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Blockchain and Blackboard Technology for Database Systems

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Abstract- Blockchain is transaction processes which minimize transaction and data items of data sets that are encrypted transferred data items with secure data. It is peer to peer technology. The Blockchain is transaction flow or series of transactions. Blackboard technology is used transaction to store and retrieve independently. In This paper, Blockchain and blackboard technology is combined for transaction processing. The communication cost and retrial cost will be reduced using Blockchain and Blackboard technology.

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Blockchain and Blackboard Technology for Database Systems

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Keywords: mapreduce, steiner trees, blockchain technology, blackboard systems.

I. Introduction

Blockchain made valid chain of transactions using decryption codes. It made transaction between two nodes by introducing intermediate node or Steiner node.

Steiner tree is optimal tree by introducing intermediate node or Steiner node.

The Blockchain technology may be studied using strainer trees.

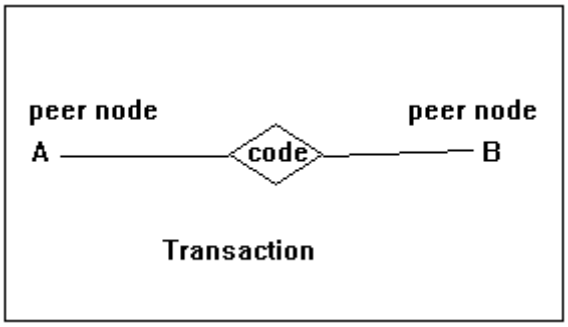

Figure 1: Blockchain

Where A is peer node and T is transaction

II. Mapreduce Algorithms

The Relational Data set is representation with domains and tuples [14]. Map is reading data sets and Reduce is writing datasets

Definition: A relational database or data set is defined as collection of attributes A_1. A_2 ... A_m and is represented as

$$R=A_1 \times A_2 \times \ldots \times A_{m***}$$

$t_i=a_{i1} \times a_{i2} x. \ldots . \times a_{im}$. $i=1. \ldots .$ n are tuples

or

$R(A_1. A_2. \ldots . A_n)$. R is relation.

$R(t_i)= (a_{i1}. a_{i2}. \ldots . a_{im})$. $i=1. \ldots .$ n are tuples

For instance, consider cluster data set for Account are given by

Ac.No.	Ac.Name	Ac.Bal.
8347102	Rama	10000
8347103	Sita	15000
8347104	Jhon	20000
8347105	Khan	15000
8347106	Marry	18000
8347107	Krishna	25000

Figure 2: Account

For instance, consider cluster data set for Bank are given by

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Ac.No	Ac.Name	Bank
8347102	Rama	SBI
8347103	Sita	ANZ
8347104	Jhon	ICCI
8347105	Khan	AB
8347106	Marry	SBI
8347107	Krishna	AB

Figure 3: Bank

In the following some of the data mining methods are discussed for MapReduce algorithms.
Consider the data set Account-Address of figure 3.

a) Frequency

Frequency is the repeatedly accrued Data.
Find the frequently customers purchase more than one Item.

Bank	Frequency
SBI	2
ANZ	1
ICCI	1
AB	2

Figure 4: Frequency

b) Association Rule

Association is of the <Ac.No ⇔Bank> is given by

Ac.No	Bank
831	SBI
832	ANZ
833	ICCI
834	AB

Figure 5: Association

i. *Clustering*

Clustering is grouping the particular data.
Group the customers who are account in Bank.

Ac.No	Ac.Name	Ac. Bal	Bank
8347102	Rama	10000	SSBI
8347106	Marry	18000	
8347103	Sita	15000	A
8347104	Jhon	20000	ICCI
8347105	Khan	15000	AAB
8347107	Krishna	25000	

Figure 6: Clustering

III. Mapreduce Algorithms for Logical Design using Blockchain Technology

Steiner tree is tree by b introducing intermediate node to made minimum Steiner tree.

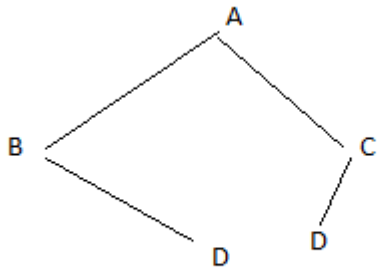

Figure 7: Tree

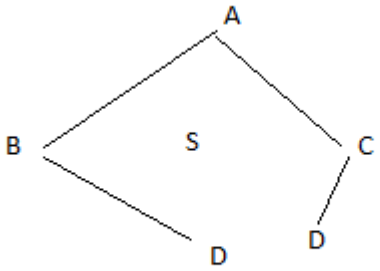

Figure 8: Steiner Node

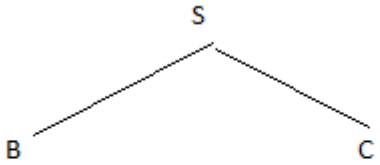

Figure 9: Steiner Tree

Blockchain is direct transactions from source to destination; For instance, the amount for account to another account shall be transferred with 'OTP number (Steiner nod).

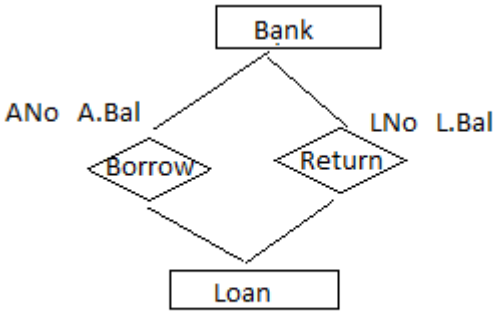

Figure 10: Bank Loan

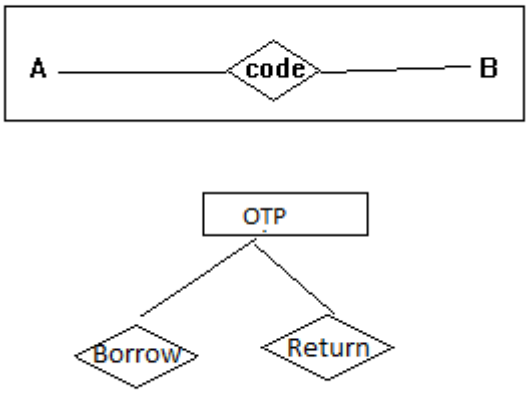

Figure 11: Blockchain

Here OTP is FOT number

The logical design Blockchain technology does not change logical independence. The transaction shall be made with or without Blockchain technology but Blockchain technology is minimize the series of transactions.

For instance, logical query is given by

Q1: Update loan return amount paid by borrower.

IV. Mapreduce Algorithm for Concurrency using Blackboard System

Usually in database systems, the entire data has to taken into main memory for operation. There is no need to take entire data in main memory in Blackboard Architecture, Blackboard Architecture used to store and retrieve knowledge sources [3]. Data mining is a knowledge discovery process. Blackboard Architecture may used to store and retrieve data sources. Parallel, distributed and concurrent retrieval of data items shall be achieved through the Blackboard architecture.

The blackboard systems may construct with the creation of data item sources in Oracle. Here is algorithm is given to create blackboard architecture, store and retrieve for data item sources.

For instance, each account is a table for banking information systems.

Algorithm:

Begin

Create table with account number

Insert data item into account number table

Retrieve data item from account number table

End

Each data item is data source which is created by h(x) account number table.

The blackboard structure is created with each account.

```
SQL> create table ab8347102 (acno int, acname
varchar (10), acbal real);
SQL> create table ab8347103 (acno int, acname
varchar (10), acbal real);
SQL> create table ab8347104 (acno int, acname
varchar (10), acbal real);
SQL> create table ab8347105 (acno int, acname
varchar (10), acbal real);
SQL> create table ab8347106(acno int, acname
varchar(10), acbal real);
SQL> create table ab8347107(acno int, acname
varchar(10), acbal real);
```

Inserted accounts into blackboard structure.

```
SQL> insert into ab8347102 values (8347102, 'Rama',
10000);
SQL> insert into ab8347103 values (8347103, 'Sita',
16000);
SQL> insert into ab8347104 values (8347104, 'John',
20000);
SQL> insert into 8347105 values (8347105, 'Khan',
15000);
SQL> insert into ab8347106 values (8347106, 'Marry',
18000);
SQL> insert into ab8347107 values (8347107, 'Krishna',
25000);
```

Select each account number from blackboard structure.

```
SQL> select * from ab8347102 where acno=8347102;

ACNO ACNAME  ACBAL
---------- ------------------------------ ----------
8347102  Rama      10000

SQL> select * from ab8347103 where acno=8347103;

ACNO  ACNAME     ACBAL
---------- ------------------------------ ----------
8347103    Sita          16000
```

Suppose, all tuples shall be brought in to single database by creating views

CREATE VIEW *view-name* AS
SELECT *
FROM *table_name, table-name2,.*
WHERE *condition*;
Here is an example
CREATE VIEW *account* AS
SELECT *
FROM ab8347101, ab8347102,…, ab834710.
The transaction may be defined using SQL as
UPDATE ab8347107
SET balance = balance + 1000
WHERE account no = ; ab8347107.
These data items are stored in blackboard structure.

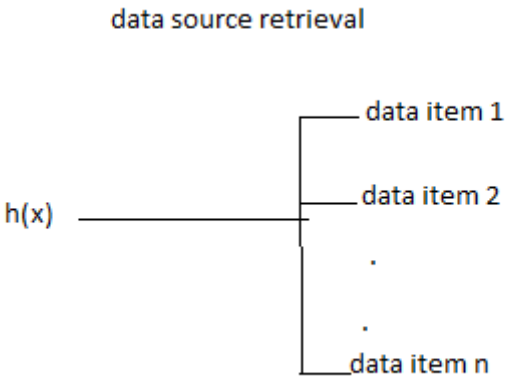

Figure 28: Blackboard System

h(x) is create, store and retrieval of data sources. When transaction being possessing, there is no need to take entire database into main memory. Just it is sufficient to retrieval of particular data item of particular transaction from the blackboard system.

The advantage of blackboard architecture is directly operated on data sources.

The Blockchain technology is also operates on data sources or data items to direct transactions.

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