24	1.70
14	12	BHU	15	1.07
15	13	IICT	12	0.85
16	13	JNU	12	0.85
17	14	HBTI	11	0.78
18	14	Tripura Univ.	11	0.78
19	15	Madras Univ.	9	0.64
20	15	BE College	9	0.64

Table 1 and Table 2 collectively show the progress of research and the changing rank of institutions. Institutions like Indian Statistical Institute, IIT Bombay, Institute of Mathematical Sciences (Miss), JNU, TIFR, etc. improved their rank, whereas institutions like, Indian Institute of Science, IIT Kharagpur, University of Delhi, University of Calcutta, etc. declined in their rank over the second half of last decade as compared to the first half. The top fifteen institutions have less percentage of research output in the second half of last decade as compared to the first half. Table 3 shows the top twenty institutions during the last decade. It shows the cumulative total and its percentage over the total research output. Table 3 depicts that Indian Statistical Institute secured first rank and contributed 12% of total research output.

Indian Institute of Science secured second rank and contributed 11.22% of total research output. Indian Institute of Technology, Kharagpur secured third rank and contributed 10.3% of total research output. Other institutions in the list of top twenty in accordance with their descending order of rank are IIT Madras, IIT Delhi, University of Delhi, IIT Bombay, IIT Kanpur, University of Calcutta, Jadavpur University, Visva Bharati, Tata Institute of Fundamental Research, Institute of Mathematical Sciences Chennai, Banaras Hindu University, Indian Institute of Chemical Technology, Hyderabad, Jawaharlal Nehru University, HBTI Kanpur, Tripura University, Madras University and BE College, Howrah. These twenty institutions contributed 74.79% of the total research output. Two institutions, IICT and BE College, which did not find place in the top fifteen institutions (Table 1 and Table 2), but found their ranks in the top twenty institutions (Table 3). Table 1 to Table 3 show the top ranked institutions based on their research works published in various international journals. Mostly either first-tier institutions or second tier institutions have secured ranks in these Tables. Third-tier and fourth-tier institutions, except IMSc, TIFR and IICT, do not figure here. However, this does not mean that they carry out less research works. Mostly, they are engaged in result-oriented research which is applied in nature and their research output is not in the form of publication of research articles in the international journals, rather in the forms of patent, software-copyright, standard, etc.

CONCLUSION

India is growing its technological abilities in CS and is collaborating in CS studies programmes for presenting indigenous answers to diverse thrust regions except different regions. Since independence India has installation a sizable S&T infrastructure within side the U. S. A. for human useful resource improvement in addition to for R&D sports closer to reaching technological self-support. This consists of putting in of a sequence of countrywide laboratories beneathneath diverse valuable authority's bodies like, MIT (in advance called DOE), CSIR, DRDO, ISRO, DoS, DAE, DST, etc. Indian universities, numbering almost four hundred together with the R&D organizations constantly cater to the medical and technological want of the nation. To conclude, it may be stated that Indian CS studies has ability to supply trail-blazing improvements of global standards. The enhancement of country wide abilities via home and global collaboration through the pinnacle ranked establishments has been discovered on this study. The establishments, like IIITs, which can be mounted very lately to offer brand new studies centres in addition to educational excellence, are predicted to beautify India's R&D abilities in CS and statistics technology. So far, Indian CS studies is preserving tempo with global fashionable and it holds a very good and mounted function in evaluation with different growing countries.

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