

B2B Digitization Project Report

Mohith Damarapati

SCQ : Automate document entry task.

Situation

- Entries into standard excel sheet from receipts of various forms like images, PDFs, excel sheets are done manually.
- Person who does entry into standard excel sheet, looks for each detail(like Product ID, description, Quantity, UOM, etc.) in receipts which is tedious and time consuming. It is also prone to manual errors.
- Automation of the task can save time and human resource, eventually have cost savings.
- Receipts can be of the following formats:
 - Images
 - PDFs
 - Emails
 - Excel Sheets

Complications

- Major complication is, the receipts we get are of different types.
- Some times receipts are crumpled which makes it more difficult to extract text.
- The pdfs are scanned images of invoices and not always in a document format.
- Standard OCR libraries are not matured enough to be able to extract text from these input types with high accuracy.

Key Questions

- Are there any other custom OCR libraries that can offer better productivity and accuracy?
- Are there any alternate methods like voice recognition tool to replace the existing process?
- Will it be accurate enough to offer similar accuracy if not more?
- Will it help in crunching the turn around times with respect to SLA's?

End State

- Automation of document entry task with high accuracy.

Problem Statement

- Ugam gets receipts in various formats from which certain data elements like invoice id, date, product details etc. need to be extracted and entered into standard Excel format.
- We do it manually by looking into receipts and entering the required data into standard Excel sheet which is tedious.
- Receipts can be images, PDFs or Excel sheets.
- ***AIM: Automate the Excel entry task using advanced OCR techniques or ease the task with other approaches like voice recognition.***

Approach 1 using (OCR)

- OCR (Object Character Recognition) can be used to extract data.
- Tesseract OCR developed by Google is the best OCR library implemented in python.
- The results obtained from Tesseract OCR aren't accurate.
- Some characters are wrongly extracted. Output for crumpled images is totally inaccurate.
- Then, I tried a different approach by segmenting, re-sizing and removing noise. It gave me moderate results.
- I was successfully able to extract Invoice ID and Date.
- But due to uncertainty of the receipt format, extraction of other details seemed impossible with standard OCR libraries.

Demo

Complications in OCR Approach

- Format of receipt is uncertain.
- Some receipts are crumpled and some are not clear.
- It is highly difficult to automate the task with standard OCR systems.
- Custom OCR system may solve the problem.
- Designing a custom OCR requires research to be done and takes more time.

Approach 2 using Voice Recognition Tool

- If the task cannot be automated completely using OCR then is there an alternate technique that can partly automate and yet give efficiencies in time and cost savings.
- Next approach is to develop a voice recognition tool which can be used to fill excel sheets by just reading out the data.
- However, it requires manual intervention.
- I used speech_recognition library of python which uses Google's API to get voice from the user.
- Voice is then converted into text and is entered into Excel file in the required fields automatically.
- A custom excel entry assistant can be developed which can ease the typist's task.
- Moreover, the voice recognition tool can be used in other applications.

Demo

Complications in Voice Recognition Approach

- Need to be performed in isolated place with minimal noise.
- Person operating it should be proficient in pronouncing words.
- Voice recognition system takes certain amount of time to get the voice and convert it into text.
- Wrong conversions need to be made manually.
- Special characters need to be taken care off. This is apparently, a solvable task.
- People used to manual data entry may do it relatively faster and may not accept the change that easily.

Other use case of Voice Recognition Tool

- Competitor's data can be obtained easily from online stores through crawling.
- In case of offline stores, sales team does the job manually as mystery shoppers.
- Voice recognition tool can ease the task of mystery shopper.
- Mystery shopper can simply connect to the tool through a call, and speak out the data which will be directly written into excel sheet.

Conclusion

- Although the automation of the excel entry is difficult, an OCR system which can extract Invoice ID and Date is developed.
- Custom OCR systems can be designed in future with research oriented approaches.
- Voice recognition tool mayn't outlay fast typists, but can be used in other applications like mystery shopping.

STEWA



SPEECH TO EXCEL WRITING ASSISTANT

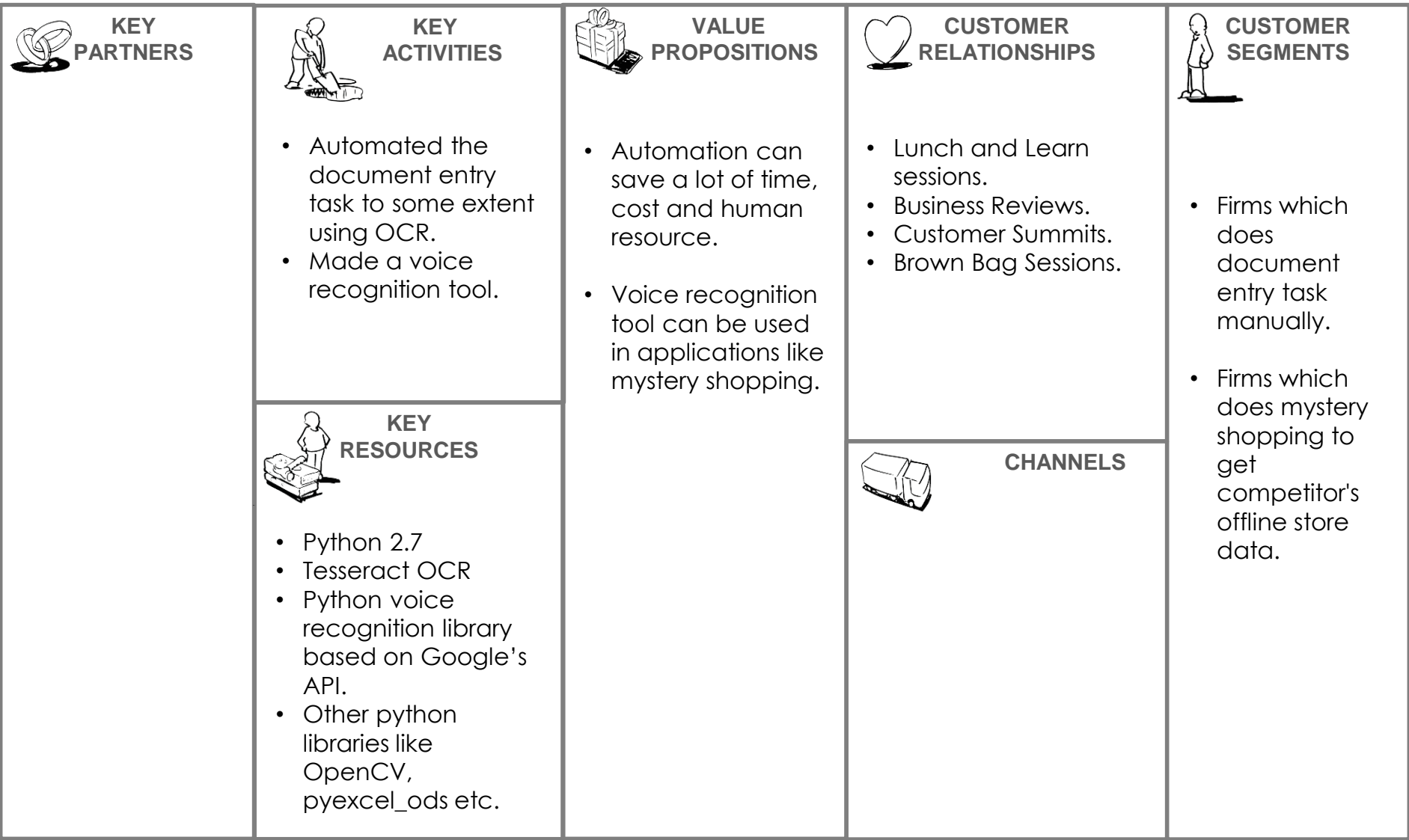
Dependencies

- **Python 2.7**
- **PIP** (To install python libraries)
- **Python Libraries:** Image, OpenCV 3.0, pytesseract, speech_recognition, sys, pyexcel ods, JSON, AST.
- ***Python libraries can be installed simply using pip.***

Bibliography

- Open-CV 3.0.0 Python Documentation
- http://docs.opencv.org/3.0-beta/doc/py_tutorials/py_tutorials.html
- Python 2.7 Documentation (To learn functions of libraries used)
- <https://docs.python.org/2/index.html>
- Py-Tesseract Library Documentation
- <https://pypi.python.org/pypi/pytesseract/0.1>
- Blog to learn usage of Google speech recognition API
- <https://pythonspot.com/en/speech-recognition-using-google-speech-api/>
- Speech_Recognition Library Documentation
- <https://pypi.python.org/pypi/SpeechRecognition/>

Value Proposition Model



Thank you!



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