AirPrint

Project report Phase–I submitted
in
partial fulfillment of requirement for the award of
degree of

Bachelor of Engineering
in
Computer Science and Engineering

by

Ms. Simran Gyanchandani [CSE-C]
Mr. Vishitosh Kapale [CSE-C]
Mr. Yash Nayak [CSE-C]
Mr. Niraj Ranjan [CSE-C]

Guided by
Prof. Piyush Ingole

Department of Computer Science and Engineering
G. H. Raisoni College of Engineering, Nagpur
(An Autonomous institute under UGC act 1956 & affiliated to Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur)

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Declaration

We, hereby declare that the project report titled **"AirPrint"** submitted herein has been carried out by us in the department of Computer Science. The work is original and has not been submitted earlier as a whole or in part for the award of any degree / diploma at this or any other Institution / University.

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Mr. Vishitosh Kapale [CSE-C]
Mr. Yash Nayak [CSE-C]
Mr. Niraj Ranjan [CSE-C]

Certificate

The project report titled "**AirPrint**" submitted by **Ms. Simran Gyanchandani [CSE-C], Mr. Vishitosh Kapale [CSE-C], Mr. Yash Nayak [CSE-C] and Mr. Niraj Ranjan [CSE-C]** for the award of degree of Bachelor of Engineering in Information Technology has been carried out under our supervision. The work is comprehensive, complete and fit for evaluation

Department of Computer Science and Engineering

Dr. Meenakshi Arya	Head of the department	
Prof. Piyush Ingole	Guide	

ACKNOWLEDGEMENT

*We would like to express our special thanks of gratitude to our guide (**Prof. Piyush Ingole**) as well as Head of the Department (Computer Science and Engineering),* **Dr. Meenakshi Arya** *who gave us the golden opportunity to do this wonderful project on the topic (AirPrint), which also helped us in doing a lot of Research and we came to know about so many new things we are really thankful to them.*

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ABSTRACT

The printing market has dramatically expanded in response to the spread of digital and mobile phone. As a result, making the quality and price of printing a more serious issue. Accordingly, this paper proposes and implements a digital paper printing system with a Smart Automated Printing Solution to solve the two above-mentioned concerns. As such, the IOT Device compensates for the gamut difference between the device and the printer to provide high quality printing. Plus, since it is used for real-time processing, the proposed system offers a one-touch interface for easy use. In tests, the proposed system produced paper printing without any human concern other than user himself/herself. AirPrint is a printing system of this advance era, this machine has a design like an ATM machine, here one can print any document and this system doesn't have any human influence other than user, this system provides account to user where one can upload his/her documents through their mobile phones and an e-wallet would be provided from which the total printing charges would be deducted after print operation, this account would have advance security features. Online printing services have appeared to respond to the growth of this new user population. An Android app would be available on play store, through that users would be able to handle their AirPrint account. After the documents are automatically uploaded, a touch screen interface is used to print the document. In addition, the purpose of the current research is to provide a printing, avoiding the flaws caused between the human and the printer. The proposed system also includes Black and White Printing functions, Color Printing functions, Photo Paper Printing functions. Consequently, the user can print various types of document such as pdf, doc, etc. AirPrint also has recycling features in it.

LIST OF FIGURES

LIST OF TABLES

LIST OF SYMBOLS

S.no	Title	Interpretation
1.	IOT	Internet of Things
2.	LAN	Local Area Network
3.	USB	Universal Serial Bus
4.	ATM	Automatic Teller Machine
5.	PC	Personal Computer

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INTRODUCTION

AirPrint System is a printing system of this advance era, this machine has a design like an ATM machine, where one can print any document and this system doesn't have any human interference ,this system provides an account to user where one can upload his/her documents through their mobile phones and an e-wallet would be provided from which the total printing charges would be deducted after print operation , this account would have advanced security features , APS also has recycling features in it. Thus, online printing services have appeared to respond to the growth of this new user population. An Android app would be available on play store, through that users would be able to handle their APS account. After the documents are automatically uploaded, a touchscreen interface is used to print the document. In addition, the purpose of the current research is to provide a printing, avoiding the flaws caused between the human and the printer. The proposed system also includes Black and White Printing functions, Color Printing functions, Photo Paper Printing functions. Consequently, the user can print various types of document such as pdf, doc, etc.

LITERATURE REVIEW

Vprint:

Existing system focuses on print jobs more efficiently but the problem that students are facing is due to blind multiple scanning. Jobs get printed at the specified Printer attached to it only. And sometime it leads to document lost. Student's or users are unable to know how much time to get our print job done? Specified printer print releasing makes and specified server print releasing methodology. At the print release station no effective utilization of the resources because of improper queue monitoring and lack of blind scanning it becomes very tedious and time consuming for students. As the VPRINT accounts crediting process is done manually only this consumes more time and efforts of students. Hence our project is an attempt to overcome such problems.

Figure 1: Vprint

Vprint	Airprint
Inconvenient	User Friendly
Inconvenient Screen Interface	Touch Screen Interface
No Internet Print Portal	Internet Print Portal
Only For A4 Size	All Type Of Printing
Non Scalable	Scalable
No Payment Methods	Payment Gateway
No Provision For Recycling	Provision For Recycling

Figure 2: Comparison between Vprint and AirPrint

METHOLOGY

The AirPrint basically works on combination of some of the modern concepts in the world of computer science, AirPrint in all comprises IOT, Networking, Linux, Android /iOS/Java application development and Web development concepts.

Architecture of AirPrint

- AirPrint application runs on Raspberry pi 2(IOT developer board/credit card size computer).
- It has a touch screen display of 7 inches interface compatible with Raspberry pi.
- A CPU which acts local as a server for AirPrint.
- Numeric Keypad used at the time of Authentication.
- A printer to print the documents on A4 size paper.

Printing Mechanism

It was a challenge to count the number of pages in the document before printing it ,so this problem was solved using Linux command to count pages in a document further this mechanism carries out the printing process if the user has sufficient balance in his/her account or else it asks the user to credit their account.

User's Database

This database contains all the information of every single user who has registered on AirPrint portal. This database also contains the information about the balance credited or debited by the user.

AirPrint Portal

This portal is divided into two parts

1) Web Application.

The web application is used for registration, authentication, file uploading and payment gateway purpose. One can run its link in their browser and then they can use the features of this app.

Android & iOS application is also developed which in turn works as web application.

2) Java Application.

The Java application is used for only Authentication and further printing process. This application would be running on Raspberry pi-2 24x7 and one would be able to authenticate and take printouts

from AirPrint dashboard which would contain files they uploaded from web app or android/iOS/windows app.

Multiple Platforms

We have developed applications for the platforms, iOS, Android, Windows through which the user can register on AirPrint portal, Login to the portal, upload his/her files or credit the money into his or her AirPrint account.

Bots

If any user wants to forward the file through the Mail or Message then he/she can forward these files to Gmail/Telegram bot of AirPrint which in turn places the files automatically to user's AirPrint dashboard from where user can easily print these files.

TOOLS

1. Hardware Tools
    a. Raspberry Pi 2 Model B+

        Here is the full list of specs for Raspberry Pi 2 Model B:

        - SoC: Broadcom BCM2836 (CPU, GPU, DSP, SDRAM)
        - CPU: 900 MHz quad-core ARM Cortex A7 (ARMv7 instruction set)
        - GPU: Broadcom Video Core IV @ 250 MHz
        - More GPU info: OpenGL ES 2.0 (24 GFLOPS); 1080p30 MPEG-2 and VC-1 decoder (with license); 1080p30 h.264/MPEG-4 AVC high-profile decoder and encoder
        - Memory: 1 GB (shared with GPU)
        - USB ports: 4
        - Video input: 15-pin MIPI camera interface (CSI) connector
        - Video outputs: HDMI, composite video (PAL and NTSC) via 3.5 mm jack
        - Audio input: I²S
        - Audio outputs: Analog via 3.5 mm jack; digital via HDMI and I²S
        - Storage: MicroSD
        - Network: 10/100Mbps Ethernet
        - Peripherals: 17 GPIO plus specific functions, and HAT ID bus
        - Power rating: 800 mA (4.0 W)
        - Power source: 5 V via Micro USB or GPIO header
        - Size: 85.60mm × 56.5mm
        - Weight: 45g (1.6 oz)

    b. Memory Card [16GB]

        Secure Digital is a non-volatile memory card format developed by the SD Card Association for use in portable devices. The standard was introduced in August 1999 by joint efforts between SanDisk, Panasonic and Toshiba as

an improvement over Multimedia Cards, and has become the industry standard.

c. Touchscreen Display

Touch Screen Display Solutions from Desktop Monitors to Video Walls. Planar is a leader in durable, vibrant touch screen display solutions providing a range of high-quality solutions across a spectrum of interactive technologies

d. Printer

We are using HP Deskjet 1112. With we help of this, user can take printout of their work.

e. PC

f. Numeric Keypad

A numeric keypad, number pad, numpad, or ten key, is the palm-sized, 17-key section of a standard computer keyboard, usually on the far right. With the help of this user are able to login his account.

2. Software Tools

a. CUPS

CUPS is the standards-based, open source printing system developed by Apple for macOS and other UNIX -like operating systems. CUPS uses the Internet Printing Protocol (IPP) to support printing to local and network printers

b. PyKota v1.27

The purpose of using PyKota is helps us to take the control of printing system. PyKota is one of the most advanced Open Source Software dedicated to print accounting and print quota enforcement. It is a full featured, internationalized, centralized, and extensible print quota system for CUPS.

c. Apache Derby

Apache Derby, an Apache DB subproject, is a relational database implemented in Java. Its footprint is so small you can easily embed it in any Java-based solution. In addition to its embedded framework, Derby supports a more familiar client/server framework with the Derby Network Server. This tutorial introduces Derby's basic features and walks you through using both frameworks; first the embedded framework using the Derby Embedded JDBC driver, then the Network Server framework using the Derby Network Client JDBC driver.

d. Google Cloud Print Connector

This allows users in your organization to print to your legacy printer(s) from Chrome devices and other web-enabled devices. Running the connector as a service means that Cloud Print is always on—running on your organization's servers.

e. Ngrok tunnel

Public URLs for testing your chatbot. Public URLs for demoing from your own machine.

f. Pkpgcounter

pkpgcounter is a generic Page Description Language parser which can either count the number of pages or compute the percent of ink coverage needed to print various types of documents. pkpgcounter is both a command line tool and a Python library distributed under the terms of the GNU General Public License of the Free Software Foundation, version 3 or higher.

g. Pkipplib

Pkipplib is a Python library which can prepare IPP requests with the help of a somewhat high level API. These requests can then be sent to an IPP printer or print server (e.g. CUPS).This library can also parse IPP answers received, and create high level Python objects from them. Both of these actions can be

done through an IPP Request class and its instance methods. Finally, a CUPS class can be leveraged to easily deal with CUPS print servers. This entire library being written in the Python language, there's no need to link the code with the CUPS' API, which makes it independent of the CUPS version being installed. Some command line tools which rely on pkipplib are now included.

h. jQuery Core

JQuery is a fast, small, and feature-rich JavaScript library. It makes things like HTML document traversal and manipulation, event handling, animation, and Ajax much simpler with an easy-to-use API that works across a multitude of browsers. With a combination of versatility and extensibility, jQuery has changed the way that millions of people write JavaScript.

i. NetBeans

NetBeans is an integrated development environment for Java. NetBeans allows applications to be developed from a set of modular software components called modules. NetBeans runs on Microsoft Windows, macOS, Linux and Solaris

j. Android Studio

Android Studio is the official integrated development environment for Google's Android operating system, built on Jet Brains' IntelliJ IDEA software and designed specifically for Android development. It is available for download on Windows, macOS and Linux based operating systems.

SYSTEM ARCHITECTURE

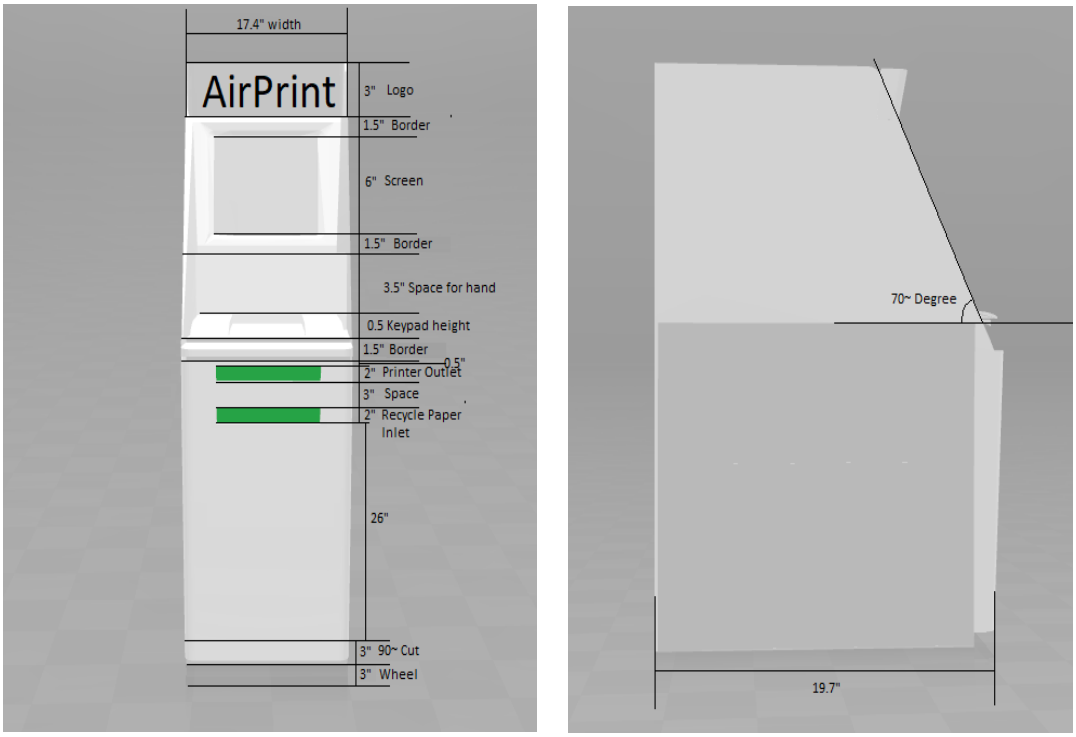


Figure 3: Architecture

DESIGN

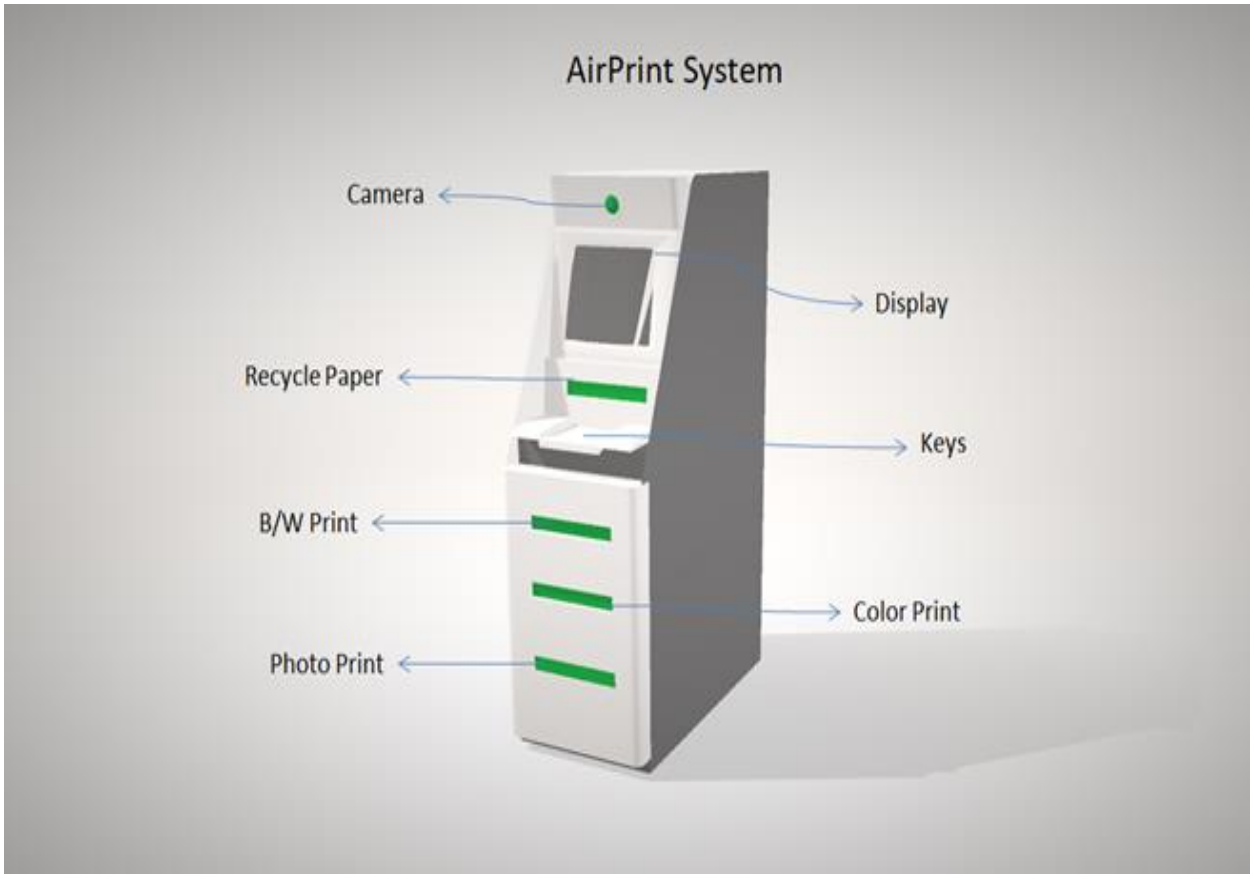
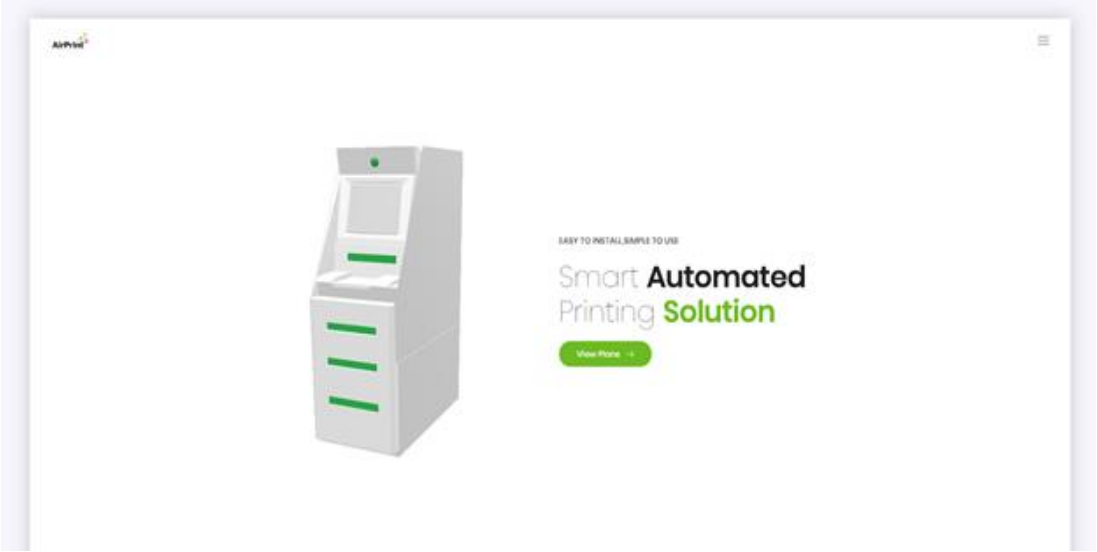
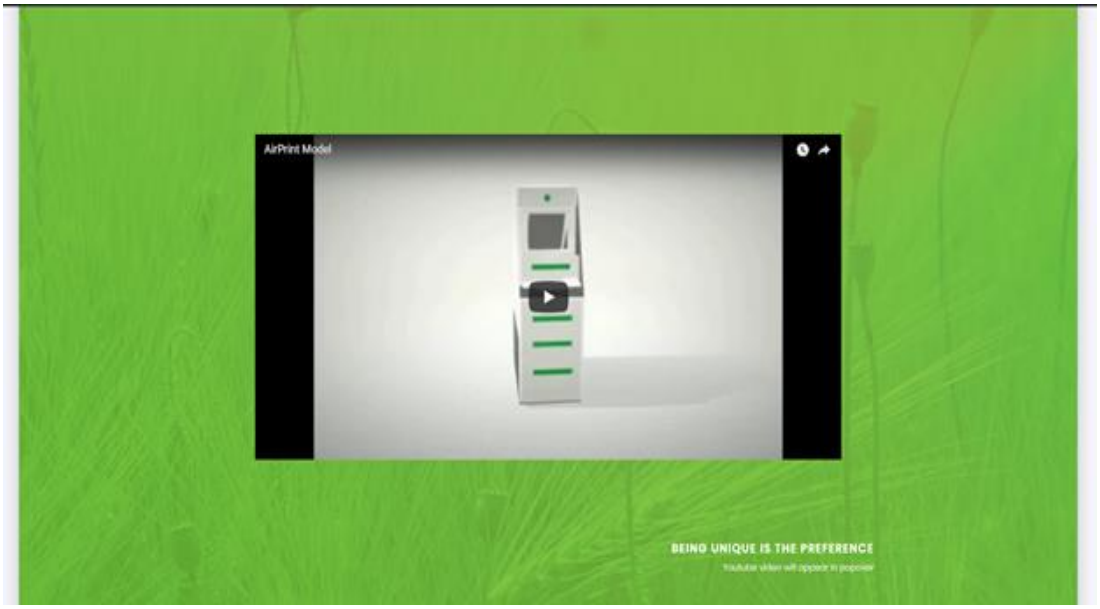


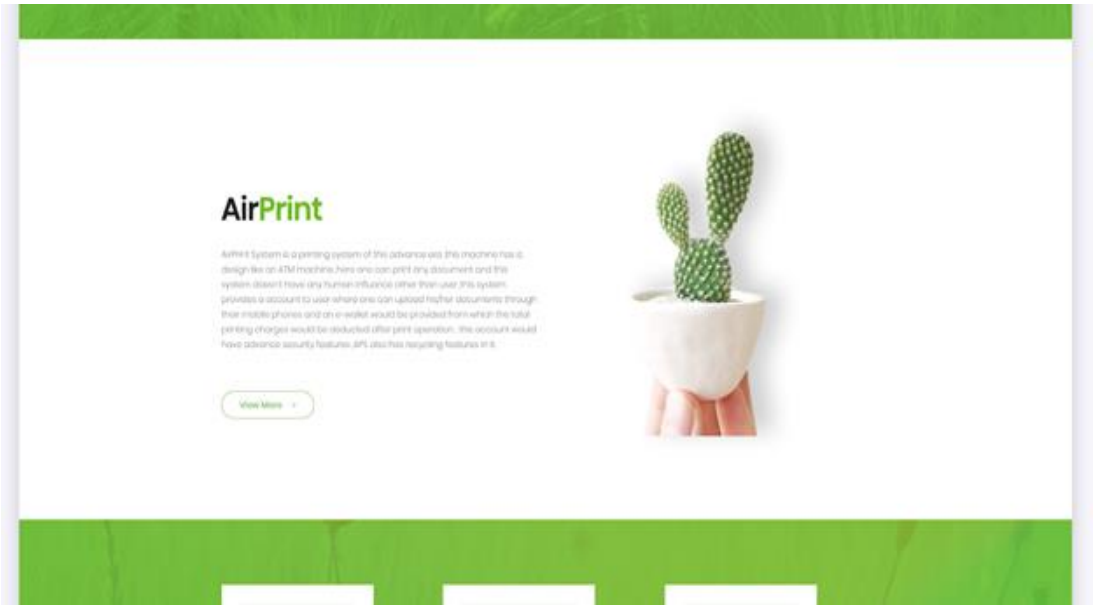
Figure 4: Design

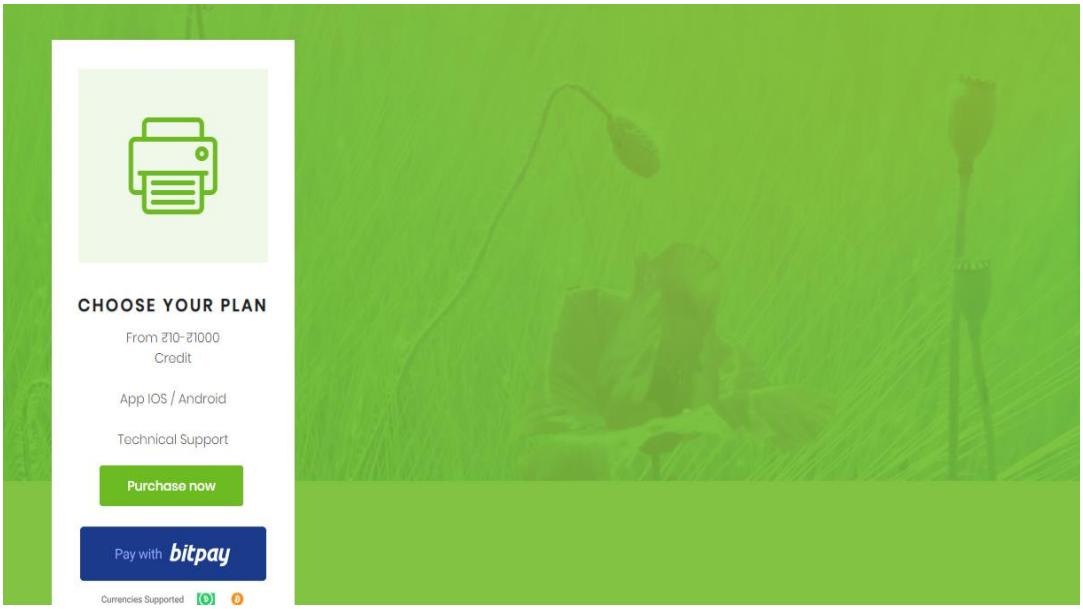
Figure 5: Workflow

WEBSITE


EASY TO INSTALL,SIMPLE TO USE
Smart Automated
Printing Solution


AirPrint Model
BEING UNIQUE IS THE PREFERENCE


AirPrint


CHOOSE YOUR PLAN
From ₹10-₹1000
Credit
App IOS / Android
Technical Support
Purchase now
Pay with bitpay
Currencies Supported

ANDROID APPLICATION

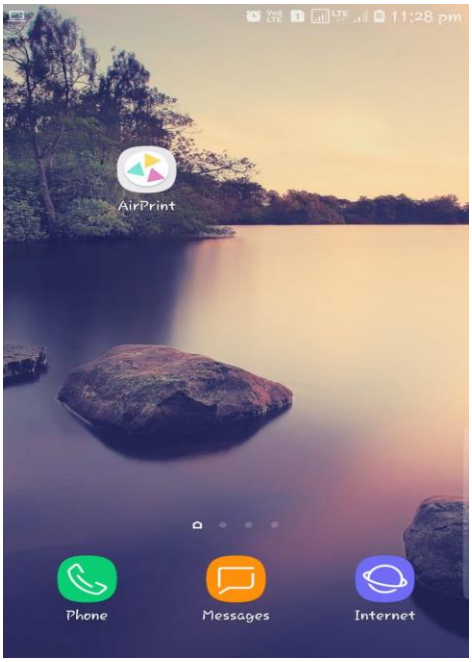


Fig 5: App Logo

Fig 6: Splash Screen

Fig 7: Login Screen

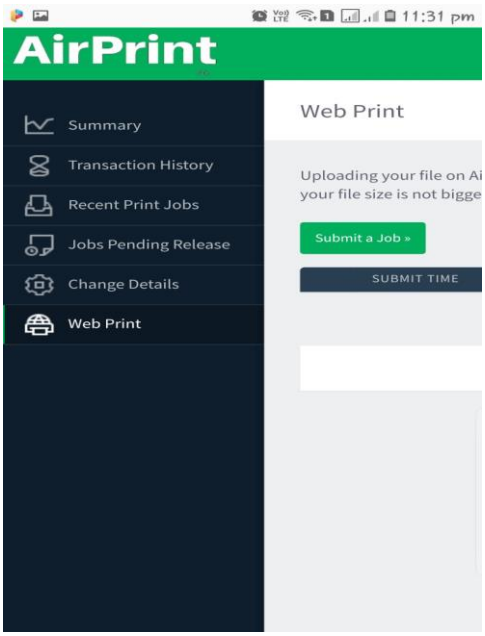
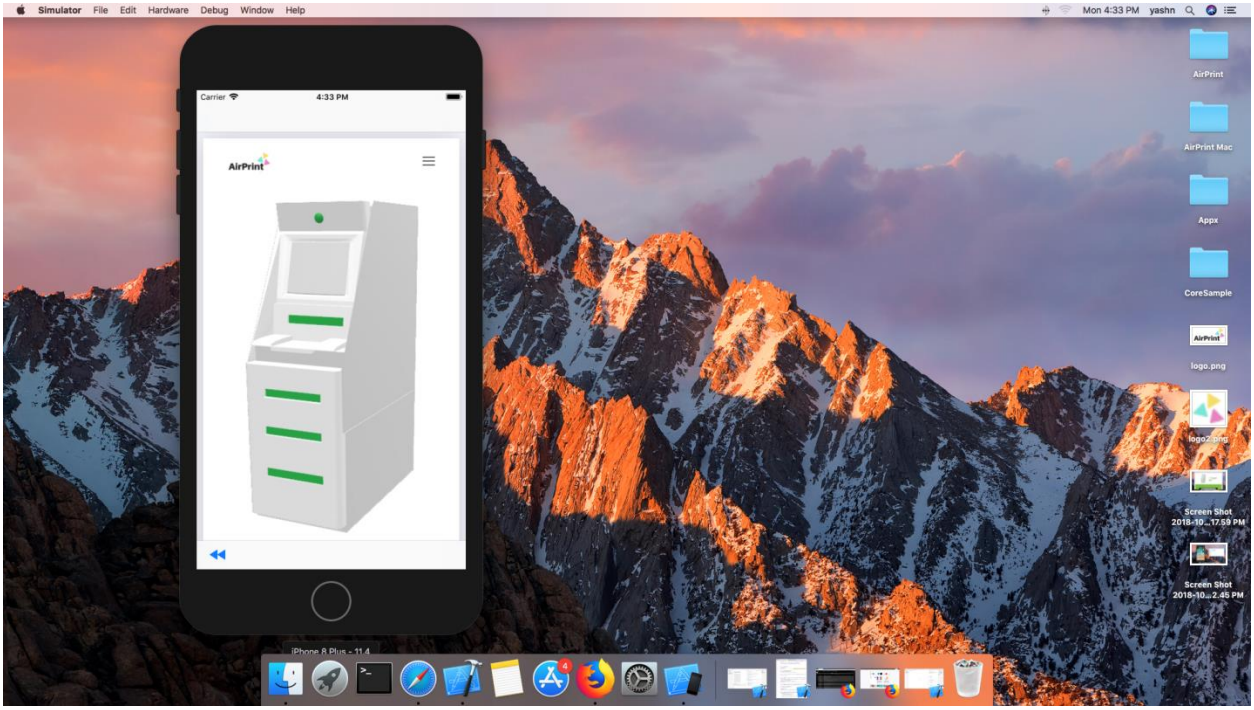
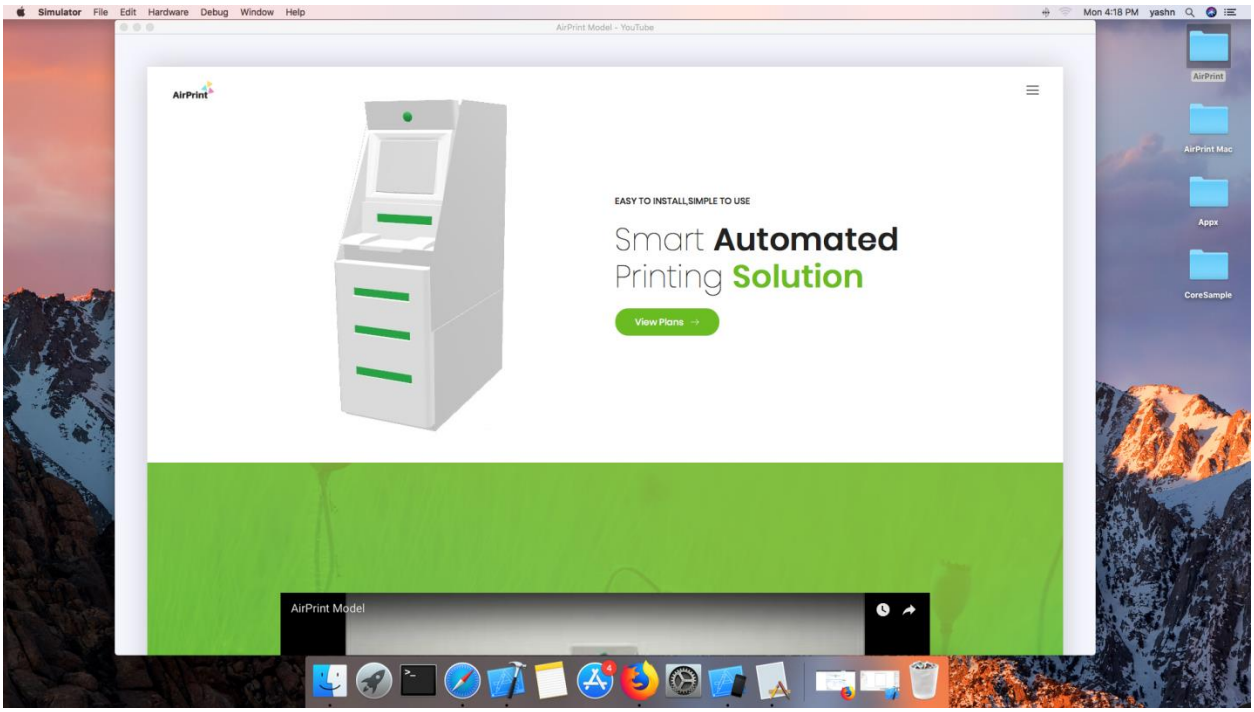


Fig 8: User Account

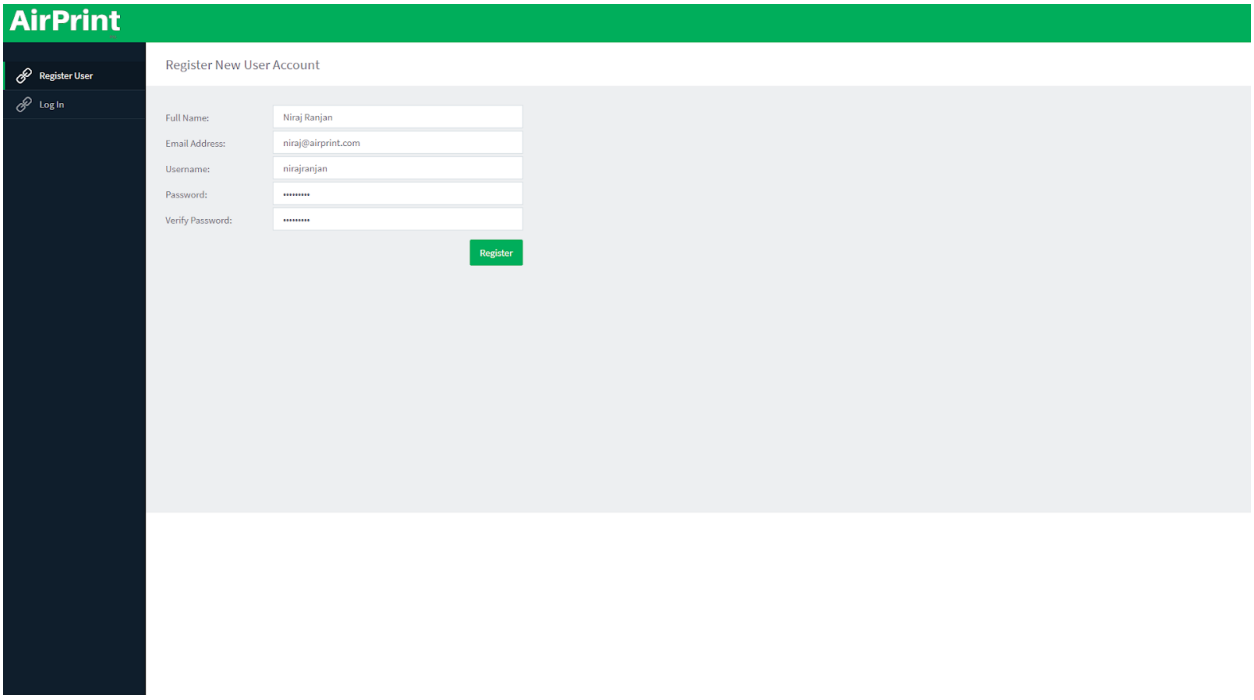
IOS APPLICATION

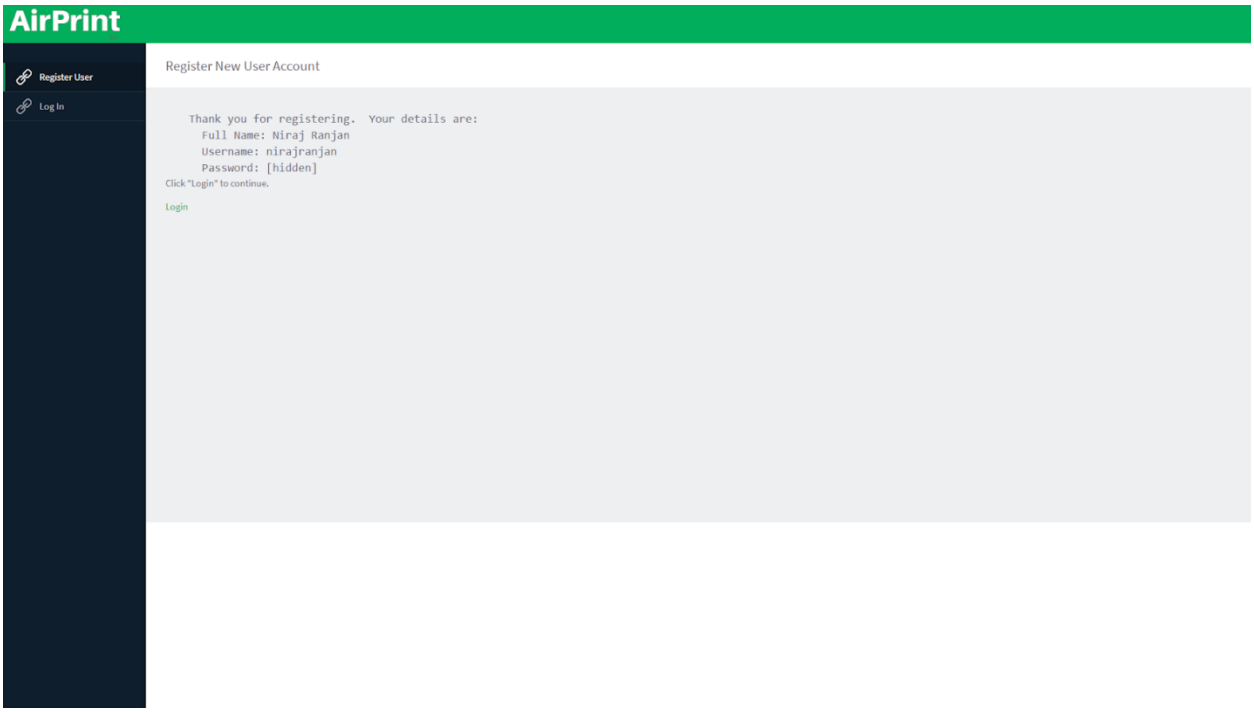


MACOSX DESKTOP APPLICATION

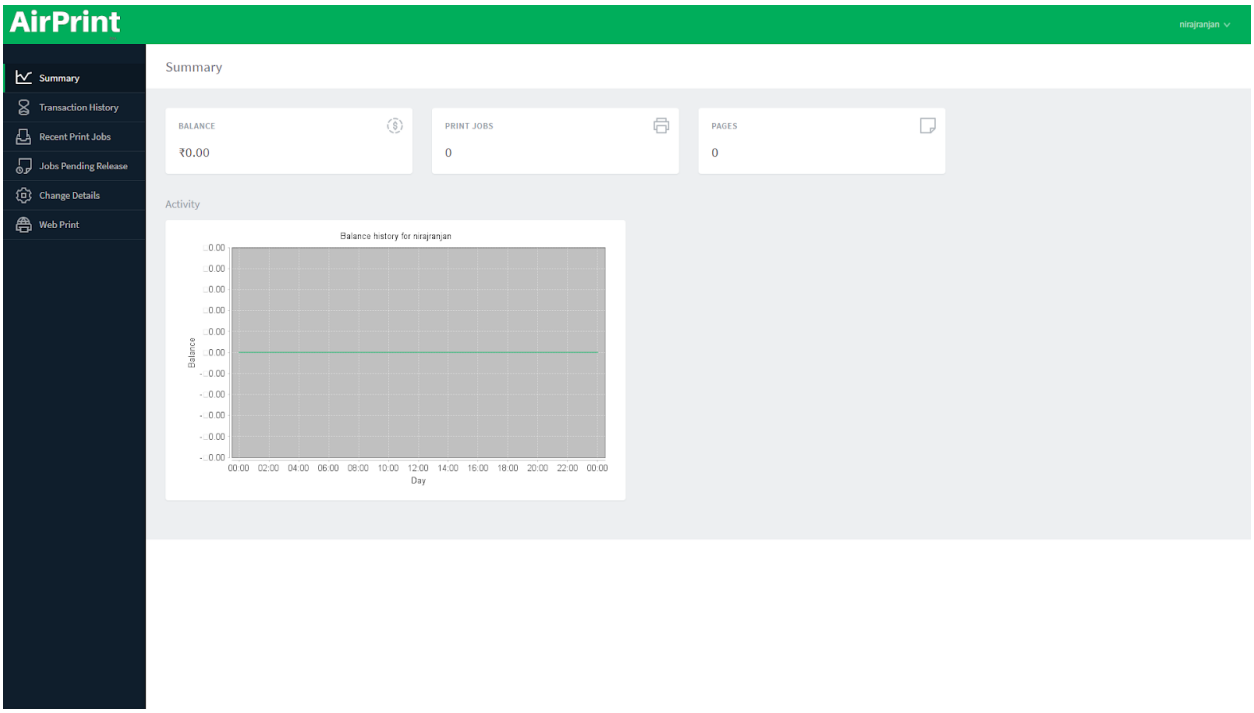


WINDOW/DESKTOP APPLICATION






AirPrint
Username
nirajranjan
Password
Log in
Register as a New User


AirPrint
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Transaction History
Recent Print Jobs
Jobs Pending Release
Change Details
Web Print
Summary
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PAGES
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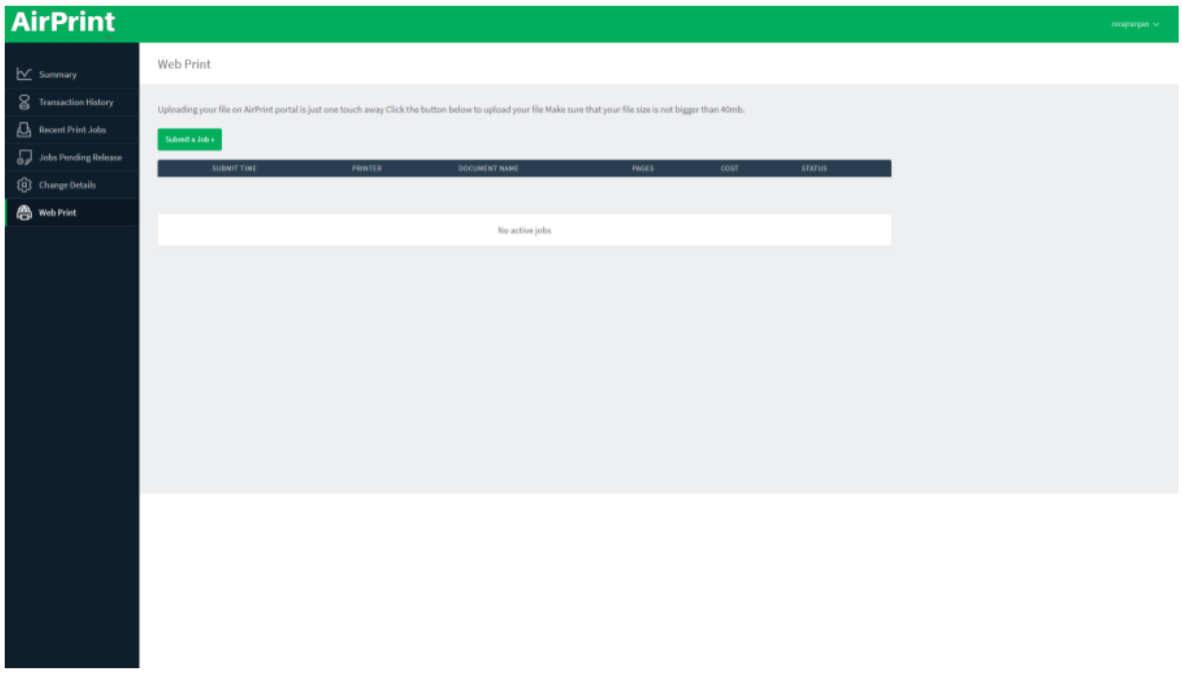
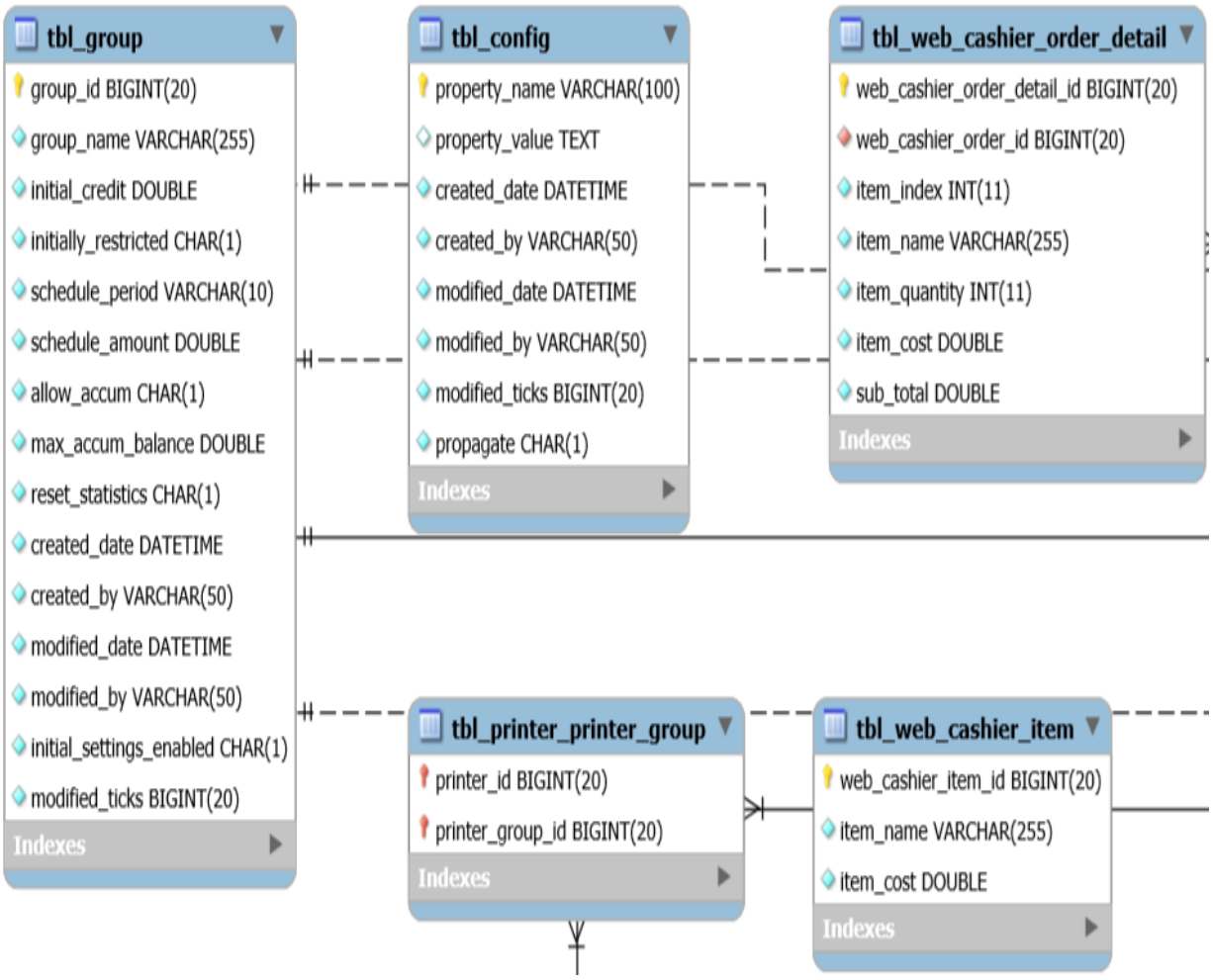

AirPrint
Summary
Transaction History
Recent Print Jobs
Jobs Pending Release
Change Details
Web Print
Web Print
Uploading your file on AirPrint portal is just one touch away Click the button below to upload your file Make sure that your file size is not bigger than 40mb.
Submit a Job »
SUBMIT TIME
PRINTER
DOCUMENT NAME
PAGES
COST
STATUS
No active jobs

DATA MODEL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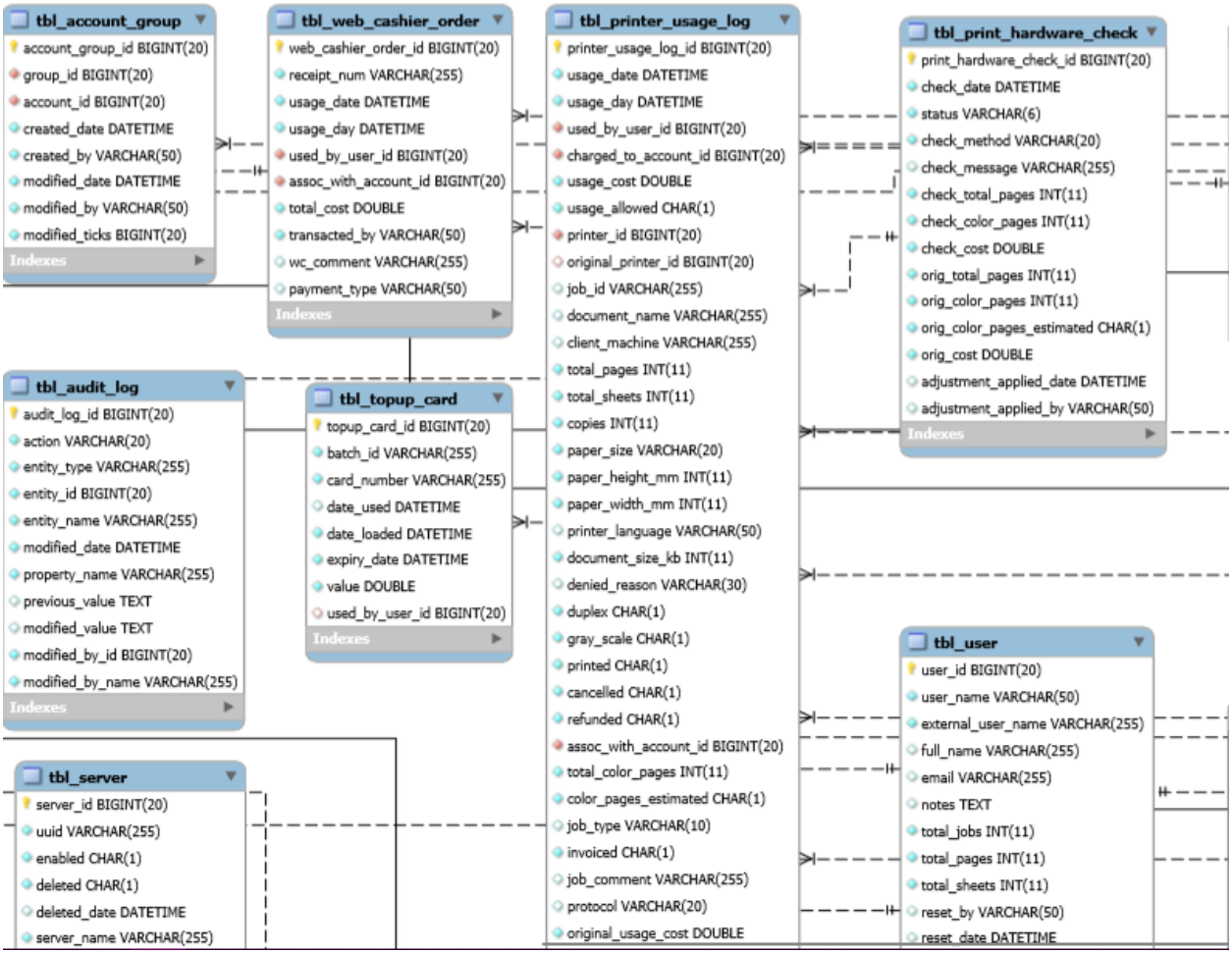
Indexes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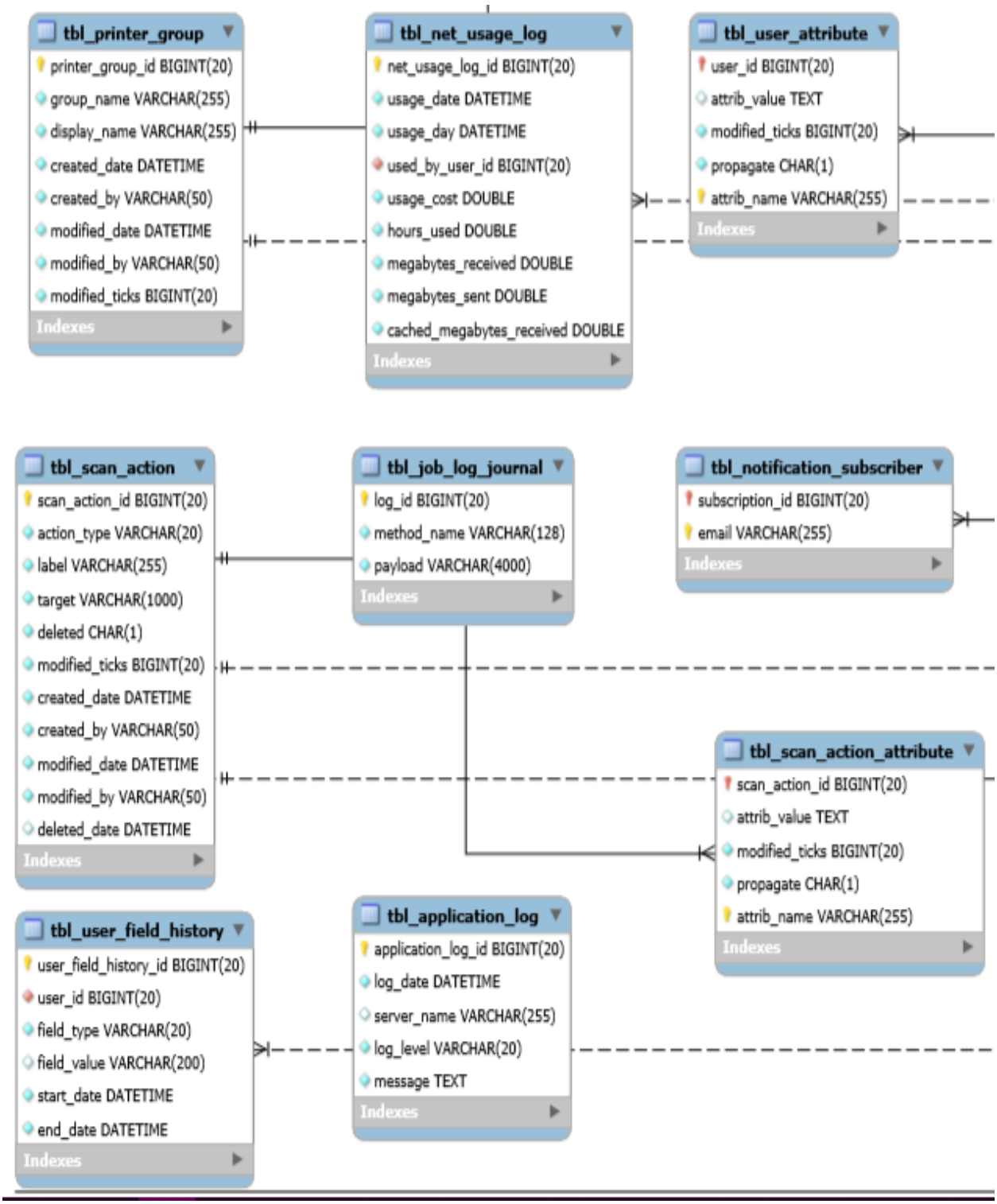
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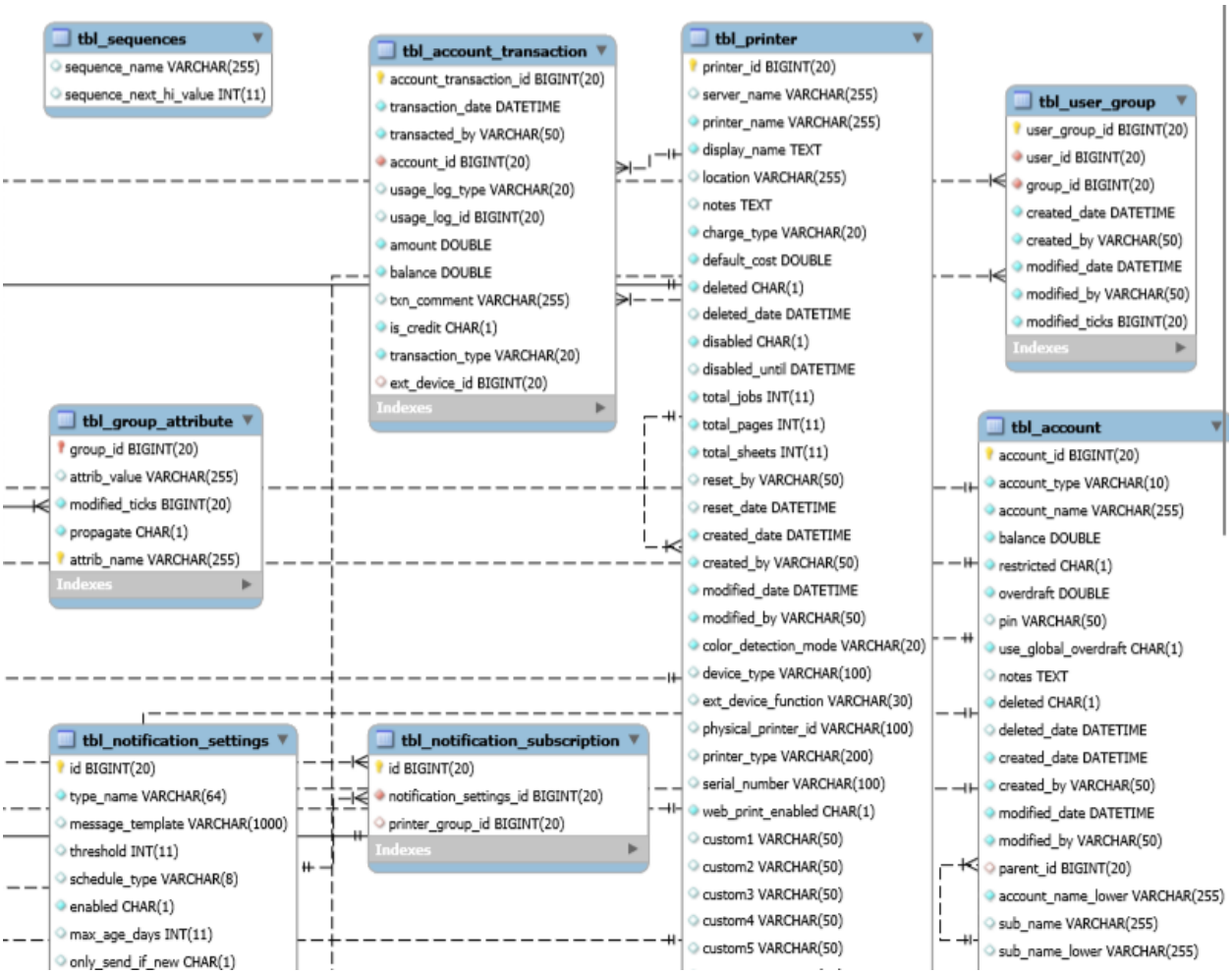
Indexes
tbl_user_attribute
user_id BIGINT(20)
attrib_value TEXT
modified_ticks BIGINT(20)
propagate CHAR(1)
attrib_name VARCHAR(255)
Indexes
tbl_scan_action
scan_action_id BIGINT(20)
action_type VARCHAR(20)
label VARCHAR(255)
target VARCHAR(1000)
deleted CHAR(1)
modified_ticks BIGINT(20)
created_date DATETIME
created_by VARCHAR(50)
modified_date DATETIME
modified_by VARCHAR(50)
deleted_date DATETIME
Indexes
tbl_job_log_journal
log_id BIGINT(20)
method_name VARCHAR(128)
payload VARCHAR(4000)
Indexes
tbl_notification_subscriber
subscription_id BIGINT(20)
email VARCHAR(255)
Indexes
tbl_scan_action_attribute
scan_action_id BIGINT(20)
attrib_value TEXT
modified_ticks BIGINT(20)
propagate CHAR(1)
attrib_name VARCHAR(255)
Indexes
tbl_user_field_history
user_field_history_id BIGINT(20)
user_id BIGINT(20)
field_type VARCHAR(20)
field_value VARCHAR(200)
start_date DATETIME
end_date DATETIME
Indexes
tbl_application_log
application_log_id BIGINT(20)
log_date DATETIME
server_name VARCHAR(255)
log_level VARCHAR(20)
message TEXT
Indexes


tbl_sequences
sequence_name VARCHAR(255)
sequence_next_hi_value INT(11)
tbl_account_transaction
account_transaction_id BIGINT(20)
transaction_date DATETIME
transacted_by VARCHAR(50)
account_id BIGINT(20)
usage_log_type VARCHAR(20)
usage_log_id BIGINT(20)
amount DOUBLE
balance DOUBLE
txn_comment VARCHAR(255)
is_credit CHAR(1)
transaction_type VARCHAR(20)
ext_device_id BIGINT(20)
Indexes
tbl_printer
printer_id BIGINT(20)
server_name VARCHAR(255)
printer_name VARCHAR(255)
display_name TEXT
location VARCHAR(255)
notes TEXT
charge_type VARCHAR(20)
default_cost DOUBLE
deleted CHAR(1)
deleted_date DATETIME
disabled CHAR(1)
disabled_until DATETIME
total_jobs INT(11)
total_pages INT(11)
total_sheets INT(11)
reset_by VARCHAR(50)
reset_date DATETIME
created_date DATETIME
created_by VARCHAR(50)
modified_date DATETIME
modified_by VARCHAR(50)
color_detection_mode VARCHAR(20)
device_type VARCHAR(100)
ext_device_function VARCHAR(30)
physical_printer_id VARCHAR(100)
printer_type VARCHAR(200)
serial_number VARCHAR(100)
web_print_enabled CHAR(1)
custom1 VARCHAR(50)
custom2 VARCHAR(50)
custom3 VARCHAR(50)
custom4 VARCHAR(50)
custom5 VARCHAR(50)
tbl_user_group
user_group_id BIGINT(20)
user_id BIGINT(20)
group_id BIGINT(20)
created_date DATETIME
created_by VARCHAR(50)
modified_date DATETIME
modified_by VARCHAR(50)
modified_ticks BIGINT(20)
Indexes
tbl_group_attribute
group_id BIGINT(20)
attrib_value VARCHAR(255)
modified_ticks BIGINT(20)
propagate CHAR(1)
attrib_name VARCHAR(255)
Indexes
tbl_account
account_id BIGINT(20)
account_type VARCHAR(10)
account_name VARCHAR(255)
balance DOUBLE
restricted CHAR(1)
overdraft DOUBLE
pin VARCHAR(50)
use_global_overdraft CHAR(1)
notes TEXT
deleted CHAR(1)
deleted_date DATETIME
created_date DATETIME
created_by VARCHAR(50)
modified_date DATETIME
modified_by VARCHAR(50)
parent_id BIGINT(20)
account_name_lower VARCHAR(255)
sub_name VARCHAR(255)
sub_name_lower VARCHAR(255)
tbl_notification_settings
id BIGINT(20)
type_name VARCHAR(64)
message_template VARCHAR(1000)
threshold INT(11)
schedule_type VARCHAR(8)
enabled CHAR(1)
max_age_days INT(11)
only_send_if_new CHAR(1)
tbl_notification_subscription
id BIGINT(20)
notification_settings_id BIGINT(20)
printer_group_id BIGINT(20)
Indexes

CONCLUSION

This work described web-based printing system with significant features allows users to save their time. Associated features of the system make it maximum utilization. As Queue Monitoring, Centralized server Print Releasing and for online transactions E- wallet is congaed.

It is our privilege to express our sincerest regards to our project guide, Prof. Piyush Ingole for his valuable inputs, able guidance, encouragement and constructive criticism throughout the duration of our project. We thank our college for providing us with excellent facilities that helped us to work on the project. We would also like to thank the staff members and lab assistants for permitting us to use computers in the lab as and when required. We express our deepest gratitude towards our project guide for his valuable and timely advice during the various phases in our project. Finally we would like to thank everyone who helped us directly or indirectly in our project.

FUTURE SCOPE

- Cashless Printing.
- It uses is so many places as:
    - Usage
    - Colleges
    - Schools
    - Airports
    - Hotels
    - Shopping Mall
    - Commercial buildings
    - Government Office
    - Office Building

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