



# TEXT RECOGNITION ON VARIOUS PRODUCT LABELS FOR VISUALLY IMPAIRED PEOPLE

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**Abstract:** Reading is essential in daily life for everyone. Visually impaired persons can read-only by use of the special application by them like Braille language. Visually challenged people are very strong in their other sensing organs like smelling and touching to lead their life. They are unable to perform visual tasks. In this project, the technology of optical character recognition (OCR) enables the recognition of texts from image data. People cannot witness the price written on the product so this project can help them to find the price which is written on the product.

**Index Terms** - OCR, Braille language, Impaired.

## I. INTRODUCTION

The main objective of our work is to enhance the efficiency of our proposed generic OCR system's for recognizing prices from grocery product image, accuracy of tesseract ocr and the limitation of same objective using template matching. Methodology presented in product image has a lot of false positive results and weak heuristics. In this project we will be using some rule and advance heuristics for extracting required and valuable text from the image. As we have shown some images in product image that have complex and constantly changeable structure, here our algorithm presents many false positive results and garbage text. To get rid of these false positive and garbage text from product image, we have design some advance rules and heuristics. These rules and heuristics greatly add efficiency to OCR results. This project presents the extension of our previous work. The overall system starts with basic image processing techniques like image binarization, image resizing, non textual area removing etc. These operations are performed as pre-processing for tesseract ocr, which add value to tesseract ocr results. The text (OCR result) is stored in text file. Now from text file, text is read line by line and on each of the line we apply rules and heuristics to extract item names, item quantities, item prices and units used in the product image. Regular expressions are used to extract names, numbers from the text. Text contains (mainly depend upon the image quality; but product image images usually of low quality) garbage text, that is not human readable or not valuable. This type of text is filtered using rules, such as item name cannot be greater than 40 letters, cannot contains numeric type etc. The complex part was to identify these parameters from the different product image as all product images are of different structure and contents. Product image usually use short names for items such as GRLC for garlic. This is handled by dictionary of such short names. At last the item names detected may be misspelled, theses misguided words are corrected by the context aware dictionary I-e dictionary only contains food item names. For matching we used fuzzy search. Rest of the project includes related work, tesseract OCR open source API, Image Pre-processing techniques, proposed methodology, Rules and Heuristic, Regular Expressions, Grocery Dictionary spelling correction, Results, conclusion and future work. Tesseract is an open source Optical Character Recognition (OCR) Engine or API, available under the Apache 2.0 license. It can be used directly use or using an API to extract typed text, handwritten text or printed text from images of different formats. It supports a wide variety of languages (we are using python) and almost for all operating systems. For configuring py- tesseract in Ubuntu use following command `pip install py-tesseract` `get-apt install tesseract ocr` After configuring it, you can select language, configuration according to your need. We are using 'eng' English as a language, "psm 6" as a config parameter and Image object as a parameter. Optical Character Recognition, or OCR, is a technology that enables us to convert different types of documents, such as scanned paper documents, PDF files or images captured by a digital camera or phone into editable and

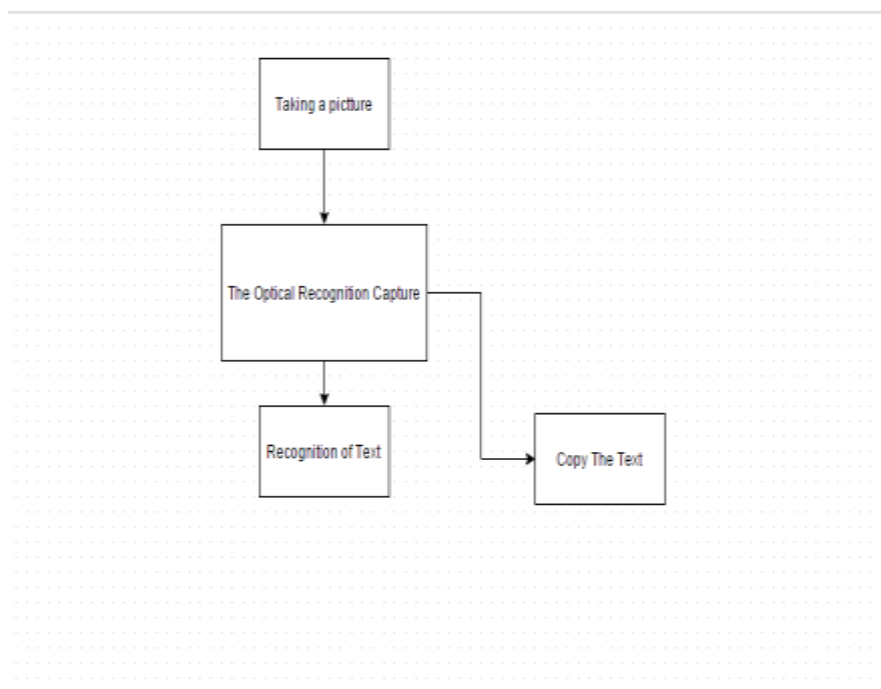


Fig 1: Process

searchable data. This technology is very useful since it saves time without the need of retyping the document. It can perform the action in few minutes. It is able to recognize text in images and convert it into editable text by going throughout a simplified process as illustrated in figure 1.

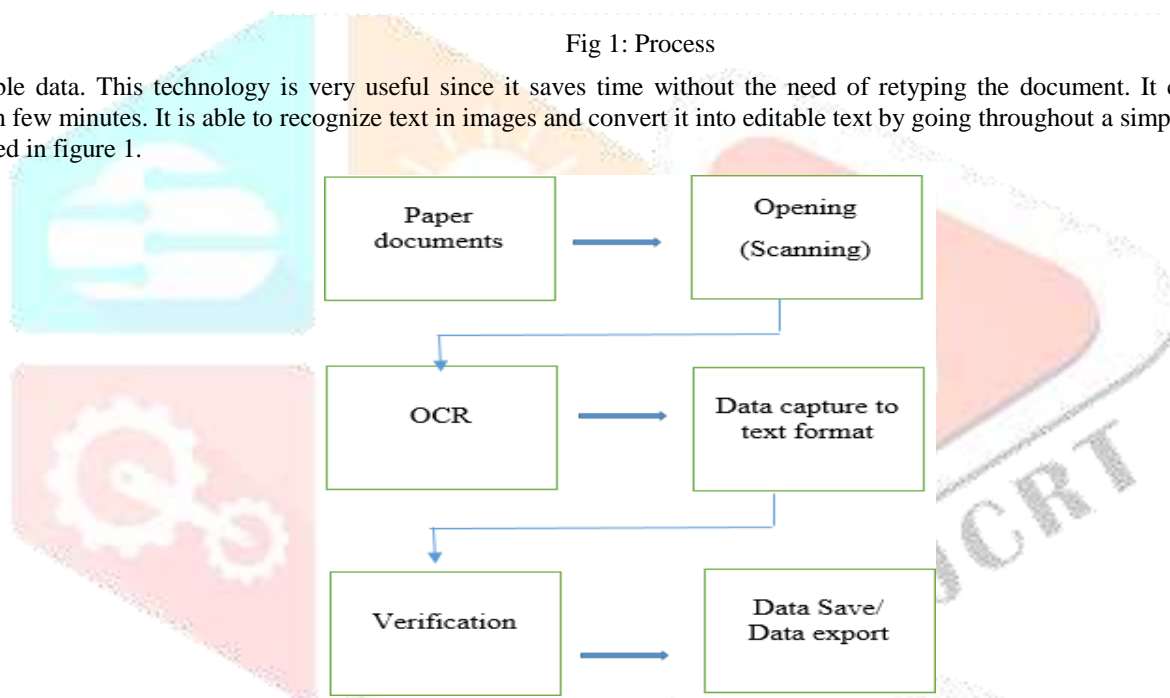


Fig 2: Block Diagram

This process generally consists of three stages: Open (Scan) the document, Capture and recognize data and then Save in a convenient format.

## II. EXISTING SYSTEM

By using MATLAB coding and camera it is tried to help blind persons to read the information of the products. In this project camera act as a main vision in detecting the label image of the product then image is processed internally and separates label from image by using MATLAB program. Finally, identifies the product name and information the optical character recognition.

## III. PROPOSED SYSTEM

The proposed idea involves text extraction from scanned image using tesseract Optical Character Recognition (OCR) and converting the text to speech by e-Speak tool, a process which makes visually impaired persons to read the text. This is a prototype for blind people to recognize the products price in real world by extracting the text on image and converting it into speech.

## IV. DESIGN ARCHITECTURE

### 4.1 IMPLEMENTATION

#### 4.1.1 INPUT DESIGN

The input design is the link between the information system and the user. It comprises the developing specification and procedures for data preparation and those steps are necessary to put transaction data in to a usable form for processing can be achieved by inspecting the computer to read data from a written or printed document or it can occur by having people keying the data directly into the system. The design of input focuses on controlling the amount of input required, controlling the errors, avoiding delay, avoiding extra steps and keeping the process simple. The input is designed in such a way so that it provides security and ease of use with retaining the privacy. It can read the pictures having the format MRP, Rs and the price ending with .00, /-. Input Design considered the following things:

- What data should be given as input?
- How the data should be arranged or coded?
- The dialog to guide the operating personnel in providing input.
- Methods for preparing input validations and steps to follow when error occur.



Fig 3: Taking Input



Fig 4: Camera

#### 4.1.2 OBJECTIVES

1. Input Design is the process of converting a user-oriented description of the input into a computer-based system. This design is important to avoid errors in the data input process and show the correct direction to the management for getting correct information from the computerized system.
2. It is achieved by creating user-friendly screens for the data entry to handle large volume of data. The goal of designing input is to make data entry easier and to be free from errors. The data entry screen is designed in such a way that all the data manipulates can be performed. It also provides record viewing facilities.
3. When the data is entered it will check for its validity. Data can be entered with the help of screens. Appropriate messages are provided as when needed so that the user will not be in maize of instant. Thus the objective of input design is to create an input layout that is easy to follow.

### 4.1.3 OUTPUT DESIGN

A quality output is one, which meets the requirements of the end user and presents the information clearly. In any system results of processing are communicated to the users and to other system through outputs. In output design it is determined how the information is to be displaced for immediate need and also the hard copy output. It is the most important and direct source information to the user. Efficient and intelligent output design improves the system's relationship to help user decision-making.

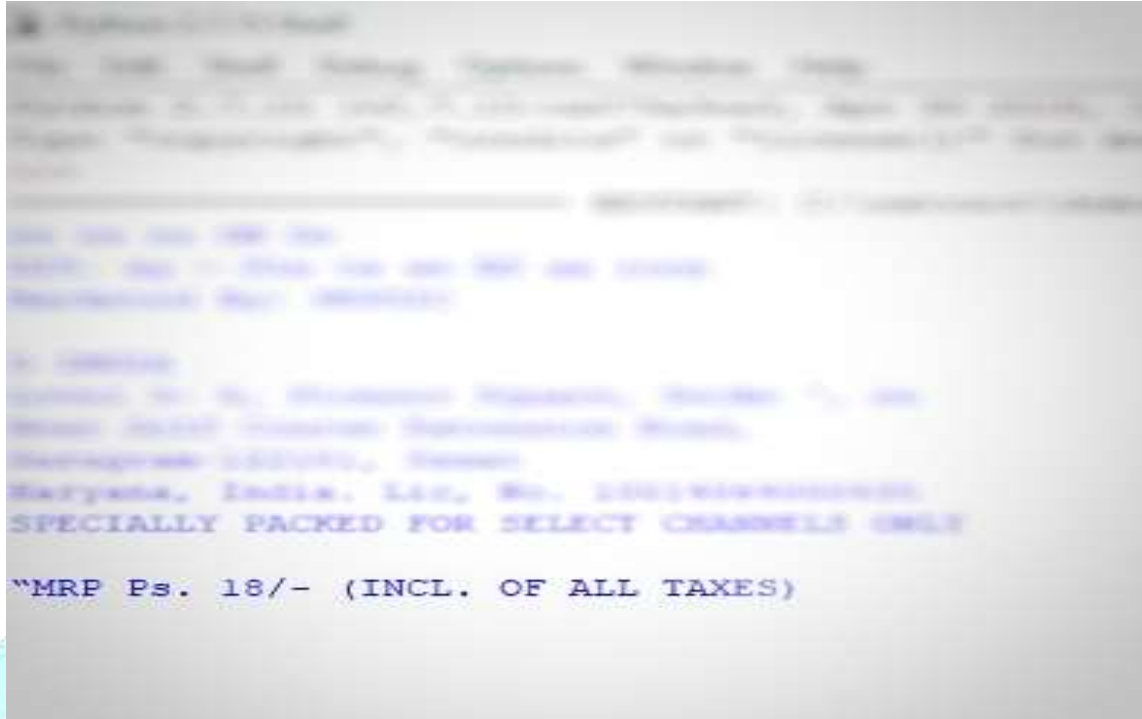


Fig 5: Output



Fig 6: Speaker

1. Designing computer output should proceed in an organized, well thought out manner; the right output must be developed while ensuring that each output element is designed so that people will find the system can use easily and effectively. When analysis design computer output, they should Identify the specific output that is needed to meet the requirements.
2. Select methods for presenting information.
3. Create document, report, or other formats that contain information produced by the system.

The output form of an information system should accomplish one or more of the following objectives.

- ❖ Convey information about past activities, current status or projections of the
- ❖ Future.
- ❖ Signal important events, opportunities, problems, or warnings.
- ❖ Trigger an action.
- ❖ Confirm an action.

### V. Conclusion:

We have used state of the art tesseract-ocr open source by Google with novel image processing technique and heuristics rules to get better results of parsing grocery receipt images. Image background is removed, resized, text deskewing and binarization is applied then, then forwarding to tesseract-ocr. After text extracted from image short form words are converted to full form using "short names dictionary". Unwanted text is simply discarded using "constant words dictionary". Garbage text removed using heuristics rules (described above). Items prices are extracted using regular expressions.

## VI. REQUIREMENTS

As aforementioned, we need to retrieve text from scanned documents or any text image and make it editable to reuse it and read it word by word. For instance, there are plenty of books that are only available on printed format, so even if we scan them, they will be stored only as images. With the use of the Optical Capture Recognition (OCR), these scanned documents will be available for later editing and can be reused by the user. After the feasibility study and a deep understanding of the functionalities of the project, and after looking at the tools that will be needed to develop and realize the application, me and my teammates have been able to collect the main user classes and the different requirements and classify them as follows:

## VII. REFERENCES

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