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Optimization of Revenue Optimization Tool for Business Firm By Implementing Big Data Concept

Seema[1], Amita Dhankhar[2] , Kamna Solanki[3]
M.Tech student , Assitant Professor,Assitant Professor
Department of C.S.E.
UIET, M.D UNIVERSITY, Rohtak , Haryana India
Corresponding Author: Seema

Abstract: In Revenue Estimation Tool, the big data challenge emerges from the enormous measures of data required so as to run tool for big clients. In a case, where fifty thousand columns may be deal with, with various conditions and rebate rates connected to each and every one of them. While the data set itself isn't to a great as per the present models, the unpredictable tasks and computations which must be performed on every last one of them adds new measurements to the tool management.Rebates are for instance acquired through a huge tree structure containing a huge number of hubs and the outcomes must be exhibited to the client inside a sensible measure of time. Client who needs to sit longer for results of complex figures will lose its focus - something which has negative impact during transaction with a client. A perfect tool system would dependably restore the outcomes by taking only a couple of moments, since this would imply that tool will keep running amid ordinary discussion without requiring any holding up whatsoever. This research is important to overcome following question in big data.

1. How exact is that data in predicting business values?
2. Do the consequences of a big data investigation really make sense?

With this research work a new algorithm design will be available both for revenue estimation tool and for scaling tool functionalities.

Keywords: Big Data, Revenue Optimization, Data Base

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I. INTRODUCTION

In business dealing, two persons are involved, one is sales representative of the organization and the second is customer (who is willing to buy product or article from the company). By taking example of example of simple communication a customer is willing to get maximum discount from the sales person and similarly sales person is willing to get maximum profit from the deal by minimizing the discount rate or by selling more no. of value on discount rate**. [1-3]**

Existing customer discount simulator is completed implemented in PCT developed over java programming language with database for storing customer and sales data. In existing simulator sales representative will find out profit gained over same customer from its previous orders using new discount condition over previous history of sales. New condition can be applied on sales history so that sales representative can find out effect of new sales condition and whether they will generate profit or not. Figure 1 represents the basic conversation between sales representative and customer**.[2-6]**

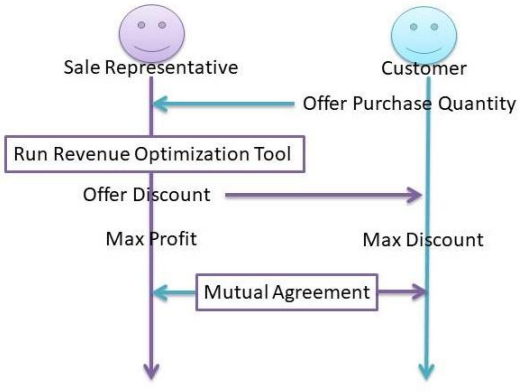


Fig 1 Sales representative with Customer

Sales History

Sale history form the existing revenue optimization tool is represented in the figure 2.Sales history contains database with large set of record based out of history of the company with its customers. Fields in existing sales database are as: period, customer id, article no, actual discount, agreed discount, avg target discount, co, currency, customer level, price, organization, target discount, value, volume, weight unit, market code. **[6-8]**

Period	Customer ID	Article No	Actual Discount
Agreed Discount	Avg. Target Discount	C0	Currency
Customer level	Price	Organization	Target Discount
Value	Volume	Weight Unit	Market Code

Fig 2: Sale history table in existing tool

Existing Customer Conditions

In the existing simulator whenever sales representative and customer settled on an avg discount rate for a particular article in article tree then that data is added into the customer condition database. Customer condition database consists of following fields: Contract id, discount, freeze start data, freeze end data, eff stop date, start date, end date, note, status, Price level, user ID, customer ID, avd Value, Command, status, unfreeze condition id. Figure 3 represents the database structure of customer condition.

Contract ID	Discount	Freeze Start Date	Freeze End Date
Eff Stop date	Start Date	End Date	Note
Status	Price Level	User ID	Customer ID
Avg Value	Command	Status	Unfreeze Condition Id

Fig 3: Customer Condition table in existing tool

II. LIMITATION OF EXISTING TOOL

Existing revenue optimization tools has lots of drawbacks & limitations. Most important factor is that when we are working on big data improvements must be performed over a period again and again to cope with new data and factor.[8-11] Even existing system is perfect when it is developed; it will be out of date to handle more extensive calculation as required with new data. When working with big data optimization it might be possible that the no of filed get shorter than existing one. And no of records get multiplied with any factor. This is because old field might be of no use now & for this while updating big data we might scrap old filed and will add new field as required**.[11-12]** Following are the drawbacks & limitations of the existing revenue optimization tool as of current period that are updated in the proposed optimization of existing technology are**[12-14]:**

1. Data accuracy
2. Time taken in execution.

To overcome the drawback following section of technology has been updated.

1. Article Tree

2. Sales History Data Base
3. Customer Condition updated
4. Discount Structure Updated
5. Execution of Tool

III. LITERATURE REVIEW

Nawsher Khan et.al. , Big data: Survey Technologies, Opportunities and Challenges, 2014.
In this author completely overviews and characterizes the different traits of Big Data, including its tendency, definitions, quick development rate, volume, administration, investigation, and security.

Dylan Maltby, Big data analytics, 2011.
A considerable lot of the significant advancements and procedures utilized as a part of huge information examination will be secured quickly and the advantages of enormous information investigation crosswise over different segments will be investigated

Bo Li, Survey of Recent Research Progress and Issue in Big Data, 2011.
This paper reveals most recent progress on big data networking and big data. Author has categorized reported efforts into four general categories.

C.K Enamai et .al. , Understandable Big Data, 2015.
This study displays the idea of Big Data. Right off the bat, a definition and the highlights of Big Data are given. Besides, the diverse strides for Big Data information handling and the fundamental issues experienced in huge information administration are depicted.

Miss. ChetnaKashyap, Review Paper of big data and methodology, 2015.
The term 'Enormous Data' portrays imaginative methods furthermore, innovations to catch, store, appropriate, oversee and investigate petabyte - or bigger estimated datasets with high-speed furthermore, extraordinary structures. Enormous information is famous term used to portray the exponential development and accessibility of information, organized, semi-organized and unstructured information has the potential to be dug for data.

Tanvi Ahlawat et.al, Literature Review on Big Data, 2015.
Author likewise have attempted to arrange the Big Data components into a model and endeavored to get Big Data Ecosystem from it. The V Display for the Big Data has been characterized and arranged into 3V, 4V or 5V reliant on the association which utilizes it and under which business situation.

SimranjotKaur , Review Paper on Big Data: Applications and Different Tools,2017.
The term Big Data assume vital part in different fields. It is the gathering of information in the vast sum which needs to store, catch, oversee and process. For this procedure author have presented different device and strategies in this paper.

JafarRazaAlam et.al, A Review on The Role of Big Data in Business, 2014.
The primary issues why these associations are not start their arranging stage to execute the enormous information methodology since they don't know enough about the huge information and they don't comprehend the advantages of huge information. In this examination, an endeavour is made to audit the part of enormous information in the business.

Gambhire Swati Sampatrao I , A Study of Revenue Cost Dynamics in Large Data Centers: A Factorial Design Approach ,2017.
This paper proposes a model to advance the income in cloud server farm and breaks down the model, income and different speculation or cost duties of associations contributing in server farms.

Ron Davies ,Big Data and Data Analytics The Potential for Innovation and Growth,2016.
The incorporate 'information proprietorship' rules that figure out who partakes in the rights related with enormous information; information localisation necessities that may ridiculously meddle with the 'free stream of information'; work deficiencies of talented information laborers and information mindful directors; and the making of another computerized partition that dangers minimizing the individuals who don't make broad utilization of data and correspondence innovations

Chad Vicknair et.al, A Comparison of a Graph Database and A Relational Database, 2010.
This paper gives an account of an examination of one such No SQL diagram database called Neo4j with a typical social database framework, MySQL, for use as the hidden innovation in the advancement of a product framework to record and question information provenance data.

Dr. Alexander Henschelet.al ,Big Data is The New Content: How Publishers can use Big data to Increase revenues,2014.
This report describes opportunities how publishers can make use of Big Data technologies to achieve cost savings and exploit new revenues opportunities along the value chain.

Jeffrey D. Buck, Parking Meter Price Optimization: How Big Data can Increase City Revenue, 2016.
The article will finish off by investigating the key perceptions from the information and presents suggested following stages in using these bits of knowledge to market huge information in enhancing stopping meter valuing.

M. Osias , The Right Database for Your Growing Business,2012.
This paper will talk about different database advances right now accessible in view of the multifaceted nature of information.

Chad Vicknair et.al, A Comparison of a Graph Database and a Relational Database,2016.
This paper covers a correlation of one such No SQL chart database called Neo4j with a typical social database framework, MySQL, for use as the fundamental innovation in the advancement of a product framework to record and inquiry information provenance data.

Vijay Dipti Kumar et.al, Software Engineering for big data projects: Domains, Methodologies and Graphs, 2016
This paper aims to provide perspective to future researchers looking into big data applications from a software engineering point of view.
Vadlamani Ravi, Big Data Analytics Enabled Smart Financial Services: Opportunities and Challenges,2017.
The paper presented the current digital trends in financial services industry with a particular emphasis on the banking industry, where several business problems solved by big data analytics are highlighted.

Sharyn O' Halloran , Big Data and The Regulation of Financial Markets ,2015.
This paper develops scalable computational data science tools to understand a fundamental problem in political economy, the institutional structure of financial regulation.

Matthew Ridge et.al, The Use of Big Data Analytics in the Retail Industries in South Africa, 2015
This study was to assess the use of big data analytics in the retail industry. The findings showed that retailers are not using big data analytics because there is a focus on exploiting existing structured data completely before tapping into unstructured and semi-structured data**.**

Paolo Costa, Camdoop: Exploiting in Network Aggregation for Big Data applications, 2016.
Author described Camdoop, a MapReduce-like system that exploits CamCube's unique properties to achieve high performance. Author shown, that using a small prototype, that Camdoop running on CamCube outperforms Camdoop running over a traditional switch.

IV. OPTIMIZATION IN EXISTING TECHNOLOGY

Existing revenue optimization tool has been optimized over the drawbacks of time taken in execution and the data in database accuracy. Time taken for execution of the process must be minimized as it should not provide ant delay in between conversation. If the execution system is taking too long time in execution so that use has to wait in middle of the conversation than the tool is of no use. Basic structure of communication process will remain same as in existing tool. And new optimized revenue optimization is also implemented in java programming language as original tool is implemented.

Data Needed

Extensive changes has been made in the data needed section of the exiting tool. Optimized sections are Product Category, Sales History database and Existing Customer Database. Figure 4 represent the new optimized data needed for the execution of the revenue optimization tool.

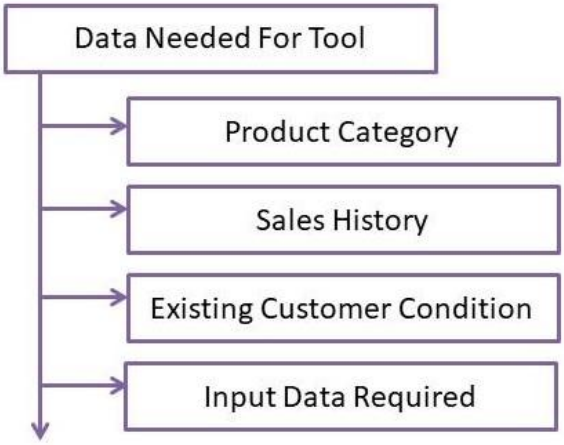


Fig 4: Data needed for new optimized tool

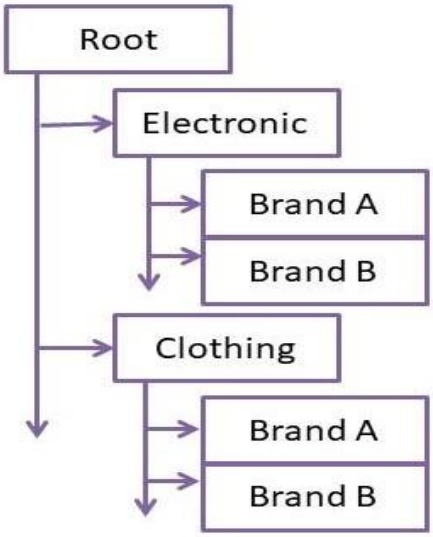


Fig 5: Production Category storage

Product Category

In place of article tree as in original revenue optimization tool that inherit the properties of main category is preplaced by new product category as it is not advisable to apply same price and same discount structure to all product that come in one category. Figure 5 represents the new product category storage. Different item in product category may have different price range with different production stage and criteria. For this discount inheritance is also updated with discount stairs.

Sales History Database

Sale history database has been updated with new fields and some of the old fields have been scraped to provide more accurate data and this will also increase the speed of execution. As new fields are little shorter and consists of new accurate data that are needed by the organization for estimation of revenue. Figure 6 represents the new database structure of sales history. This is big data optimization.

Duration Cycle	Customer Id	Organization	Customer Level
Invoice No	Invoice Date	Invoice Value	
Article ID	Market Code	Price	Quantity
Actual Discount	Agreed Discount	Target Discount	

Fig 6: Sales history in optimized tool

Existing Customer Condition

This is also the part of big data optimization. With the new optimization in the above mentioned section old "existing customer condition" database has been replaced by completely new database to cope with sales history database and with new discount stairs structure. New database structure is illustrated in figure 7 below:

Article ID	Start Date	End Date	Sales Person ID
Vol0	Vol1	Vol2	Vol3
Dis0	Dis1	Dis2	Dis3

Fig 7: Customer Condition for Optimized Tool

User Input

Data needed by the user at the time of execution is same as in original revenue optimization tool although data and database has been changed in various sections to provide optimization in existing tool.

Discount Structure

Whole new discount structure is presented which consists of Vol range with discount range for every article in the product catalog. All of these discount stairs will be saves in the new existing customer condition database for future order with the same customer. In this as sales representative wants to max its profit not only by decrease discount rate but also by increases the quantity of sales. Figure 8 represents the basic of new discount stairs that will vary with every simulator run. Figures in the figure 9 are only for representation purposes only.

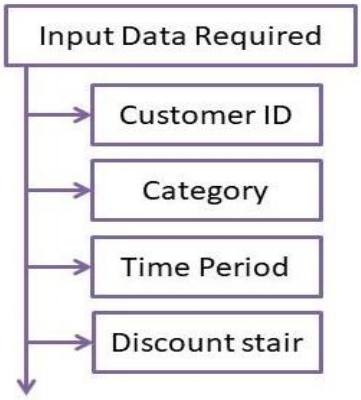
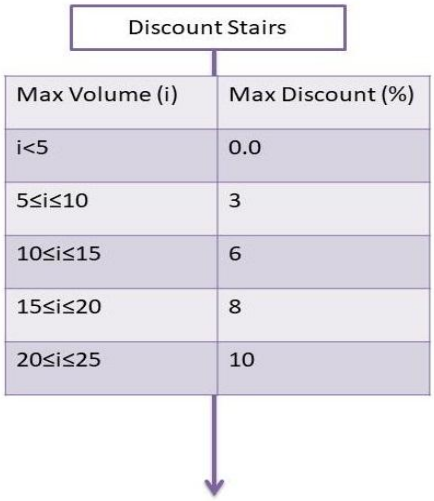


Fig 8: Data input from user



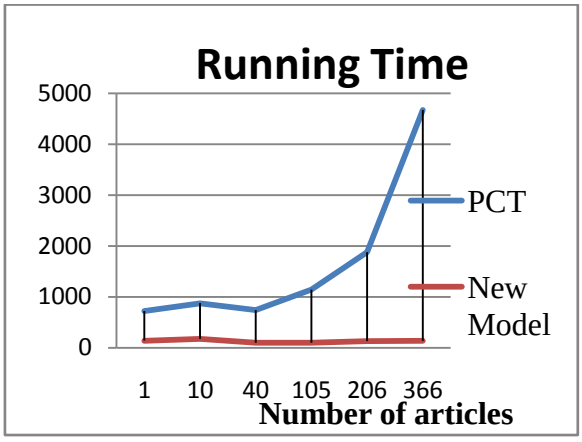
Max Volume (i)	Max Discount (%)
i<5	0.0
5≤i≤10	3
10≤i≤15	6
15≤i≤20	8
20≤i≤25	10

Fig 9: New Discount Stairs

V. EXECUTION OF MODEL

With optimization in revenue optimization tool execution process of the tool will also be updated so that revenue optimization tool can work as per new proposed optimization. Figure 10 represents the working architecture of the new proposed optimization of revenue optimization tool with change in database and working architecture. Initial run of the tool will almost remain same as in this run data extracting process is done based on the old history of sales. The difference will come in the in terms of database value as new database is implemented for big data optimization. No. of passes in new tool will depend upon the conversation between sales representative and the actual customer.

VI. PERFORMANCE EVALUATIONS



Graph 1: Running Time

Performance of the existing tools is collected over the internet from various sources. While performance of new optimized tool gathered by running tool very large number of times with different data base. Evaluation of the new tool is done based on following three metrics:

1. Number of Article
2. Product Distribution
3. Sales History

Number of Article

In this, change in running time of PTC with increase in number of district articles in the customer's sales history grows. Data used for PCT is collected over internet from various sources. The number of articles with running times is represented in graph 1 and is shown as in table 1.

Product Distribution

In this, for every run of simulator distribution of articles has been changed. It is common for customers to buy articles lying under different price level; it shows how different product distributions affect the simulation's running time. The results of this are shown in graph 2 and the measured values can be seen in table 2

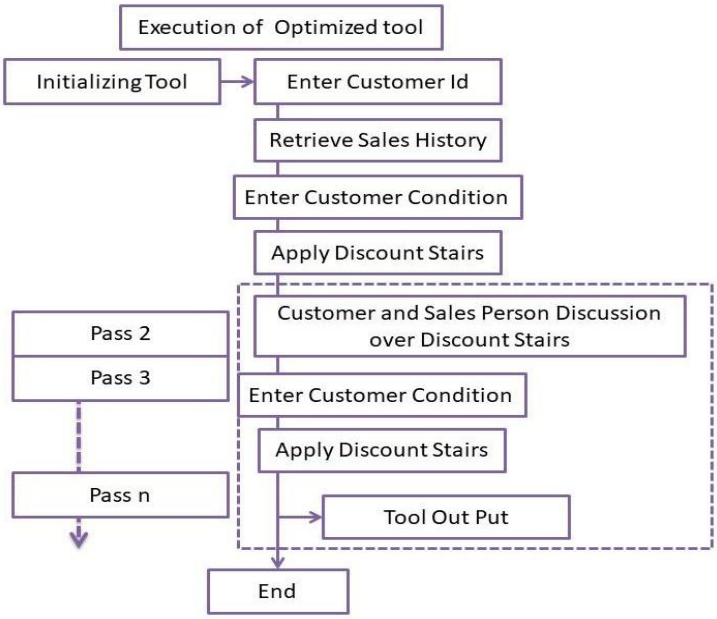


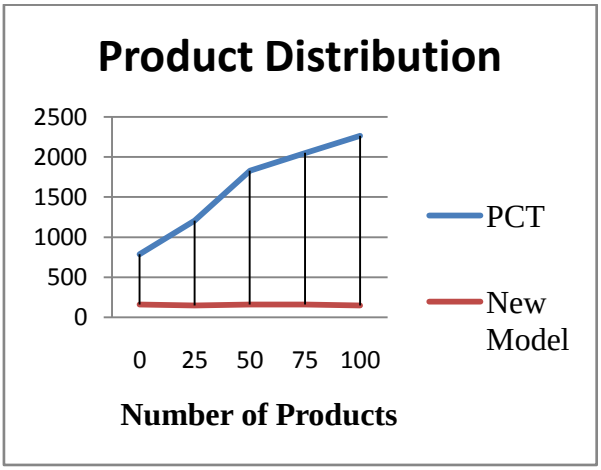
Fig 10: Execution of optimized Tool

Table 1: Running time

Articles	PCT	New Model
1	723	140
10	876	175
40	741	99
105	1,142	101
206	1,879	129
366	4,671	139

Sales history

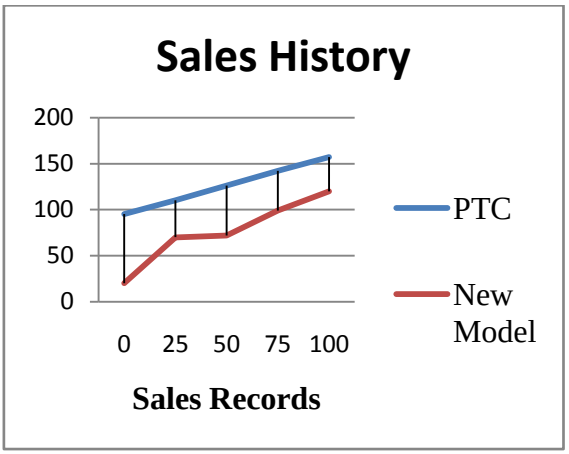
In this, running time of a simulation changes as the proportion of a customer's sales history affected by the scaling node's discount stair increases. Graph 3 shows the result of the test, where the blue part marks the constant calculations and the red part makes the scaling simulationand the measured values can be seen in table 3.



Graph 2: Product Distribution

Table 2 Product Distribution

Product	PCT	New Model
0	786	160
25	1,206	148
50	1,830	159
75	2,051	160
100	2,265	150



Graph 3: Sales Distribution

Table 3: Sales Distribution

Sales	PTC	New Model
0	95	20
25	110	70
50	126	72
75	142	99
100	157	120

VII. CONCLUSION

New revenue optimization model proposed in this research work is implemented in java programing language as similar to original PCT model. This this we are dealing with tree structure,an implementation by database such as"Neo4j" which is graph based can provide much higher results. This research is compresses of optimization & execution of the existingrevenue optimization tool. Form the implementation of new proposed optimization results show that the new model provides extensive level of performance enhancement for reasonableexecution times in between conversation customer and client for even large customers.

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