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# Profit Contribution of Bank Customer from Different Business Liabilities

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**Abstract:** ***The purpose of this study is that the banks can meet customer needs and gain their own interests, to find the contributing customers from huge customer transaction data, and to satisfy their needs and obtain greater profits. In view of the fact that the original corporate customer profit contribution model can not meet the requirements, this paper improves the corporate profit contribution model in three aspects from the actual situation of the bank, and constructs a new customer profit contribution model to further enhance the effectiveness of the model. Then, the improved model is applied to the customer evaluation process of the bank company, and the difference of customer profit contribution is obtained through the calculation results, and the difference is analyzed to show the effect of the model. The results show that the improved customer profit high contribution model is of great significance to the improvement of bank management and operation.***

**Keywords:** Bank, Client, Benefits, Hadoop, Commitment, Svm algorithm, profit.

## 1. Introduction

The financial business is the principle body of many countries monetary framework. The fast improvement of huge information, distributed computing, and Internet of Things innovation have enormously changed the channels and apparatuses of money. Driven by new advances, clients' plans of action, improvement models, and monetary necessities will go through nonstop and significant changes. The motivation behind this examination is that the banks can address client issues and gain their own advantages, to track down the contributing clients from tremendous client exchange information, and to fulfil their necessities and get more prominent benefits.

## 2. Literature Survey

1) Driving a model of a system with suitable inputs and observing the corresponding outputs' (Ackoff 1962,1979a,1979b) suggest that models fall into three categories: iconic, analogue and symbolic; he includes mathematical models under the symbolic category. Based on the solution approach: analytical or simulation. Many mathematical problems cannot be solved analytically and simulation offers a means of 'solving' such problems. Simulation is a process of 'driving a model of a system with suitable inputs and observing the corresponding outputs'
2) In effect simulation is a means of experimenting with a model of reality(Paul, Fox, & Schrage, Nelson and Winter,1987,1982)see a computer programe as 'a type of formal theoretical statement' and simulation as 'a technique of theoretical explanation'. Simulation is particularly useful where it is impossible, dangerous or inordinately expensive to experiment with reality. This is generally speaking the case with real-life business firms or economies and hence simulation offers the business researcher a means of examining and experimenting with economic and business systems.
3) Phelan and Wigan (1995) point out that it is particularly difficult for researchers in the strategy field to successfully carry out experiments in order to determine the 'laws' of successful strategic management. They suggest that three distinct difficulties arise: that of observation, manipulation, and replication; they go on to suggest that simulation may assist strategy researchers in overcoming some of these difficulties. The tools and technique of simulation.
4) The missing element of time Norreklit (2003) argues that strategy maps do not discriminate amongst logical and causal links. Typically, in many organizations, there are inconsistencies in the frequency of gathered values and the range in which the values vary over a period of time. Predictions about the future state of a market and values that business goals and objectives can reach always contain the issue of uncertainty.
5) The most notable example of this type of PMSs, is the Balanced Score Card (BSC) (Kaplan & Norton, 2004). It consists of four perspectives, financial perspective, customer perspective, internal process, and learning and innovation. Usually, 20 to 25 key performance indicators are allocated to each of perspective. The aim of the BSC is to link business objectives with operational objectives in a balanced way.
6) Feedback loops (Franco & Bourne 2005) The development of strategy maps could be criticized as too much of an inward-looking exercise. Also, the cause-and-effect relationships depict a one-way, linear approach often starting with the 'learning and growth' perspective and culminating in financial results instead of depicting non-linear, two-way linkages. However since the Balanced Scorecard perspectives are not independent, feedback loops should be included in the maps .

7) Othman (2007) argues that a very serious drawback of strategy maps is the lack of representing the time evolution element in strategic plans. This missing time element also influences the ability to model performance indicators in SMs.A model is essentially an imitation of something real and simulation is a process of using a model to imitate the behavior of something real.
8) Need for dynamic-flexible SMs According to Buytendijk (2008) relying on a static SM over the mid and long term, is equivalent to assuming not only that the organization and its strategy will stay the same, but also that competitors will continue to behave in the same way. Furthermore, if strategy maps are supposed to have predictive abilities, one could question the validity of analyzing past data to predict future states.

## 3. Customers Profit Contribution Analysis

In financial industry, different kinds of customers have different economic driving factors and influence variables, so banks need to integrate customer life cycle value chain elements, grasp customer personalized needs and expectations, and help customers realize asset value-added while maximizing customer profit contribution. Customer profit contribution calculation is a dynamic interactive process, requiring banks to participate in customer management and service departments to cooperate actively in customer development and service processes, strictly control data quality, with data standards related provisions, and business development caused by business rules changes and business numbers. According to the changes, timely information sharing and synchronous updating are needed to ensure the accuracy of the calculation results and the scientificity of decision-making information.

Private banking customers need to analyze the value of their customers and tailor-made financial products and services. Private bank customers are characterized by large scale assets, high contribution to bank profits, high level of service, strong ability to select banks and strong bargaining power. In customer relationship management, banks should fully embody their financial professional ability, comprehensive and specialized financial products such as financial management and investment for these customers, which realizes the preservation and appreciation of their assets, increase their customers' understanding and trust of banks, and eventually cultivate loyal customers of banks.

High-end customers need to prevent customer churn, and gradually excavate and enhance the value of those customers. They establish a relatively long period of customer life cycle development planning, through the analysis of historical data to predict if the customer has realized the lifetime value. According to the value of the order, it is combined with the matching degree of bank resources, and selected as many as possible customers with greater value, as the key development object. To consider the customer's current profit contribution, we can also pay attention to and predict the customer's potential value, and do a good job of customer resource reserve for the maximization of bank's future profit. Potential customers should pay attention to their value enhancement.

The development and cultivation of potential customers by banks can effectively control the marketing cost, which is the future profit growth point of high quality. Taking the existing high-value customer profit contribution as the reference system to evaluate the potential customer profit contribution. The paper positions the promotion of customer profit contribution on the basis of historical data analysis, and measures it from the perspective of sustainable and dynamic development. Although the current customer contribution is not great, for potential customers, and from a strategic height, flexible use of customer profit contribution to customer lifetime value analysis is needed. Customer Profit Contribution = (Interest Revenue - Capital Cost) + (Capital Value - Interest Expenditure) + (Procedure Revenue - Procedure Expenditure + Exchange Net Income and Loss) - Business Tax - Cost - Risk Cost In above equation, the cost of capital is based on a single transaction, and the cost of the use of funds such as loans and investments is calculated according to the interest rate of the capital market; the value of capital is calculated according to the use of different accounting rules for different bank products, and its value contribution to the sources of funds such as deposits; the cost calculation is based on the principle of gradual apportionment, according to the principle of gradual apportionment. The accrual basis is allocated to each product and every customer. Risk cost is the sum of expected losses and capital costs in credit risk, market risk, and operational risk. Capital cost = economic capital * capital expected return, and cost is the sum of direct and indirect costs.

**a) Existing System**

The current market-arranged change of the monetary business is speeding up, and a multi-subject, staggered, multi-field complete monetary market structure is progressively framing its shape. The quick advancement of huge information, distributed computing, and Internet of Things innovation have enormously changed the channels and apparatuses of money. Driven by new advances, clients' plans of action, improvement models, and monetary necessities will go through constant and significant changes. The design of insightful CRM in Many countries business banks for the most part comprises of the accompanying viewpoints: through the huge convergence of information, gathering everyday business information of banks and client related letters, a client driven focal information stage is shaped; in light of this stage, the framework build up an assortment of choice investigation apparatuses to break down the information and measure the client esteem; the examination consequences of the choice investigation device are taken care of back to the pertinent bank clients in a specific type of show, and the clients change the market strategies and business targets as per the input results.

**b) Disadvantages of Existing System**

1) Computer disappointment Computer disappointment is the one of the impediments of centre banking. In the event that any disappointment in PC framework happen, it can cause whole organization go down.
2) Driven by new advancements, clients' plans of action, improvement models, and monetary requirements will go through nonstop and significant changes.
3) More time taken.

**c) Proposed System**

The reason for this examination is that the banks can address client issues and gain their own advantages, to track down the contributing clients from gigantic client exchange information, and to fulfil their requirements and get more prominent benefits. Considering the way that the first corporate client benefit commitment model can't meet the prerequisites, this paper improves the corporate benefit commitment model in three perspectives from the real circumstance of the bank, and builds another client benefit commitment model to additional upgrade the viability of the model. At that point, the improved model is applied to the client assessment interaction of the bank organization, and the distinction of client benefit commitment is gotten through the estimation results, and the thing that matters is dissected to show the impact of the model. The outcomes show that the improved client benefit high commitment model is of incredible importance to the improvement of bank the board and activity.

**d) Advantages of Proposed System**

1) To track down the contributing clients from gigantic client exchange information.
2) Every person's benefit commitment is shown. Eventually the equilibrium is been introduced.
3) Customer benefit commitment is acquired through the computation results.
4) Ability to Multitask

## 4. System Design

In this section we will learn to about the Architectural, Workflow, Sequence, Use case and Activity diagrams.

**a) Architectural Diagram**

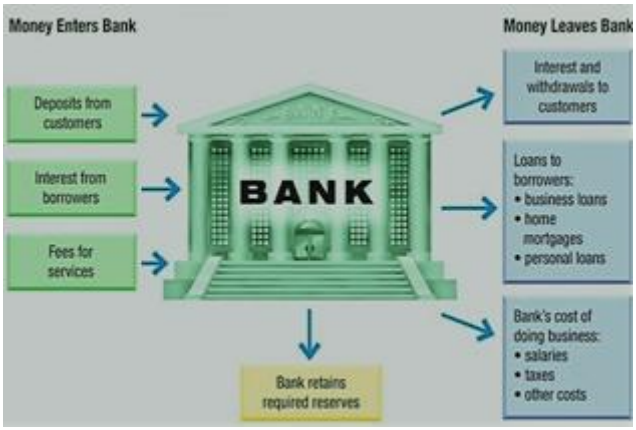



**Figure 1:** Architectural Diagram

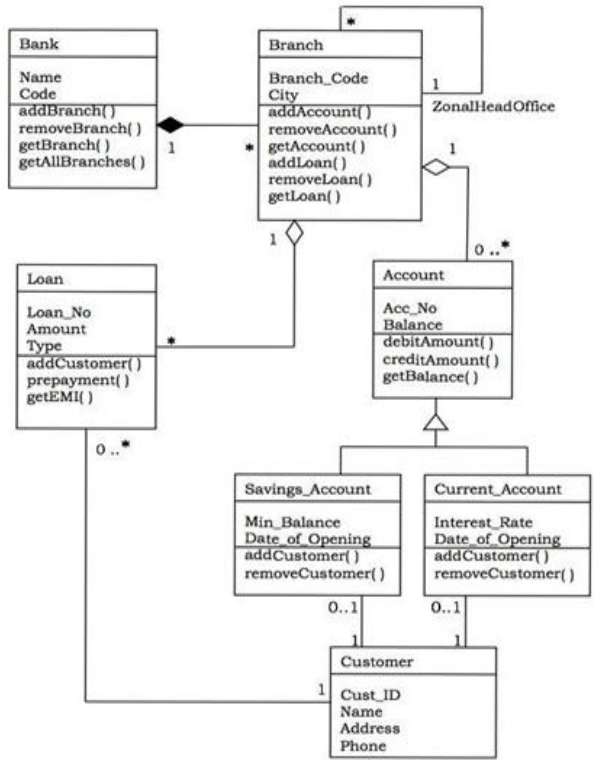
As demonstrated in Fig: 1 in the estimation of the benefit commitment of certain unfamiliar banks, account based computation is frequently received. It gathers all exchange expenses and advantages of similar record just as the different working expenses and hazard arrangements that ought to be assigned to the record. At that point it figures the commitment in accordance with the genuine circumstance of the record, lastly totals the commitment to the client level, and ascertains the all-out commitment of the record possessed by a similar client, that is, the benefit of the client. Since various organizations may exist in a similar record, the commitment to the benefits of the record ought to be the amount of the commitments to the benefits, everything being equal. We pick the most widely recognized store, credit and card utilization as the primary business of computing the benefit commitment of the record, at that point the declaration of the benefit commitment of the record level.

**b) Class Diagram**

A class graph models the static perspective on a framework. It contains the classes, interfaces, and joint efforts of a framework; and the connections between them. Class Diagram of a System Allow us to consider a worked on Banking System. A bank has numerous branches. In each zone, one branch is assigned as the zonal administrative centre that regulates different branches around there. Each branch can have numerous records and advances. A record might be either an investment account or a current record. A client may open both an investment account and a current record. Notwithstanding, a client should not have more than one investment account or current record. A client may likewise secure credits from the bank. The following figure shows the comparing class outline.

Class Diagram of Banking System

Classes in the framework




Bank, Branch, Account, Savings Account, Current Account, Loan, and Customer. Connections

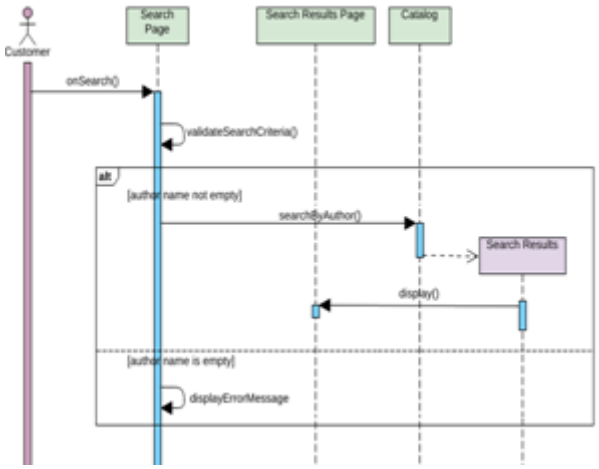
A Bank "has" various Branches − organization, one–to–numerous

A Branch with job Zonal Head Office oversees different Branches − unary affiliation, one–to-numerous A Branch "has" various records − total, one–to–numerous From the class Account, two classes have acquired, to be specific, Savings Account and Current Account. A Customer can have one Current Account − affiliation, balancedA Customer can have one Savings Account − affiliation,

coordinated A Branch "has" various Loans − accumulation, one–to–numerous A Customer can take numerous credits − affiliation, one–to–numerous

**c) Sequence Diagram**

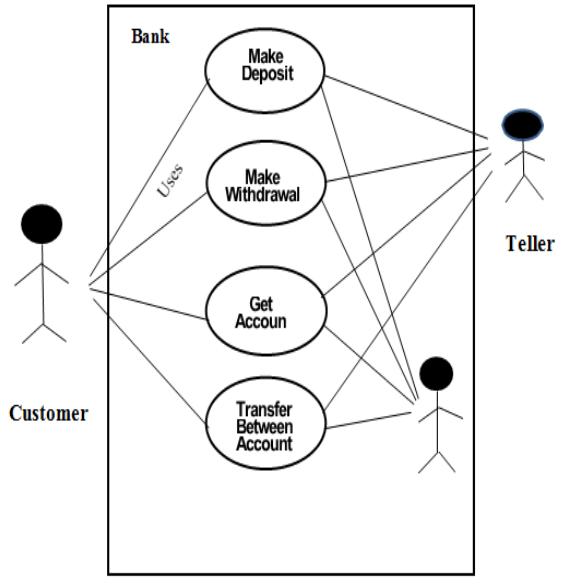
Succession chart shows object cooperation's orchestrated in time arrangement. It portrays the items engaged with the situation and the grouping of messages traded between the articles expected to do the usefulness of the situation. As demonstrated in the Fig: 5. for pretty much every moneylender the meaning of the term Loan beginning is unique – where it begins, the various stages inside the cycle and where it closes. Each Loan type will have an alternate endorsement measure that can be manual or programmed. Banks have their "mystery ingredient" with regards to Loan Origination that they never need to share as Loan beginning is the thing that makes Companies stand apart from their opposition. Credit Origination System is answerable for overseeing everything from pre-capability to the endorsement of subsidizing the advance. These are the means in arrangement outline Pre-Qualification Process, Loan Application, Application Processing, Underwriting Process, Credit Decision, Quality Check, and Loan Funding.




**d) Use Case Diagram**

A utilization case chart at it easiest is a portrayal of a client's communication with the framework that shows the connection between the client and the diverse use cases in which the client is included. As demonstrated in the above class graph models ledger framework.

"A ledger is a monetary record between a bank client and a monetary organization. A ledger can be a store account, a charge card, or some other sort of record offered by a monetary organization. The monetary exchanges which have happened inside a given timeframe on a ledger are accounted for to the client on a bank explanation and the equilibrium of the record anytime is the monetary situation of the client with the establishment. An asset that a client has endowed to a bank and from which the client can make withdrawals."




Use case diagram

**e) Activity Diagram**

Action outlines are graphical portrayals of work processes of stepwise exercises and activities with help for decision, cycle and simultaneousness. As demonstrated in This is the Activity UML chart of Banking Management System which shows the streams between the movement of Balance, Accounts, Customer, Employees, Fixed Deposit. The fundamental action associated with this UML Activity Diagram of Banking Management System is as per the following: Balance Activity. Records Activity. Client Activity. Exchange Activity. UML Activity Diagram delineates the business and operational bit by bit work processes of parts in a framework and shows the general progression of control.

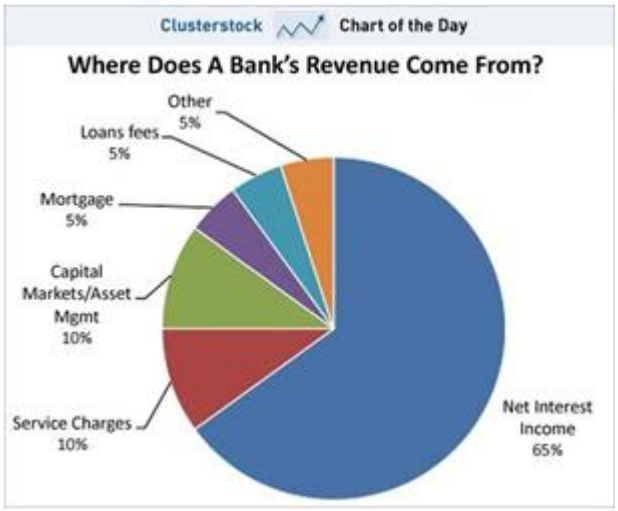



**Figure 6:** Activity Diagram

As demonstrated in Fig: 6 Apart from the monetary administrations industry, profiling client benefit commitment or potential for benefit at the individual level is seldom polished. Present day bookkeeping practice doesn't request this information and most advertising or CRM professionals are uncertain how to go about it. Most firms, whenever pushed, will confess to having some unrewarding clients. In a workshop I was engaged with associates Jan

Kitshoff and Robin Gleaves, out of 30 CEOs just one was resolved that every one of his clients were beneficial. When he comprehended somewhat more about Customer Profitability Analysis (CPA) even he collapsed. Numerous individuals depend on the got intelligence from Vilfredo Pareto that 80% of income comes from 20% of clients, and by suggestion a comparable picture is probably going to be valid for benefits. Benchmarking research by John Murphy and his group at Manchester Business School, across a scope of enterprises and driving firms, showed that after a point by point CPA, the Pareto standard rarely applied. His group tracked down that as a rule unrewarding clients made up more than half of the client base.

## 5. Expected Result


## 6. Future work

With the business scale and business extent of bank growing, the first basic client benefit commitment has been not able to address the issues of bank advancement. Through the investigation of bank clients and business structure, this paper centres on the benefit commitment of 90% of bank's corporate clients. As indicated by the constituent components of the bank's benefit, this paper examines the benefit commitment model from resources, liabilities and mediator business, and conveys the working expense and capital expense sensibly, to improve the bank's benefit commitment model. At long last, through exact examination, we sum up the challenges that might be experienced in the use of the model, and the application impact of the improved client benefit commitment model in the genuine computation.

## 7. Empirical Analysis

To better illustrate the calculation of the customer profit contribution model, the paper takes a company of a bank as an example. Guangzhou A Investment Co. Ltd. is a public customer of BankB, Guangzhou Branch. The business data in 2016 are shown in table 1:

| | Ending Balance | Daily Balance | Full Bank Balance |
|---|---|---|---|
| Liability Business | 25,330 | 25,220 | 702,558 |
| Asset Business | 45,000 | 29,000 | 540,551 |
| Intermediate Business | 10 | | |
| Marketing Cost | 7 | | 1,836 |

The client's deposit is a one-year fixed deposit with interest rates rising by 10% or 3.33% of the central bank's benchmark interest rate; the loans term is three-year, with a yield of 7.36% and a deposit certificate of 50% pledge; the loans in 2016 is averaged 280 million yuan a day, with no additional provision for impairment. Business tax and surcharge rate are 5.5%. According to the inquiry of internal transfer price, one-year FTP is 5.25%; three-month FTP is 4.84%; three-year FTP is 5.96%. Deposit reserve ratio is 18% and interest rate is 1.62%; economic capital coefficient is 10.4%; capital return rate is set by head office to 12%, and indirect expenses that should be shared among company customers is 18.25 million yuan. The customer's profit contribution: deposit profit contribution = (5.28% - 3.30%)×25230 - (4.84% - 1.62%) × (25230 × 18%) = 499.55 - 146.23 = 3.533 million yuan Loan profit contribution = (7.38%-5.93%) × 28000- 28000×7.38% ×5. 5%=406-113. 65=292. 350 thousand yuan Intermediary Profit Contribution = 10-10 × 5.5% = 94,500 Yuan Cost Shared = 7+1,825×40% × (25,230=702,235) + 1,825 × 60% × (28,000=540,553) = 899,500 Yuan Capital cost = (28000-28000*50%) × 10.5% × 16%=235. 200 thousand yuan The customer's profit contribution is =353. 32+292. 35+9. 45-89. 95-235. 20=329. 970 thousand yuan. The profit contribution rate of the customer is =329. 97/ (89. 95+235. 20) =1. 05 From the analysis of above customer's profit contribution, the customer's profit contribution to the bank in 2016 was 3.299 million yuan, and the profit contribution rate is 1.05, indicating that the customer is the high-quality customer that the bank should strive for. According to the calculation method of the above model, ten company customers are extracted to calculate the company's profit contribution, and the final data are depicted as follows

| | $E_{Li}$ | $E_{ai}$ | $V_{m_i}$ | $V_i$ | Contribution rate(%) |
|---|---|---|---|---|---|
| 1 | 353.34 | 292.33 | 89.94 | | 1.01 |
| 2 | 30.38 | 72.11 | 60.77 | 253.20 | -0.45 |
| 3 | 545.41 | - | 27.05 | 285.33 | 20.35 |
| 4 | - | 60.41 | 30.54 | 211.54 | -0.37 |
| 5 | 79.21 | -1.85 | 11.02 | - | 5.91 |
| 6 | 100.32 | - | 21.60 | - | 3.31 |
| 7 | 64.80 | 169.24 | 85.65 | 131.42 | 0.07 |
| 8 | 13.15 | 252.81 | 51.02 | - | 4.41 |
| 9 | 63.35. | 212.33 | 45.69 | 159.66 | 0.35 |
| 10 | 840.21 | -186.65 | 168.39 | 85.69 | 1.75 |

From the above results, we can get the following conclusions:

1) Customers who only have loans and deposits are less profitable than those who have deposits. As loans require capital costs, a 5.7% reduction in business tax, and the allocation of operating expenses is also biased towards the proportion of loans, so winning customer deposits is the guarantee of increasing profit contribution.
2) Risk mitigation of loans has a greater impact on profit contribution. From the calculation of the cost of economic capital in the profit contribution model, it can be seen that if there is no risk mitigation, the profit contribution needs to deduct 1.67% of the economic capital cost of the loan principal, i.e. The capital cost of the loan of 100 million yuan needs to be deducted by 1.68 million yuan. Therefore, a loan with a qualified risk mitigation tool has a greater impact on profit contribution.

3) When calculating profit contribution, the average daily balance of deposits and loans is taken as the base, which weakens the influence of the balance of deposits and loans concentrated at the end of the accounting period on the calculation of profit contribution. Therefore, the calculation of profit contribution can only be influenced by long-term stable growth of business.

## 8. Conclusion

This project is developed to furture the needs of a user in a banking sector by embedding all the tasks of transactions taking place in a bank. Future version of this project will still be much enhanced than the current version. Writing and depositing checks are perhaps the most fundamental ways to move money in and out of a checking account, All banks have rules about how long it takes to access your deposits, how many debit card transactions you're allowed in a day, and how much cash you can withdraw from an ATM. Access to the balance in your checking account can also be limited by businesses that place holds on your funds. Banks are providing internet banking services also so that the customers can be attracted. By asking the bank employs we came to know that maximum numbers of internet bank account holders are youth and business man. It is a successful strategic weapon for banks to remain profitable in a volatile and competitive market place of today. If proper training should be given to customer by the bank employs to open an account will be beneficial secondly the website should be made friendlier from where the first time customers can directly make and access their accounts. Thus the Bank Management System it is developed and executed successfully.

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