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Time-Table to Mobile Reminders

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Abstract: ***'Time–table to Mobile Reminders' is an Android software aimed towards faculty and student use in schools, colleges and other institutions. The idea to built this app arose because in an education institution keeping track of timetable becomes an tedious job for the teachers and students as well. In order to tackle this problem we decided to built an app that would automate the reminders without any hassle, the only input has to be an image of the time-table. This project is divided into four modules. This includes capturing the image of the time-table, scanning and extracting text from the image using OCR with the help of OpenCV and Tesseract, Identifying the text stored in excel file and classifying it into date, time and lecture, and then Setting reminder accordingly in the app itself. In this way, the faculty or the student will receive a notification on their device a few minutes before the lecture is about to commence without having to look for physical timetable or even digital for that matter every time.***

Keywords: Time-table, calendar, image-processing, OCR, mobile app

I. INTRODUCTION

Time-tables are used daily for scheduling lectures or any other activities that are to be carried out in schools, colleges, and other institutes. A time-table provides information like the day and time in which the activity has to take place.. A well-constructed timetable establishes a natural rhythm and routine, which might be comforting to teachers and students. a student timetable with mandated period lengths, and specific subjects for every period helps administrators allocate sufficient resources to the foremost important curriculum areas. But most of the time, students and teachers prefer a hardcopy or a picture of the time-table to keep track of their lectures. There is a possibility that they lose the copy or even the picture of the time-table and spending time in search of it can be tedious. To prevent this problem, we have come up with an effective solution which will be both useful and time-saving alternative for students as well as the faculty.

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I. PROJECT IDEA

The basic idea of the project is that if an image of the time-table is captured through this app, then the app will scan the image and extract the text from the image. After extracting, it will identify information such as subjects, day, time and set a reminder according to the app so that the student or the teacher receives a notification a few minutes before the lecture commences. This will completely avoid the need to search for the time-table to check what lecture or activity is about to begin.
This semester we are planning to implement scanning and extracting text from the captured image using the OCR technique with the help of Tesseract and OpenCV.

II. EXISTING SYSTEMS AND RESEARCH

Currently, there is no such integrated system that can convert a time-table directly into mobile reminders. The most one can do is capture an image and extract the text from it. There are various apps available on the Play Store that can scan a captured image and extract text from it using OCR techniques but the drawback is that they use or directly on an image containing only text and if the image has any table it gives an anomaly. Also, in the case of reminder apps, one has to set all the reminders manually in their mobile devices. There has been researched in image processing and OCR to extract text from image and some of the research previously done in this field have been discussed here briefly.
Poonam A. Wankhede, Sudhir W. Mohod[1] proposed a content-based image retrieval using OCR techniques Content-Based Image retrieval is the process of searching and retrieving images from the huge set of a database based on the visual content such as color, texture, shape, and edge-based on user's request using a query. Vijay Agamamidi, Dulal Kar and Ajay Katangur[2] have proposed a method to improve the accuracy of OCR and develop an application accordingly that can be used to help the user in getting input from sources such as images, paper documents, non-editable document formats, etc. for any immediate use. The appliance so developed is capable of recognizing phone numbers, email addresses, and geographic addresses within the processed image and prompt automatically the user to call the telephone number, send an email to the e-mail address, or get directions to the address location. This is done by analyzing and parsing data such as phone numbers, email addresses, and addresses from the text obtained from images and presenting the data to the user in a way that the user can use them easily and immediately. Derek Ma, Qiuhau Lin, and Tong Zhang[3] have developed automatic text detection, OCR (optical character recognition), text correction, and text translation.

Although the current version of their application is limited to translation from English to Chinese, it can be easily extended into a much wider range of language sets.

III. PROPOSED SYSTEM

So, to get the data for the reminders the first hurdle was to successfully get the text out of the image and store it in well-segregated data. The pipeline that we followed is to first get the image from the users then use image processing on that image and the use OCR to extract the data from the image and store the data obtained in an excel file, the excel file is then passed on to the app where the reminders are set according to the data from the excel file.

Time/Day	9-10	10-11	11-12	12-12.45	12.45-1.45	1.45-2.45	2.45-3	3-4	4-5
Monday	CSS(CR)	SE(SDM)	ML(VS)	Lunch Break	DWM(B1) SE(B2) SPCC(B3)	DWM(B1) SE(B2) SPCC(B3)	Tea Break	SPCC(HL)	DWM(AK)
Tuesday	SE(SDM)	SPCC(HL)	DWM(AK)	Lunch Break	SPCC(HL)	CSS(CR)	Tea Break	BCE(SG)	SE(SDM)
Wednesday	SE(B1) BCE(B2) DWM(B3)	SE(B1) BCE(B2) DWM(B3)	CSS(CR)	Lunch Break	DWM(AK)	ML(VS)	Tea Break	SPCC(B1) CSS(B2) BCE(B3)	SPCC(B1) CSS(B2) BCE(B3)
Thursday	CSS(CR)	DWM(AK)	ML(VS)	Lunch Break	CSS(B1) SPCC(B2) SE(B3)	CSS(B1) SPCC(B2) SE(B3)	Tea Break	SPCC(HL)	BCE(SG)
Friday	BCE(B1) DWM(B2) CSS(B3)	BCE(B1) DWM(B2) CSS(B3)	ML(VS)	Lunch Break	MINI PROJECT	MINI PROJECT	Tea Break	SE(SDM)	MINI PROJECT

Fig. 1 Time-table image

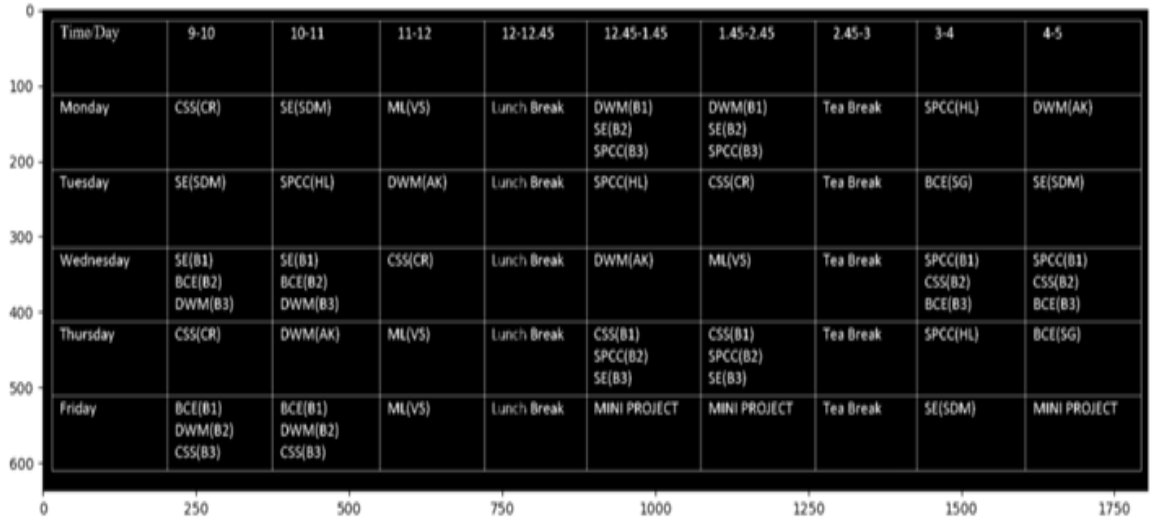

Fig. 2 Binary image grid from merging horizontal line image and vertical line image

	A	B	C	D	E	F	G	H	I	J	K	L	M
1		0	1	2	3	4	5	6	7	8	9		
2	0		9-10	10-11	11-12	12-12.45	12.45-1.4	1.45-2.45	2.45-3	3-4	4-5		
3	1	Monday	CSS(CR)	SE(SDM)	ML(VS)	Lunch Bre	DWM(B1)	DWM(B1)	Tea Break	SPCC(HL)	DWM(AK)		
4	2	Tuesday	SE(SDM)	SPCC(HL)	DWM(AK)	Lunch Bre	SPCC(HL)	CSS(CR)	Tea Break	BCE(SG)	SE(SDM)		
5	3	Wednesd	SE(B1)BCE	SE(B1)BCE	CSS(CR)	Lunch Bre	DWM(AK)	ML(VS)	Tea Break	SPCC(B1)(	SPCC(B1)CSS(B2)BCE(B3)		
6	4	Thursday	CSS(CR)	DWM(AK)	ML(VS)	Lunch Bre	CSS(B1)SP	CSS(B1)SP	Tea Break	SPCC(HL)	BCE(SG)		
7	5	Friday	BCE(B1)D	BCE(B1)D	ML(VS)	Lunch Bre	MINI PRO	MINI PRO	Tea Break	SE(SDM)	MINI PROJECT		
8													
9													

Fig. 4 Data from OCR stored in excel file

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The main algorithm followed to get data consists of three parts: the first is the table detection and cell recognition with Open CV, the second the thorough allocation of the cells to the right row and column and therefore the third part is that the extraction of every allocated cell through Optical Character Recognition (OCR) with pytesseract. Once the OCR process is completed then the excel file created is sent to the app wherein the app uses it to set reminders.

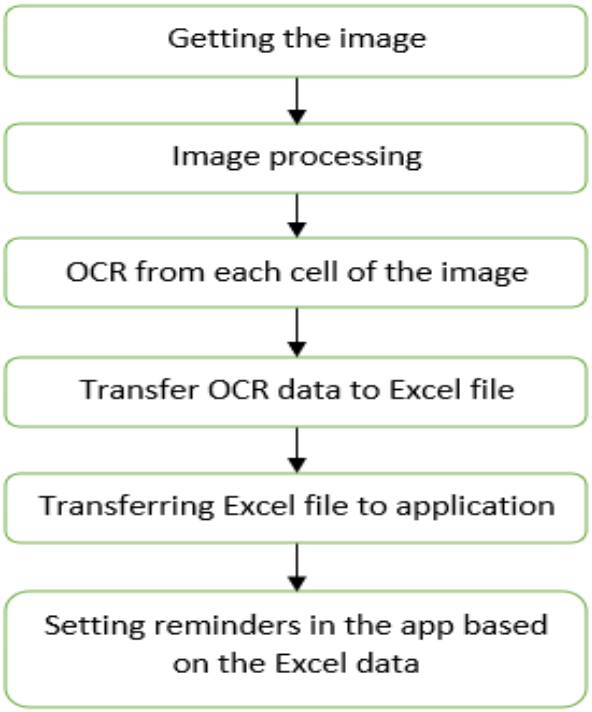

Fig. 5 Process pipeline flowgraph

IV. RESULTS AND DISCUSSIONS

By using the above-proposed system and the results there is a clear extraction of data from timetable image or screenshot given the image is of high quality as it requires the image to be of high quality for it to do the successful extraction of the data and also we have developed a calendar application for mobile on android studio wherein the app takes the inputs from users so to complete we need to integrate both the image processing system and the mobile app.

V. CONCLUSIONS

The result expected from the proposed system promises an efficient, convenient and time-saving alternative for the students and teachers of schools, colleges, etc. to keep a track of their lectures and other activities that are to be conducted. It requires less human efforts to just capture an image depending on the app to do the rest of the job instead of doing each operation manually or even using different programs for each task. The drawback of this system is that it deals with only a specific structured format of the time-table. It also depends on the quality of an image to extract text. However, with further research, performance can be improved.

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