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OCR-VR WRAPPER READER USING GOOGLE MOBILE VISION SDK

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ABSTRACT

This paper presents the design and implementation of Android smartphone application named Optical Character Recognition- Visiting card reader (OCR-Vr) using the Google mobile vision SDK. The proposed OCR-Vr is capable of recognis-ing various fields automatically in V-card (such as name, address, email id, phone number, etc.). Once the information is captured, OCR-Vr allows the user to store it as a contact Intent locally (in the application) and globally (as available to all applications).

V-card information captured using OCR-Vr can be synced to cloud. It can be accessed, modified, deleted, synched, and shared by the user across multiple devices and platforms. In a nutshell, OCR-Vr extends an easy method to store and reuse V-card contents digitally, thereby, overcoming the tough-task of preserving the paper-based physical contact card for an indefinite amount of time

Keywords: *Optical Character Recognization, Mobile Vision, V-card, Android, OCR.*

I. INTRODUCTION

Nowadays, smartphones are becoming an essential need of everyday life. The worth and performance of smartphone are measured by memory, computational power, and the range of applications that it can support. Due to technological advancements, we have gained a reasonable control over all of the aforementioned performance-related factors (memory, computational power, and application varieties) [1].

Let us focus on the variety of applications available for any smartphone user (through application markets such as Google Play, and Apple store). One such representation of available application varieties has been depicted in fig. 1, which the advent of smartphones users are enabled to perform activities such as music to finance and social media to multimedia on their fingertips.

With the advantage of ubiquitous usage and availability of smartphones, we are inspired to develop an app which permissibility will overcome the difficulties of handling and store paper-based visiting cards (V-card). Following are the disadvantages of the existing way,

- All paper cards should be stored at one physical location where all of them can be accessible.
- V-cards can become old get faded, lost, and delicate.
- There will be no way to share if anyone receives only one V-card from the other person.

Fig. 1: Range of applications supported by a contemporary smartphone

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- Finding the particular V-card during the urgent times is a tedious task.
- There is always a risk of losing physical V-card.

The easy way to overcome all the previously mentioned drawbacks of traditionally handling V-card is to digitise the contents of it. In this direction, we describe the implementation of Android platform based smartphone application named Optical Character Recognition- Visiting card reader (OCR-Vr) using Google mobile vision SDK.

Through OCR-Vr we can avail the following benefits.

- Utilizing the smartphones camera to scan the textual contents in the V-card.
- Automatically identifying the various contents of V-card (such as name, address etc.)
- Creating the contact locally (in OCR-Vr), in phones level (entry in the contact application), and globally (synching to the cloud).
- OCR-Vr allows sharing, editing, syncing and deleting the V-card across multiple platforms and devices.
- There is no overhead of physically storing or any threat of losing or misplacing the V-card any time.
- Digital contents are easily accessible.

Upcoming sections of this paper are organised as follows. Section II describes related work similar to the proposed concept in this paper, section III explains implementation details using Google mobile vision SDK for reading and recognizing the contents of V-card. Section IV presents the results of the experimental study. A brief conclusion of the study is given in section V.

II. RELATED WORK

Optical Character recognition is a digital conversion of images of handwritten or typed text into the editable form. OCR is extensively used as a means for reading information from printed paper, whether it is invoices, passports, bank statements, or digitised receipts, emails, handouts of data or any handwritten or printed document [2].

The first attempts towards OCR were towards techniques consisting of telegraphy and developing reading methods for visually impaired people. Emanuel Goldberg did early work towards OCR during 1914, who developed a machine that read and converted characters into telegraph code. During the same time, Edmund Fournier developed a device called Optophone device, which is a handheld scanner that was capable to move across a page, and capable of producing tones related to specific characters or letters [2].

Emanuel Goldberg in late 1930s [3] designed a statistical machine using optical code recognition system which was ca-pable of searching microfilm archives. In the modern era, with the invention of smartphones, OCR becomes highly accessible to devices connected to the internet, which is the natural method to extract text captured through devices camera. The smartphones which do not have OCR functionality built into the Operating system will use OCR Application programming interfaces to detect text from the captured images. OCR API returns text from the image [7].

Through online service named WebOCR, OCR made public during early 2000. WebOCR was released in the area of cloud computing environment, and mobile applications like a translation of foreign language signs in real-time demands. There is a range of open source, and commercial OCR system services are available for all the languages such as English,

III. GOOGLE MOBILE VISION SDK

Text recognition is the process of detecting text in images and video streams and recognising the text contained therein. Once identified, the recogniser then determines the actual text in each block and segments it into lines and words. The Text API detects text in Latin based languages (French, German, English, etc.), in real-time, on device.

Google mobile vision text application programming inter-faces intention is to recognize textual contents from image or video streams. It has a capability of recognizing Latin textual characters. Such as Dutch, English, French, Italian etc., Hence for extracting text out of image, Google Mobile Vision SDK extends the easy to use and quick solution for developers. It is easy to use once all of the dependencies are downloaded , and moreover it can operate in offline mode (does not require internet connection for the operation). All text recognition features will be run in the smartphone itself.

During the situation where one needs to scan the large set of documents, Android mobile vision SDK offers the features which simplifies the burden, which means, this API returns text in a structured way [5]. The returned text is divided into following three sections.

The text Recognizer segments text into blocks, lines, and words [6]. The pictorial representation is shown in fig. 2, where,:

- Each paragraph or column (i.e., set of contiguous lines of text) is represented as block.
- Each line is represented as contagious set of words on the same horizontal axis.
- Each word is represented as contiguous set of special or alphanumeric characters, separated by new line or space.

Figure 3 gives the high-level overview of how any document could be broken into block of text consisting of lines and words of characters.

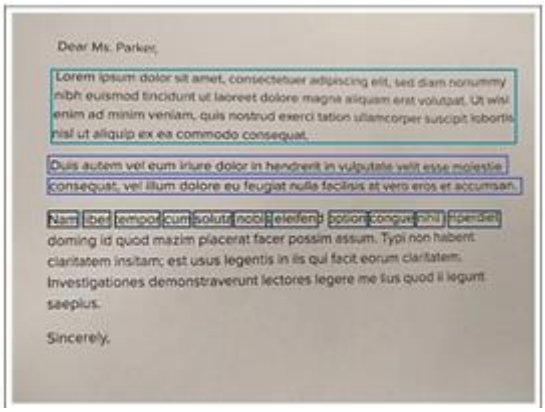

Fig. 2: Printed document scaning using OCR-Vr application

IV. EXPERIMENTAL RESULTS

This section illustrates the results of the experimental study. The proposed application OCR-Vr is tested on the range of devices running Android operating systems. Application screenshots are given in fig. 4 to fig. 8.

The initial screen of the application is shown in fig. 1. Where user can set the auto focus and flash for scanning documents. Once the basic scanning options have been finalised user can begin to scan the text. User can focus the mobile camera and capture the text.

Figure 5 shows the illustration of how applications screen looks when the user is scanning any V- card. Where the text is broken into multiple blocks. Each block will be divided into multiple lines and lines are split into multiple words. These words will be interpreted and recognised for various contact fields such as name, address, phone number and so on.

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OCR-Vr application after the successful scan is shown in fig. 6. It is shown before creating contact. It allows users to edit the contact before creating contact.

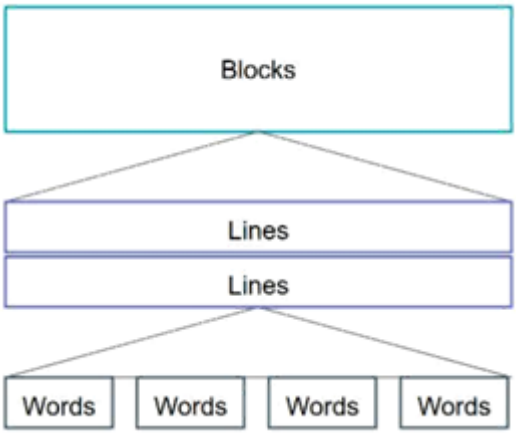

Fig. 3: Division of block of words into multiple constituent lines and words.

Fig. 4: Initial screen of OCR-Vr application

Once the user proceeds from the previous screen (i.e., from fig. 6) user will be shown the contact screen, where user has to create contact in the mobile phone, same is shown in fig. 7 and 8.

V. CONCLUSION

Through OCR-Vr we have made a sincere attempt to develop a native Android mobile app using Google Mobile Vision API.

OCR-Vr allows users to scan fields of a business card. The range of applications supported by a contemporary smart-

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Fig. 5: User scanning V-card and illustrating various blocks, lines, and words

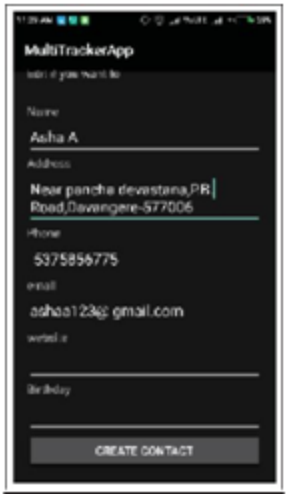

Fig. 6: OCR-Vr application depicting all captured information such as name, address etc.

phone. The OCR-Vr application is used to read, classify and store the fields V-card which is scanned. The main advantage of this app is that it runs offline and does not require internet to perform the task as a regular app. It is tested on various devices and it does work on all devices with the almost accurate result.

The future direction of OCR-Vr app involves porting the OCR-Vr app to other platforms such as IOS and Window

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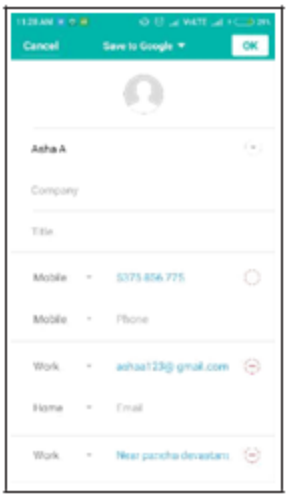

Fig. 7: Initial information entry screen for creating contact after the scan

Fig. 8: Contact of a person stored in phone

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