

A Survey on Smart Expense Recorder using Machine Learning

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ABSTRACT

Expense Tracker is a daily expenditure management system modeled to track of day-to-day expenses easily and effectively. It helps the user to track the expenditure on the regular basis, of all types of transactions using Machine Learning theorems based system, which eliminates the necessity for hardcopy results. It systematically stores and shows the record of all transactions done and easily helps the user to monitor all the payment data kept by it. An Android Application is to be developed which can read the data from the user's transactions alerts/SMS and record it in its own database categorizing it automatically where the user has transacted the money. This will make it easier for the user to analyze where the user has spent money. User can extract the data of their expenditure, where he had transacted the money and can keep a track of his expense wisely.

Keywords: *K Means clustering algorithm, naive bayes, decision tree*

INTRODUCTION

Smart Expense Recorder Application is a financial process related mobile application planned to run on Android phones. The characteristics of this application are designed in such a technique that will help the user for excellent expense management so that the user can keep record of, optimize and analyze their expenditure and budget. Our application will gather customer's information with the necessary permission, evaluate and study users' spending patterns by specific groups or types of spending, and use this information to track market trends. By using machine learning approaches from data mining, such as clustering techniques, association techniques, and classification algorithms, it is possible to find analytics patterns.[1-3]

MACHINE LEARNING FOR EXPENSE TRACKER

Machine Learning provides complete

visibility into all expenses, anytime, anywhere, and by using device of your choice. It helps identifying and preventing expense fraud. In addition, the analytics gained will guide you in making informed decisions that reduce and save costs. The structured expense management application will reduce the load of manually processing expert analytics. It allows finance groups to mainly focus on strategizing and improving their workflow, which mostly matters. As the expenditure grows, workflows also evolve. An efficient expense manager like Fyle is one of the best tracking apps for expenses that will help individuals adapt and adjust to change.[4-6]

EXISTING MODEL

In the Present System, when a user pays/spends their money with UPI'S transaction, he/she can add that into daily expense manager. After adding the expenses done by the user to the application user can store all the details. If

the user wants all the detail of credit and debit he/she can get it through the Expense Tracker but need to enter manually.

Notification Manager also reminds about credit and debit details after the salary is updated.



Fig. 1: Existing Model.

Table 1: Available Mobile applications.

Founder	Expense Manager Applications	Why We checked These	Main Benefits
David Barrett 2008	Expensify	Best for Saving our receipts	One app lets you scan receipts, keep track of both personal and professional costs, and arrange travel.
Dmytri Baglai 2019	Monefy	There is no need to manually enter each category.	You'll rapidly begin to recognize important spending patterns using Monefy.
Gurdev Singh, Harbans Singh 2015	Money Manager.	It contains a lot of tools that may be used to track and arrange finances.	Include transfers, expenses, and income

PROPOSED SYSTEM

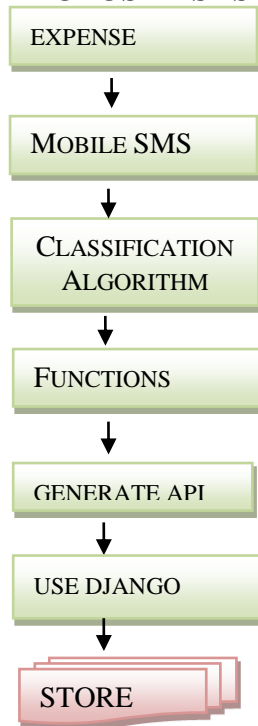


Fig. 2: SMS Classification Model.

Expense Tracker Applications	Why We checked These	Main objectives
Mint	In general Best	Availabilities in this are budgeting tools, expense tracking and Credit monitoring
Expensify	Best for Saving our receipts	It reads and imports receipt information for you automatically.
Personal Capital	Ideal to the Investors	Investment instruments, guidance, and management
QuickBooks Accounting	Excellent for low cost Businesses	Invoices should be sent and tracked.
Everlance	The best option for mileage and reimbursement	Create an IRS-compliant mileage log and sync accounts to track expenses automatically.
Nerd Wallet	Top Free Choice	You can keep track of your credit and expenses for nothing at cost.

In the existing system, the user must enter the data manually into the application/software whereas in our application, the application itself detects the messages of a transaction from the

bank (credit/debit) with the appropriate authorization or permission from the user. The detection of messages is done using the machine learning classification algorithm.[7-9]

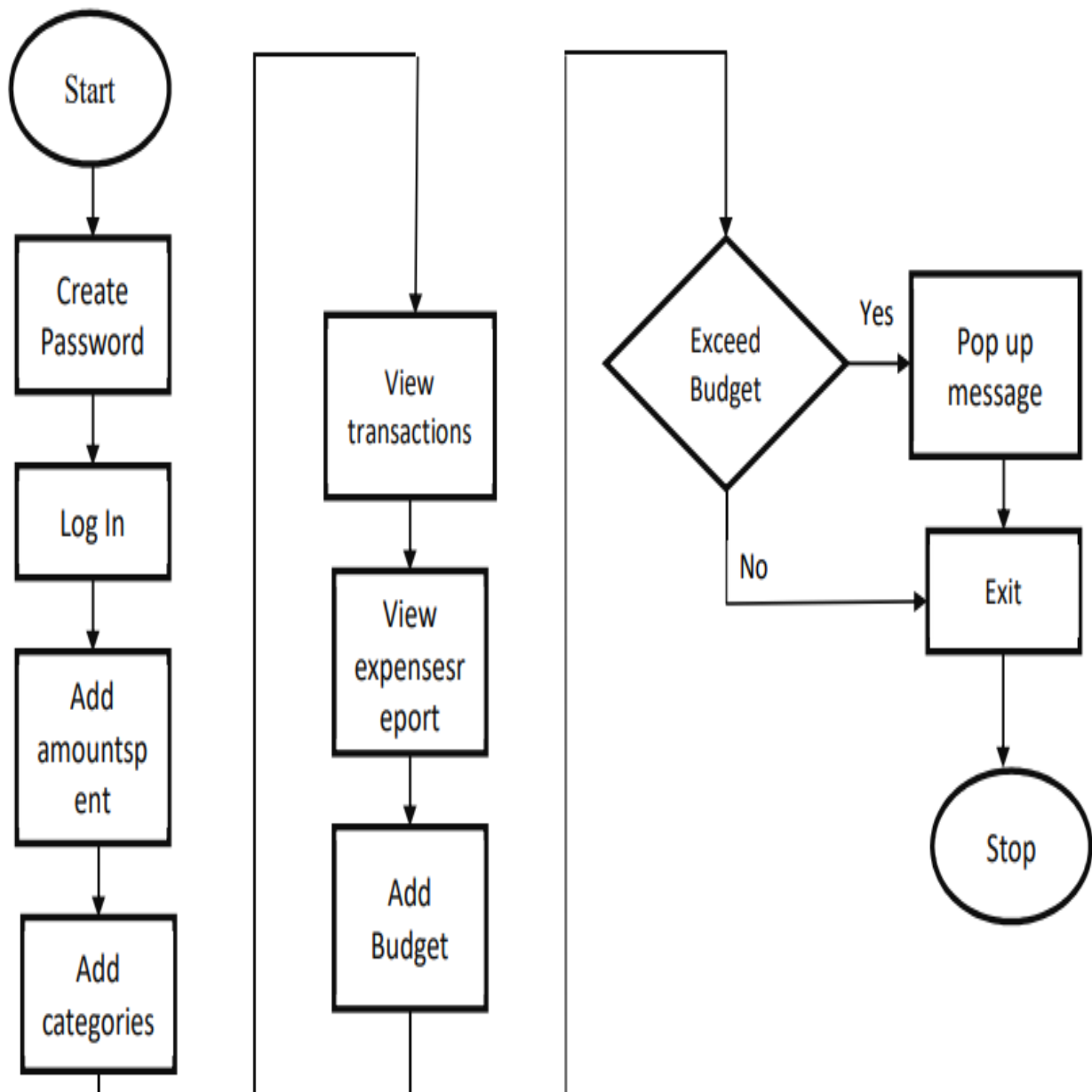


Fig. 3: Explained view of our system.

**TECHNIQUES (ALGORITHMS)
USED FOR DETECTING SMS**

(NB) Naïve Bayes

NB is a classification technique based on the "Bayes theorem" which takes predictor independence into account. This Bayesian classifier makes the assumption that there is no correlation between the existence of a particular characteristic in one class and the existence of any other features. In the event that there are any connections between the existence of a feature and one

another, this classifier will regard each desired characteristic as an independent factor in the probability score. When the dimensionality of the desired input is high, the Naive Bayes classifier is reliable and straightforward. The latest and improved Naive Bayes is called Multinomial Naive Bayes (MNB).

(DT) Decision Tree

It is a supervised learning-based method primarily employed for classification-

related tasks. Both categorical and continuous variables can be used with this technique. The algorithm will initially divide the entire population into a number of homogeneous groups on the basis of independent variables or significant features. Because decision trees are nonparametric, it is not necessary to check for anomalies or separation in the data.

(CNN) Convolutional Neural Network

ConvNet, another name for this network, is a specific kind of artificial neural network that employs the use of supervised learning perceptrons. This learning strategy is applied to data analysis. Convolutional neural network implementation covers a wide range of applications, including conventional image processing (traditional) and language generation processing (nowadays).

(LR) Logistic Regression

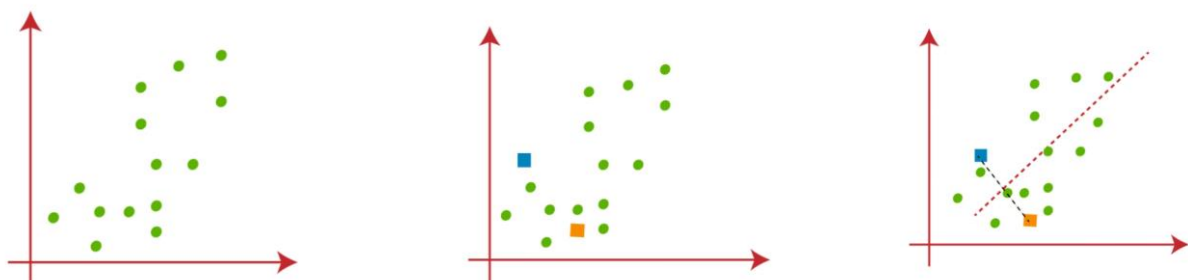
The distinct values are characterized using binary classification techniques according to a set of independent criteria. Logistic regressions, typically help in the process of prediction, produce the event probability by changing data into logistic functions. Most often, these functions are referred to as sigmoid functions.

But in our application, we are using below algorithm techniques:

K_Means_Clustering_Algorithm

It is a repeated algorithm that distinguishes

The working is explained with figure below



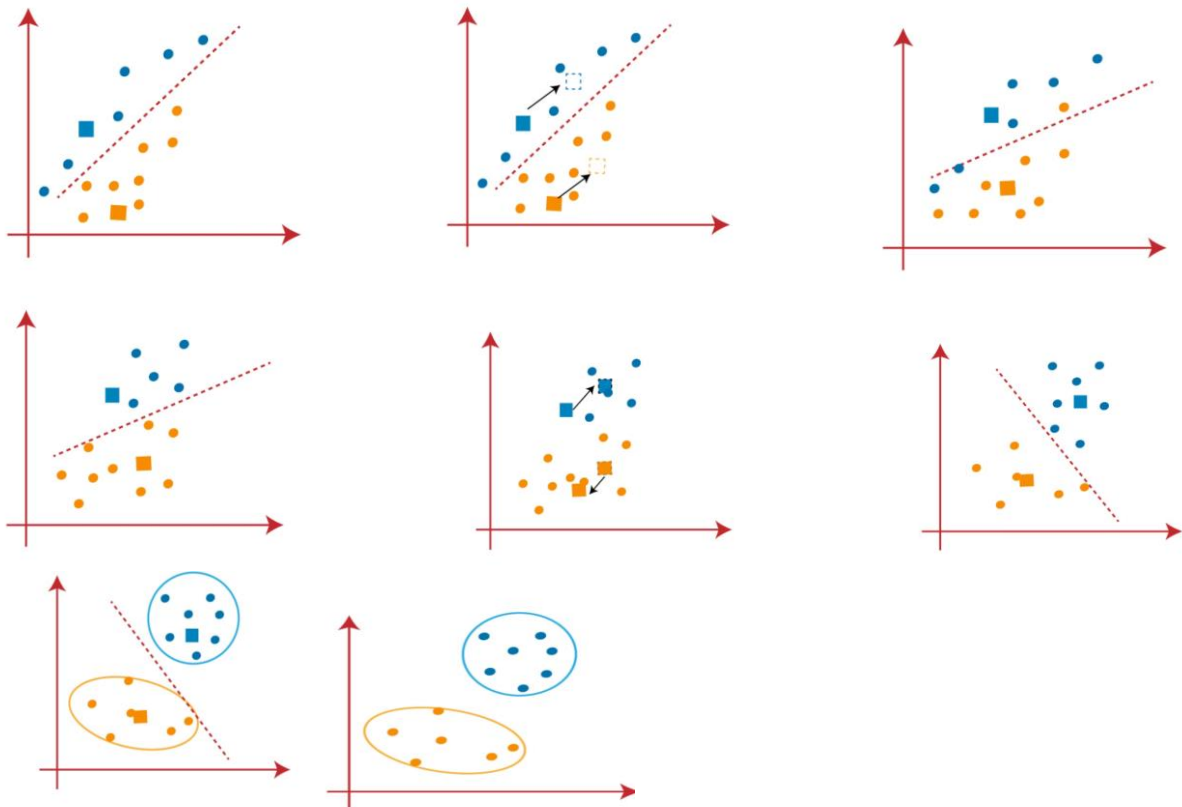
the unlabeled dataset into "K" distinct groups of clusters so that each dataset only comes to one group and shares the same properties. Automatically detect expenses Detect Category.

Basically, this algorithm carries out two tasks

- By doing a repeating activity, chooses the best value for the number "K" Centroids or centre points.
- Every data point should be set to be closest to the k-center. Data points will form a group or cluster of that which are closer to the particular "k"-center.

Functioning of K-Means_Algorithm:

- To calculate the number of clusters, pick one value of 'K'.
- Pick any K points / centroids randomly.
- Set all data point with its nearest centroid, which would arrange the 'K' groups or clusters which been initially identified.
- Compute variance and input the latest new centroid of every group.
- Redo 3rd step that indicates re-set every data point to the new nearest centroid of every group.
- Check whether recast comes, jump to 4th step else finalize it as FINAL and Finish.
- The clone is well set to execute.



MAIN OBJECTIVES

1. This system will have several options to keep track of (for example, Travelling, Food, Fuel, Salary, etc.).
2. It will keep on sending notifications for our daily expenditure automatically based on their expends.
3. In today's expensive and busy life, we are in a great rush to make moneys, but at the end of the month we broke off. As we are spending money on unwanted things unknowingly. So, we have come to up with the plan to get our profit.
4. The user don't need to define their own categories for expense type, our app will add automatically some data in extra data to indicate the expense.

FUTURE SCOPE

- We will be adding credited amount also.
- The Total amount credited will be also showing.

- The final figure will be shown in a graphical representation.
- More focus on credit and debit both.

CONCLUSION

A Mobile application that manages and stores track of all of your everyday purchases might make suggestions for the optimal user experience for you. Our application's primary goal is to do away with sticky notes, spreadsheets, and handling enormous amounts of data; the new experience is incredibly user-friendly and devoid of hassle. Therefore, our application will provide an area for the user to more easily record and manage their spending. Additionally, our technology can assist digital marketing firms in more effectively launching their advertising campaigns. Further investigation led us to the conclusion that the user experience would be improved by adding discussed attributes. In order to make the application portable, we will link

the user's profile to their contact information, which consists mostly of phone numbers, emails, and social media accounts like Facebook, Instagram, and Twitter. This software will perform well in calculating split expenses, documenting the expense accurately with real date and time, and maintaining a database of records.

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