COMPARISON OF EFFICIENCIES OF LINEAR REGRESSION AND GAUSSIAN BELL CURVE FOR CASH INFLOW MANAGEMENT OF ATM'S

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Abstract

Management of Cash inflow is an essential operation of banks for the ATM machines on day to day basis.So, Estimation of cash inflow is required in a very precise manner hence the need arises that we use the best possible methodology to garner optimum results .therefore,either the best single methodology or the combination of methodologies in an appropriate manner is needed to be sought.

Index Terms- *Linear regression, Gaussian bell curve, Time series analysis*

I.INTRODUCTION

Comparison of efficiencies of linear regression and Gaussian bell curve for cash inflow management of atm's involves:

1. Finding out the linear regression efficiency.
2. Finding out the Gaussian bell curve efficiency.
3. Finally, comparing the efficiencies and finding out the best suitable algorithm.

Automated Teller Machines (ATMs) are 24-hour self-service machines that enable bank customers conducting their financial transactions without visiting the bank branch. In spite of online banking facilities expansion, need for ATMs transactions remains high over years and makes ATMs an irreplaceable devices in everyday life. In order to meet growing cash needs of bank clients, banks have to increase continually the number of their ATMs in different location to make cash available.

1. While supplying ATMs with cash, Bank faces with minimizing of total costs. Total costs are consisted of 3 basic parts:

   1. Cost for unwithdrawn cash in the ATM itself (cash freezing);
   2. Cost for transport from the branch to the ATM.
   3. Cost for insurance of the cash in the ATM.

There is negative correlation between frequency of filling-in ATMs and costs of cash freezing. If ATMs are often supplied with cash the costs of cash, freezing are lower and if they are rarely filled-in, costs for cash freezing are higher.

Furthermore, costs for insurance are proportional depending on amount of money in ATM. When it comes to the cost of transport, the Bank deals with the situation on the following way. In order to decrease costs for filling-in, Bank always organizes cash transport for multiple subjects in the neighborhood, therefore the transport is done in the loop (for 3-4 subjects) and not as star (for each subject separately). The Bank uses an application, which proposes the time, and the amount of flling-in for each ATM based on historical data.

II. RELATED WORK

Very large no of reasearches are done by years for Atms cash inflow prediction.

1) Kausar Fiaz Khawaja , Irfan Manarvi:Evaluating Evaluating CustomerPerceptions towards ATM services in Financial Institutions; A Case study of Pakistani Banks (2017 IEEE Conference)
This paper explores the Use of Automatic Teller Machines (ATMs) in Pakistan. This investigation is based on establishing reasons of this increasing trend from the perspective of new technologies being introduced by service sector organizations
especially banks in this country. The research was based on lessons learnt in use ofATMs in other countries and evaluating the personality, benefit and behavioral responses of the customers through quantitative analysis based on a questionnaire
covering all these attributes of customers. The results were analyzed using statistical tools. It was observed that customers preferred convenience of use of ATMs when the banks started converting the software to their national language as well as the
availability of more number of ATMs in near vicinity of customers.

2) Akber Rajwani, Tahir Syed, Behraj Khan, Sadaf Behlim: Regression analysis for ATM cash flow prediction(2017 International Conference on Frontiers of Information Technology)
One of the most challenging task for a bank is to maintain cash in their ATMs (Automated Teller Machines) so that they can easily serve their customers. To solve this problem, they create a daily estimate for each of their ATM, which can result into"Out of Cash" or "Over Stock" situations. This paper aims to present an insight on how to provide a solution predicting how
much cash inflow would be needed for the next day examining and learning from past transactional data. This paper present results for regression techniqes, including using the LSTM model for time-series for the first time to the best of our knowledge, to solve the "Cash Estimation" problem. This would allow banks to adopt to the changing needs of cash according to specific occasions, holidays, etc.
Department of Computer Engineering, AIT Pune 2018-2019 8
Decentralized Logging Service using IPFS for Cloud Infrastructure

3) Vishal Bhatnagar: Data mining-based big data analytics: parameters and layered
framework(Int. J. Computational Systems Engineering, Vol. 1, No. 4, 2013)
This paper, presents tell us about Need of data mining-based business analytics, The data mining is finding its application in every field of the business. This is evident from
study of the papers on various service sector organisations data that are able to identify crucial information which helps business executives to take important business decision
this paper also provides an insight on large flow of data and need to handle such bulk data, The flow of data in every organisations or industry is growing at a very rapid
pace. This resulted in accumulation of tera byte of data and executives want to find vital information from the same. The existing algorithms and tools of the data mining
are capable of handling data to a capacity. This puts limitation and demand for the large
scale scalable algorithms for analysing such bulk and continuous flow of data. A thorough study of papers pertaining to such problems and solution was done by the author

4) Delyno Johannes du Toit:" ATM Cash Management for a South African Retail
Bank " Proceedings of the 2017 ACM on Conference on Information and

Knowledge Management. ACM, 2017.

Cash can be seen as a fast moving consumer good. Approaching cash as inventory within the ATM cash management environment of a South African retail bank, provided the opportunity to apply well known industrial engineering techniques to the financial industry. This led to the application of forecasting, inventory management, operationalresearch and simulation methods. A forecasting model is designed to address the multiple seasonalities and calendar day effects that is prevalent in the demand for cash.

Special days, e.g. paydays, lead to an increase in demand for cash. The weekday on which the special day falls will also influence the demand. The multiplicative Holt-Winters method is combined with an improvised distribution method to determine the demand for cash for the region and per ATM. Reordering points are calculated andsimulated to form an understanding of the effect this will have on the ATM network.

Direct replenishment and the traveling salesman problem is applied and simulated todetermine the difference in using one or the other.

III. PROPOSED SYSTEM

1. To reduce time and cost through open source and product enabled services..
2. Provide a common platform for financial analysis
3. Compare and find the best overall model.

IV. PROBLEM DEFINITION

To manage the cash input into the atm's by analyzing the varying trends subject to occasions such as holidays, festivals, fiscal burden, timings and various other aspects which may cause dynamism in the overall requirement to avoid cash inflow cycle outburst using open source technology.
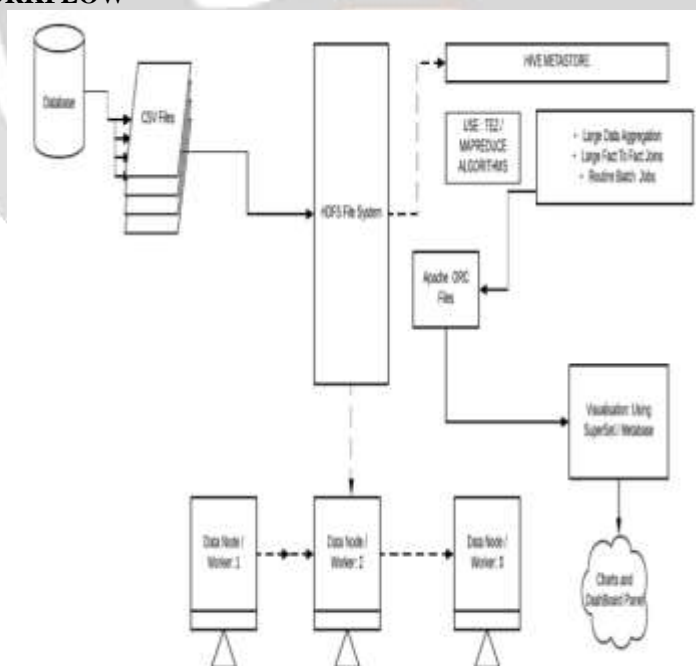
V. SYSTEM DESIGN

A.SYSTEM WORKFLOW

Fig 2: Component Diagram

Fig 1 shows workflow of the whole system which consists of
Trained model and elastic search.

B. SYSTEM MODULES

1.HADOOP ARCHITECTURE

 Hadoop skillset requires thoughtful knowledge of every layer   in the hadoop stack right from understanding about the various   components in the hadoop architecture, designing a hadoop cluster, performance tuning it and setting up the top chain responsible for data processing. .

2.HADOOP DISTRIBUTION FILE SYSTEM (HDFS)

The Hadoop Distributed File System (HDFS) is a distributed file system designed to run on commodity hardware. It has many similarities with existing distributed file systems. However, the differences from other distributed file systems are significant. HDFS is highly fault-tolerant and is designed to be deployed on low-cost hardware. HDFS provides high throughput access to application data and is suitable for applications that have large data sets. HDFS relaxes a few POSIX requirements to enable streaming access to file system data. HDFS was originally built as infrastructure for the Apache Nutch web search engine project. HDFS is now an Apache Hadoop subproject.

3) HIGHLY IMMERSIVE VISUALIZATION ENVIORMENT (HIVE)

Apache Hive is a data warehouse software project built on top of Apache Hadoop for providing data query and analysis.[2] Hive gives an SQL-like interface to query data stored in various databases and file systems that integrate with Hadoop. Traditional SQL queries must be implemented in the MapReduce Java API to execute SQL applications and queries over distributed data. Hive provides the necessary SQL abstraction to integrate SQL-like queries (HiveQL) into the underlying Java without the need to implement queries in the low-level Java API. Since most data warehousing applications work with SQL-based querying languages, Hive aids portability of SQL-based applications to Hadoop

VI. USER INTERFACE

User will be able to scan the document and upload images.

VII. INPUT DATASET

Input dataset includes the csv file of cub bank of india.

VIII. CONCLUSION AND FUTURE SCOPE

In this project we have highlighted the main aspect for undertaking this project. We have tried to explain, to our best possible, the main motivation for moving forward with such a project. We have tried to cover various works that have been done in this field of research through our literature survey.

We have tried our best to make the introduction as abstract and absolute as possible. The introduction comprises of all necessary details to make it easier to move forward with an understanding of the context but we have also ensured that it doesn't dive deep into the specifics of the topic, which might have resulted in increasing the ambiguity and making it more complex to interpret and process. We have tried to come up with a short and concise but elaborative and self-explaining problem statement for our project.

Based on whatever knowledge we gathered from literature survey of this research area we tried to come up with a comprehensive and complete understanding of the matter. We tried to gather each and every requirement for this project in the most unambiguous manner possible. We came up with the software requirement specification for this project which we hope will act as guideline or rulebook to be referred at various stages of project development.

We have decided the development model to be followed for the purpose of implementation of the project. As mentioned, we will be moving ahead with Extreme Programming Model for the software development life cycle of this project. We have formulated the entire system implementation to act as our guiding light for the development

of this project. We have performed system design for this project by carefully taking into account each and every requirement of this project. We have performed both static and dynamic modelling for the purpose of complete design analysis of this project. For static modelling we have developed the class diagrams and component diagrams and for finishing with the dynamic modelling we have developed sequence diagram and activity diagram for this project.

We hope that with this comprehensive analysis of the project we would be able to develop our project without much hassles and complex issues.

The future scope for this project is virtually infinite. As we have already stated we have limited the scope of this project to only printed documents, this same project can be extended in future to scan and store the handwritten documents. Apart from this the horizons for this concept are quite wide scope.

On comparison we got that Gaussian bell curve is more efficient for our data because or data doesn't contains linear dependencies

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