

## Remote Printing System

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### Abstract

*This paper concerns with the productive output, which is achieved through the process of carrying out the printing of the documents remotely and without having the physical presence at the site of printing. The proposed Remote Printing System is itself a standalone and a self-sufficient module, which focuses on proper management of the printing needs of the masses.*

- If file is not present on mainframe, download it.
- Give the Print command.
- Wait for the Printer to process and print the documents.
- Collect the printouts.

A lot of user's time is consumed in doing all of the above processes and many a times the printing facility is misused.

### 1. Introduction

The entire system of remote printing is aimed at printing the documents on the go and thereby reducing the commotions at the copier rooms in the offices.

Printing documents often involve the tedious process of going to the copier rooms and getting the hard copies done. What remote printing facilitates us with is the accomplishment of this task without having to be physically present. With this system, a user already has completed the preliminary process, by giving the command for the printout of the document remotely, as soon as he decides which documents are to be hard-copied.

#### 1.1. Drawbacks of Earlier System

One of the main drawbacks of such a system is that if the user wants to print the document from the mainframe, he is required to:

- Search and open the file.

#### 1.2. Scope

The proposed Remote Printing System is established with it having an independent architecture that encompasses multiple domains like

- College/University
- Organisation
- Self Governing Organisation
- Private and ethical usage.

#### 1.3. Features

- The application consists of a webpage for users to login to their respective account where they can see the uploaded documents, balance and can upload new documents.
- The administrator is also provided with a webpage to add a user, delete a user and update balance.
- All the uploaded documents are stored in the respective accounts of the user in the database on the server PC.



**Figure 1. The home page of the website for authentication of the user.**

- On the kiosk, the user is authenticated by his/her username and password.
- The documents to be printed are listed on kiosk after the authentication is done and user can take the printout and check the balance as well.
- The performance of the system is improved to a greater extent since less time is consumed in performing the desired activities on the kiosk.

#### 1.4. Advantages of our system

The biggest advantage of this system is that the user can upload the documents to be printed from anywhere through the website. So even if the user wants to take an immediate print of the document the next early morning, then he/she has to just enter the user name and password on the kiosk and the list of documents which are to be printed will appear on the screen. Then user has to just select the document and click on print button.

Another advantage of the system is that the user does not need to search for the file/ document to be printed since all the printable documents will be present on the accounts of the respective users and at the kiosk the user need not care if the Internet is available or not. This would save a lot of precious time of the user.

The next advantage is that the application also includes provision for maintaining balance of each user so as to prevent misuse of the accessories by the users. The application calculates the amount of money required for printing the selected document and that much amount is deducted from the user account. If the balance is not enough to print the document, the user is not allowed to take the printout.

## 2. The Process

The entire Remote Printing Process is divided into three stages:

- Upload the files remotely.
- Store the files on the server.
- Take printout of the documents at the kiosk.

### 2.1. Upload the files remotely

The user of the system can login to his account from anywhere through the Remote Printing website. Once logged in, the user is provided with various functionalities. The user can:

- Browse through the files he has previously uploaded on the system. The user is provided with the information about the files such as file name, file type, file size and date on which the file was uploaded.

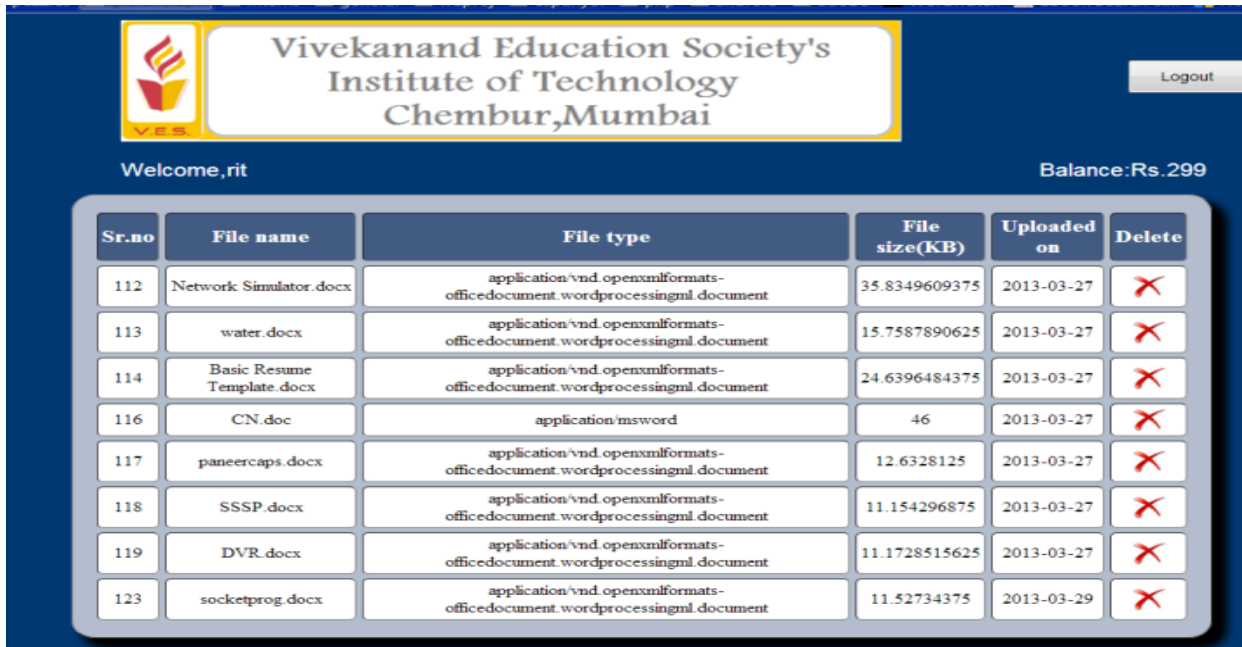


Figure 2. The logged in page of the user 'rit' showing all the details of the uploaded files with the balance and an option to delete the files which are no longer required.

- Delete uploaded files. The user might want to delete files that are no longer required or delete files he may have accidentally uploaded.
- Upload the files required to be printed. The user is provided with upload module through which he can select a file on his system and upload it to his account.

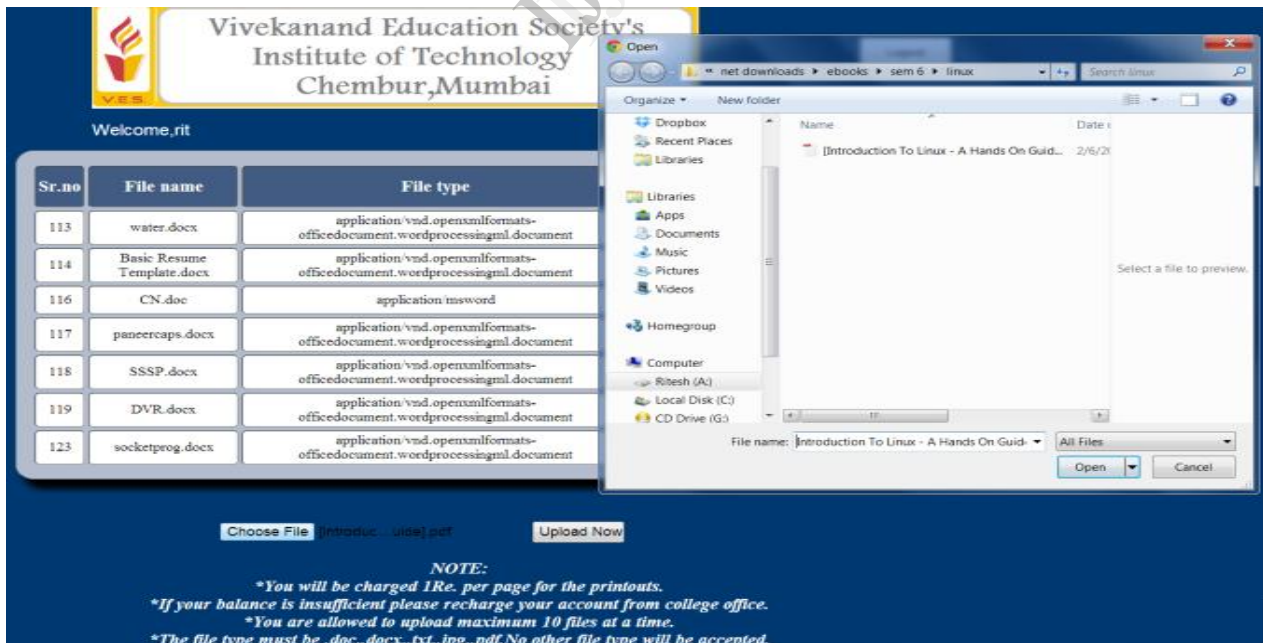


Figure 3. The upload procedure of the file on the website.

- Check the account balance. This helps user to know whether his balance amount is sufficient to take required printouts or he needs to recharge his balance.

## 2.2. Store the files on the server

Once the user clicks on the Upload button, the file is uploaded onto the server and its information is saved into the MySQL database.

But before being stored on the server, the file is checked for certain constraints. The constraints are put up on the files so that the server is not overloaded and its efficiency is maintained. The constraints are as follows:

- The size of the file must be maximum 1 MB.
- Only files with extension .doc, .docx, .txt, .jpg, .png, .pdf can be uploaded
- The file queue limit is 10 i.e. at a time an user can have only 10 files uploaded to his account. If the user wishes to upload more files, he may have to delete some previously uploaded files.

If all these constraints are satisfied only then the file is uploaded onto the server.

## 2.3. Take printout of the documents at kiosk

When the user wants to take the printout of the documents he has uploaded, he needs to arrive at the kiosk. After logging into his account at the kiosk, the user will be shown the list of files he has uploaded.

The user can then select one of the documents he wants to print, enter the number of copies he requires, choose whether he wants a colored or black-and-white printout and give the print command.

Depending on the number of copies and total number of pages in the document, certain amount will be deducted from the user's account balance. If the balance is not sufficient, then the user cannot get the printouts else he can collect the printed documents. The user can also delete the documents once he is done with its printing.

The screenshot shows the kiosk interface for Vivekanand Education Society's Institute of Technology, Chembur, Mumbai. The user is logged in as 'rit' and has a balance of Rs. 299. A table displays the list of uploaded files with columns for id, filename, filetype, filesize, and uploaded\_on. Below the table, there is a 'Number of copies' input field set to 1, and buttons for 'Print' and 'Delete'.

id	filename	filetype	filesize	uploaded_on
113	water.docx	application/vnd.openxmlformats-officedocument.wordprocessingml...	15.7587890625	3/27/2013
114	Basic Resum...	application/vnd.openxmlformats-officedocument.wordprocessingml...	24.6396484375	3/27/2013
116	CN.doc	application/msword	46	3/27/2013
117	paneercaps....	application/vnd.openxmlformats-officedocument.wordprocessingml...	12.6328125	3/27/2013
118	SSSP.docx	application/vnd.openxmlformats-officedocument.wordprocessingml...	11.154296875	3/27/2013
119	DVR.docx	application/vnd.openxmlformats-officedocument.wordprocessingml...	11.1728515625	3/27/2013
123	socketprog.d...	application/vnd.openxmlformats-officedocument.wordprocessingml...	11.52734375	3/29/2013

Figure 4. The Kiosk look when logged in by the user, showing all the details of the files uploaded by him.

### 3. Flowchart

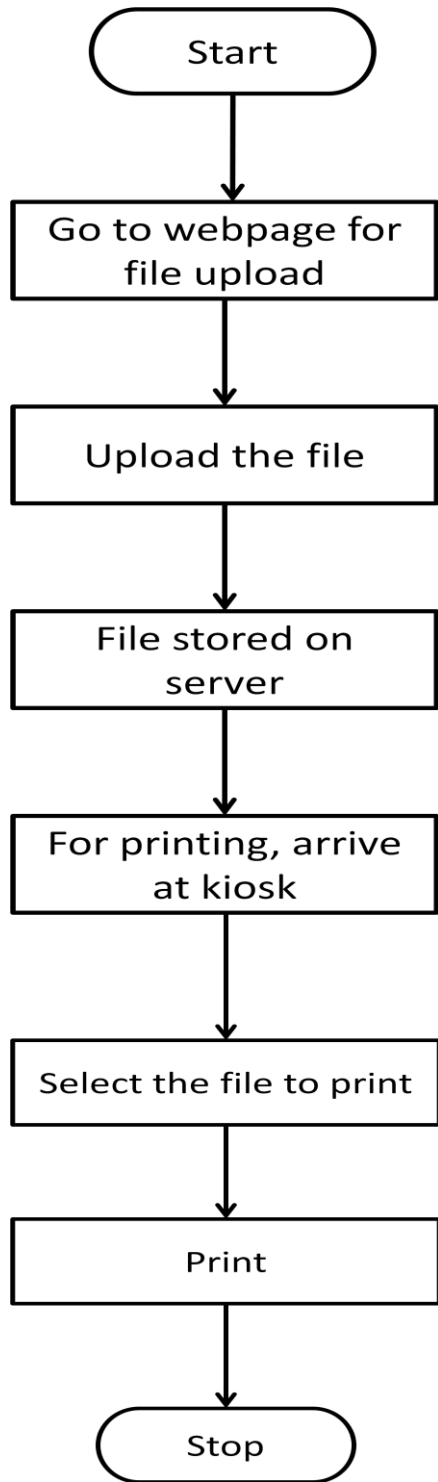


Figure 5. The flowchart of the entire printing process.

### 4.UML Diagrams

Unified Modelling Language diagrams indicate the process flow in a typical SDLC (Software Development Lifecycle), which intertwines the techniques of business modelling, object modelling and data modelling. There are a total of fourteen diagrams supported by UML, a few of which describing more clearly the functioning of a pragmatic Remote Printing System and underscore the possibility of its realistic nature.

#### 4.1.UML diagrams for website

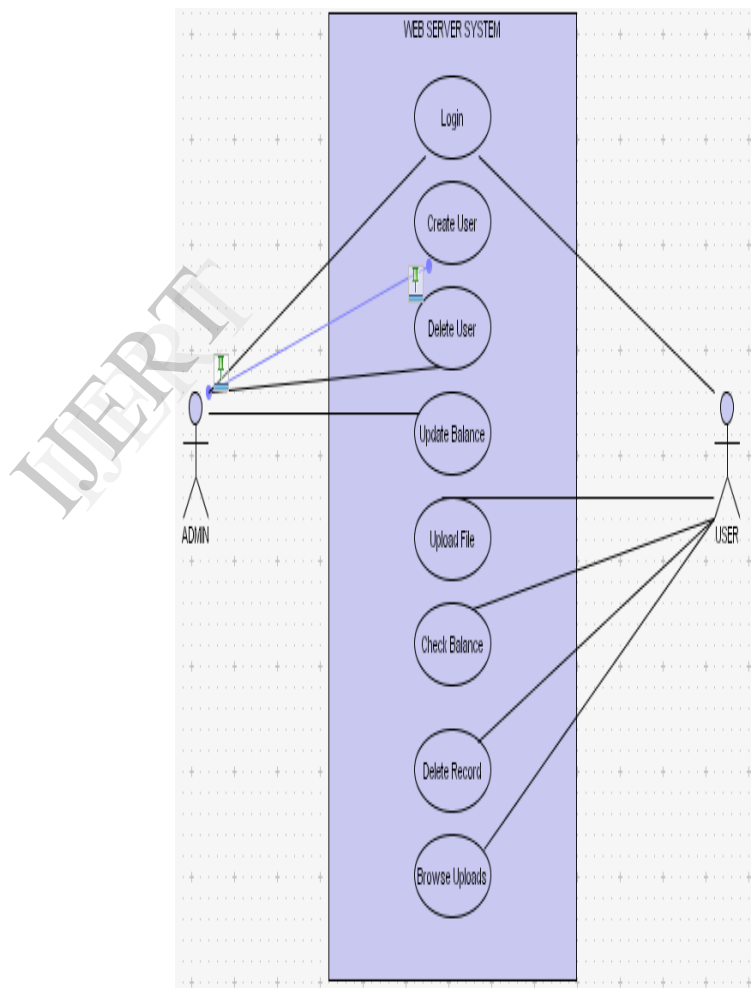


Figure 6. The Use-Case diagram

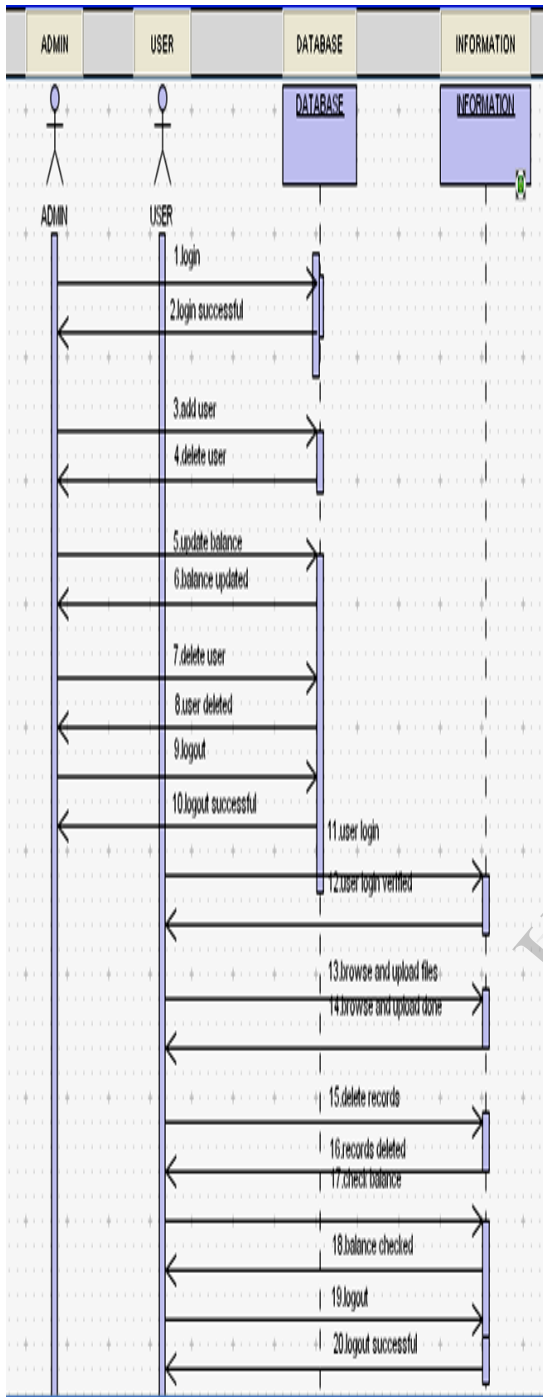


Figure 7. The Sequence diagram.

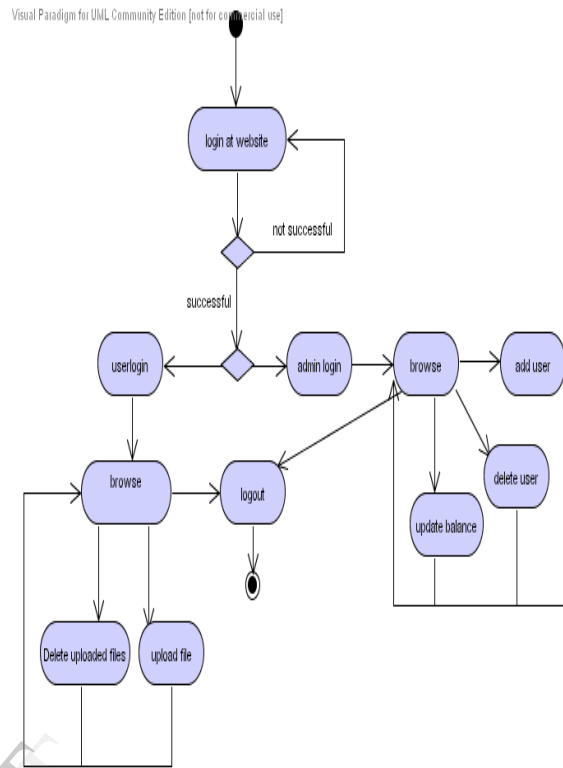


Figure 8. The Activity diagram.

4.2UML diagrams for VB.NET application

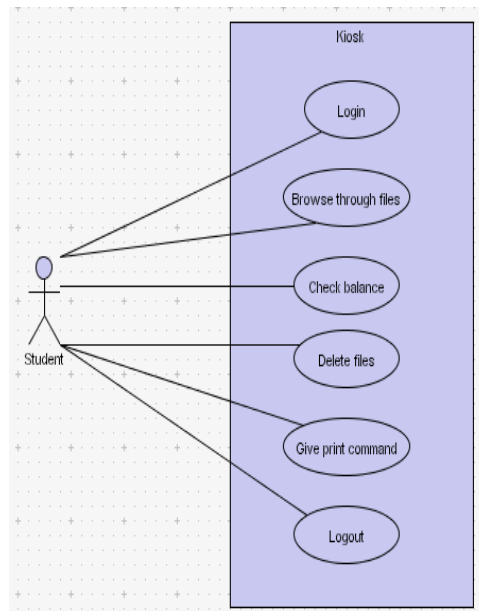


Figure 9. The Use-Case diagram

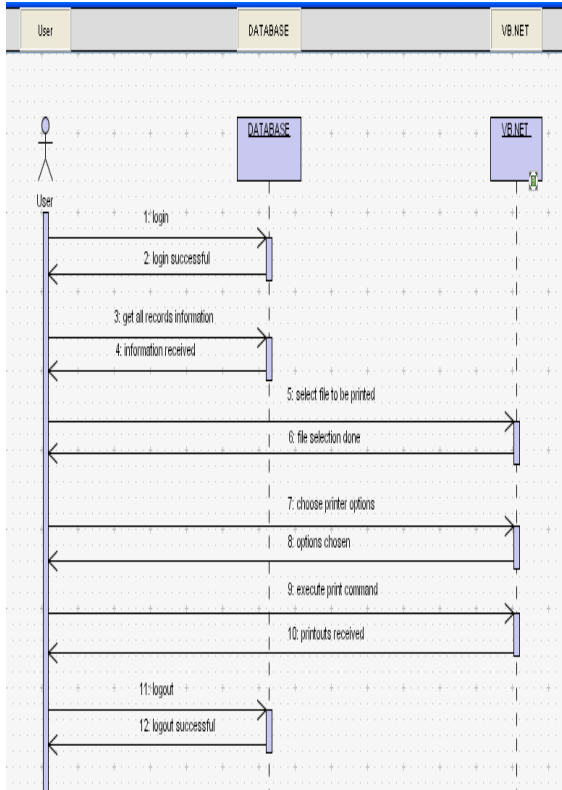


Figure 10. The Sequence diagram.

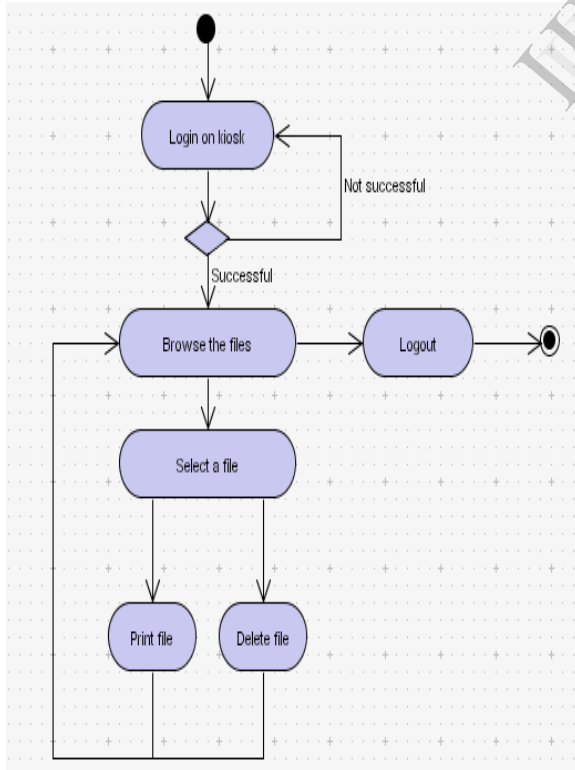


Figure 11. The Activity diagram.

### 5. Conclusion

The main objective behind studying and developing this project is to make the printer usage facility more convenient and efficient to the users.

By the implementation of this project in any institute, organization or office where there is massive use of printers, the staff members can properly handle their documents and take a print of the same in a convenient way.

For example, if this project is implemented in engineering colleges then the college server can keep a record of each student and staff and all of their respective documents which they might have uploaded through the web page linked to the college website that may have the facility of viewing, uploading & deleting the documents, checking the balance. By installing the executable file on the kiosk machine via an N-computing device, the students and staff members can easily view, print or delete the documents. This may also lead to proper use of college property since every person of the college will be charged of each print that they take.

### 6. Future Scope

Many more additional features can be added on to the Remote Printing System. A few of them are listed below:

- While implementing the Remote Printing System in universities or companies, the ID cards of the users i.e. the students or employees could be provided with bar code to uniquely identify the users. A bar code scanner needs to be placed at the kiosk where the user can authenticate himself using his ID card.
- The user can upload the documents remotely which are hold in a queue and the user can release the document from the queue using an application on his smart-phone when he arrives at the printer.
- Provision for selection of coloured or black and white printer.



- Allowing the uploading and printing of files with other extensions.
- Auto deletion of documents which are present in the user account for a long time and have not been updated for a long while.

## 7. Acknowledgement

We wish to acknowledge our mentor Dr.(Mrs.) Nupur Giri, Professor, Department of Computer Engineering at Vivekanand Education Society's Institute of Technology for her constant support and valuable feedback.

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