



MOBILE BASED AUTOMATIC ELECTRICITY BILL GENERATION

Vikrant A. Agaskar¹ | Abhishek D. Singh² | Onkar D. Kandalgaonkar² | Shilpa S. Wade²

¹ Professor, Computer, VCET, Vasai, India -401202.

² Student, Computer, VCET, Vasai, India -401202.

ABSTRACT

Today in 21st century the things are changing from old traditional methods to new modern technology. Most of the things are being computerized. But the process of meter reading and generation of bills has not been changed yet. Meter reading and billing are complex tasks of electricity, water and gas supplier companies. The current technology of billing process uses manual process of meter reading, updating the server with reading and billing customer. We have planned to implement a technology that includes android application and web application to get reading, updating server and inform consumers about bill units and amount. Android application we develop will be used to get the readings from the meter automatically by simply capturing the image of the meter. The customer will receive a mail regarding the bill as soon as the bill is generated. With the help of web application customer can view his bill. For building our project, we have used Android studio which supports Android Software Development Kit. To get readings from the image, OCR(optical Character Recognition) is used. We are using Tesseract OCR engine for it.

KEYWORDS: Optical Character Recognition, OCR, Tesseract, electricity bill.

Introduction

Android based meter reading is a modern technique which will be used for generation of electricity bills using the Optical character recognition. OCR is the mechanical or electronic conversion of scanned or photographed images of type-written or printed text into machine-encoded/computer-readable text. It is widely used as a form of data entry from some sort of original paper data source, whether passport documents, invoices, bank statement, receipts, business card, mail, or any number of printed records. OCR is a field of research in pattern recognition, text recognition.

Materials and Methods:

Reading input:

- Lines are read from scanned image, in edge detection.

Edge detection/outlines:

- Black pixels are split into blobs, also known as edge detection
- Blobs are processed to extract outlines, in edge detection.

Lines/skew:

- Lines are derived from strings of blobs with outlines
- Gradient/rotation of page is calculated
- Lines are adjusted for skew
- Final touches on assigning blobs, now that lines KNOWN, underlines

Words/segmenter:

- Higher-level procedure to order blobs into words
- Blobs in lines are segmented into words
- Fine-tuning of vertically seams/splits between some blobs, spacing

Classification:

- Classification of features in letters of all words performed,
- Words are checked in dictionary and permuted to improve them
- Play with xht (height of letter 'x') for words,
- Words are fitted to lines and assigned to rows that fit them best

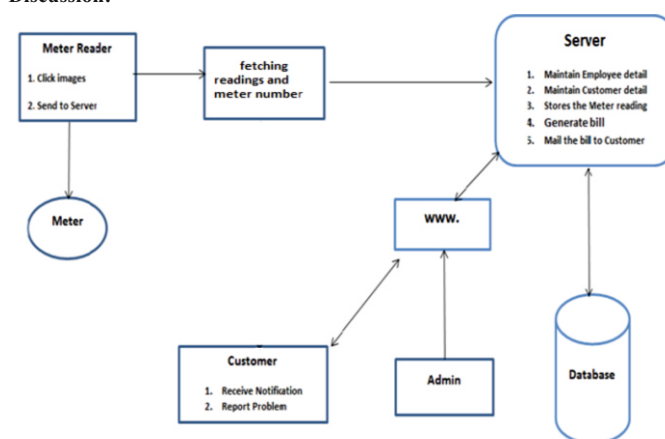
Quality:

- Quality of words and letters is checked
- Output is generated.

Results:

The development of Mobile Based Electricity Generator demonstrates more robust and error free concept of electricity bill generation. It provides hassle free service in terms of optimizing the bill recording and bill generation for the electricity company. Mobile Based Electricity Generator has less paper work. Besides it also provides the facility of sending soft copy of bills through electronic mails. Therefore it eliminates the problem of conventional meter reading and may also implement few interesting features in its future scope.

Discussion:



The android based meter reading using OCR suggests: Android application and a Web application. Android app is for meter using OCR for reading the meter. Meter reader carries android device having android app in it which enables a list called customer meter list which has list of customer address that he has to read the meters within a day. Once the meter reader reads the meter, the color of pointer on list is changed so that reader can know the meters that are read.

REFERENCES:

- Chirag Patel, Atul patel, Dharmendra patel, Optical Character Recognition by Open Source OCR Tool Tesseract: A Case Study, International Journal of Computer Applications (0975-8887) Volume 55-No.10, October 2012
- S.V. Rice, F.R. Jenkins, T.A. Nartker, The Fourth Annual Test of OCR Accuracy, Technical Report 95-03, Information Science Research Institute, University of Nevada, Las Vegas, July 1995
- SMITH, R.2007.An Overview of the Tesseract OCR Engine. In proceedings of Document analysis and Recognition. ICDAR 2007. IEEE Ninth International Conference.
- Umapada Pal, Partha Pratim Roy, Nilamadhaba Tripathy, Josep Lladós. December 2010.Multioriented Bangla and Devnagari text recognition, Pattern Recognition, Volume 43,Issue12,Pages 4124-4136, 10.1016/j.patcog.2010.06.017.
- R.W. Smith, The Extraction and Recognition of Text from Multimedia Document Images, PhD Thesis, University of Bristol, November 1987.

6. R. Smith, "A Simple and Efficient Skew Detection Algorithm via Text Row Accumulation", Proc. of the 3Rd Int. Conf. on Document Analysis and Recognition(Vol. 2), IEEE 1995, pp. 1145-1148.
7. P.J. Rousseeuw, A.M. Leroy, Robust Regression and Outlier Detection, Wiley-IEEE, 2003.
8. S.V. Rice, G. Nagy, T.A. Nartker, Optical Character Recognition: An Illustrated Guide to the Frontier, Kluwer Academic Publishers, USA 1999, pp. 57-60.