

# A Brief Study of Optimization Strategies for Operation Site Allocation Plans for Distributed Queries

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## ABSTRACT

Query optimization was and remains a dominant subject area in the field of centralized and distributed database system. The objective of query optimization is to reduce to minimize the execution time or usage of system resource need to complete the query [1][2]. As per the statement Sharma query is defined as a way for accomplishing distinct database operations viz. selection, insertion, alteration, sorting, filtering and deletion[3]. The unprecedented rise in the database industry has created a momentous volume of data which is normally distributed over different sites. The growth of IT industry and need of data mining has changed the shape and complexity of distributed queries. Nowadays, the queries are becoming more complex and data intensive. The structure of distributed database and the obligation of an enterprise are the major reasons for the design of large and complex distributed queries [3][4].

In the last decades, several authors have tried to optimize both OLTP and DSS queries. Table 1 describes the details of the query optimization works done in the 21<sup>st</sup> century.

Authors	Year	Country	University	Type of Query	Approach used
Gorla, N., Song S. K. [1]	2010	UAE and USA	American University of Sharjah & Youngsan University	OLTP	Genetic Algorithmic
M. Sharma, G. Singh, R. Singh [2]	2013	India	Punjab Technical University, Guru Nanak Dev University	DSS	Exhaustive Enumeration, Genetic Algorithm
Yannis E. Ioannidis [3]	1996	New York, NY, USA	Computer Sciences Department, University of Wisconsin, Madison	Distributed Query	Database Techniques
Jorng-Tzong Horng Ching-Chang Yeh [4]	2000	Republic of China	National Central University, Taiwan	Document retrieval	Genetic Algorithm
Manik Sharma, Gurvinder Singh, and Rajinder Singh [5]	2018	India	DAV University Jalandhar, GNDU Amritsar	Clinical Queries	Firefly algorithm And Restricted

						genetic algorithm
R.Gomathi, D. Sharmila [6]	2014	India	Annari Amman Institute of Technology, Sathyamangalam	Queries for large RDF Graph	Cuckoo Search	
M. A Bayir ; Ismail H. Toroslu ; A. Cosar [7]	2006	New York	University of Buffalo	Multi query optimization	Genetic algorithm	
N. L. Tudor [8]	2007	Romania	Petroleum-Gas University of Ploiesti	Distributed queries	Conjunction of Predicates	
Sharma, Manik, Gurvinder Singh, and Rajinder Singh[9]	2018	India	DAV University, Guru Nanak Dev University	OLTP and DSS	Review of Different techniques used to optimize query	
Voratas, Numptik [10]	2018	Thailand	Asian College of Engineering, Thailand	OLTP and DSS Queries	Brief Review	
Kumar, TV Vijay, Vikram Singh, and A. K. Verma [11]	2011	India	Jawaharlal Nehru University, India	Distributed Queries	Genetic Algorithm	
NS Gajjam, SS Apte [12]	2013	India	Walchand Institute of Tech.	Distributed Queries	Genetic Algorithm	
Timos K. Sellis [13]	1988	USA	Univ. of Maryland, College Park	Relational queries	multiple-query processing algorithms	
Dong Li et al. [14]	2014	China	South China University of Technology	Xpath	value-encoding histogram	
N. Singh, J. Prakash, T.V. Vijay Kumar [15]	2016	India	Jawaharlal Nehru University, New Delhi, India	Distributed Query	Firefly algorithm	
Hui Ma, Klaus-Dieter Schewe, Qing Wang [16]	2006	New Zealand	Massey University	Distributed Queries	Heuristic Approach	
Sharma, Manik, et al [17]	2013	India	Punjab Technical University	Distributed Queries	Exhaustive Enumeration, GA	
Sharma, Manik, et al. [18]	2015	India	Punjab Technical University	DSS Queries	Entropy based Restricted GA	

From Google Scholar's database, it was verified that significant research efforts have been made to optimize distributed queries using soft computing techniques.

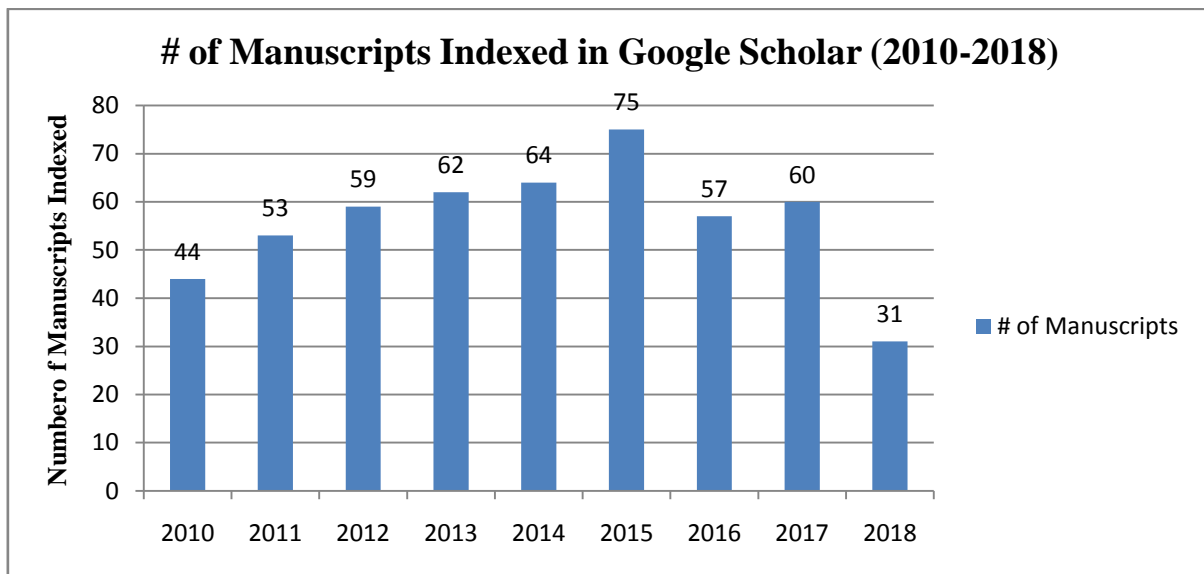


Figure 1: # of Manuscripts Indexed in Google Scholar (2010-2018)

Figure 1 represents the last ten year record of the number of query optimization related manuscript indexed in Google Scholar. In addition to research paper, several authors have written survey paper on different aspects of the query optimization [19][20][21][22]. One the latest review on query optimization has been written by Sharma and his co-authors which have been published in one of the Springer journal. Additionally, It has been found that in last ten years researcher have used different techniques to optimize database queries. However, soft computing techniques are dominant in solving the problem of query execution plan. It has been found that significant query optimization work has been done by Indian researchers in optimizing OLTP and DSS queries. Additionally, genetic algorithm seems to be more frequently used in query optimization as compared to other nature inspired computing techniques. At last, significant amount of query optimization work has been done by Indian, Chinese and Americans. Moreover, no one has used and examine the performance of some latest nature inspired computing techniques in solving the operations site allocation plan of the distributed query whether OLTP or DSS queries.

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