A REPORT
ON
DOCUMENT MANAGEMENT SYSTEM ANDROID APPLICATION

BY

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Krish Ambre	2017B4A80869P

AT

Podar Mills (NTCL), Mumbai
A Practice School-I Station of

BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE, PILANI
(JUNE,2019)

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Prepared in partial fulfillment of the
Practice School-I Course

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BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE, PILANI
(JUNE,2019)

BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE
PILANI (RAJASTHAN)
Practice School Division

Station: Podar Mills, NTCL **Centre:** Mumbai
Duration: 2 months **Start Date:**21/05/2019
Date of Submission: 10/07/2019
Title: Document Management System Android System

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Dr. Abhishek Sarkar (Instructor)
Mr. Chaitanya Modak (Co-instructor)
Key Words:
Java Development, App Development, NoSQL querying, Database Design, OOP patterns, Firebase, UI/UX
Project Areas:
Android Development, Java, Android Studio, Firebase
Abstract:
An android app application for uploading, searching, and managing documents was proposed by us to be developed in the Android Studio using Java. This requires familiarity with Java development, OOP principles, Database Management and Cloud Storage.

Signature of Student: Signature of PS Faculty:
Date : 10/07/2019 Date:10/07/2019

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1. Introduction

Information Technology has taken over all sectors, and we are constantly drifting towards the mobile era. The number of mobile phone users is greater than desktop users. While mobile devices like laptops, and tablets made it possible to work on the go, now workers can use their applications on their mobile devices to take advantage of business capabilities and insights.

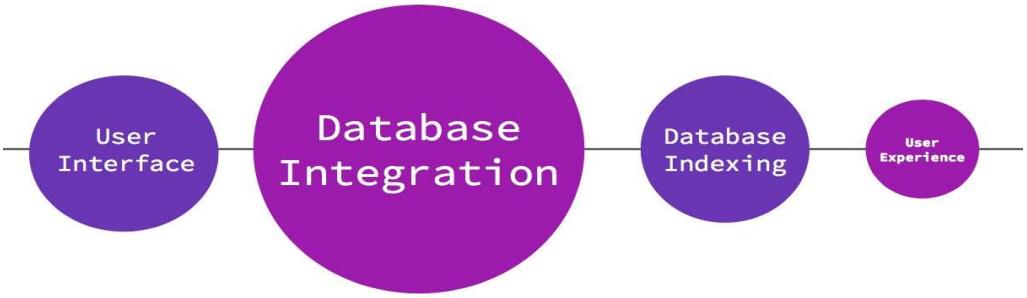
Our Project, Document Management System Android Application will offer its' users, i.e. the employees of Podar Mills various benefits. Currently, the system is manual. This restricts access to information and documents to the workplace only. Since the employees at Podar Mills have to quite often commute between offices and various other places the application will offer the information at the fingertips of the user. It will allow employees to improve quality of service to customers by giving them access to the relevant information quickly. Having information at the fingerts helps mobile workers deepen business relationships and response times. This application makes it easy for employees to enter all relevant data easily as they gather it in the field without computing the data into back end systems (potentially making errors along the way).

Currently, the system will be hosted through the Android application but later on can be expanded to iOS and web application as Firebase offers cross-platform connectivity. At a time, the application will support 100 simultaneous users and 5GB of document storage.

With this application, employees can take advantage of the functionality, data, and benefits of this application not only in the office, but from remote places also. Mobility is becoming more and more prevalent in the workspace, and hence it is important for the organizations to choose a system that can scale up their business and also have the flexibility and capability to integrate with new technology solutions.

Methodology:

Development Stage:



User Interface: Developing the basic User Interface to start with programming the logic. This includes making Bottom Navigation Bar, Buttons, Edit Texts and Dropdowns (Spinner) and linking up to the activities. We referred to various internet sources to help us design them. *Android Studio* has been used to code the User Interface. *Java* and *XML* have been used for UI designing.

Database Integration: Firebase Realtime Database is used for storing the User details, which includes the login credentials as well as document details. The documents are stored in Firebase Cloud Storage. The database is queried using *NoSQL* language.

Database Indexing: This technique helps in faster retrieval of data and can be used in sorting as well. Queries usually result in much better performance.

User Experience: Adding various features which will improve the user experience. This includes improving the User Interface as well as adding features like save passwords, uploading images by capturing through the mobile camera.

Post-Development: A beta version of the application will be released for the employees to find the various bugs present. After all these issues are resolved, the application will be deployed through the Google Play Store after completing documentation.

2. Technologies Required

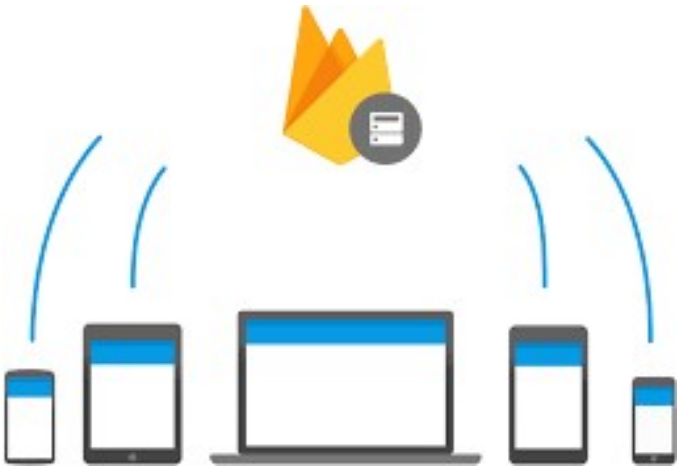
2.1. Android Studio

Android Studio is the official integrated development environment (IDE) for Google's Android operating system, built on JetBrains' IntelliJ IDEA software and designed specifically for Android development. It is available for download on Windows, Linux and MacOS based operating systems. It is created as a replacement for the Eclipse Android Development Tools (ADT) as primary IDE for native Android application development. It has a poweful editor tool for developing creative UI/UX and emulators for different versions to test and simulate sensors without having actual Android devices. It also has a very intuitive Gradle plugin feature by which we can create application files (apks) with different configurations. Moreover, it makes exporting and uploading app bundles or apk on play store easy with a single click.

Languages used:

- *Java*
- *XML*
- *Kotlin*
- *NoSQL*
- *JSON*

2.2. Firebase Realtime Database



The **Firebase Realtime Database** is a cloud-hosted database. Data is stored as JSON and synchronized in realtime to every connected client. When you build cross-platform apps with our iOS, Android, and JavaScript SDKs, all of your clients share one Realtime Database instance and automatically receive updates

with the newest data.

Instead of typical HTTP requests, the Firebase Realtime Database uses data synchronization—every time data changes, any connected device receives that update within milliseconds. Provide collaborative and immersive experiences without thinking about the networking code.

Firebase apps remain responsive even when offline because the Firebase Realtime Database SDK persists your data to disk. Once connectivity is reestablished, the client device receives any changes it missed, synchronizing it with the current server state. This is used to access and maintaining user information and setting up their power.

2.3. Firebase Cloud Storage

Cloud Storage for Firebase is a powerful, simple, and cost-effective object

storage service built for Google scale. The Firebase SDKs for Cloud Storage add Google security to file uploads and downloads for your Firebase apps, regardless of network quality. Firebase Storage SDKs can be used to store images, audio, video, or other user-generated content.

Firebase SDKs for Cloud Storage perform uploads and downloads regardless of network quality. Uploads and downloads are robust, meaning they restart where they stopped, saving the users time and bandwidth.

Cloud Storage for Firebase is built for exabyte scale, so when the app goes viral, we can effortlessly grow from prototype to production using the same infrastructure that powers used in Spotify and Google Photos. This is used to store documents and to access them from anywhere.

2.4. Firebase Authentication

Firebase Authentication provides a platform to authenticate users by providing backend services, SDKs, and ready-made libraries to authenticate users to the app. The method can vary from simple email/ password register to google,

facebook, GitHub login using OAuth.

Implementing Firebase Authentication is a fast and easy than other methods of authentication. From the Firebase console, we just need to choose from the popular login methods that we want to offer in our app(like Facebook, Google, Twitter and email/password) and then add the Firebase SDK to our app. The app will then be able to connect securely with the real-time database, Firebase storage or to any other firebase service. If we have an auth system already, we can use Firebase Auth as a bridge to other Firebase features. This feature of firebase is used in our app to identify the user and give particular access to a different user in the apps.

2.5. Github

GitHub is a web-based repository hosting and managing service. It offers all of

the distributed version access control and source code management functionality of Git as well as adding its features. Unlike Git, which is strictly a command-line tool, GitHub is basically a web GUI of git and desktop as well as mobile integration. It also provides access control and collaboration features such as bug tracking, issue reporting, pull requests, task management, and guidlines for every project.

GitHub offers both plans, private repositories and free accounts, which are usually used to host open-source software projects. Projects on GitHub can be accessed and operated using the standard Git command-line interface and all of the standard Git commands such as push, pull, commit work with it. As of April 2018, GitHub reports having more than 16 million users and more than 55 million repositories, which makes it the largest community host of source code in the world. My git handle is djain454.

3.0 App Structure

Android provides a rich application framework that allows us to build innovative apps and games for mobile devices in a Java language environment. Android apps are built as a combination of distinct components that can be invoked individually. Now, NTC already had a web-based application for the E-DMS (Document Management System) but it was only a prototype and not fully functional. And they wanted an android app which would implement all those functionalities because it's just easier for everyone to access the app and they won't have to sit at a computer every time they need some small document.

So, following is the structure of the app we developed.

The structure of the app is as given below:

1. Login Page
    - Login
    - Forgot Password
2. Home/Welcome
    - Home
    - Departments
        - ♦ Human Resources
            - Upload Documents
            - View Documents

        - View Policies
    - Marketing
        - Upload Documents
        - View Documents
        - View Policies
    - Technical
        - Upload Documents
        - View Documents
        - View Policies
    - Finance
        - Upload Documents
        - View Documents
        - View Policies
    - Logout

- Documents
    - Upload Documents
    - Search Documents
- User Management
    - Add User
- Change Password

- ♦ Logout

Now there are two broad parts of any android application; namely –

- Front end development (UI/UX of the app)
- Back end development (Services running to make everything functional)

The front-end part consisted of the interface of the app and the transitions between the various sections of the app. So first of all, a colour code was decided for the app which is important because the colors of the screen and the app bar should go together for the app to look appealing.

Next a dummy username and password were put into place temporarily because we didn't have the details of the employees and chose to complete the interface first. So, the next few pages were implemented such as the welcome place and the pages afterwards like the documents page, user management, change password etc. All of this was based on the existing web application of the Document Management System on NTC's website.

One innovation was to create a navigation drawer which opens up from the left side of the screen to facilitate a more interactive experience. This is shown below.

As we navigate through the app the drawer is always there to help us and even a separate drawer was designed when you enter the 'Departments' section. Now these drawers were created by using separate xml files called menus and were later referenced in every activity's code.

We also created pages where the admin can upload the documents and policies to be accessed by the other employees. There was also a 'User Management' section where the admin can create a new user. All the fields were created along with the dropdowns, but nothing was functional just yet.

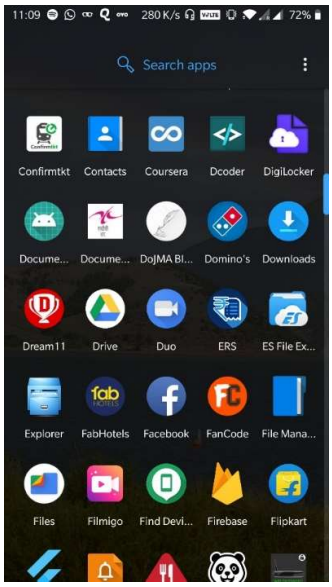
Lastly there was the linking up part where we used android's intent feature to create the hierarchy among pages and also in places like the 'Home' and 'Logout' buttons which caused the app to go to the home page and the login screen respectively.

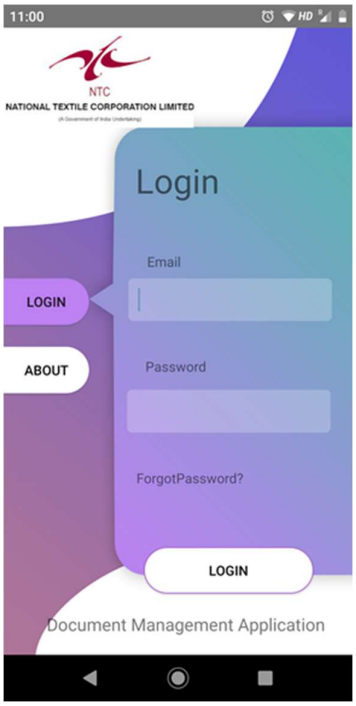
With a few more touches to the buttons, background and the few images used, the front-end work was more or less complete.

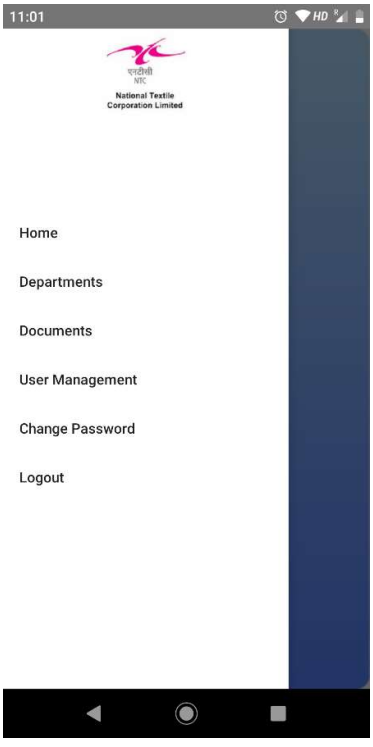
The backend part includes the stuff like adding a new user which included all basic details like the e- mail address, password, department, office etc. and these details were saved on the firebase platform. Also, the functionality for uploading and downloading documents was added through this.

So below is the structure and hierarchy of the application.

This is the icon




11:00
NTC
NATIONAL TEXTILE CORPORATION LIMITED
Login
Email
LOGIN
ABOUT
Password
ForgotPassword?
LOGIN
Document Management Application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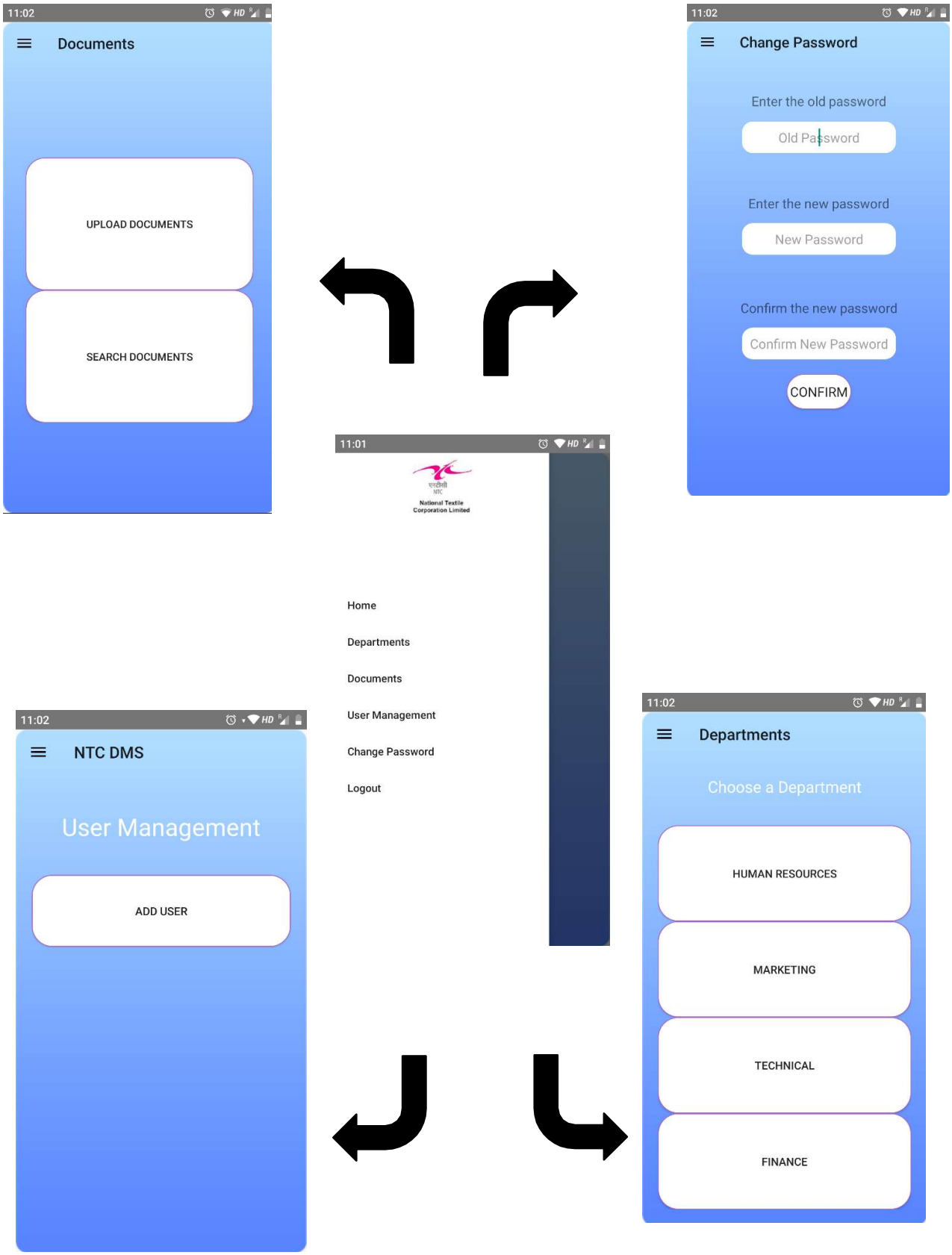
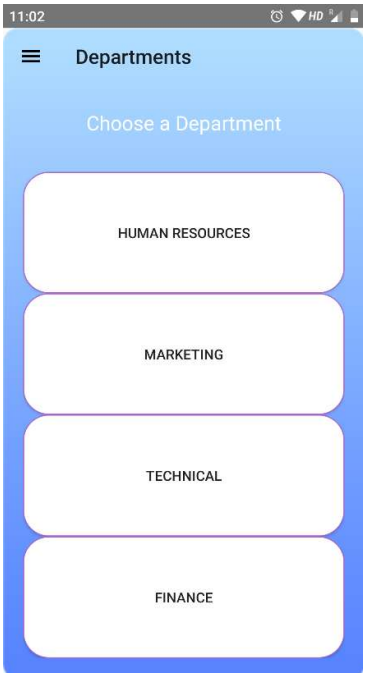
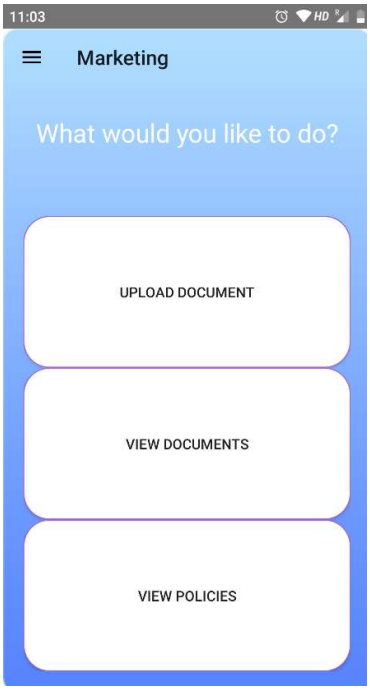
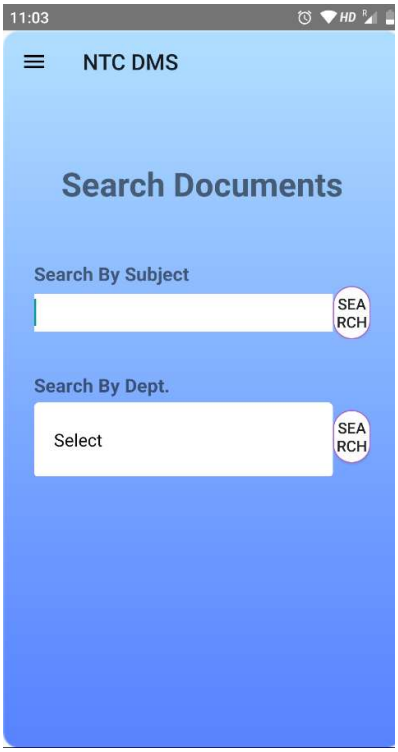
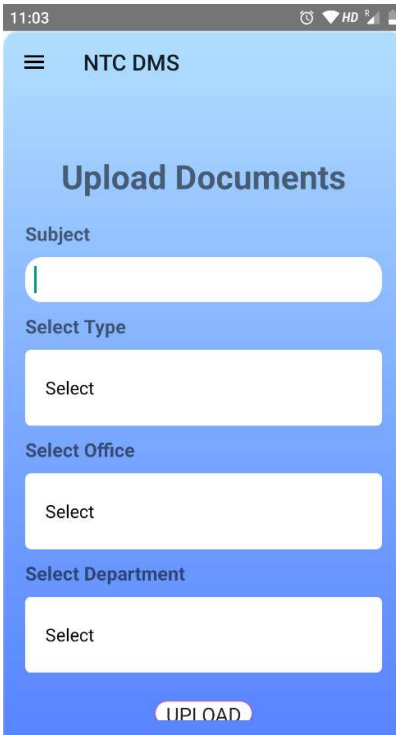
एनटीसी
NTC
National Textile
Corporation Limited
Home
Departments
Documents
User Management
Change Password
Logout


11:02
Documents
UPLOAD DOCUMENTS
SEARCH DOCUMENTS
11:02
Change Password
Enter the old password
Old Password
Enter the new password
New Password
Confirm the new password
Confirm New Password
CONFIRM
11:01
National Textile Corporation Limited
Home
Departments
Documents
User Management
Change Password
Logout
11:02
NTC DMS
User Management
ADD USER
11:02
Departments
Choose a Department
HUMAN RESOURCES
MARKETING
TECHNICAL
FINANCE

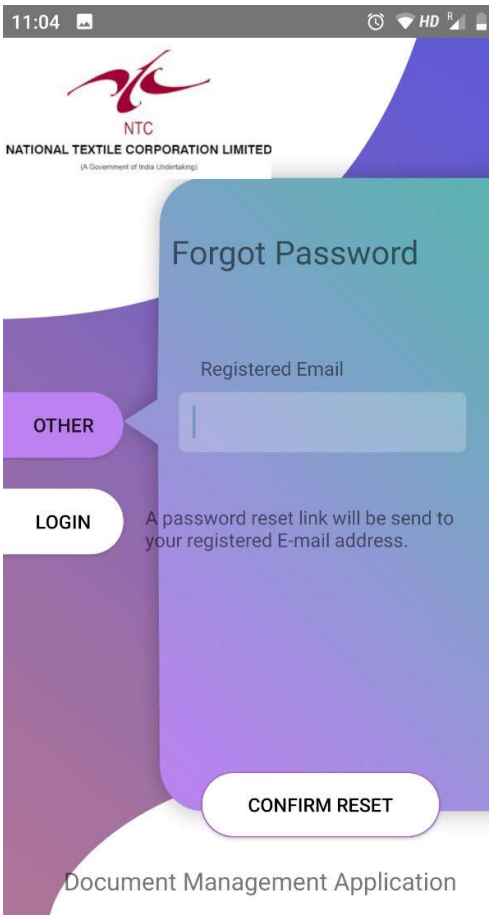

11:02
Departments
Choose a Department
HUMAN RESOURCES
MARKETING
TECHNICAL
FINANCE


11:03
Marketing
What would you like to do?
UPLOAD DOCUMENT
VIEW DOCUMENTS
VIEW POLICIES


11:03
NTC DMS
Search Documents
Search By Subject
SEARCH
Search By Dept.
Select
SEARCH


11:03
NTC DMS
Upload Documents
Subject
Select Type
Select
Select Office
Select
Select Department
Select
UPLOAD

The forgot password functionality is essentially a back-end implementation and will be explained in that section.



4.0 Conclusion

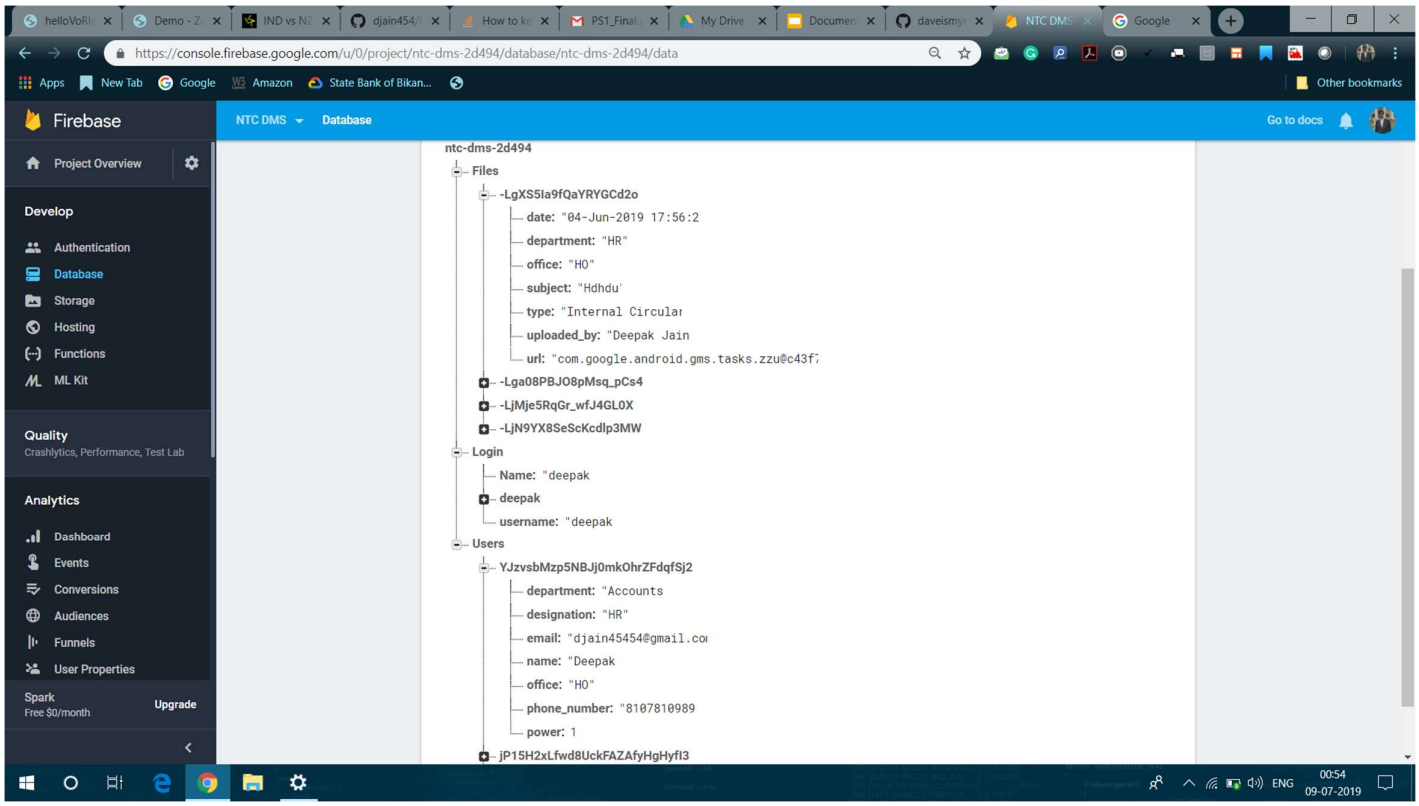
For our project, the broad conclusion is that an android app makes work a lot easier than a web app; and that is due to the following –

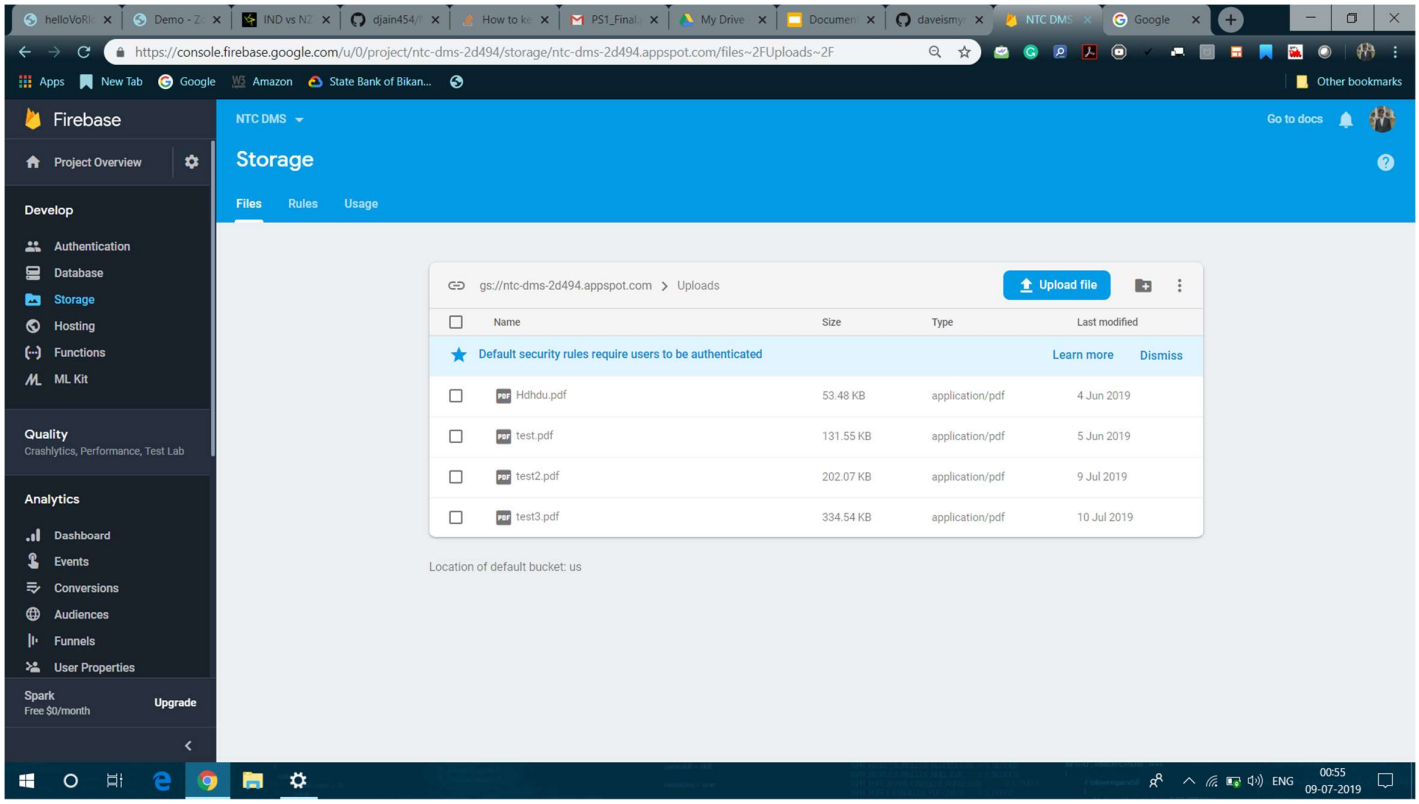
- Android is an open source platform, and everything is freely available to the users, thus making it a very low investment.
- The market share of Android is somewhere near 85% while of the other 15%, Ios has 14% and the rest is Blackberry, Windows etc. So, if the company is using an android app, it is essentially accessible to almost everyone.
- It is very easily customizable and also a very secure platform since Google has rolled out the security fixes.
- And lastly it can be accessed anytime unlike a web app for which a computer system is needed.

5.0 Appendix

Code Snippets

1. Firebase

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Firebase
NTC DMS
Project Overview
Develop
Authentication
Database
Storage
Hosting
Functions
ML Kit
Quality
Crashlytics, Performance, Test Lab
Analytics
Dashboard
Events
Conversions
Audiences
Funnels
User Properties
Spark
Free $0/month
Upgrade
Storage
Files
Rules
Usage
Go to docs
gs://ntc-dms-2d494.appspot.com > Uploads
Upload file
Name
Size
Type
Last modified
Default security rules require users to be authenticated
Learn more
Dismiss
Hdhdu.pdf
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application/pdf
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test2.pdf
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application/pdf
10 Jul 2019
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ENG
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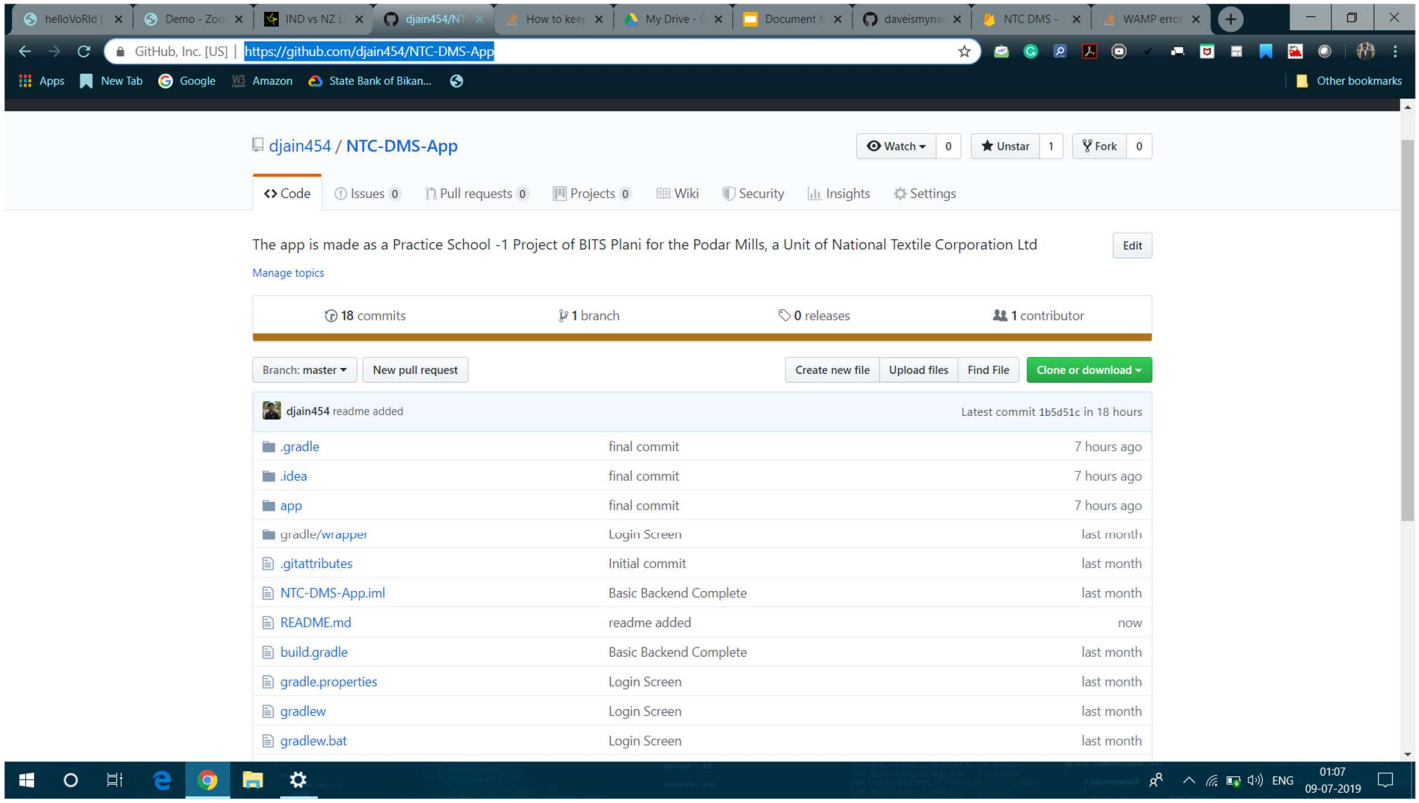
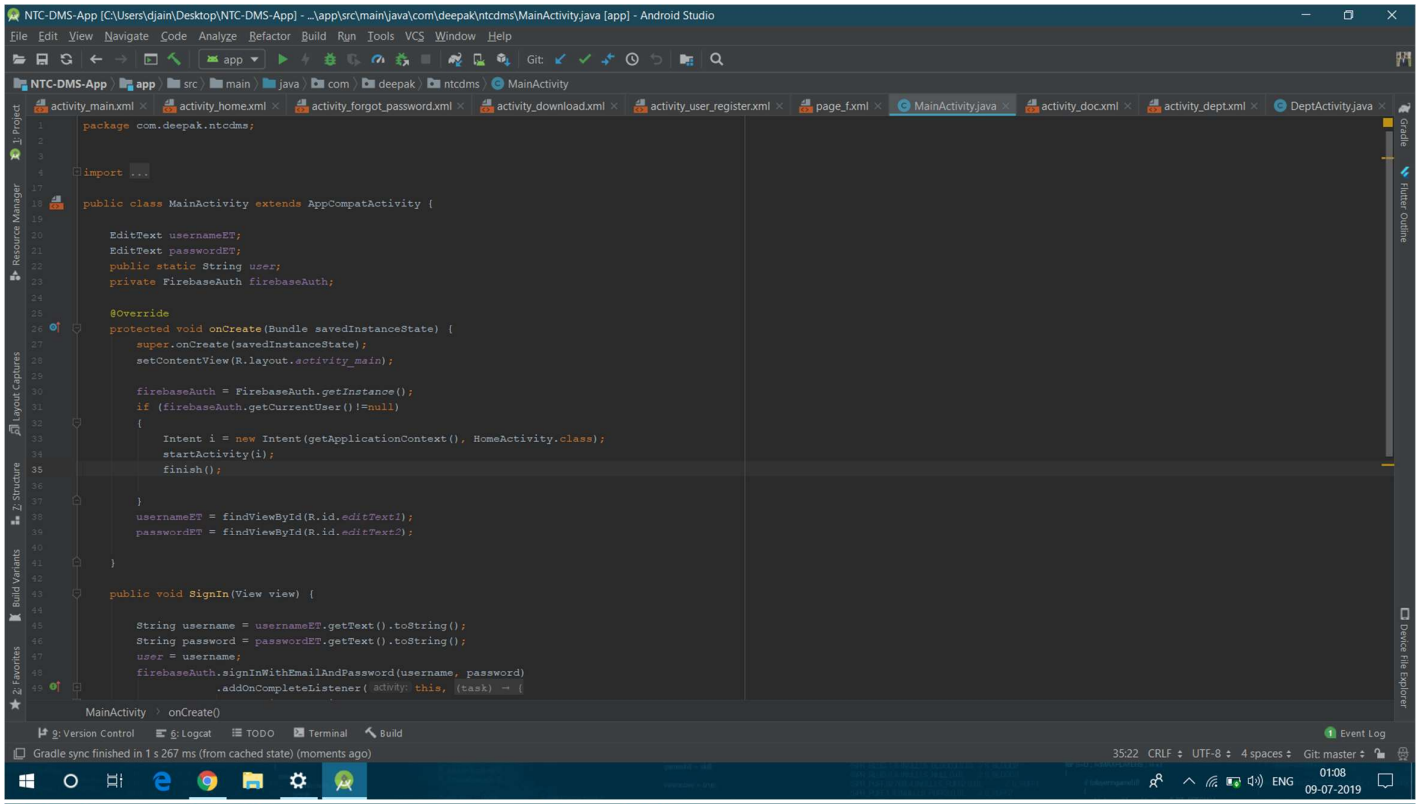
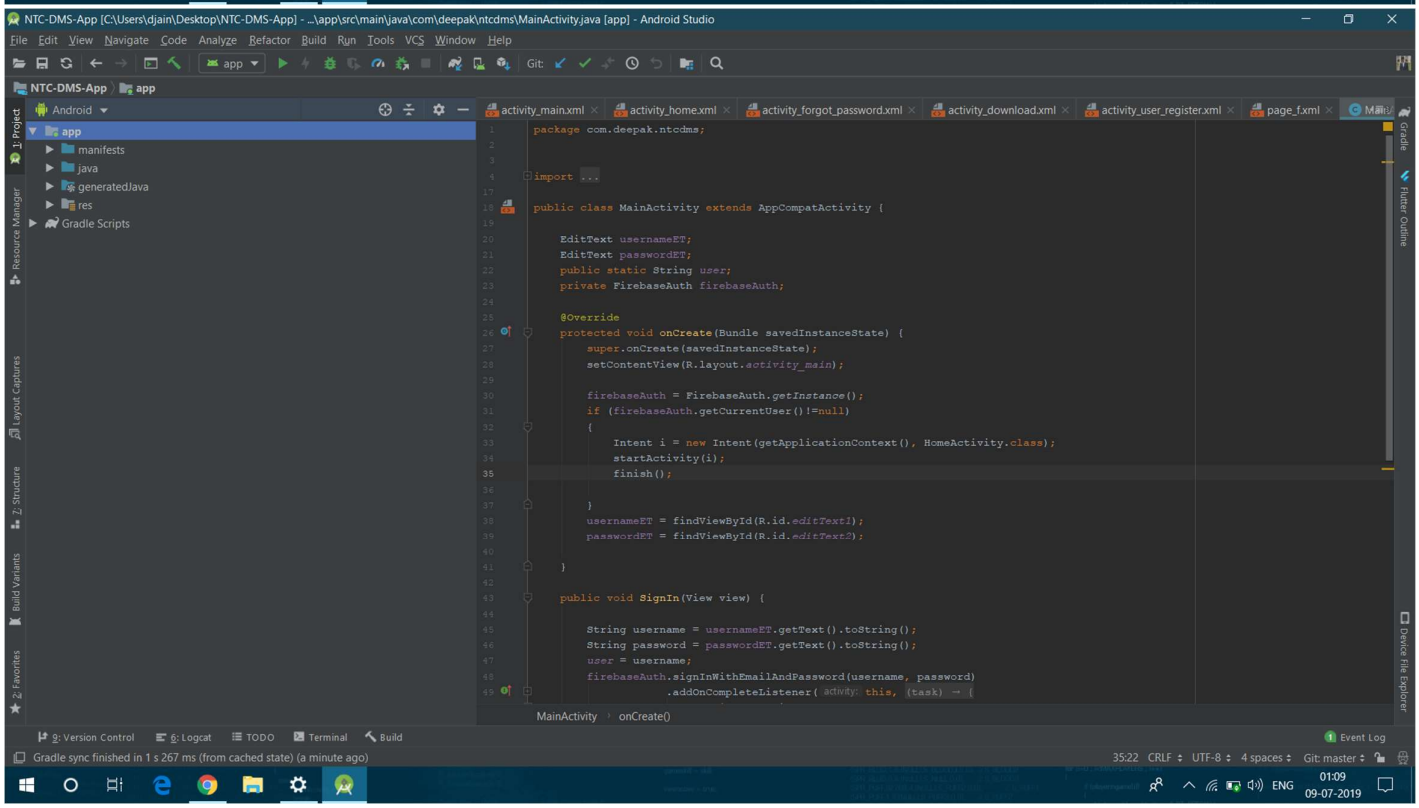
09-07-2019

2. Github


https://github.com/djain454/NTC-DMS-App
djain454 / NTC-DMS-App
Watch 0
Unstar 1
Fork 0
Code
Issues 0
Pull requests 0
Projects 0
Wiki
Security
Insights
Settings
The app is made as a Practice School -1 Project of BITS Plani for the Podar Mills, a Unit of National Textile Corporation Ltd
Edit
Manage topics
18 commits
1 branch
0 releases
1 contributor
Branch: master
New pull request
Create new file
Upload files
Find File
Clone or download
djain454 readme added
Latest commit 1b5d51c in 18 hours
.gradle final commit 7 hours ago
.idea final commit 7 hours ago
app final commit 7 hours ago
gradle/wrapper Login Screen last month
.gitattributes Initial commit last month
NTC-DMS-App.iml Basic Backend Complete last month
README.md readme added now
build.gradle Basic Backend Complete last month
gradle.properties Login Screen last month
gradlew Login Screen last month
gradlew.bat Login Screen last month
ENG
01:07
09-07-2019

3. Android Studio





6. References

1. Firebase Help Docs: https://firebase.google.com/docs/
2. Android Developers Help Doc: https://developer.android.com/
3. Github Guides https://guides.github.com/