Mobile Radio Email Application

NORTHERN ARIZONA UNIVERSITY

School of Informatics, Computing, and Cyber Systems

Operation RM: William Rogers, Nicholas Henderson, Isaac Faulkner, Andrew Milizia

Client: General Dynamics Mission Systems

Team Mentor: Tayabba Shaheen

Project

GENERAL DYNAMICS Mission Systems

Client: An aerospace and defence company that creates life saving systems along with **tactical radio modems**

Method: An Android application that connects to a radio modem and provides an **email system** for communication

Impact: An **easier and quicker** way for the client to communicate with their peers

- **File / camera transmission**
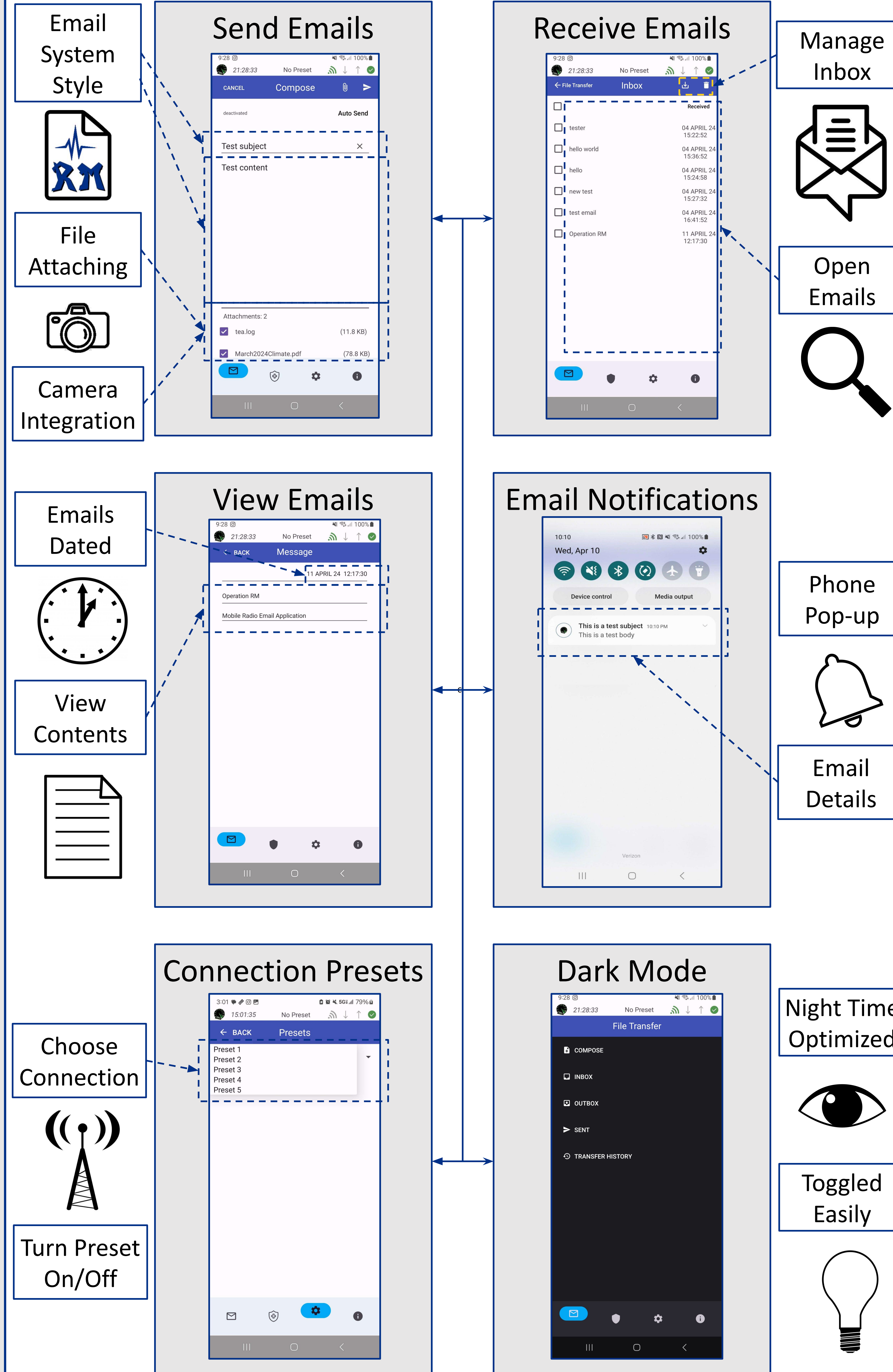- **Radio connection presets**
- **Auto-send functionality**

Overcoming Challenges

- ✓ **Initial Radio Connection**: Assistance from the client and persistence was the solution
- ✓ **C and Java Communication**: The solution to this is using the Java Native Interface (JNI)
- ✓ **Remote File Transfer**: The solution was researching a desirable software library
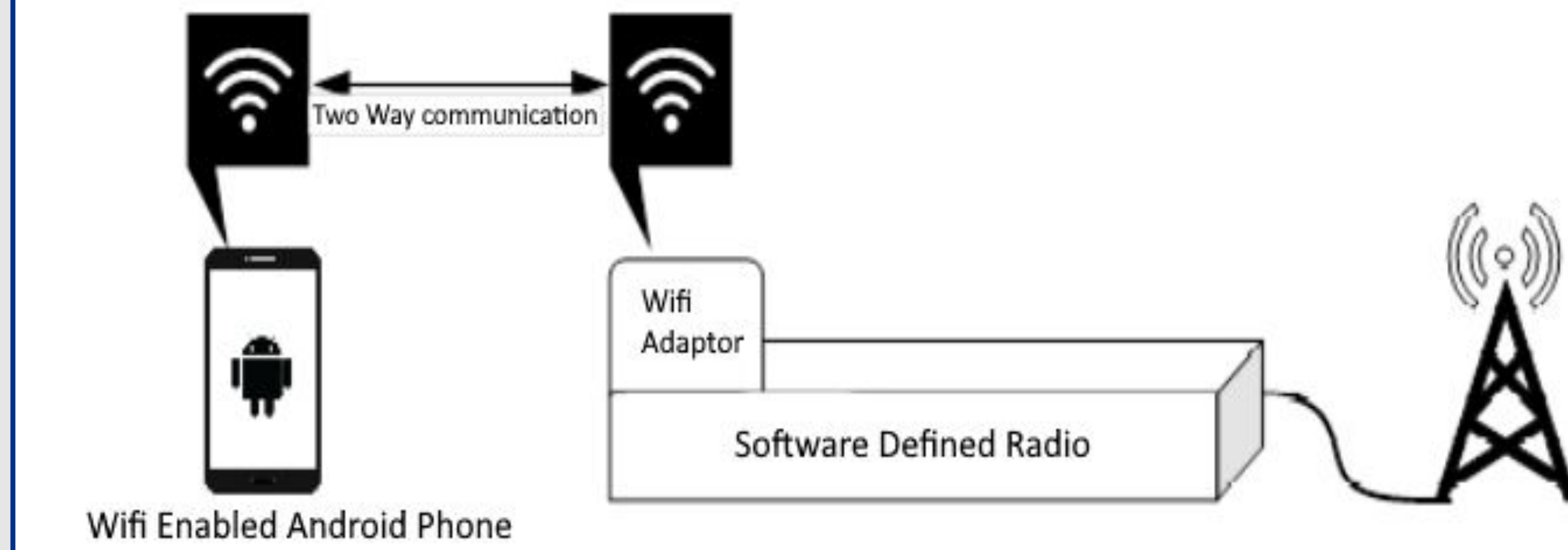
Testing

Testing primarily consists of **usability** testing along with a mix of unit and integration testing. These tests will make sure that the application is **robust** which is an important part for the project.
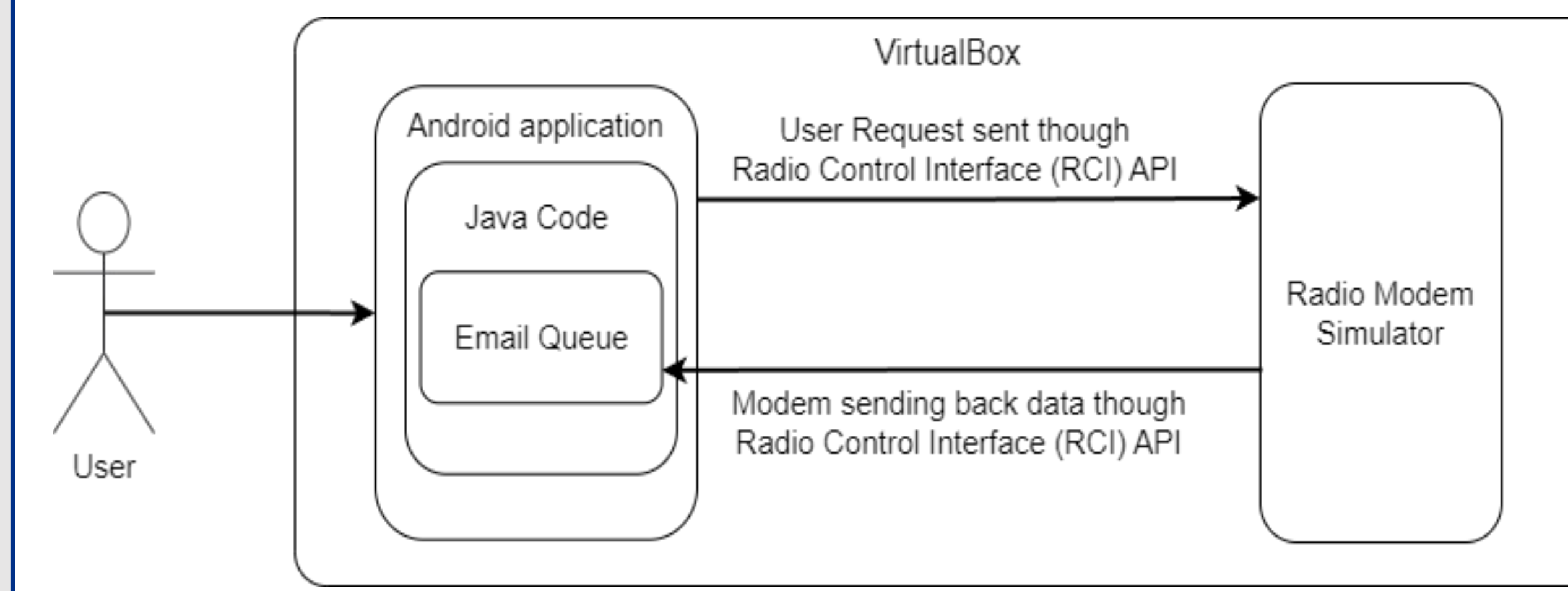
Key Features

Send Emails
Email System Style
File Attaching
Camera Integration

Receive Emails
Manage Inbox
Open Emails

View Emails
Emails Dated
View Contents

Email Notifications
Phone Pop-up
Email Details

Connection Presets
Choose Connection
Turn Preset On/Off

Dark Mode
Night Time Optimized
Toggled Easily

Architecture

System architecture:

Two Way communication — Wifi Enabled Android Phone — Wifi Adaptor — Software Defined Radio

Software architecture:

VirtualBox — Android application — Java Code — Email Queue — User Request sent though Radio Control Interface (RCI) API — Radio Modem Simulator — Modem sending back data though Radio Control Interface (RCI) API — User

Technologies

VirtualBox · android studio · Java

Outcomes

The project successfully **controls** the radio modem so emails can be **sent** and **received**. Integration with Android OS allows the application to demonstrate the usefulness of using a **mobile device** with this type of application.

Team Website: