

Blog Post

MEDI ID

Team Name

Medi ID Group

Timeline

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Students

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Sponsor

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Abstract

Medi ID is a bracelet with an NFC tag built into the bracelet that stores the user's medical information. This is useful for first responders that give aid to a person who is physically unable to document their medical information. A verified EMT or first responder can scan the bracelet and use the Medi ID progressive web application to view that person's medical background and insurance information. Access to this information can be crucial and potentially life-saving for a person who is in an emergency situation.

Background

Current models of the Medical ID bracelet use a QR code to scan and open a webpage with the user's information on it. The problem with the QR code method of retrieving the user-stored data is that the QR code on current models is facing the user's wrist and the user's sweat over time fades the QR code out, causing the user to re-order the bracelet, costing the user more in the long term. Furthermore, the bracelet does not have enough

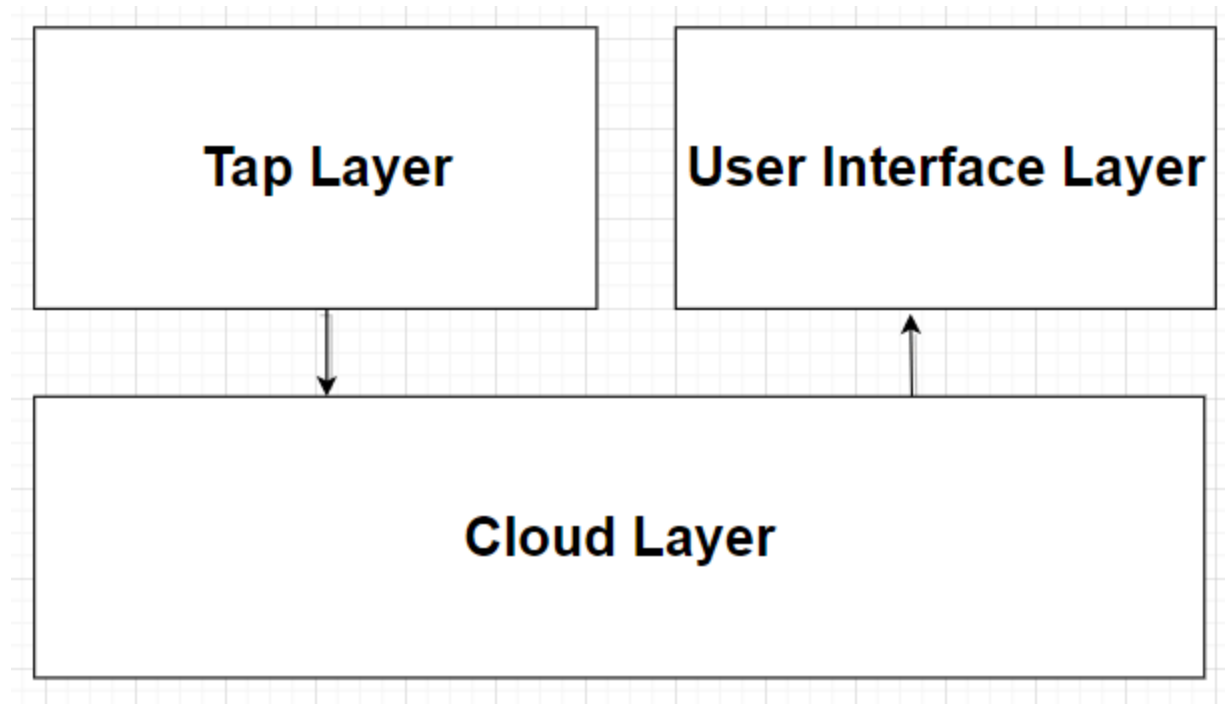
security. NFC does not fade out and can be read using a phone just like a QR code, this would not change the technology needed to read the information and would enhance the technology currently used. Furthermore, we will add a layer of verification where the user has to log in before exposing the user's information to ensure that only the allowed users are accessing the medical information, which mitigates the problem of insufficient security.

Project Requirements

- A durable, long-lasting bracelet must be developed to hold an NFC chip
- A verified user can scan the bracelet
- Users can register an account to the progressive web application
- Users can log in to their account in the progressive web application
- Users can add/edit/delete their own medical information
- The progressive web application must be accessible to patients and verified users at all times
- A manual must be created to demonstrate how the bracelet works and how to set up a patient profile on the progressive web application
- NFC chip must be stored inside the bracelet, with a unique key that belongs only to one user
- A database must be created to support the data of all users that access the progressive web application
- Password encryption must be implemented to protect user accounts and maintain security

System Overview

The medical identification diagram has three main layers the first layer is the tap function, once a phone taps the NFC chip in the medical identification bracelet it will redirect the user to our website and ask them for their credentials. This directs the user to the next layer which interacts with the cloud or database, this is where all the user's information will be stored. This takes us to the final layer which is the user interface layer, this is where all the user's data will be displayed to either the user or the medical professional.



Architectural Layer Diagram

Results

Our finished product of the Medi ID Bracelet matched the general requirements specified by the sponsor and intended users. The hardware matches the requirements declared by our group, and the software development matched the overall system layout that we designed in our ADS and DDS layouts.

During this project, we learned the beneficial process of designing products using Agile methodology, which includes working through sprints and documenting the design process. This improves customer interaction, flexibility, productivity, constant development rates, and overall risk reduction.

[Demo Video](#)



Medi ID Bracelet Prototype

Future Work

Future Requirements include Introducing Optical Character Recognition to the patient info portal to add images of medical documents. Another requirement would be designing the user manual for the bracelet and setting up an automatic registration system for new users. Product packaging and secure sign-on methods (Face ID, Touch ID) have also been considered as future requirements.

Project Files

[Project Charter](#)

[System Requirements Specification](#)

[Architectural Design Specification](#)

[Detailed Design Specification](#)

[Poster](#)

References

1. Bai RMF Resource Center. <https://rmf.org/wp-content/uploads/2017/10/CNSSI-4009.pdf>.
2. "IEC/IEEE 82079-1:2019." ISO, 20 May 2019, <https://www.iso.org/standard/71620.html>.
3. "ISO 18530:2021." ISO, 27 Jan. 2021, <https://www.iso.org/standard/77333.html>.
4. "ISO 20302:2022." ISO, 17 Jan. 2022, <https://www.iso.org/standard/79931.html>.
5. Jethanandani, Mahesh, et al. "RFC 9314." RFC 9314: YANG Data Model for Bidirectional Forwarding Detection (BFD), <https://www.rfc-editor.org/rfc/rfc9314.html>.
6. "NIST Special Publication 800-63B." Pages.nist.gov, <https://pages.nist.gov/800-63-3/sp800-63b.html>.