
Mitigate input drawbacks of Expense Tracking Application

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Expense Sharing Applications: Manual Input

Drawback of Manual Input

- 1. Input Errors**
- 2. Time Consuming**
- 3. Errors while reading from Receipt**
- 4. Non English Linguistic Errors**
- 5. Technology Unfamiliarity Errors**

Miscellaneous Errors:

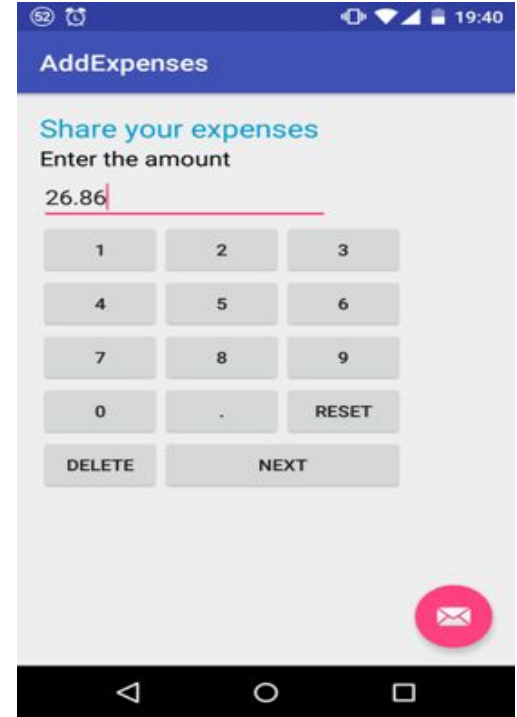
- Non intuitive user interface**
- Frequent use of Backspace**

Solution 1: Manual Input Interface

1. Inbuilt, Minimized, customized
2. Separate components for different entries
3. Better UI leads to less error
4. Restriction of entry of invalid input

Cons:

1. No automation of input
2. Increase in navigation time



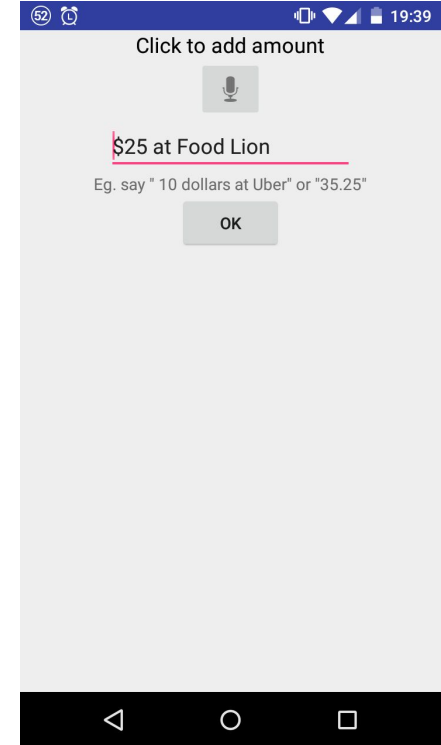
Solution 2: Input via Voice

Using Google recognizer intent for speech

1. **Intuitive, fast and reliable**
2. **Can be used to populate both the amount and description**
3. **Adequate accuracy in numerical data**

Issues:

1. **Language barrier or varied results with different accents**



Solution 3: Input via Image

Implemented using Tesseract OCR

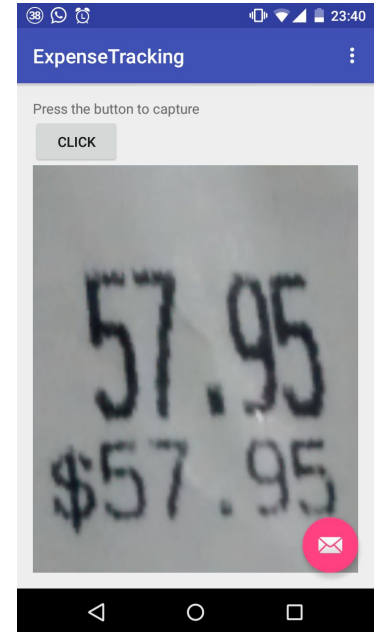
Taining with given data is required

Advantages:

1. Saves bills in history permanently
2. It overcomes linguistic barrier

Disadvantages

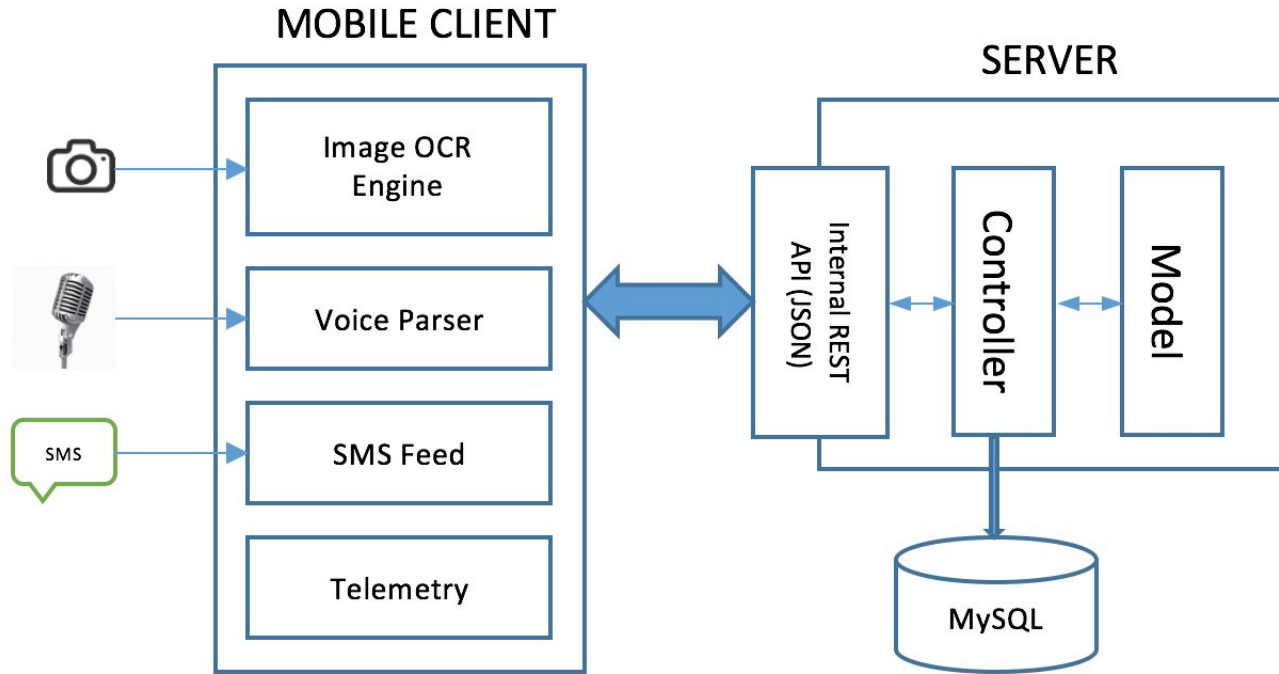
1. Blurry or damaged bills cause problems.



Solution 4: Input via SMSes

- **Scan SMS Inbox for expense messages**
- **Implementation**
 - ◆ Android APIs
 - ◆ Regex to match dollar amounts
 - ◆ REST call to the backend to save the expense data
- **Advantages**
 - ◆ Natural way to look out for expense related messages.
 - ◆ Automated expense entry
- **Disadvantages**
 - ◆ False positives due to raw text processing

Architecture

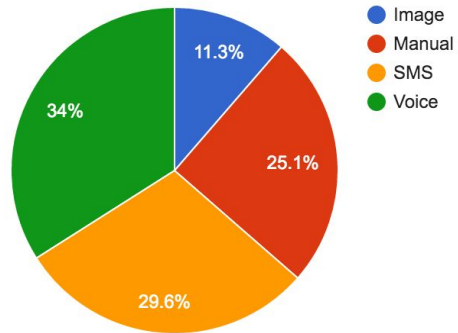


Telemetry

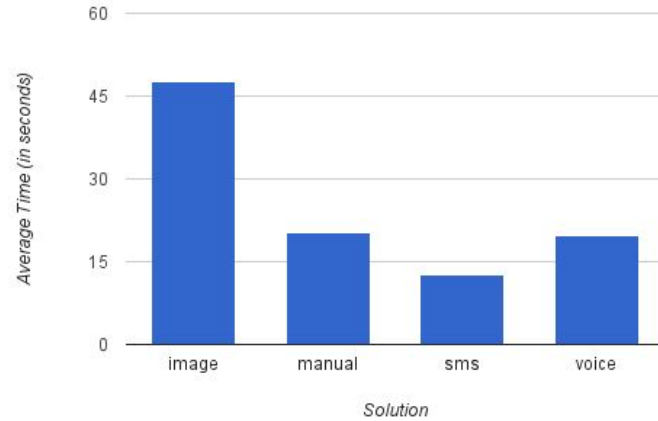
1. Collects metrics
2. High-level Metrics
 - a. Type of solution used
 - b. Duration
3. Granular Metrics
 - a. User Intervention Factor in terms of
 - i. Edit
 - ii. Delete
 - b. For attributes like
 - i. Amount
 - ii. Description

Results from Data

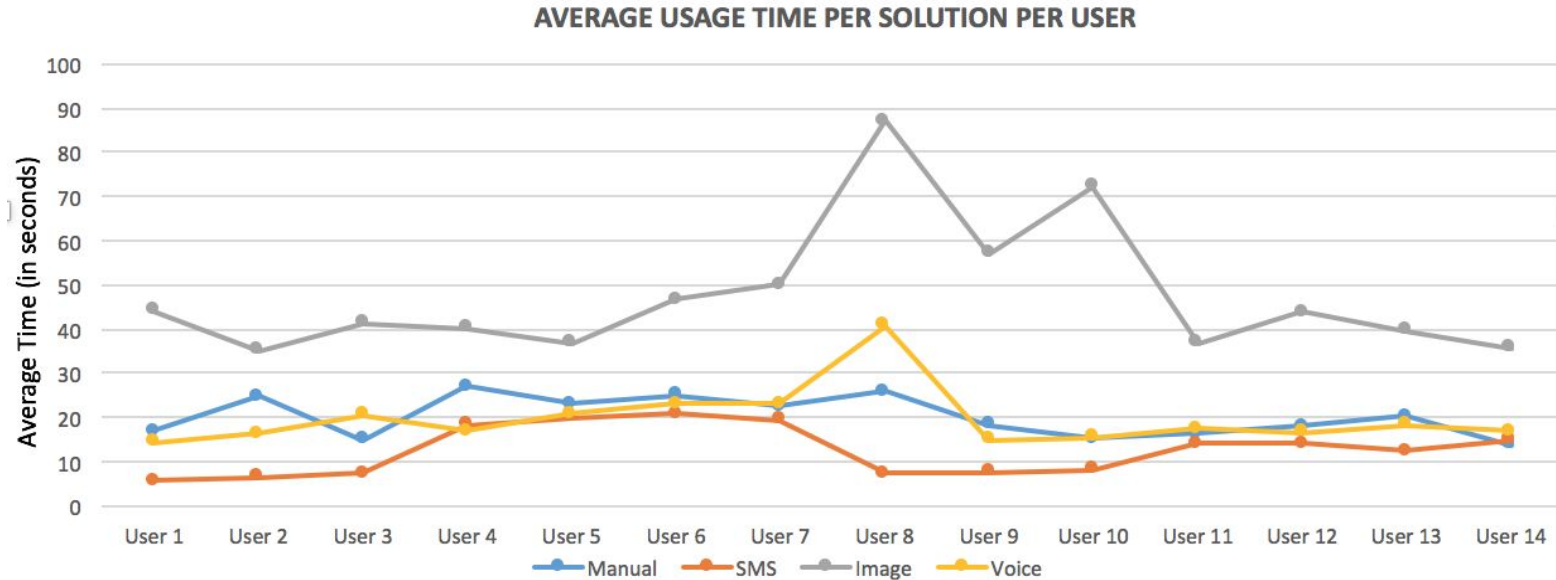
Total Usage for each solution (%)



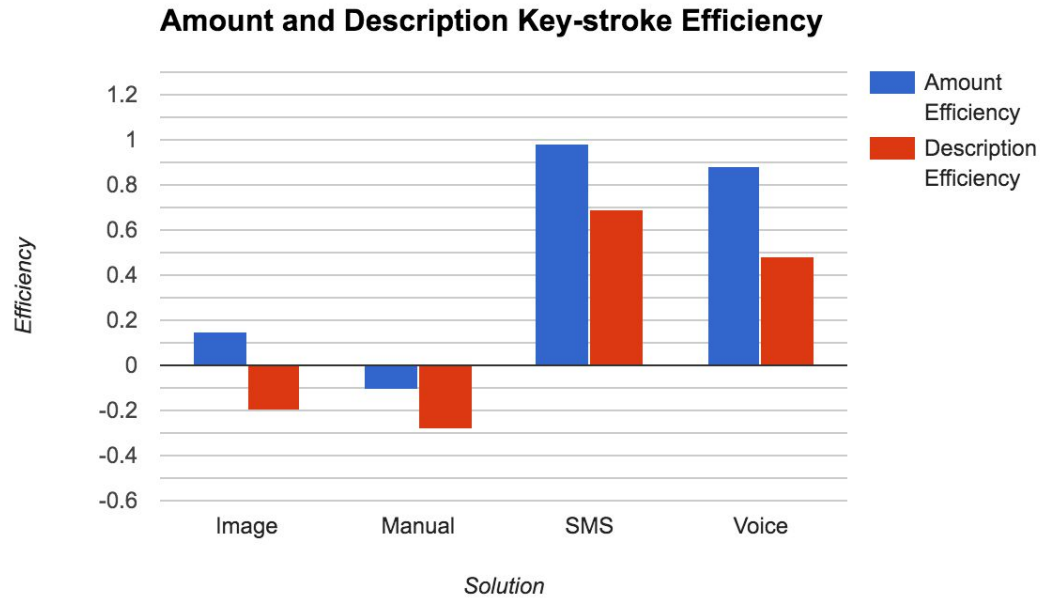
Average Time vs. Solution



Results from Data

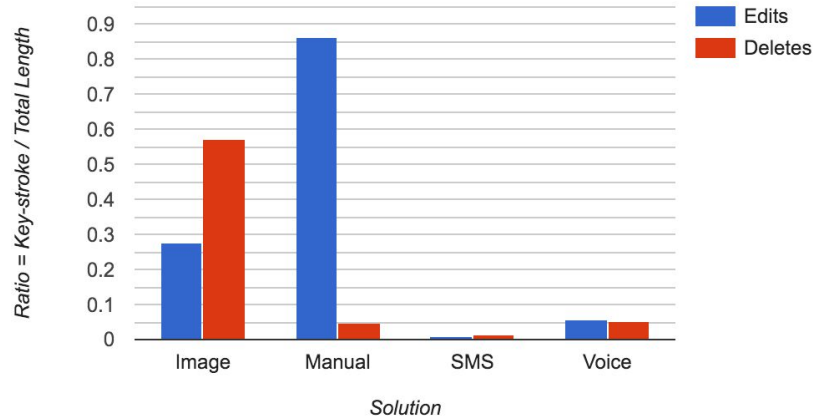


Results from Data

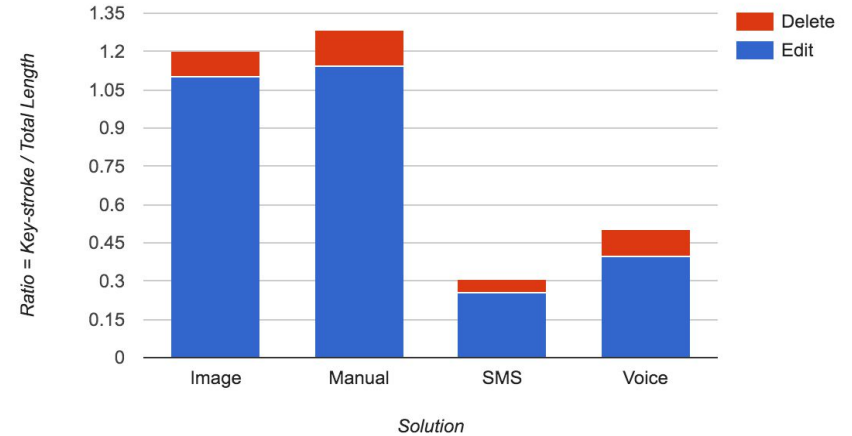


Results from Data

Effort in terms of Key-stroke for Amount



Effort in terms of Key-stroke for Description



Interpretation from Results

- 1. Most Used: Voice (34%)**
- 2. Minimal Usage time: SMS (12.7 seconds)**
- 3. Keystroke efficiency (Amount): SMS (0.98)**
- 4. Keystroke efficiency (Description): SMS (0.67)**
- 5. Least User Intervention Factor (Amount): SMS (0.010)**
- 6. Least User Intervention Factor (Description): SMS (0.155)**

Best Solutions

SMS

1. **Least time consuming**
2. **Minimal effort**
3. **Most efficient**
4. **No third party API is required**

Voice

1. **Most widely used**
2. **Natural and intuitive input**

Business Point Of View

1. **Saves time**
2. **More accurate**
3. **Single point to track all the expenses**
4. **Pro version to view charts for expenses**

Future Scope

1. **User Interface to display or modify the previous expenses**
2. **Itemized entry of expenses from bill through image**
3. **Include the paid version of image OCR to improve the accuracy**
4. **Pro version to visualize the expenses and detailed breakdown for each category of expenses**
5. **Include the paid version of image OCR to improve the accuracy**

Thank You