Librametric Mapping of the '*Libraries, Archives & Information Technology*' R & D during 1970-1990

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Abstract

The bibliography: 'Libraries, Archives & Information Technology' consisting 5802 publications during the period 1970-1990 encompassing (i) literature originated and published in India; (ii) literature published by Indians in foreign countries; (iii) literature published by foreign professionals on India; and (iv) literature of general interest on South Asia and developing countries was quantified domainwise. Sub-domain-wise productivity variations were illustrated. Prominent 15 authors were identified by documenting their contributions to various domains, and collaboration sociometry has been depicted. Most productive 15 journals were identified, out of the 327 journals having 3533 articles, and domainwise contributions were tabulated. Growth was visualized for number of articles per year in the highly productive five journals.

Introduction

The term 'Librametry' was coined by S. R. Ranganathan on 18th September 1948 while giving remarks on the speech by Prof. Bernal, who had referred to library statistics in his lecture at the Leamington Spa, annual conference of Aslib (Aslib, 1949). The present impulse of Librametric (Ranganathan, 1969; and Subba Rao, 1993) episode restricted to the publications output phenomena only is a very narrow kaleidoscopic view indeed. In practice, any given historical account must be limited by its choice of coverage, technique of analysis and objectives. Effective use of already available knowledge is as valuable as creation of new knowledge. Hence, present effort is to highlight it through librametric mapping and stimulate the target groups to open up and use the treasure trove of past experiences.

Materials and Methods

Source used for the purpose is the '*Libraries, Archives & Information Technology: An Annotated Bibliography 1970-1990* Vol. 11 & 12, Part 1 & 2 of the series: *Handbook of Libraries, Archives & Information Centres in India*' (Gupta, 1991; and Gupta, 1992). The bibliography encompasses: (i) literature originated and published in India; (ii) literature published by Indians in foreign countries; (iii) literature published by foreign professionals on India; and (iv) literature of general interest on South Asia and developing countries.

Normal count procedure (Kalyane and Vidyasagar Rao, 1995) is used throughout the collection of data. Focus of the present paper is on domains and sub-domains highlighting contributions by prominent personalities and journals.

Results

One can easily follow the self-explanatory Table 1. Out of the total 5802 documents, publications in the domain: 'Types of Libraries' were 682 (11.75 %) followed by 'Classification' 617 (10.63 %), and 'Archives' 539 (9.29 %). Overall Collaboration Coefficient (CC) was low (0.20) as multi-authored contributions were 1204 (20.75 %) of the total documents.

Table 1: Domain-wise documents in '*Libraries, Archives & Information Technology*' during 1970-1990

Code	Domains	N	%	MA	MA/N
a	Types of Libraries	682	11.75	105	0.15
b	Classification	617	10.63	166	0.27
c	Archives	539	9.29	56	0.10
d	Library and Information Science Education & Training	462	7.96	82	0.18
e	Scientometrics / Bibliometrics	403	6.95	162	0.40
f	Librarianship	357	6.15	63	0.18
g	Reference and Information Services	258	4.45	62	0.24
h	Translation	274	4.72	51	0.19
i	Biography of Librarians	256	4.41	30	0.12
j	Acquisition & Book Selection	191	3.29	43	0.23
k	Cataloguing	177	3.05	29	0.16
l	Information & Reference Sources	161	2.77	35	0.22
m	Library and Information Management	148	2.55	26	0.18
n	Information Seeking Behaviour, Needs and Requirements	137	2.36	41	0.30
o	Collection Development	126	2.17	22	0.17
p	Bibliographical Control	120	2.07	25	0.21
q	User Education	114	1.96	24	0.21
r	User Studies and Surveys	105	1.81	34	0.32
s	Resource Sharing	91	1.57	25	0.27
t	Staff	80	1.38	24	0.30
u	Professional Associations	76	1.31	14	0.18
v	Library Legislation	65	1.12	9	0.14
w	Library Buildings, Furniture and Equipment	62	1.07	9	0.15
x	Standardization of Library & Information Activities	62	1.07	13	0.21
y	Librarianship as a Profession	46	0.79	6	0.13
z	Document Delivery & Universal Availability of Publications	40	0.69	17	0.43
za	Library Literature	38	0.65	6	0.16
zb	Mutilation, Losses and Weeding of Materials	34	0.59	8	0.24
zc	Stock Verification	25	0.43	2	0.08
zd	Circulation System	23	0.4	4	0.17
ze	Interlibrary Loan	10	0.17	3	0.30
zf	Exchange of Publications	9	0.16	2	0.22
zg	Periodicals Management	9	0.16	5	0.56
zh	Maintenance & Storage	5	0.09	1	0.20
a-zh	Total	5802	100	1204	0.21

(N = No. of documents; MA = Multi-Authored documents; and MA/N = Collaboration Coefficient)

Documents in the domain 'Types of Libraries' consisted of Special Libraries (222), Public Libraries (126), University Libraries (95), National Libraries (84), College Libraries (58), School Libraries (56), Academic Libraries (27), Government Libraries (10), and Technical Libraries (4), which is presented in Figure 1 as stacked bars of single-authored documents and multi-authored documents. The lowest CC (0.04) was in the sub-domain Academic Libraries and highest CC (0.25) was in Technical Libraries. Overall CC for 'Types of Libraries' was 0.15.

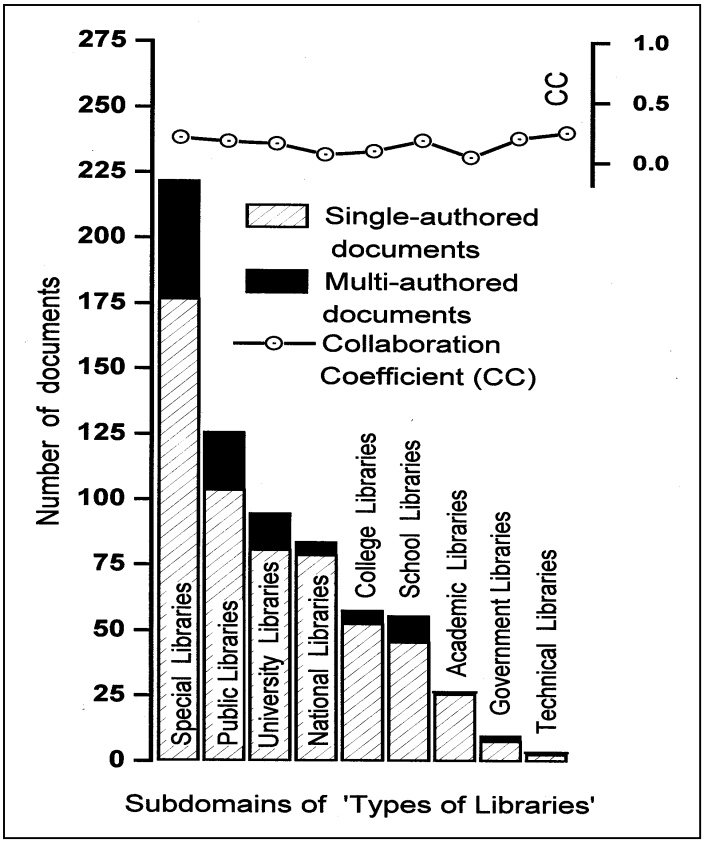

Fig. 1: Number of documents in various sub-domains of 'Types of Libraries' (1970-1990)

Documents in the domain 'Classification' consisted of On Universal Systems (255), Structure Construction of Classification System & Thesaurus (149), Classing & Indexing (91), Theoretical Foundation (45), Text Books (13), Classification of Special Subjects (12), Classification and Language (11), Book Number (10), On Special Object CS (Taxonomy) (9), Applied Classing & Indexing (8), Classification Environment (8), Form Division (3), and On Other Universal Systems (3) which is presented in Figure 2 as stacked bars of single-authored documents and multi-authored documents. There was no collaboration activity in On Other Universal Systems. The highest CC (0.78) was in On Special Object CS (Taxonomy). Overall CC for 'Classification' was 0.27.

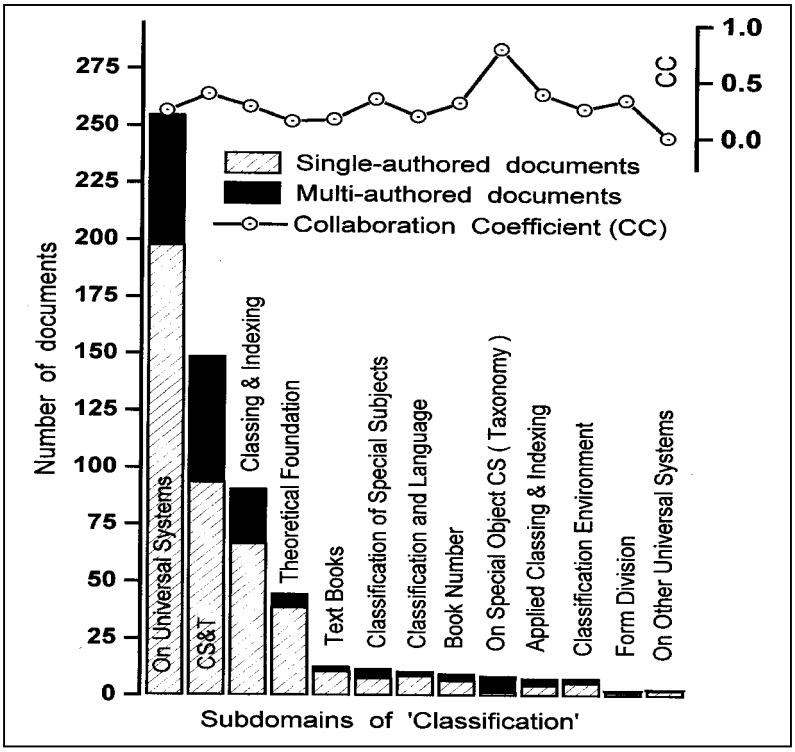

Fig. 2: Number of documents in various sub-domains of 'Classification' (1970-1990)

Documents in the domain 'Archives' consisted of Source of History of India (211), Conservation & Preservation (114), Private Papers and National Register (52), Regional & State Archives (35), Source Material for India in Foreign Depositories/Archives (24), Foreign Archives (19), Manuscripts (18), Record Management (17), Archives: Ancient & Administration (16), Subject Archives (13), General Aspects (11), Maps & Cartography (5), National Archives of India (4), Business Archives (3), Departmental and Institutional Archives (3), Ecclesiastical Archives (3), Archives: Ancient & Medieval (2), and Automation in Archives (2) which is presented in Figure 3 as stacked bars of single-authored documents and multi-authored documents. There was no collaboration activity in the following sub-domains: Source Material for India in Foreign Depositories/Archives, Archives: Ancient & Administration, Maps & Cartography, Business Archives, Departmental and Institutional Archives, Ecclesiastical Archives, Archives: Ancient & Medieval, and Automation in Archives. Highest CC (0.54) was in Subject Archives. Overall CC for 'Archives' was 0.10.

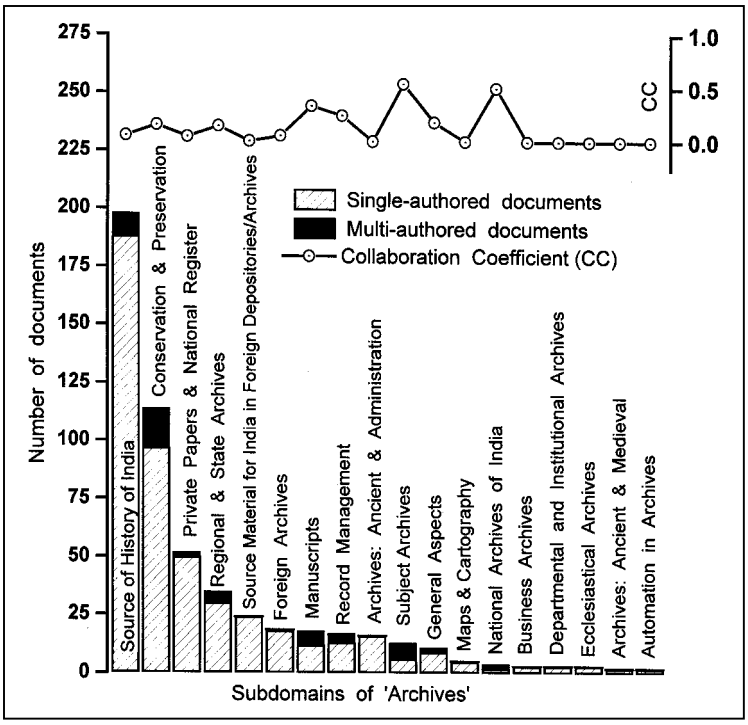

Fig. 3: Number of documents in various sub-domains of 'Archives' (1970-1990)

Documents in the domain 'Librarianship' consisted of General Librarianship (192), Documentation & Information Activities (43), Library & Adult Education & Neo-Literacy (23), New Education Policy & Libraries (21), Five Laws of Library Science (14), Directories (10), Libraries & Community (9), Technical Assistance (9), Comparative Librarianship (7), Dictionaries (7), Library & Future (6), Library Communication (5), Library Statistics & Surveys (4), Promotional Bodies (4), and Library & Society (3) which is presented in Figure 4 as stacked bars of single-authored documents and multi-authored documents. There was no collaboration activity in the following sub-domains: Comparative Librarianship, Library & Future, Library Communication, and Library & Society. Highest CC (0.50) was in Directories. Overall CC for 'Librarianship' was 0.17.

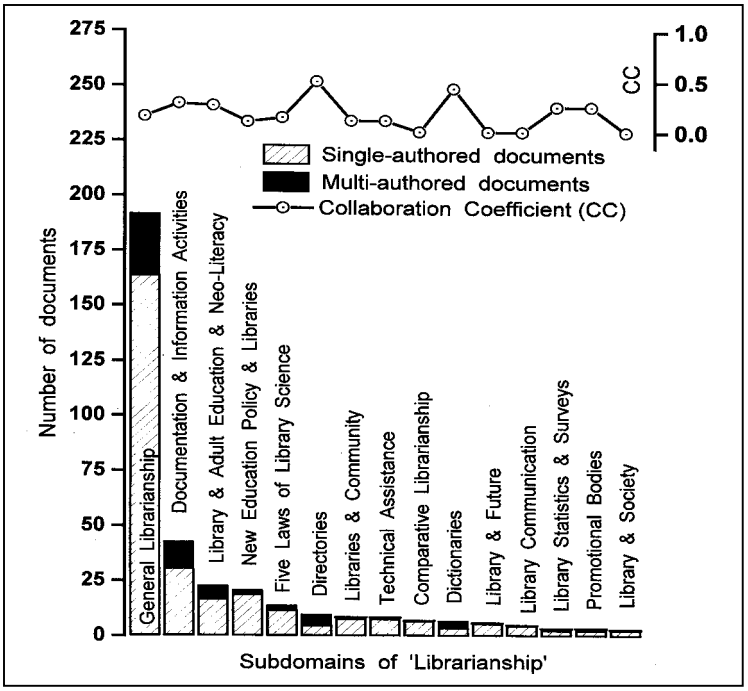

Fig. 4: Number of documents in various sub-domains of 'Librarianship' (1970-1990)

The variations in the mean number of documents of various sub-domains in each of the domains as indicated in Figure 5 were: Types of Libraries (75.78±2.60), Classification (47.46±3.05), Archives (31.71±2.32), Library and Information Science Education & Training (16.50±0.95), Librarianship (23.80±2.52), Reference & Information Services (64.50±1.21), Biography of Librarians (4.27±0.89), Acquisition & Book Selection (14.69±1.36), Cataloguing (7.38±0.50), Information & Reference Sources (7.32±0.51), Collection Development (7.41±0.78), Bibliographical Control (8.57±1.25), Staff (8.00±0.91), Professional Associations (12.67±1.66), Librarianship as a Profession (15.33±2.01), and Library Literature (9.50±1.57).

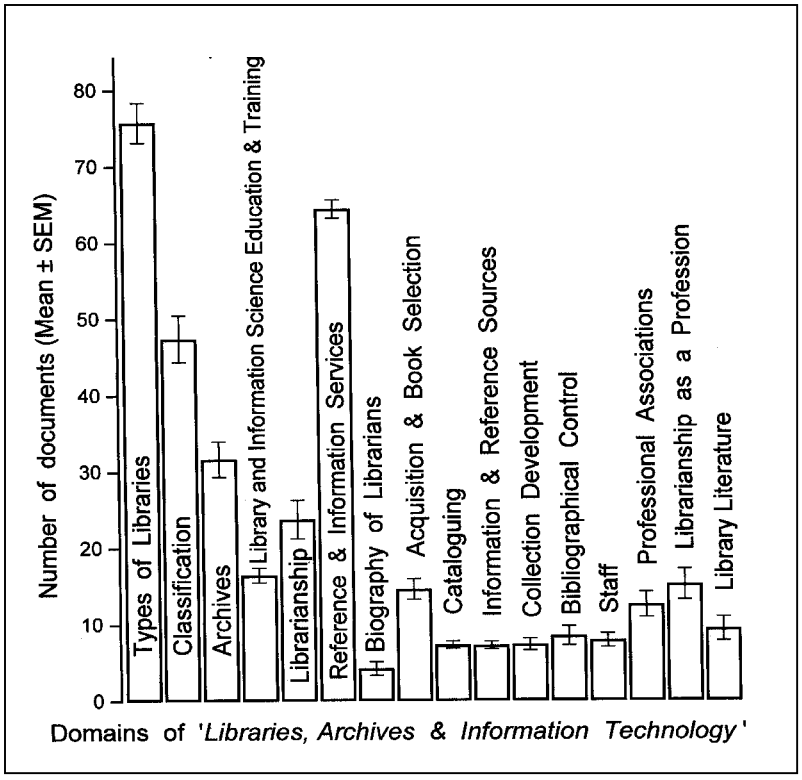

Fig. 5: Variation in number of documents (Mean ± Standard Error of Means) in various sub-domains of each domain in '*Libraries, Archives & Information Technology* ' (1970-1990)

Biography literature on librarians included following number of documents: S. R. Ranganathan (107), P.N. Kaula (33), N. K. Goil (14), Melvil Dewey (10), Sant Ram Bhatia (7), Jagdish S. Sharma (7) General who's who (6), Helmut Arntz (3) and S. Bashiruddin (3). There were only two documents on each of the following personalities : G. L. Bhatkal, Charles Amni Cutter, Harinath De, D. R. Kalia, P. Kirkegaard, P. B. Mangla, D. N. Marshal, A. I. Mikhailov, Motilal, B. I. Palmer, J. H. Shera, S. N. Srivastava, C. P. Shukla, L. Venkataramanayya, and C. G. Viswanathan. There was only one document on each of the following personalities: B. Anderson, K. M. Asadullah, G. C. Bansal, John Baskerville, J. D. Brown, H. C. Campbell, William Carey, Andrew Carnegie, James B. Child, Benjamin Custer, S. Dasgupta, B. K. Datta, D. J. Foskett, B. Guha, B. S. Gujrati, Thomas James, Allen Kent, B. S. Kesavan, Girja Kumar, Herald Lancour, P. Lazar, L. R. McColvin, B. Mishra, Lewis Mumford, Janardhanam Naidu, Vishwanath Rajwade, S. Roy, S. S. Saith, Nasser Sharif, Ralph R. Shaw, A. P. Shrivastava, M. Subramanyam, S. C. Sutton, G. L. Trehan, B. C. Vickery, and Justin Winsor. Total no. of biographical documents were 256, out of which 226 were single-authored whereas 30 documents were multi-authored. Hence, very low collaboration coefficient (0.12) was observed for the literature on Biography of Librarians during 1970-1990.

Highest number of documents (19) of biographical literature on S. R. Ranganathan found in each of the years 1973 and 1986, which were of either homage to him (due to his death on 27th Sept., 1972) or appreciation of his thoughts and deeds. These articles on S. R. Ranganathan were in: journals (77), books (28), and encyclopedia (2).

Divergent Thinking Creativity Ratio (DTCR) is defined as the ratio of the number of domains to which an individual contributed to the total number of domains in the discipline (Kalyane and Kalyane, 1996). There were 34 domains considered for the discipline (Table 1). Highest DTCR was observed (Table 2) for Girja Kumar (0.53) followed I.V. Malhan (0.47), Krishan Kumar (0.41), B. Guha (0.41), P. N. Kaula (0.38), M. A. Gopinath (0.35), P. S. G. Kumar (0.35), Sewa Singh (0.35), M. P. Satija (0.32), M. Bavakutty (0.32), S. R. Ranganathan (0.29), P. B. Mangla (0.26), A. Neelameghan (0.24), Ganesh Bhattacharyya (0.24), and M. Mahapatra (0.21).

Table 2: Fifteen prominent authors and number of documents to their credit in various domains (1970-1990)

Code*	AN	MAG	PNK	GB	MPS	KK	GK	BG	SRR	PSGK	IVM	PBM	MM	MB	SS
a			6		1	5	7		4	3	6	7		13	2
b	41	40	8	23	24	8		5	11	7	1		10	3	1
d	17	8	9	6		6	2	2		10	5	16	5	1	2
e		1	1				1	3			1		7		2
f		1	10	4	1		3	4	3	7	1	3		1	2
g	1	1	2		1	2		3		1	8	1			6
h								5							
i	1	4	17	1	8	1	2	1	10	5	3	1			
j		1	1				3				1			1	
k	1		5	12		7	2	10	7	1	1	1			
l					2						1			1	
m		1				2	4						6		
n	3	2				3	2	1					1		
o		3					3					1		1	1
p	1				4	1	1	1	1	1		1			1
q	5			1		5	6	2		1	1			2	
r		1				1	1		1				1	3	
s							1				3				
t					1	1	1		1	1	2		1	2	
u			2	1			1	2							1
v		1	1		1							3		1	
w			2				1								
x		3			2	1	1	1							
y				2					1	1					1
z		1						1							
za			2		2	1				1	1				8
zb									1		1				1
ze											1				
N	70	68	66	50	47	44	42	41	40	39	37	34	31	29	28
Domains	8	14	13	8	11	14	18	14	10	12	16	9	7	11	12
DTCR	0.24	0.41	0.38	0.24	0.32	0.41	0.53	0.41	0.29	0.35	0.47	0.26	0.21	0.32	0.35
Collabo-rators	13	15	2	3	4	7	4	7	4	5	15	3	10	1	3
MA	26	23	3	5	10	14	10	11	8	7	23	3	19	1	2
CC	0.37	0.34	0.05	0.10	0.21	0.32	0.24	0.27	0.20	0.18	0.62	0.09	0.61	0.03	0.07

(* Domain code: see Table 1; Author code: **AN**= A. Neelameghan, **MAG** = M. A. Gopinath, **PNK** = P. N. Kaula, **GB** = Ganesh Bhattacharyya, **MPS** = M. P. Satija, **KK** = Krishan Kumar, **GK** = Girja Kumar, **BG** = B. Guha, **SRR** = S. R. Ranganathan, **PSGK** = P.S.G. Kumar, **IVM** = I.V. Malhan, **PBM** = P. B. Mangla, **MM** = M. Mahapatra, **MB** = M. Bavakutty, **SS** = Sewa Singh; N= No. of documents; DTCR = Divergent Thinking Creativity Ratio; MA = Multi-Authored documents; and CC = Collaboration Coefficient)

A. Neelameghan had high research productivity in 'Classification' (41 doc.) and in 'Library and Information Science Education & Training' (17 doc.); Ganesh Battacharyya had high productivity in 'Classification' (23 doc.) and in 'Cataloguing' (12 doc.); M. A. Gopinath had 40 documents to his credit in 'Classification'; and M. P. Satija had high productivity in 'Classification' (24 doc.). S. R. Ranganathan (who died on 27th Sept., 1972) had high productivity in 'Classification' (11 doc.) and 'Biography of Librarians' (10 doc.) which in itself is an evidence of his dedication even at 78-80 years old age and exemplar characteristics. P. N. Kaula had published 17 documents in 'Biography of Librarians' and 10 documents in 'Librarianship'. B. Guha had high productivity in 'Cataloguing' (10 doc.); P. B. Mangla and P. S. G. Kumar had high productivity of 16 doc. and 10 doc. respectively to their credits in 'Library and Information Science Education & Training'. M. Bavakutty had 13 documents to his credit in 'Types of Libraries'. M. Mahapatra had 10 documents to his credit in 'Classification'.

High Collaboration Coefficient (CC) were 0.62 and 0.61 observed for I. V. Malhan and M. Mahapatra having multi-authored documents 23 and 19 respectively with 15 and 10 collaborators. CC was 0.37 for A. Neelameghan with 26 multi-authored doc., and 13 collaborators followed by M. A. Gopinath (0.34) having 23 multi-authored doc. and 15 collaborators; Krishan Kumar (0.32) with 14 multi-authored doc. and 7 collaborators; B. Guha (0.27) with 11 multi-authored doc. and 7 collaborators; Girja Kumar (0.24) with 10 multi-authored doc. and 4 collaborators; M. P. Satija (0.21) with 10 multi-authored doc. and 4 collaborators; S. R. Ranganathan (0.20) with 8 multi-authored doc. and 4 collaborators. P. S. G. Kumar had 7 multi-authored documents and 5 collaborators with 0.18 collaboration coefficient. Sewa Singh had only three collaborators (I. V. Malhan, R. L. Arora and Navjot Kaur) with two multi-authored documents. M. Bavakutty had only one collaborator (A. Amuthavalli) in one publication out of his 29 publications in 11 domains. Glimpses of the collaborative sociological epigrammatic ethnography (Figs. 6-10) for tacit consent of the Indian librigiants or bibliogiants (Kalyane and Shukla, 1996) during 1970-1990, are self-evident and self-explanatory and indicative of their publishing activities.

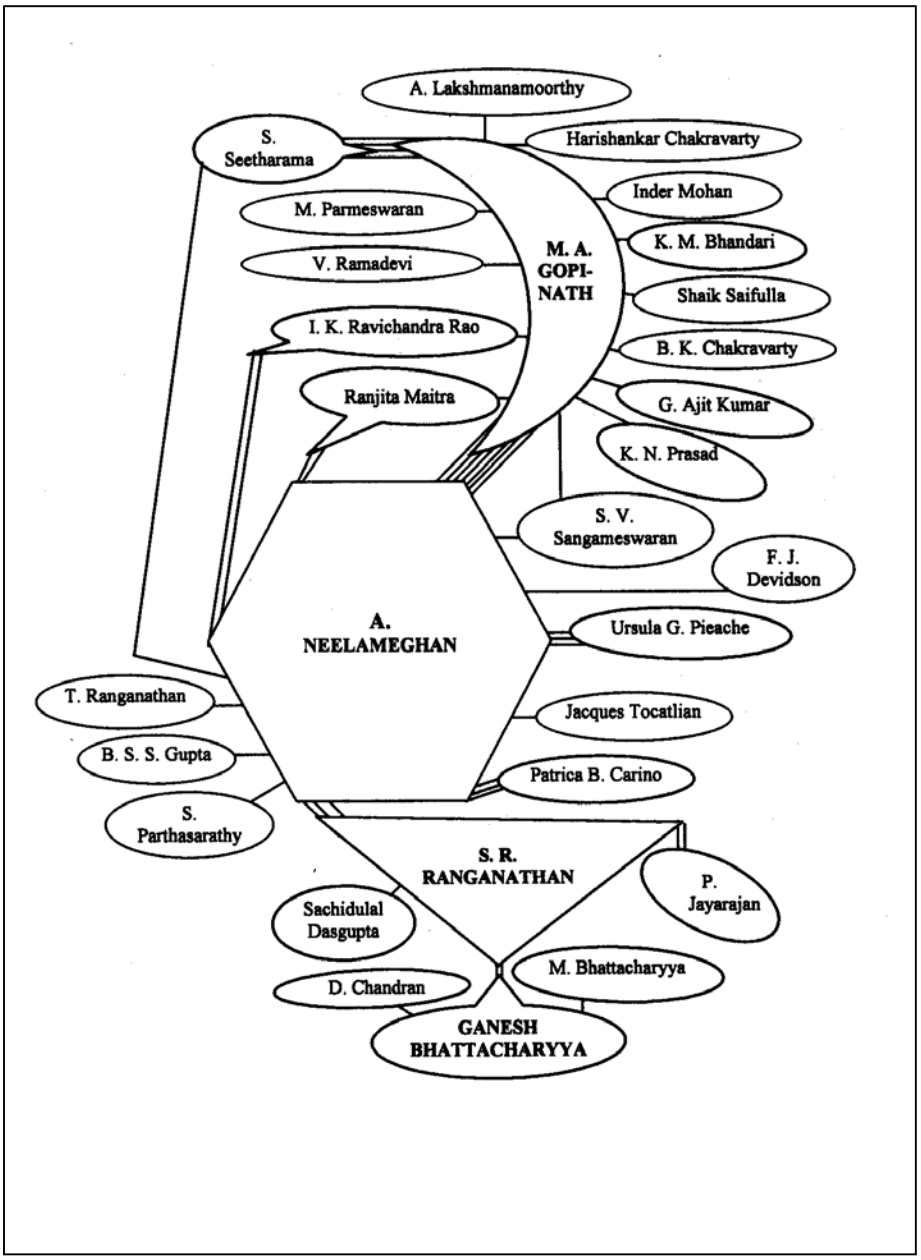

Fig. 6: Panoply of collaboration sociogram for M. A. Gopinath, A. Neelameghan, S. R. Ranganathan and Ganesh Bhattacharyya engaged in the publications productivity (1970-1990)

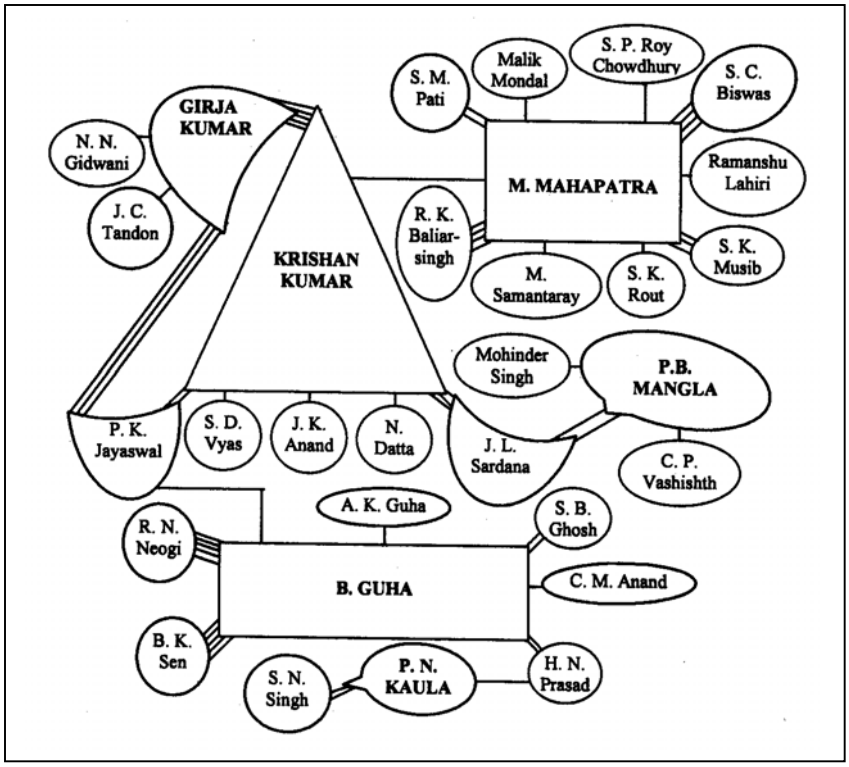

Fig. 7: Panoply of collaboration sociogram for M. Mahapatra, Krishan Kumar, Girja Kumar, P. B. Mangla, B. Guha and P. N. Kaula engaged in the publications productivity (1970-1990)

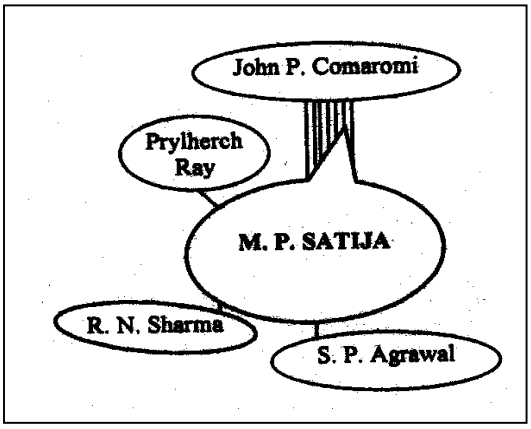

Fig. 8: Panoply of collaboration sociogram for M. P. Satija engaged in the publications productivity (1970-1990)

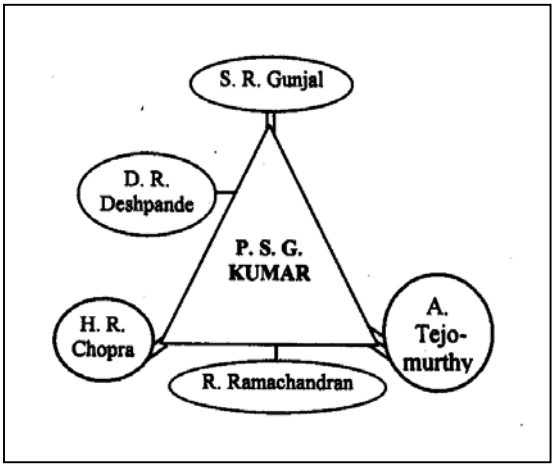

Fig. 9: Panoply of collaboration sociogram for P. S. G. Kumar engaged in the publications productivity (1970-1990)

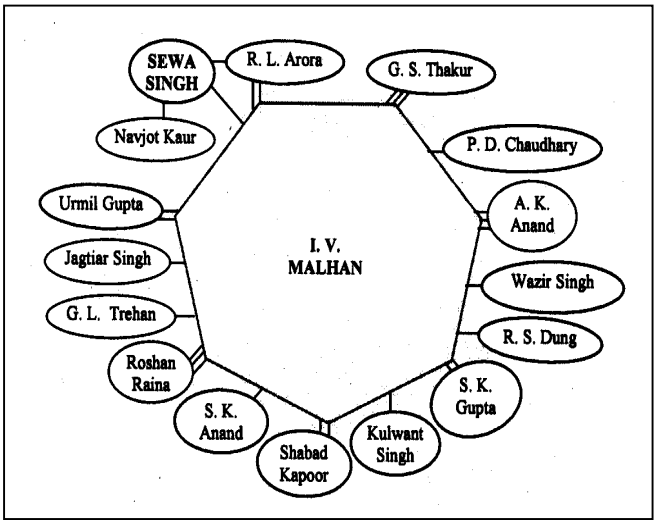

Fig. 10: Panoply of collaboration sociogram for I. V. Malhan and Sewa Singh engaged in the publications productivity (1970-1990)

The 3533 articles were in the 327 journals. Fifteen highly productive Journal sources with the number of articles were: J1) *Herald of Library Science* (412), J2) *Library Science with slant to Documentation and Information Studies* (222), J3) *Annals of Library Science and Documentation* (221), J4) *ILA Bulletin* (196), J5) *IASLIC Bulletin* (192), J6) *Library Herald* (153), J7) *International Library Movement* (132), J8) *Indian Archives* (125), J9) *Lucknow Librarian* (125), J10) *Indian Librarian* (118), J11) *Journal of Indian Scientific Translator's Association (JISTA)* (117), J12) *Journal of Library and information Science* (97), J13) *International Library Review* (72), J14) *Libra* (58), and J15) *Granthagar* (57). Domainwise productivity of the 15 journals is provided in Table 3. Growth of number of articles in the highly productive five journals is depicted in Fig. 11.

Table 3: Domainwise productivity of articles in 15 highly productive Journals

Code*	J1	J2	J3	J4	J5	J6	J7	J8	J9	J10	J11	J12	J13	J14	J15
a	**45**		14	**46**	13	**28**	**27**		17	**27**		19	11	12	13
b	**56**	**101**	**22**	6	17	16	5		5	14		8	3	5	5
c			1	1	3		3	**118**	2	2				1	2
d	19	**22**	6	9	10	15	17	3	18	8		**20**	6	12	
e	12	**21**	**67**	7	**38**	14	3		2			12	9		1
f	**28**	3	5	13	4	8	13		13	10		4	6	4	12
g	16	5	6	12	15	7	7	1	15	5		3	5	5	5
h	3	1	7	1	2	1	1		1	1	**117**			1	
I	**102**		2	5	10		3	1	3	15			1	4	4
j	8	6	8	8	9	5	3		8	2		5	4		1
k	**33**	9	12	1	6	4	3			4			5	6	
l	7	5	8	3	13	4	2		6	7		1	1		1
m	10	3	6	6	6	10	4		3	2		7	1	2	1
n	3	11	10	6	6	1	1		2	2		2	3		2
o	1	2	2	1	1		1			1			4		
p	11		2	8	3	3	2	2	3				4	1	1
q	4	10		5	7	3	3		6	3		1		1	3
r	2	11	17	8	10	10	3		2	2		3	1		1
s	6		1	7	1	2	3		2			2	3	1	
t	7	1	3	8	2	3	6		5	2		1	1		1
u	13		1	2	2	4	3		2	1					1
v	3			5	1	2	5					1		1	
w	2					4	5		2						
x	3	5	6	2		3			2	2		2	1		
y	3			4	1		4		2	1					
z	1		6	2	1	1						2			1
za	10		1			1	2					1	2		
zb	1	1	3	2	1	3	1		4	5		2		1	1
zc			1	15	1							1			
zd	2	2	1	2	5		1			1					1
ze	1	1	1		1	1				1					
zf		1	1		1										
zg		1	1		2		1								
zh				1									1	1	
Total	412	222	221	196	192	153	132	125	125	118	117	97	72	58	57

(* Domain Code see Table 1 and Journal Code see Text)

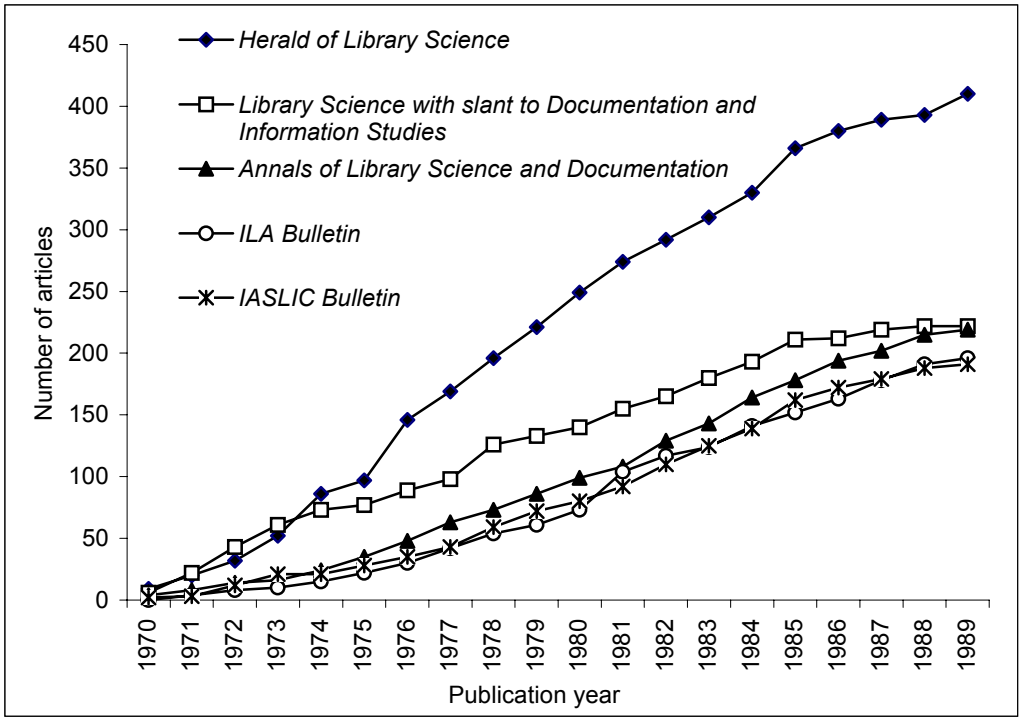

Fig. 11: Growth of number of articles in the top five highly productive journals

Conclusion

The 'Libraries, Archives & Information Technology' literature produced during 1970-1990 indicated concerted efforts in the following domains: Types of Libraries, Classification, Archives, and Librarianship. We could identify 15 leading personalities and their collaborators. Domainwise productivity of top 15 journals is indicative of the advances in each domain. Quinquennial or decade-wise exercises similar to the present one are essential for comprehensive perception of the R&D activities.

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