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BUDGET MASTER: NLP BASED SMS ANALYSIS AND EXPENSE TRACKING

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Abstract

Nowadays expense tracking is very important, as demand of automated expense tracking is increasing, so traditional methods of expense tracking seem outdated.
To avoid manual input labor, we are providing an efficient method to do the same work, which will take less time by help of SMS Tracking.
This software reduces human effort and provide the easy way to track the expense and provide good data insights.
It tracks expense by using NLP on transaction SMS. It provides several advantages for businesses also. This software helps to control unnecessary expenses. By using graphs to represent data, this app helps users to track their money to identify financial issues for future.

Keyword: Natural Language Processing, Android, Room Database, Expense, Tracker, Machine Learning

1. Introduction:

This research paper monitors SMS, it automatically analyzes them to get transaction information from them. It provides a record of all transactions to user, and provide a view of the financial situation.[5]
Manual expense tracker wasted lots of time and resources and it create inconsistency in records.[1]
It consumes paper resources and time. The problems which are identified with system which are used commonly in market are:
Much details cannot be kept and work is tedious.
Involves paperwork which:

- wastes very much space
- Can be modified or stolen easily
- Can be damaged easily and cause data loss.
- Searching is difficult and inefficient.
- Analysis of data is difficult.
- Reports cannot be generated easily.
- The data may be inaccurate.

At the end, there can be multiple factors that affect the performance of the system.[3] This software is based on the **android** platform. It uses the **regular expressions and NLP** to analyze bank's SMS to

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extract the data from message.
Project has two tier architecture:
First is database tier, where all the financial data is saved. Second one is the user interface which supports the software, where user communicates with software and store information. It uses **ROOM DB** library of android.

It is **able to create, modify and delete the transactions in the database**. Transaction has categories that the user can select. Every expense is stored under a particular category. Then we can filter out the details efficiently.
In transaction tab, user will be able to filter the transactions, User can also see report **and data is stored locally on device with strong encryption.**
It has ability to set budget limits to track the transaction SMS for the expense info.

Algorithm

Text Preprocessing

This is the first step of data analysis on the received SMS to the user, here tokenization and part of speech tagging is done to segment textual data into the tokens.

Entity Identification

After text is processed next step is to identify the corresponding entity associated with the particular sequence of words.

Entity Classification

The identified entities are categorized in the particular class and type. The entities are classified in different groups.

Contextual Analysis

It then considers the context in which the entities are used to check accuracy of classification of data and assign the particular category.

Data Extraction

The meaningful data such as amount and date of payment are extracted and stored in the database.

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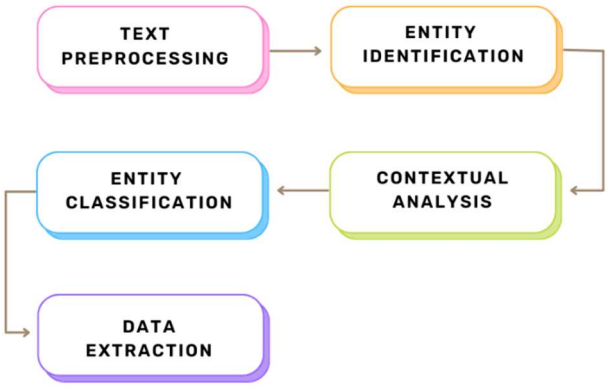

2. Proposed Work Plan:

2.1 General architecture of Research paper

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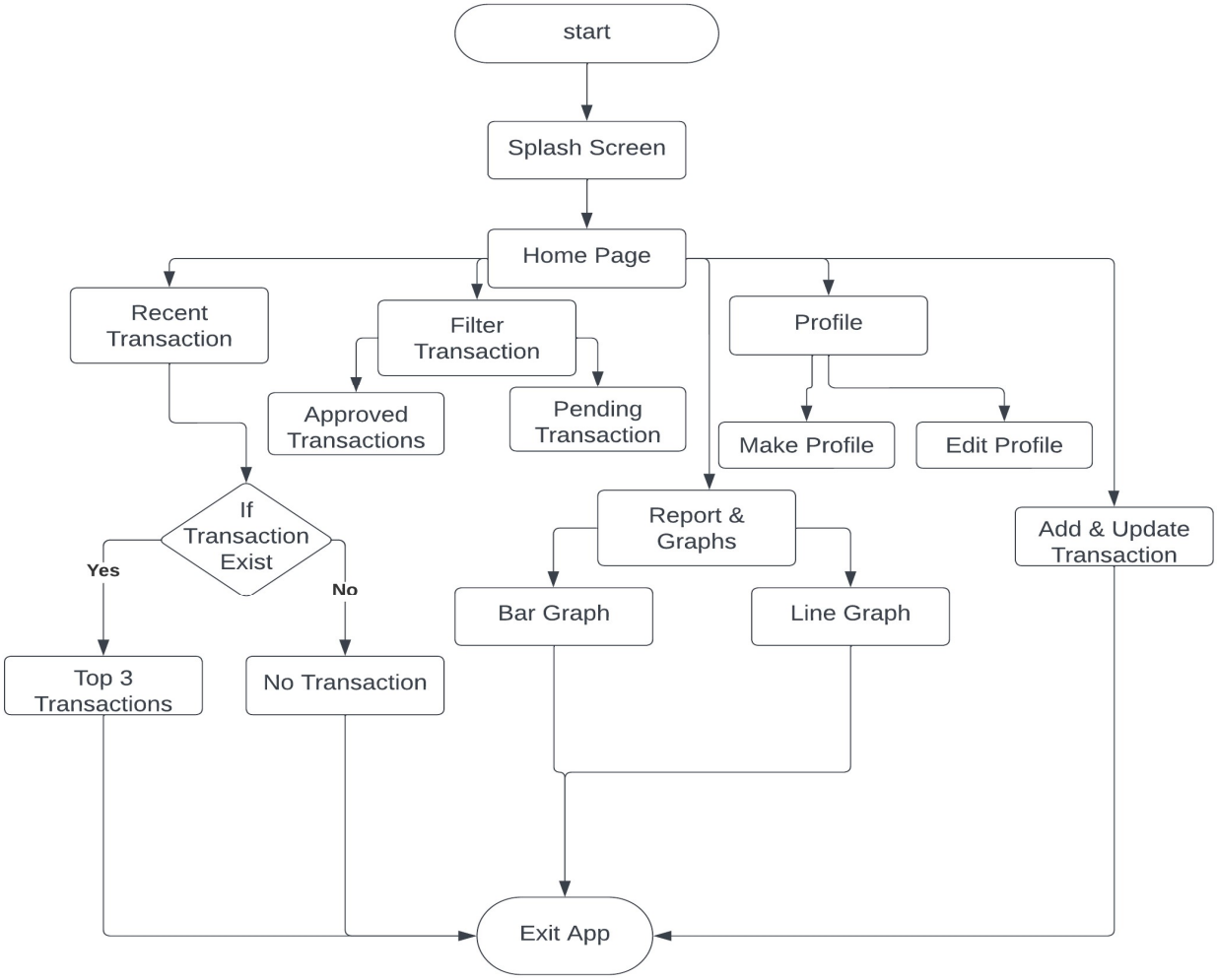

2.2 Description of modules of the research paper

Recent Transactions**: It can easily manage the financial activity of user with "View Transaction " tab, it offers a detailed display of all transactions.**

Filter Transactions**: It will streamline financial analysis by use of "Filter Transaction" feature, it allows to categorize transactions and sort transactions which are based on a specific criterion that are more tailored for efficient view.**

The Splash Screen**: This app provides an informative splash screen, that offers user a warm welcoming introduction and provides entry into application's features.**

Reports and Graphs**: User can gain useful insights from financial data with the "Reports and Graphs". It represents graphical analysis of the transactions on the monthly basis, which enhances the understanding of your expense patterns.**

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Edit and View Profile**: It personalize the user experience with the help of "Edit Profile" feature, that allows users to modify and customize the profile information in the application.**

Add Transaction**: User can manage their finances by using "Add Transaction" feature, which helps users to provide input and feed the transactions effortlessly, and ensure the updated and correct financial record**.

3. Experimental Result Analysis

3.1 Description of the dataset used

Various sample SMS of the various bank in the India are taken into account for training the system algorithm.
That helped to achieve following:

1. Easier data extraction.
2. Robust system to identify bank transactions only.
3. Accurate details of transaction.
4. Automation of expense tracking.

S No	Features	Existing system	Proposed System
1	Register	Yes	Yes
2	Add income	Yes	Yes
3	Update Transaction	No	Yes
4	Report Generation	No	Yes
5	Graph Generation	No	Yes
6	Notification	No	Yes

3.2 Efficiency of designed system to evaluate the performance

This app can be used to **recognize most of the pattern of Indian SMS** and store transaction details with timestamp into the system.
The Calculated Efficiency of system **based on the various test set** is **about 83 % accurate transaction details** stored in database.

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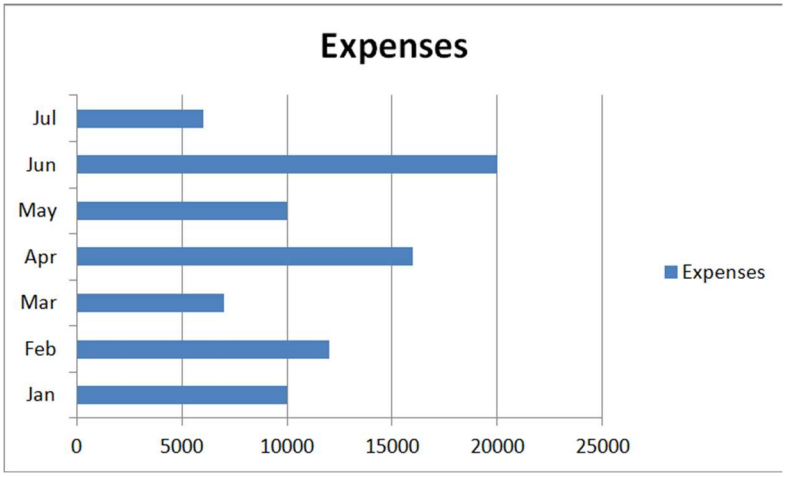

However, it's important to consider that there are some areas where this application could need refinement.
As this application may occasionally **encounter challenges to detect new pattern transaction SMS.** Additionally, **automatic categorization of the transactions is not yet provided**, so it requires users to manually provided the category of expense.
Hence, these challenges provide opportunities for the further research in this system and improvement of proposed approach.

Conclusion

Budget Master is developed as counterpart to traditional system that depends on manual labor and data inputs. This system is extremely useful for individuals who are aged 50 or above, and it offers a straightforward alternative to the conventional system. If automation is the future, then Budget Master serves as a milestone in that direction.

In today's world, time is the valuable commodity, mainly because it is not managed properly. People wants to complete tasks quickly and safely, and our system is developed to meet this demand. It provides solution to problems that are not solved yet.

It has a further scope of improvement by enhancing data analytics and gaining more information from the generated reports. The graph implementation can be improved further to depict data more clearly. This research paper is a step towards utilizing power of machine learning and natural language processing.

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