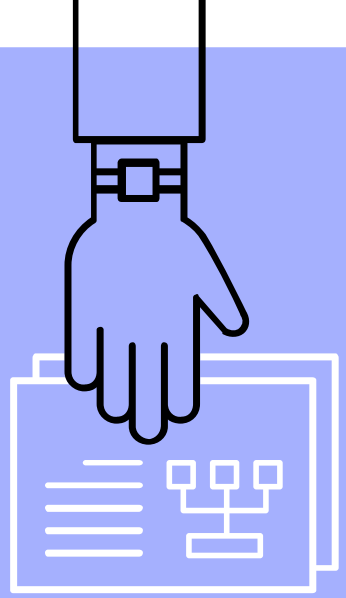
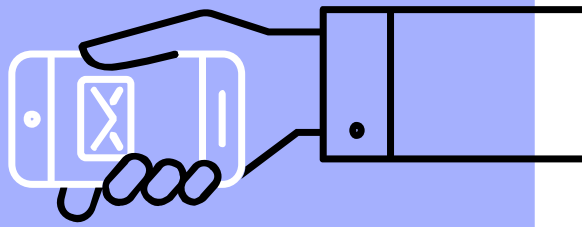
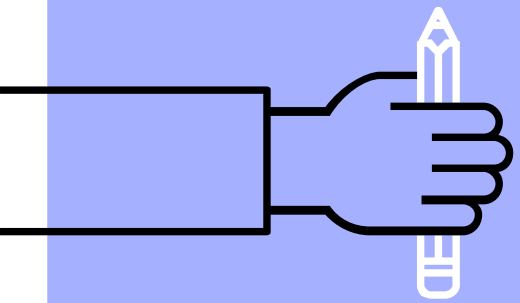
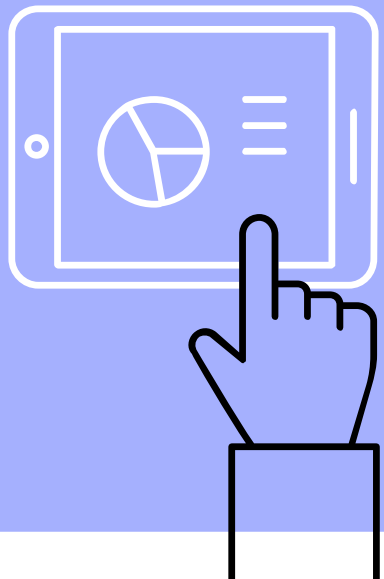
NFC DASHBOARD









Near Field Communication(NFC)

NFC

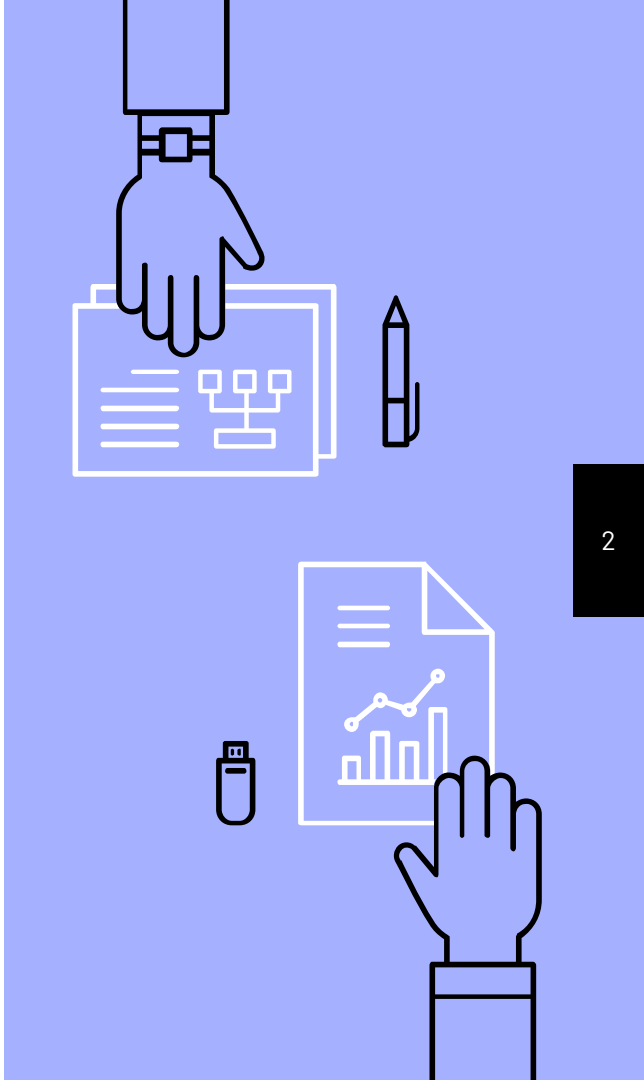
enables short-range wireless communication between compatible devices

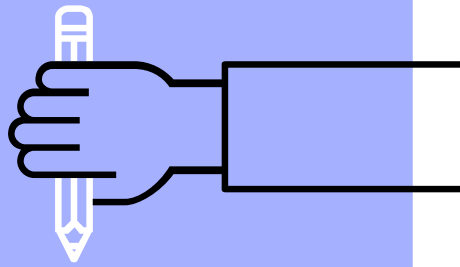
NFC

requires at least one transmitting device, and another to receive the signal

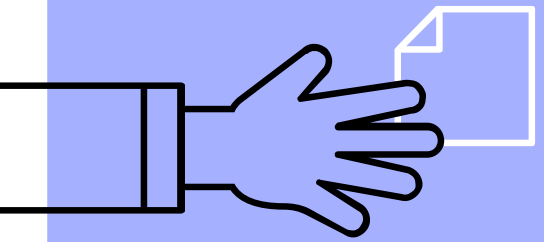
NFC

detects and then enables technology in close proximity to communicate to each other without the need of internet.





TYPES



NFC ACTIVE DEVICE

NFC PASSIVE DEVICE

Active Device

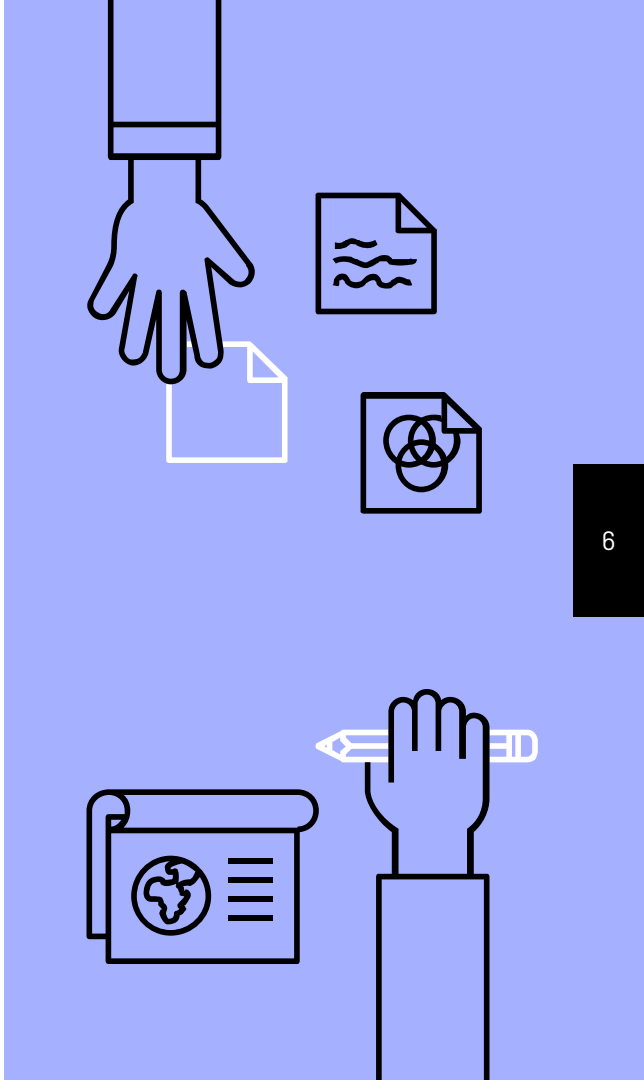
- Active devices can both send and receive data and can communicate with each other as well as with passive devices.
- Smartphones are by far the most common form of active NFC device.
- Public transport card readers and touch payment terminals are also good examples of the technology.

Passive Device

- Passive NFC devices include tags and other small transmitters that can send information to other NFC devices without the need for a power source of their own.
- They don’t process any information sent from other sources and can’t connect to other passive components.
- These often take the form of interactive signs on walls or advertisements.

HOW DOES NFC WORKS?

- NFC works on the principle of sending information over radio waves
- Technology used in NFC is based on older RFID (Radio-frequency identification) ideas, which used electromagnetic induction in order to transmit information
- NFC chip operates as one part of a wireless link. Once it's activated by another chip, small amounts of data between the two devices can be transferred when held a few centimeters from each other.



Uses Of NFC


Access control
Mobile payments
Loyalty programs
In-store marketing
10:48
NFC
STARK
RFID
Location-based services
Targeted marketing
Information exchange
Social networks

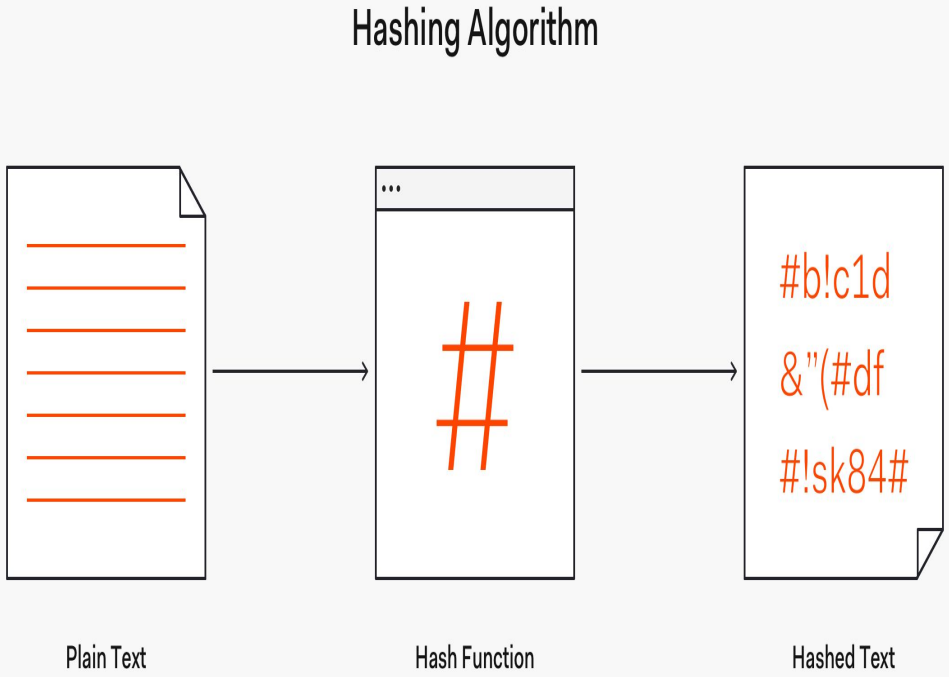
Security Protocols Used

- Hash Function
- AES

Hash Function

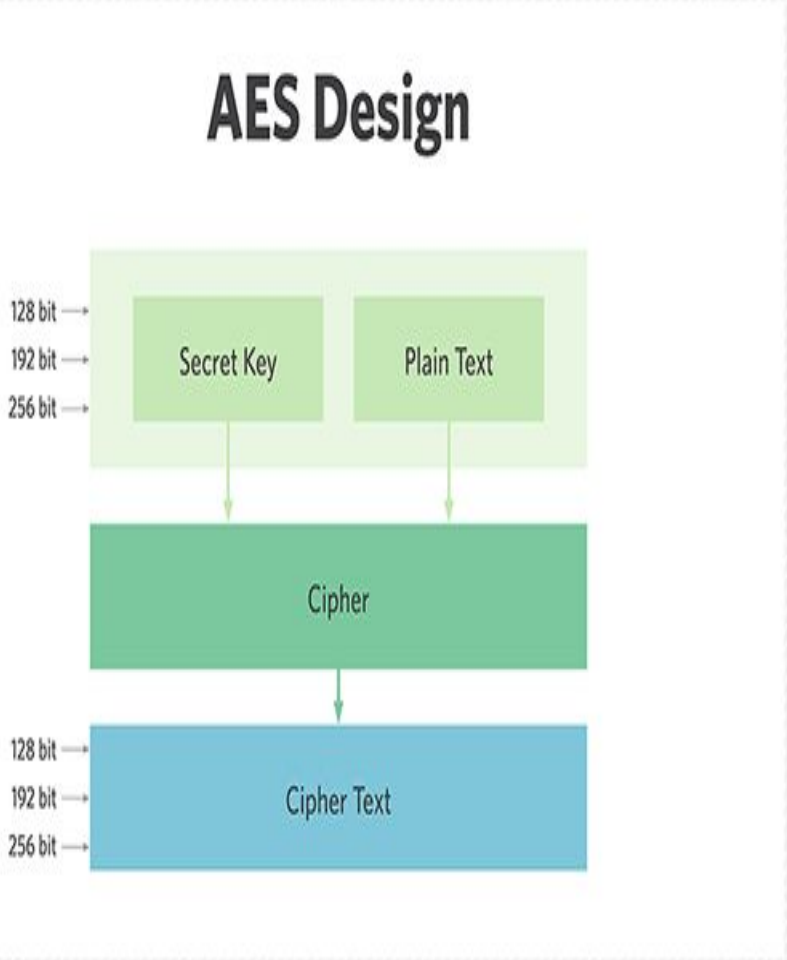
SHA - 256

- SHA-256 stands for Secure Hash Algorithm - 256 bit and is a type of hash function
- SHA-256 is a one-way function that converts a text of any length into a string of 256 bits.
- It is a cryptographically secure hashing function, in that knowing the output tells you very little about the input.



AES

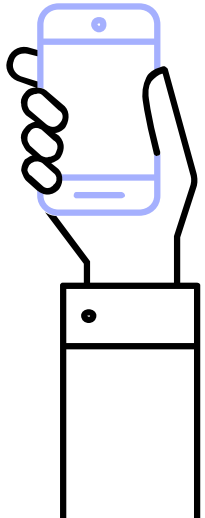
- AES or Advanced Encryption Standards is one of the most widely used methods for encrypting and decrypting sensitive information.
- This encryption method uses a block cipher algorithm to ensure that data can be stored securely.
- AES algorithm is symmetric, the same key is used for both encryption and decryption.

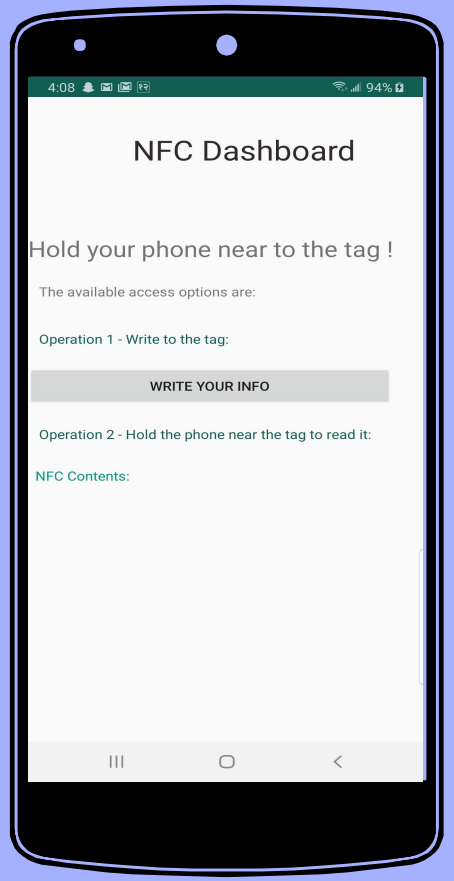


To create this Android application, I used Android studio to develop and test the application.

Functions Of NFC Dashboard

- Detect NFC tags/cards
- Write data to the NFC tags/cards.
- Read data from the NFC tags/cards

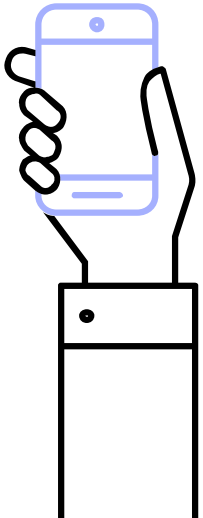


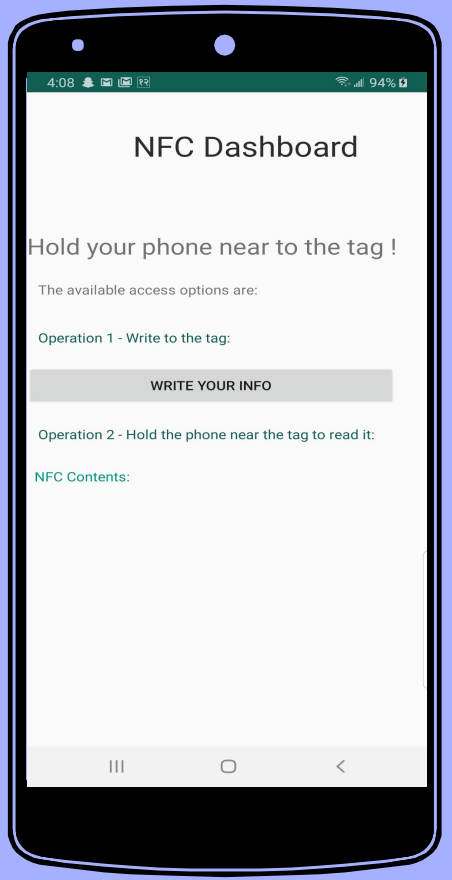


Detect NFC tags/cards

This is the Dashboard of the Application.

- If NFC tag is brought near the device, it displays the information written in the NFC tag.

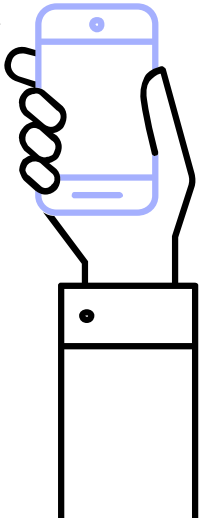


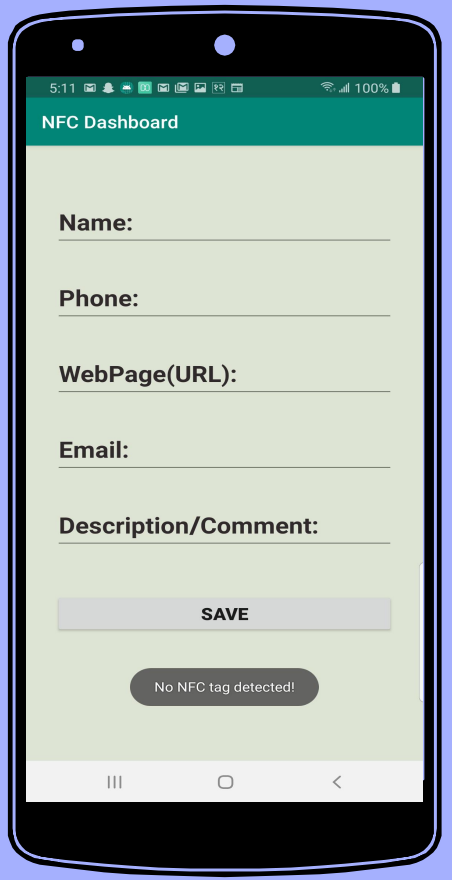


Detect NFC tags/cards

- When “**WRITE YOUR INFO”** button is clicked, this screen is displayed.

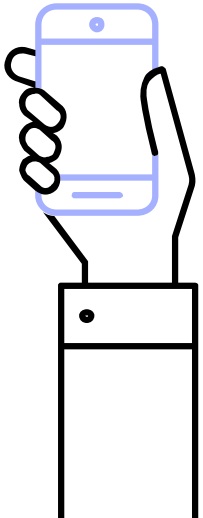
- When we press the SAVE button and there is no NFC tag/card nearby then it pop display **No NFC tag detected!** message.

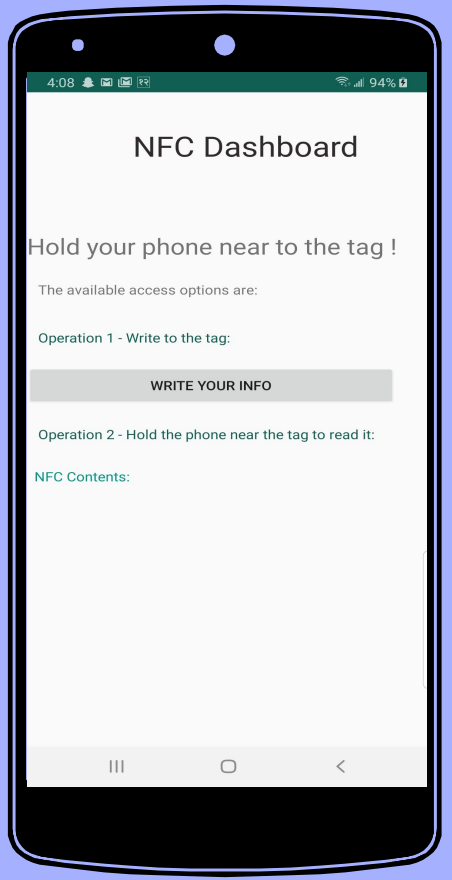




Write data to NFC tags/cards

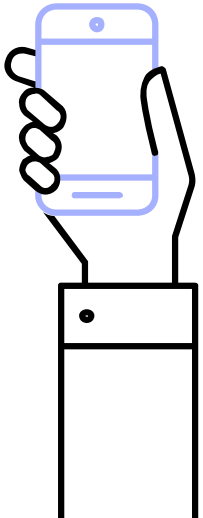
This is the main page(Dashboard) of the application.

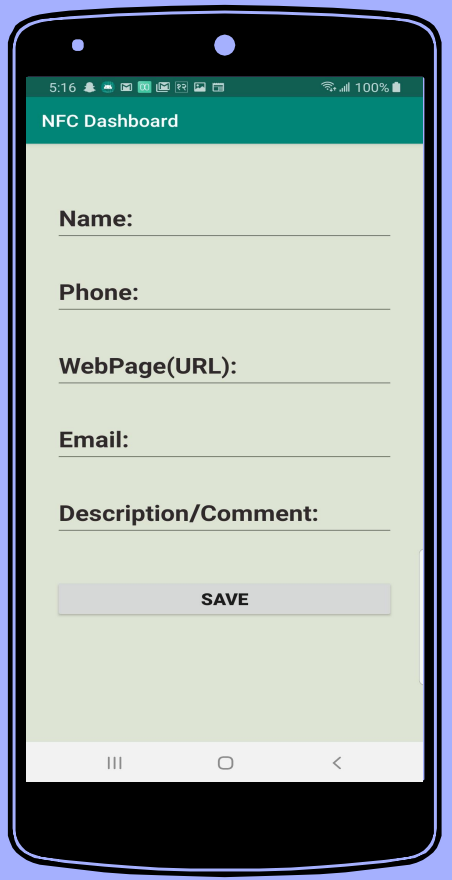




Write data to NFC tags/cards

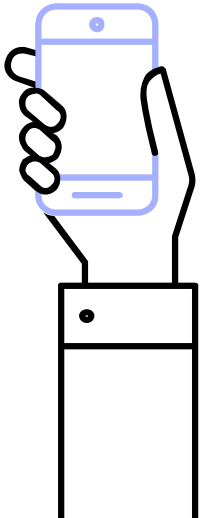
This screen is opened when **“WRITE YOUR INFO”** button is clicked.





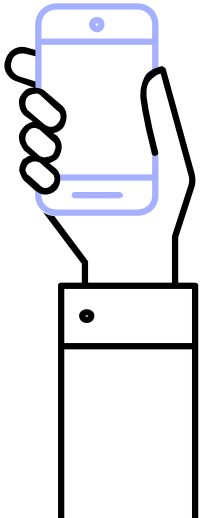
Write data to NFC tags/cards

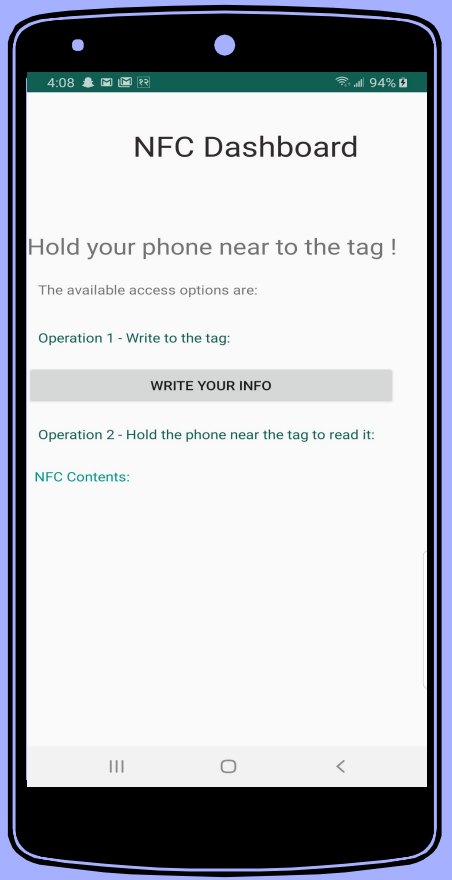
After filling the information, bring the NFC tag near the android device and click the **SAVE** button. If the NFC tag is detected nearby, it saves the information to the tag and "**Text written to the NFC tag successfully!"** message is displayed.



Read data from the NFC tags/cards

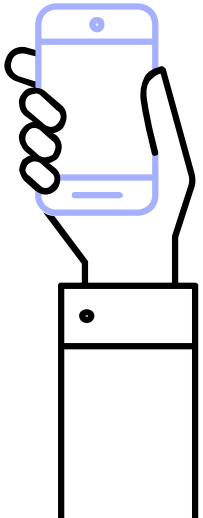
This is the main page(Dashboard) of the application.

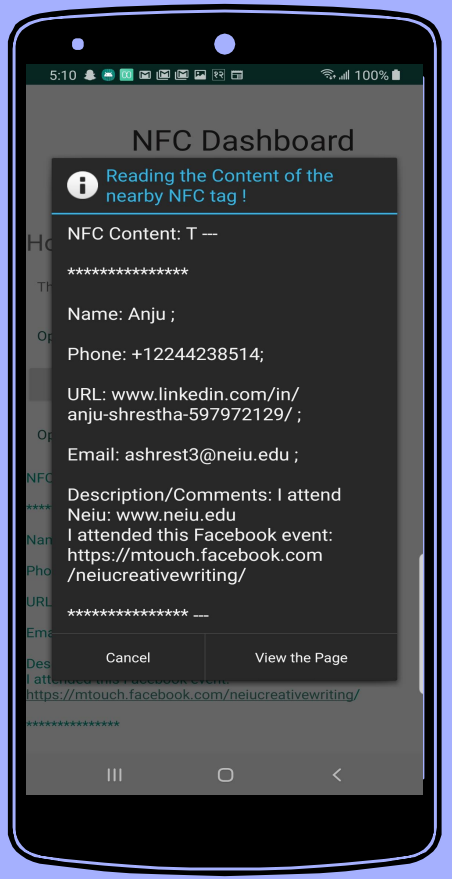




Read data from the NFC tags/cards

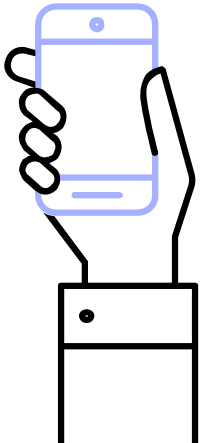
When NFC tag is brought near to the android device, it reads the information written in the NFC tag.

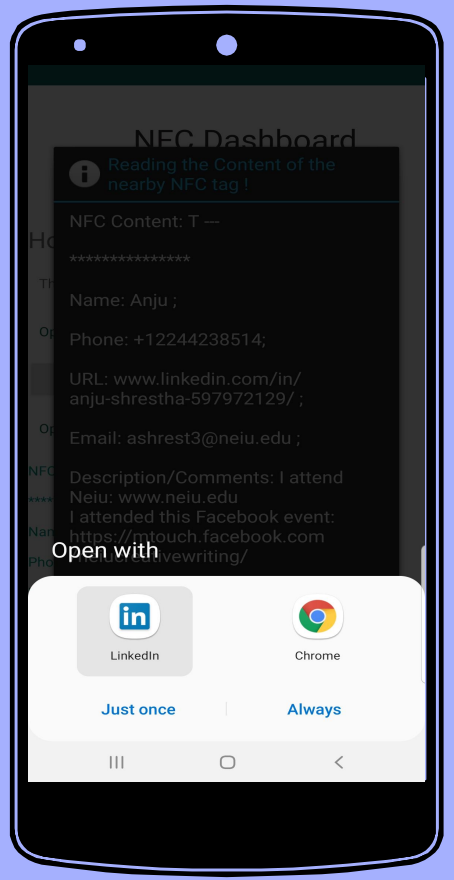




Read data from the NFC tags/cards

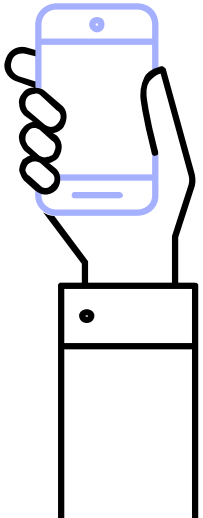
After displaying the dialog box, app looks for the URL link. If it finds the URL, it will automatically redirect to the browser and opens the first link provided.
If Application for the link (like Facebook, LinkedIn,Twitter) is already installed on the cellphone, it asks whether you want to open link through the app or through the browser.





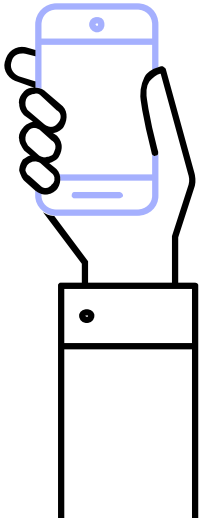
Read data from the NFC tags/cards

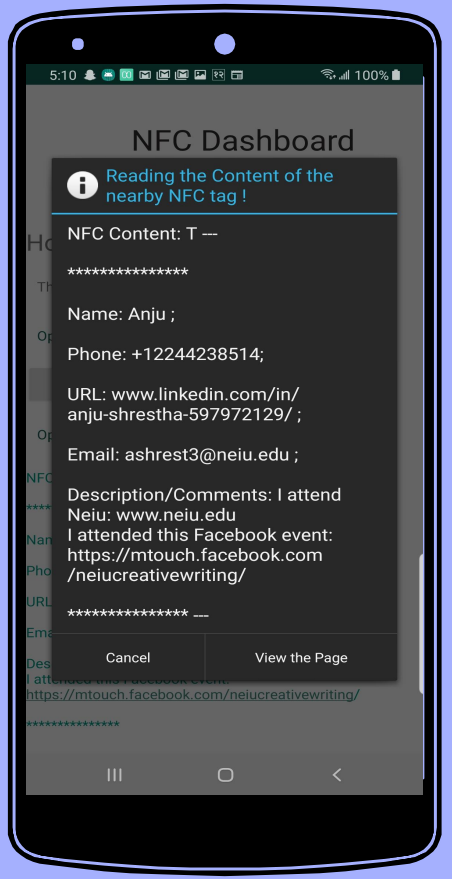
If we choose to open it through application, it opens the application installed to the phone and open the page provided on the URL, else it opens through the browser.



Read data from the NFC tags/cards

Then when we come back we can see the dialog box with the information.

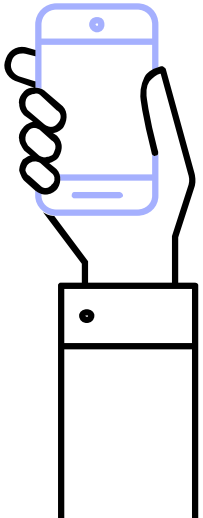


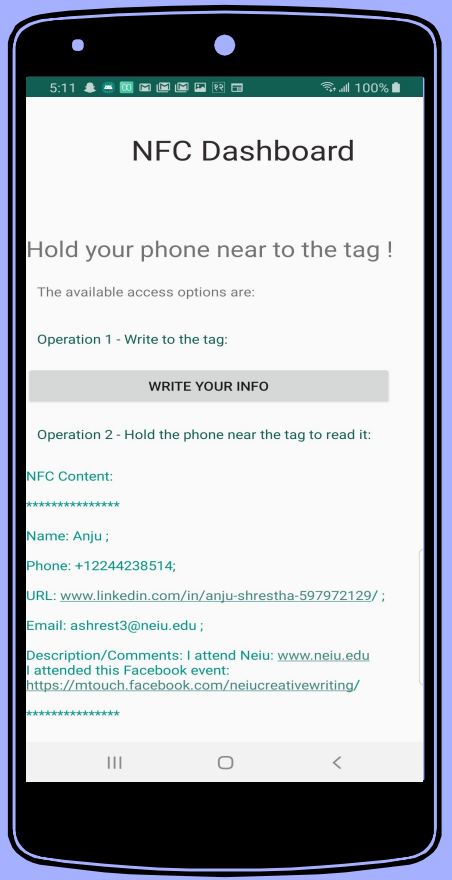


Read data from the NFC tags/cards

When we press cancel, we can see NFC contents written in the tag.

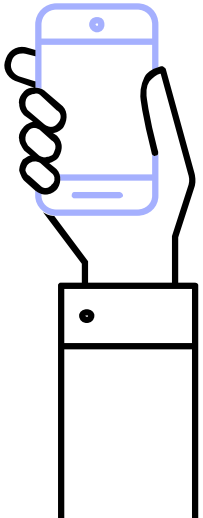
If there are more links written in the NFC tag, then those links are underlined and are viewed as clickable URL links.

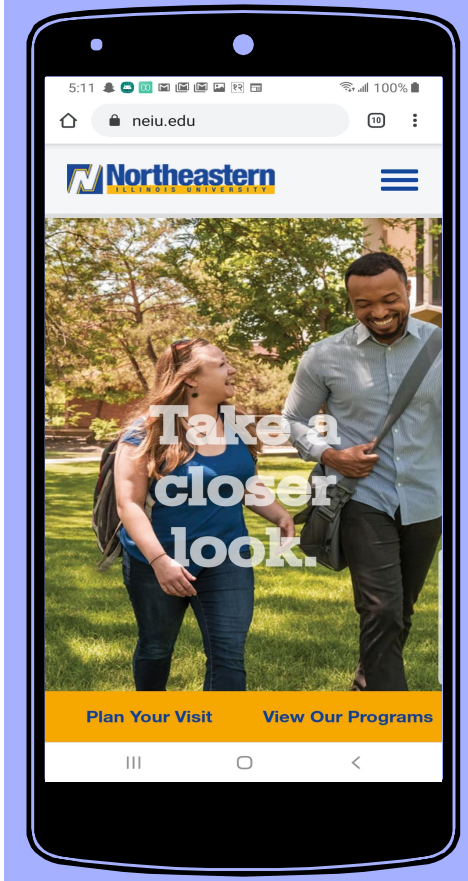




Read data from the NFC tags/cards

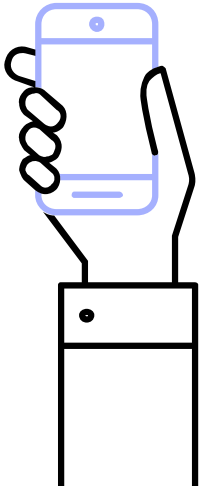
All the links written in the NFC tag can be clicked. It will redirect to the respective browser.

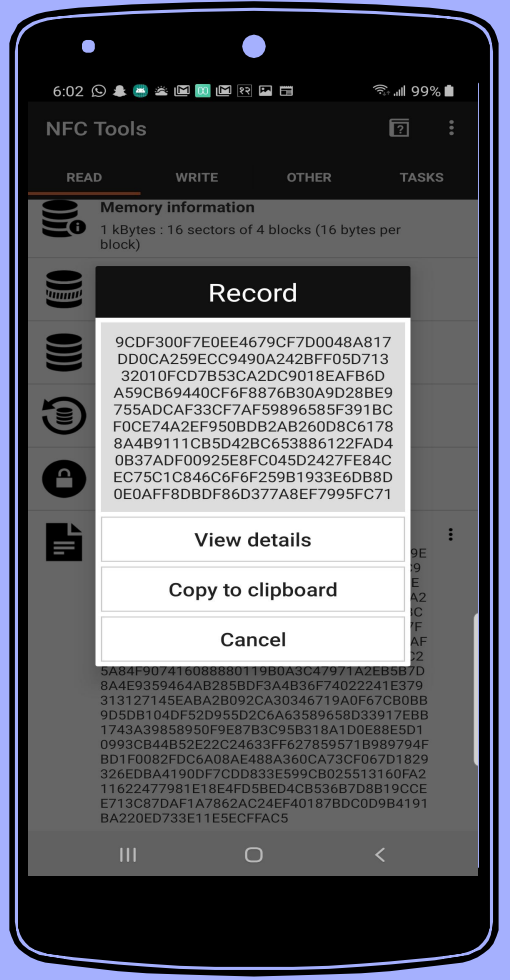




Security

- All these information is secured and no one can view it unless the master key is provided.
- If same NFC tag with all the information is read from different applications, then encrypted message is displayed.





THANK YOU!

Any questions?

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https://github.com/anzustha2

CREDITS

Special thanks to Professor Ahmed Khaled who helped me complete this project.

Thank You

Professor Francisco Iacobelli

Professor Mirza Baig