
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:

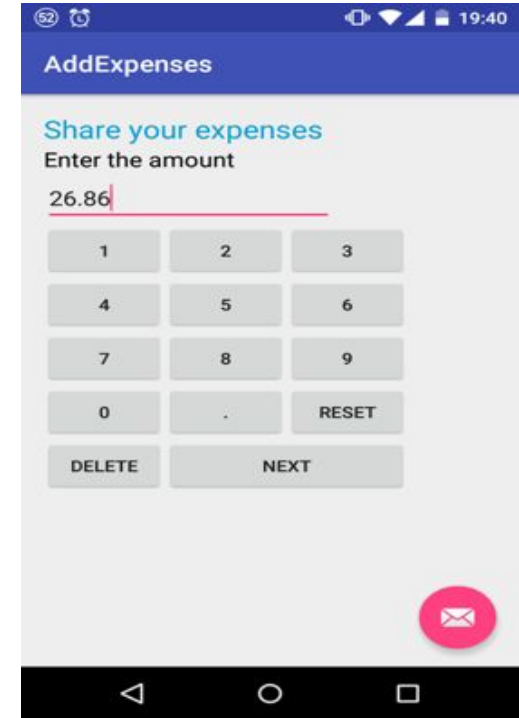
- Non intuitive user interface**
- Frequent use of Backspace**

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



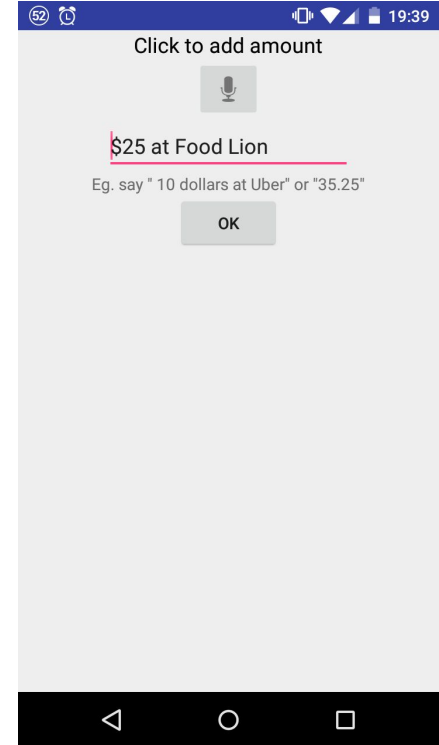
Solution 2: Input via Voice

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

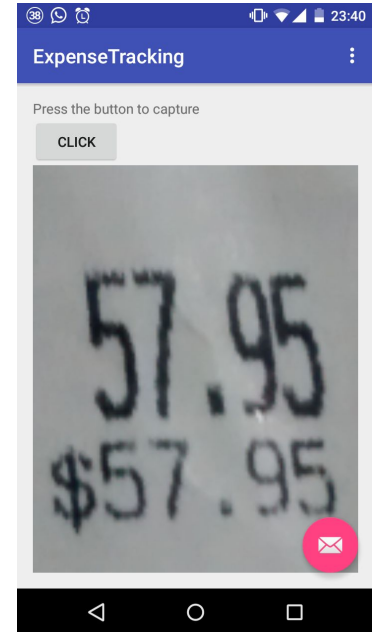
Taining with given data is required

Advantages:

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

Disadvantages

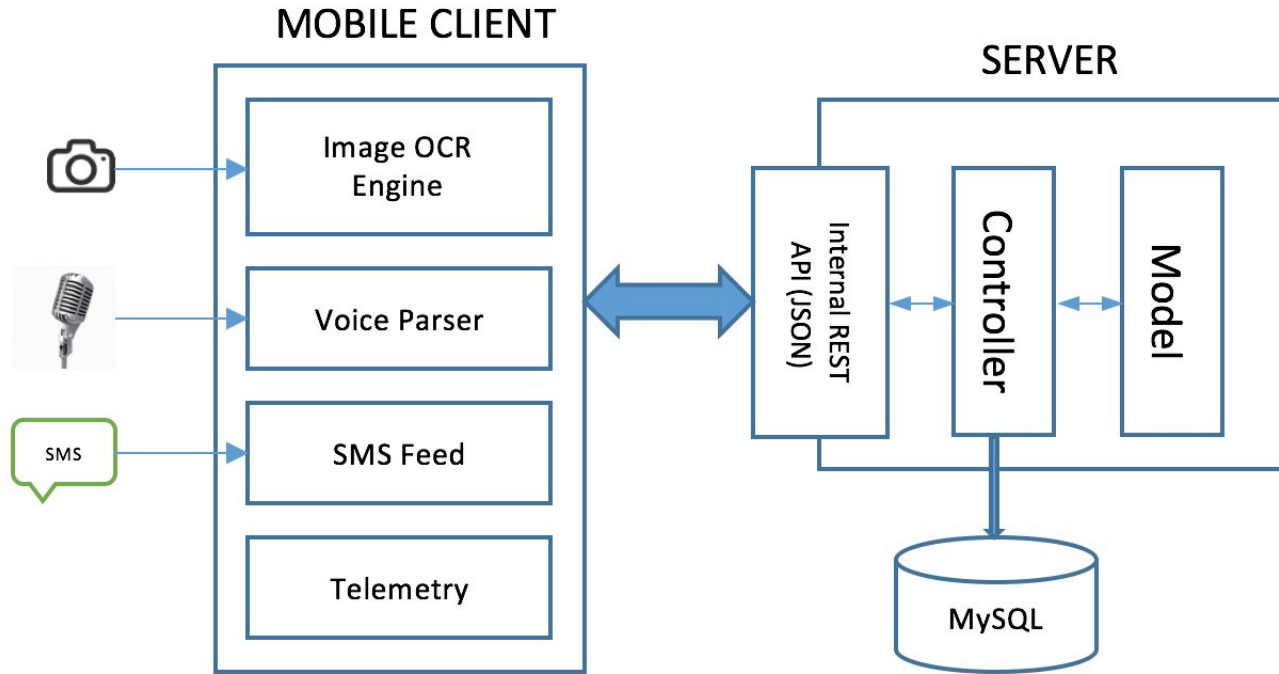
1. Blurry or damaged bills cause problems.



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

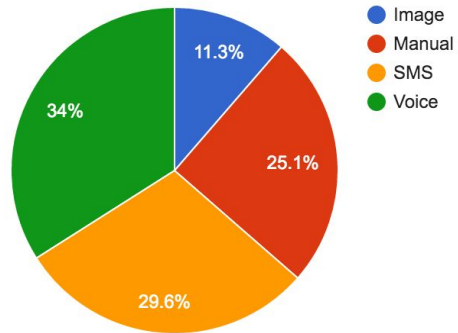


Telemetry

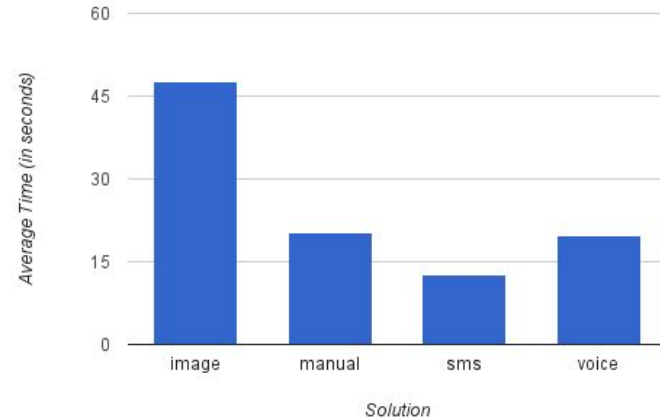
1. Collects metrics
2. High-level Metrics
 - a. Type of solution used
 - b. Duration
3. Granular Metrics
 - a. User Intervention Factor in terms of
 - i. Edit
 - ii. Delete
 - b. For attributes like
 - i. Amount
 - ii. Description

Results from Data

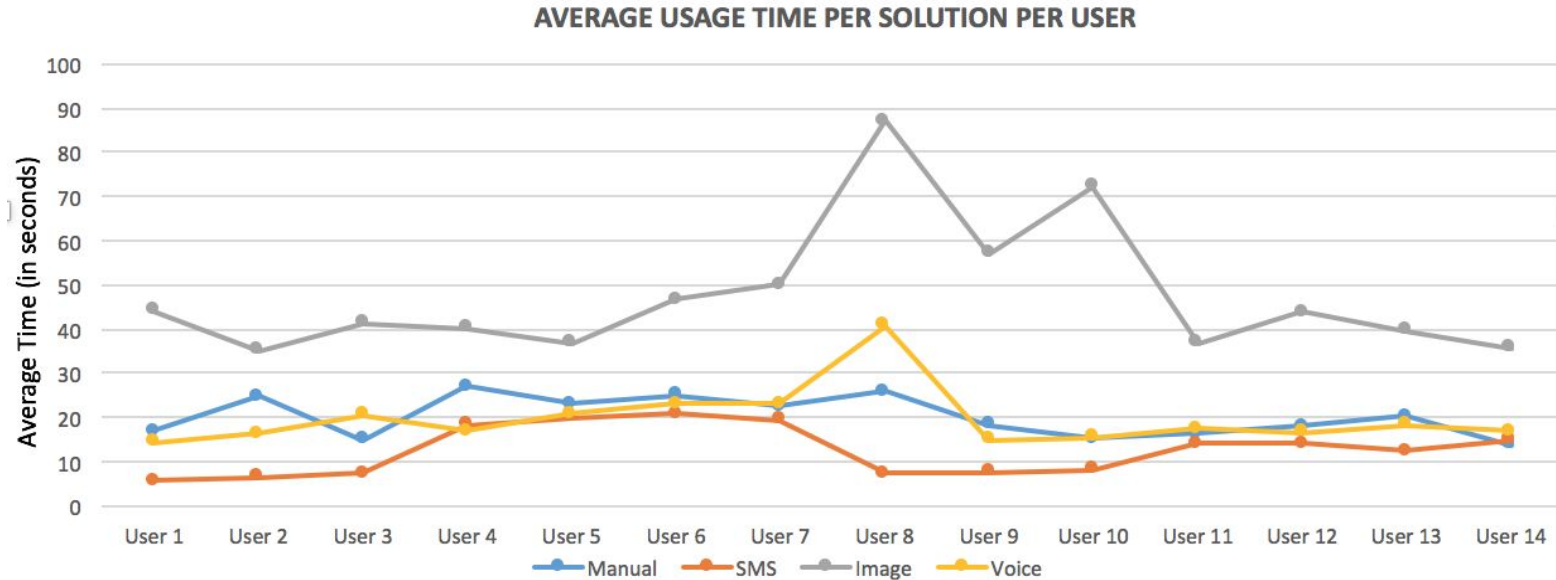
Total Usage for each solution (%)



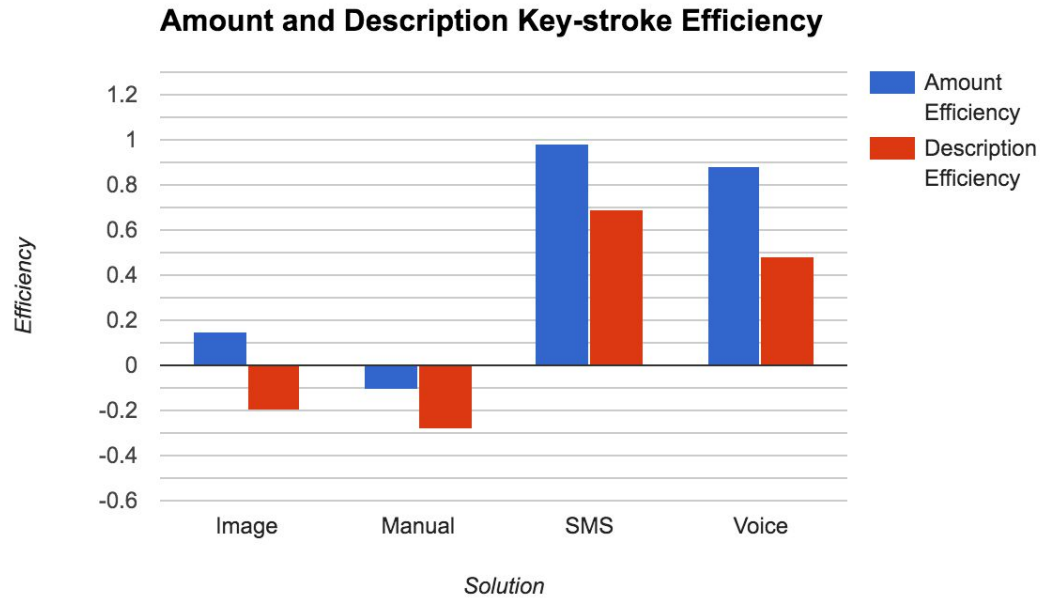
Average Time vs. Solution



Results from Data

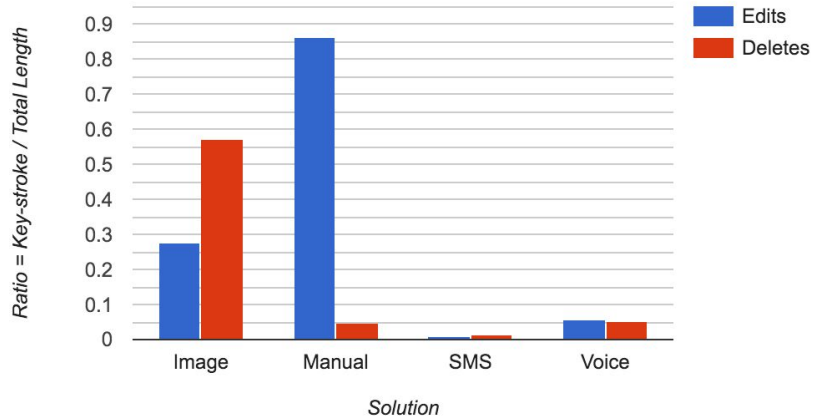


Results from Data

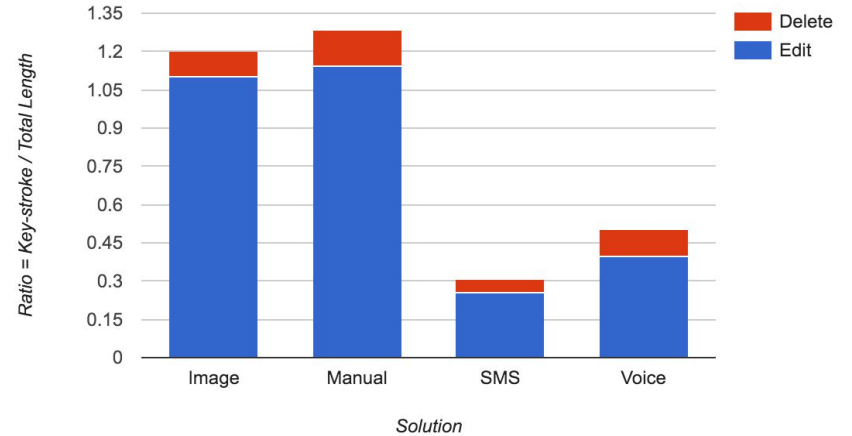


Results from Data

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