IOSR Journal of Computer Engineering (IOSR-JCE)
e-ISSN: 2278-0661,p-ISSN: 2278-8727, Volume 19, Issue 4, Ver. V. (Jul.-Aug. 2017), PP 48-52
www.iosrjournals.org

Improved Multi-objective Ant Colony based Query Optimization Technique

Daljinder Dugg [1], Er.Mandeep Singh[2], Dr.Gurpreet Singh[3]
[1] *M-Tech Scholar Deptt of Computer Science & Engineering St. Soldier Institute of Engineering &Technology, Jalandhar*
[2]*Assistant Professor, Deptt of Computer Science & Engineering St. Soldier Institute of Engineering & Technology, Jalandhar*
[3]*Professor, Deptt of Computer Science & Engineering St. Soldier Institute of Engineering & Technology, Jalandhar*
Corresponding Author: Daljinder Dugg

Abstract: *Query optimization is a stimulating task of any database system. The results of Entropy Based Restricted Stochastic Query Optimizer (ERSQO) are compared with the results of Exhaustive Enumeration Query Optimizer (EAQO), Simple Genetic Query Optimizer (SGQO), Novel Genetic Query Optimizer (NGQO) and Restricted Stochastic Query Optimizer (RSQO). In terms of Total Costs, EAQO outperforms SGQO, NGQO, RSQO and ERSQO. However, stochastic approaches dominate in terms of runtime.To overcome the issues associated with the existing techniques, a new multi-objective ant colony based query optimization technique is proposed. The effect of query cost and communication overheads will also be considered.The use of ant colony optimization can find optimistic query in order to reduce the query cost.*

Keywords: *Query optimization,Ant colony based otimization,DSS query optimizer.*

Date of Submission: 15-07-2017 Date of acceptance: 10-08-2017

I. Introduction

Query optimization is really a purpose of a lot of relational data source supervision systems. The issue optimizer tries to determine the most efficient way to complete certain issue by thinking about the potential issue plans. Usually, the actual issue optimizer cannot be accessed specifically by users: once questions usually are sent to data source server, and also parsed because of the parser, they may be subsequently surpassed on the issue optimizer the place search engine optimization occurs.

1.1 MULTI-OBJECTIVE QUERY OPTIMIZATION

1. There tend to be additional charge achievement along with delivery occasion that are tightly related to compare and contrast query plans.
2. Within foriegn computing, by way of example, one should compare and contrast query strategies not just with regards to how much time these people get to carry out but will also with regards to what kind of money his or her delivery costs.
3. This context connected with close query marketing, it is possible to do query plans on aimlessly determined trial samples on the insight files in an effort to acquire close benefits using decreased delivery overhead.
4. In such cases, alternate query plans has to be in comparison when it comes to their execution time period but additionally the detail or even toughness for the data that they generate.

1.2 DECISION SUPPORT SYSTEM (DSS) QUERY OPTIMIZE

Distributed DSS question optimizer is created in order to resolve the particular procedure internet site allowance difficulty of handed out DSS queries. To find a great optimal procedure internet site allowance approach, for starters, a new ‘SQL' centred decision assist method question is usually decomposed straight into relational algebra expression (sub-operations) based on ‘selection ', ‘projection', ‘join’ and ‘semi-join '. Most of these sub-operations are generally next issued to various web-sites for his or her delivery by means of discovering a variety of amalgams of expeditions and sites. The expense of each one sub-operation are generally computed by utilizing the measurements relation/fragment working in the question, internet site issued as well as the principles of fees coefficients of input–output, processing and communication. This procedure internet site allowance dilemma is manifested in fig 2. Listed here, a new DSS question is improved using exhaustive enumeration, stochastic, minimal stochastic and entropy centred minimal stochastic approaches.

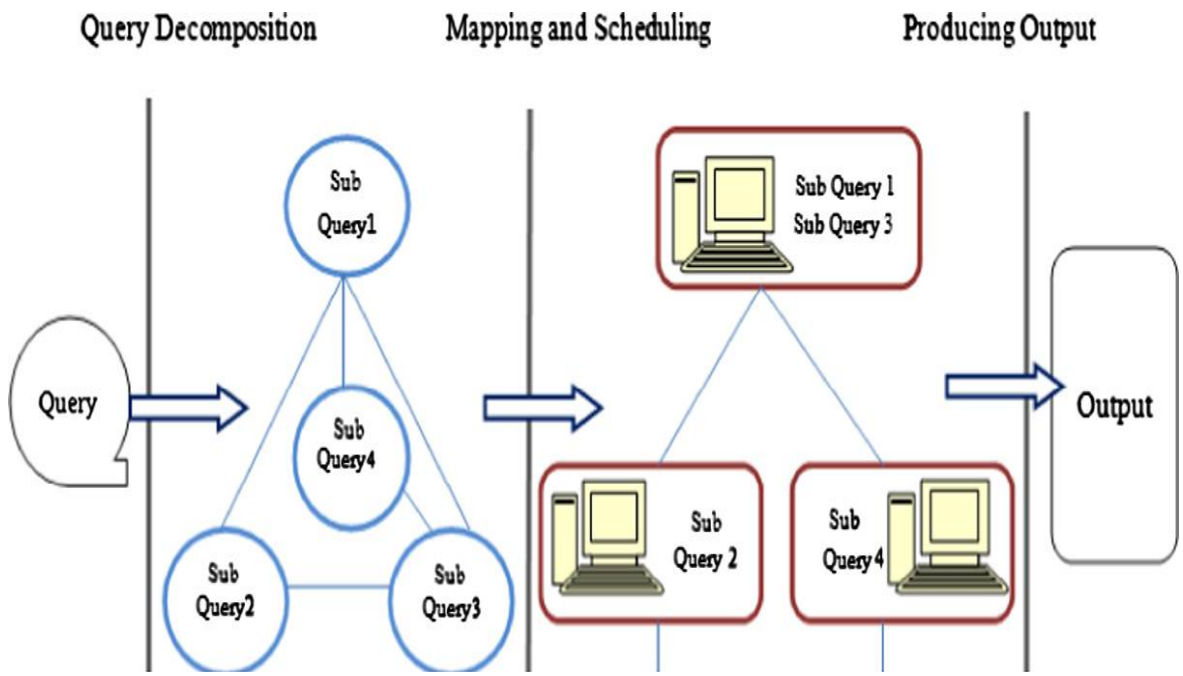

Fig 1: Query processing in distributed database system

II. Related Work

[2] design and style a information structure named Referrals Most important Key desk (RPK-table) which usually merchants the bond with key key as well as foreign key among tables. Depending on this structure, we propose to her an improved algorithm criteria on Map Reduce design regarding join-aggregate query. Findings on TPC-H dataset illustrate that the algorithm criteria outperforms present procedures concerning transmission cost as well as question response time.Varghese S. Chooralil et al. (2015) [3] presents a few folds structures to course of action a category regarding attractive consumer queries depending on Reuters-21578 Text Classification Collection Info Established, called as Semantic Useful resource Account by using Chemical substance Diet (SRD-CP). The very first times constructs your Semantic Routine Shrub good Useful resource Account Platform (RDF) concern expressions intended for detecting the particular record matter name. The RDF concern expressions employs element composition to provide the result towards broadened consumer queries. The other times is actually design for element composition throughout SRD-CP structure that will contains HTTP process along with minimal application process to handle complex concern processing.Fuqi Song et al. (2014) [4] proposes a plan intended for accomplishing issue setting up in addition to optimisation depending on a lengthy issue routine information in addition to heuristics. Initial, this specific newspaper generalizes SPARQL issue declaration rendering by subtracting various other words and phrases into mind, looking at conquering the limitations of only employing standard issue double patterns. 2nd, this specific newspaper presents the heuristics intended for privacy fencing cost the expense of executing issue double pattern. A suggested issue setting up techniques tend to be executed within just Corese issue motor and are generally looked at employing BSBM benchmark. Final results advise that a suggested techniques can easily increase correctly a issue performance time period of SPARQL issue motor.Chen Yan, et al. (2012) [5] distributed database program, made clear this objectives regarding distributed database query search engine optimization, in addition to researched this query search engine optimization course of action depending on semi-join operation together with the sensible application. Moreover, the item announced some sort of conventional criteria that is utilized to get multiple connection in addition to query search engine optimization in line with the semi-join query search engine optimization, this SDD-1 criteria.Peter Paul Beran, et al. (2011) [6] consider a variety of distinct heterogeneous and homogeneous infrastructures, parallel algorithms, and huge datasets, which often period all around several online companies (VOs) with typically simply no centralized authority. This specific cardstock presents your fresh heuristic design for the seo associated with issue delivery blueprints (QEP) on a world-wide scale.

III. Proposed Methodology

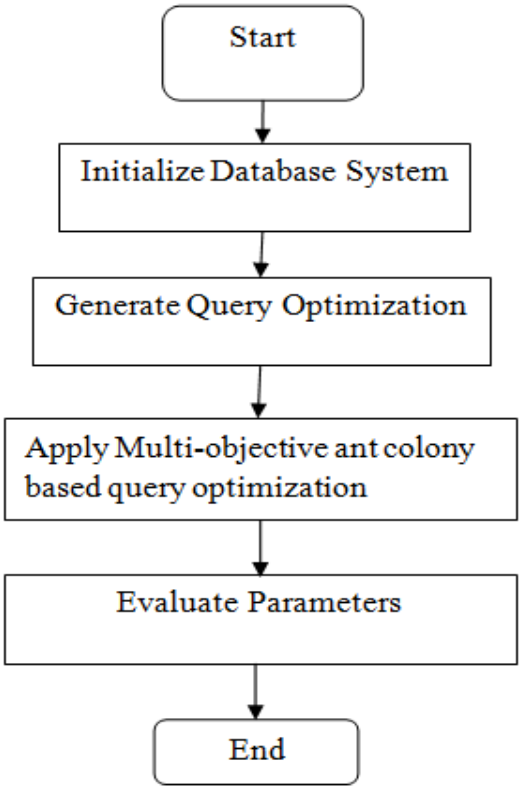

Fig 2: Proposed Methodology

IV. Gaps İn Literature

As discussed by Manik Sharma [1] , proposed Query optimization is really a revitalizing process of any database system. Many heuristics are actually applied to modern times, that recommended brand new algorithms for extensively increasing the overall performance of any query. The actual try to find the answer nonetheless continues. By simply conducting your review, that is located that will the existing researchers have overlooked several issues.The effect of query cost and communication overheads are ignored in most of existing research on distributed databases as well as use of multi-objective optimization is ignored by most of existing researchers and use of ant colony optimization to reduce query cost is also neglected in existing literature.

V. Experimentation And Results

In this the comparison performance of proposed and existing query optimization based techniques. Matlab is high performance language for technical computing and weka is a collection of machine learning algorithms for data mining task. to evaluate the performance of new multi-objective ant colony based query optimization technique by using the various parameters i.e. communication overheads and execution time.

1. **Communication Overheads** Communication Overhead could be the percentage of time you spend getting in touch with ones crew preferably of asking for fruitful work done.

Table 1: Performance Analysis on overheads

Population	Overhead (Existing)	Overhead (Proposed)
10	0.0611	0.0016
20	0.0522	0.0016
30	0.0502	0.0013
40	0.0357	0.0016
50	0.0241	0.0013
100	0.0016	0.0016
200	0.0332	0.0015
300	0.0369	0.0013
400	0.0488	0.0010
500	0.0434	0.0018

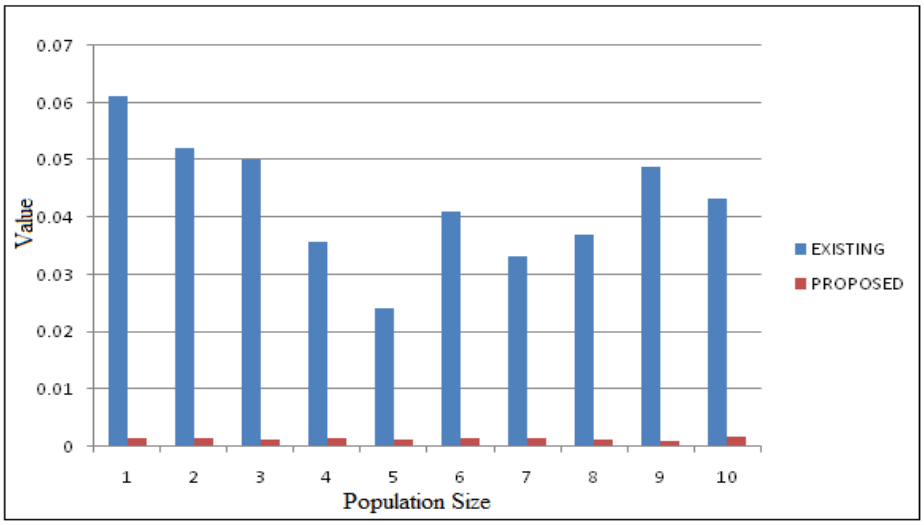

Fig 3: Represents the communication overheads

2. **Execution Time:** Execution time is the time using a person's software is exercising and also executing. As opposed to diverse program life-cycle steps as well as collect time frame, website page web page link considerable degrees of heap time.

Table 2: Performance Analysis on execution time

Population	Execution Time (Existing)	Execution Time (Proposed)
10	5.8724	2.2433
20	11.1601	3.3279
30	15.9641	4.2968
40	21.1891	5.4385
50	26.2156	6.5632
100	12.0543	0.0016
200	102.8162	23.1018
300	153.8356	34.1821
400	205.5431	45.1211
500	256.0484	0.0018

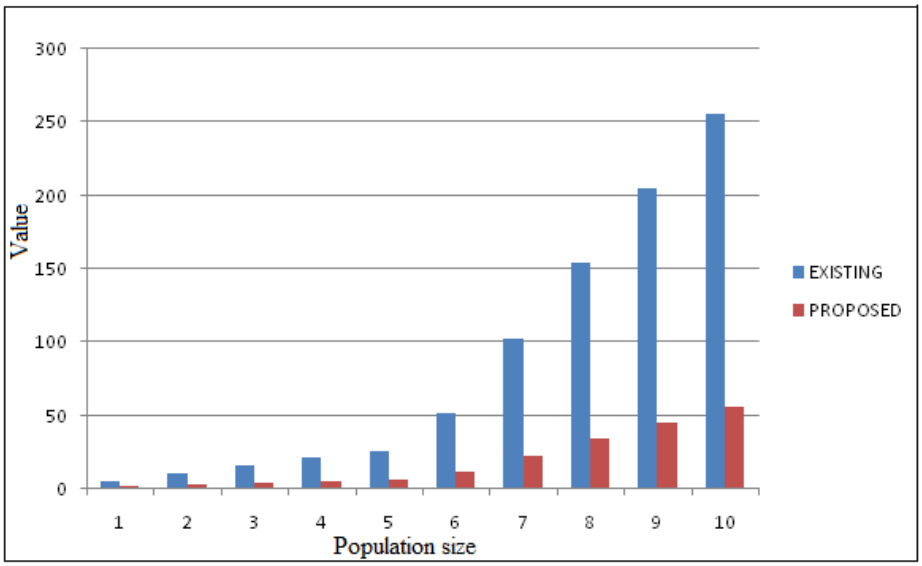

Fig 4: Represents the execution time

VI. Conclusion And Future Work

This paper represnts that Query optimization is actually a purpose of several relational data bank supervision systems. The outcomes associated with Entropy Based Restricted Stochastic Issue Optimizer (ERSQO) tend to be compared with the outcome associated with Exhaustive Enumeration Issue Optimizer (EAQO), Uncomplicated Inherited Issue Optimizer (SGQO), Book Inherited Issue Optimizer (NGQO) along with Restricted Stochastic Issue Optimizer (RSQO). With regard to Whole Charges, EAQO outperforms SGQO, NGQO, RSQO along with ERSQO. Nonetheless, stochastic approaches dominate regarding runtime. The actual Whole Charges manufactured by ERSQO is preferable to SGQO, NGQO along with RGQO by simply 12%, 8% along with 5% respectively. To conquer the down sides linked to the existing procedures, a new multi-objective insect nest dependent query marketing technique is proposed. The issue associated with query charge along with transmission overheads can also be considered.The use of insect nest marketing can find beneficial query so as to reduce the query charge along with the consist of method might be compared with existing procedures considering specified overall performance metrics.but just after there are a few problems that is improved with forseeable future with the far more evolutionary marketing technique.

Refrences

[1] Manik Sharma, Gurvinder Singh, Rajinder Singh, Design and analysis of stochastic DSS query optimizers in a distributed database system, Egyptian Informatics Journal, Volume 17, Issue 2, July 2016, Pages 161-173

[2] Zhan Li, Qi Feng, Wei Chen, Tengjiao Wang, RPK-table based efficient algorithm for join-aggregate query on MapReduce, CAAI Transactions on Intelligence Technology, Volume 1, Issue 1, January 2016, Pages 79-89.

[3] Varghese S. Chooralil, E. Gopinathan, A Semantic Web query Optimization Using Resource Description Framework, Procedia Computer Science, Volume 70, 2015, Pages 723-732.

[4] Fuqi Song, Olivier Corby, Extended Query Pattern Graph and Heuristics - based SPARQL Query Planning, Procedia Computer Science, Volume 60, 2015, Pages 302-311.

[5] Chen Yan, Zhou Lin, Li Taoying, Yu Yinging. The semi-join query optimization in distributed database system. In: National Conference on Information Technology and Computer Science. Atlantis Press; 2012. p. 606–9.

[6] Peter Paul Beran, Werner Mach, Erich Schikuta, Ralph Vigne, A Multi-Staged Blackboard Query Optimization Framework for World-Spanning Distributed Database Resources, Procedia Computer Science, 2011, Pages 156-165.

[7] Karegowda Asha Gowda, Manjunath AS, Jayaram MA. Application of genetic algorithm optimized neural network connection weights for medical diagnosis of Pima Indians diabetes. Int. J. Soft Comput. 2011;2(2):15–23.

[8] Yao, Yong, and Johannes Gehrke. "The cougar approach to in-network query processing in sensor networks." ACM Sigmod record 31, no. 3 (2002): 9-18.

[9] Chaudhuri, Surajit, and Umeshwar Dayal. "An overview of data warehousing and OLAP technology." ACM Sigmod record 26, no. 1 (1997): 65-74.

[10] Dorigo, Marco, Mauro Birattari, Christian Blum, Maurice Clerc, Thomas Stützle, and Alan Winfield, eds. Ant Colony Optimization and Swarm Intelligence: 6th International Conference, ANTS 2008, Brussels, Belgium, September 22-24, 2008, Proceedings. Vol. 5217. Springer, 2008.

[11] Parpinelli, Rafael S., Heitor S. Lopes, and Alex Alves Freitas. "Data mining with an ant colony optimization algorithm." IEEE transactions on evolutionary computation 6, no. 4 (2002): 321-332.

[12] Socha, Krzysztof, and Marco Dorigo. "Ant colony optimization for continuous domains." European journal of operational research 185, no. 3 (2008): 1155-1173.

[13] Mohan, B. Chandra, and R. Baskaran. "A survey: Ant Colony Optimization based recent research and implementation on several engineering domain." Expert Systems with Applications 39, no. 4 (2012): 4618-4627.

[14] Dorigo, Marco, and Thomas Stützle. "Ant colony optimization: overview and recent advances." Techreport, IRIDIA, Universite Libre de Bruxelles (2009).

IOSR Journal of Computer Engineering (IOSR-JCE) is UGC approved Journal with Sl. No. 5019, Journal no. 49102.

Daljinder Dugg. “Improved Multi-Objective Ant Colony based Query Optimization Technique .” IOSR Journal of Computer Engineering (IOSR-JCE), vol. 19, no. 4, 2017, pp. 48–52.