Basic description

- Use case: to measure belly fat level/ keep track

- Targeted group: People who wish to regularly monitor their belly fat level.

    (pro-users can register under one of our registered doctors to provide you medical advice)

- What is included: BFR device, BFR app (For the patients-users), BFR app (For the doctors/ fitness trainers)
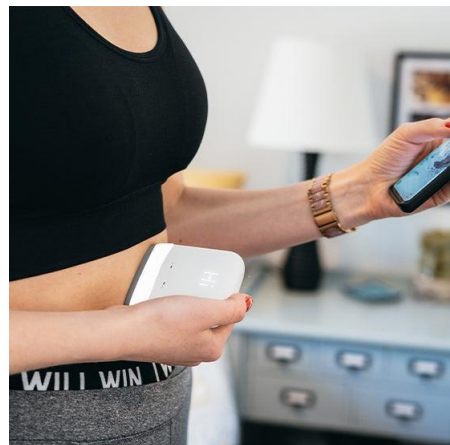
- About the device:

    compact device

    size: 80*60*30

    Uses NIR technology

    Long-lasting battery power (more details in hardware specification)

- About the App(for the patients):

    After taking measurements from the device everything else is happening from the app. You can monitor your,

    1) Belly fat level
    2) Daily / weekly/ monthly progress
    3) Fat level forecast (based on your history) (Pro version)
    4) Doctor's medical assistance (Pro version)
    5) 24/7 Technical support
    6) Updatable

- About the App (for the doctors/ fitness trainers):

  The registered doctors can log in to the BFR doctor's profile and can review their patient's history and reports sent by the BFT apps. They can provide medical assistance if required.
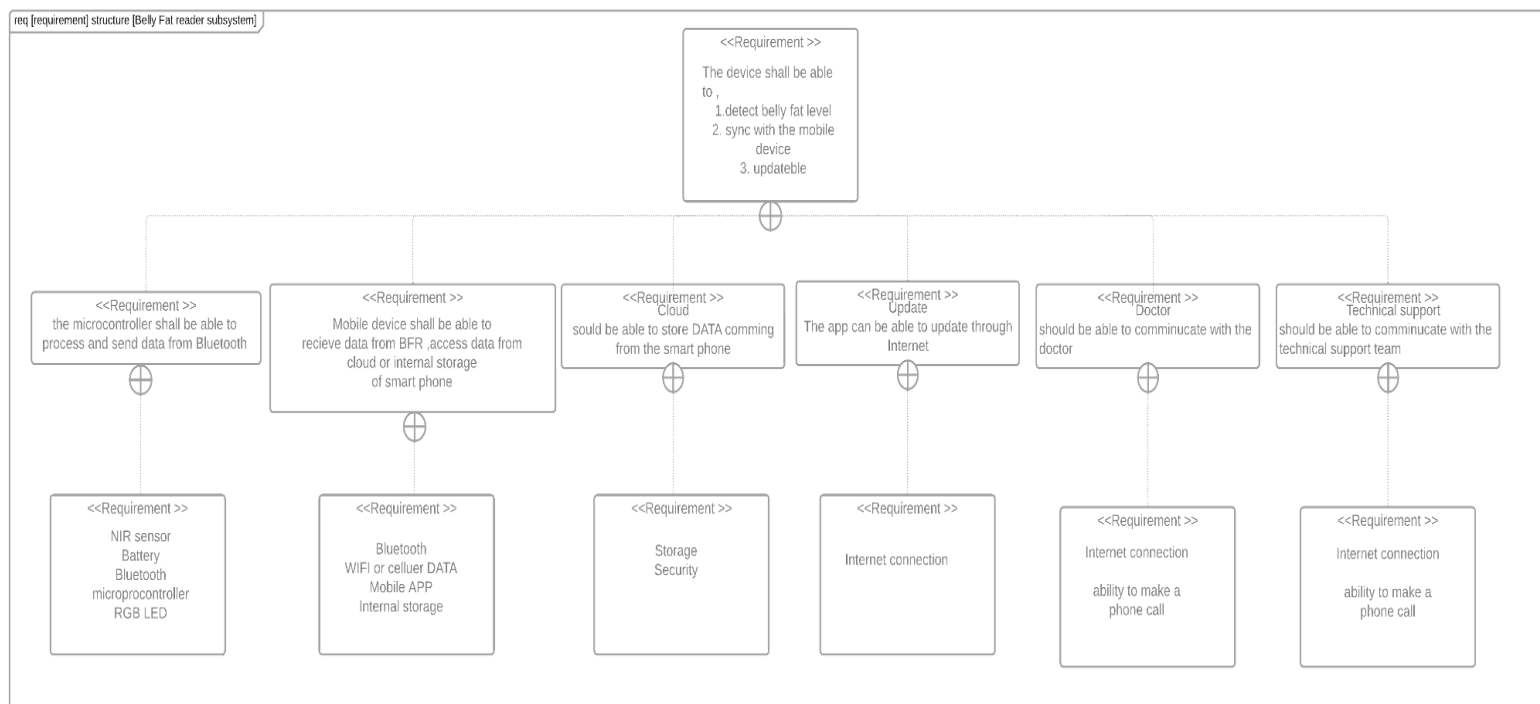
- Basic Business module
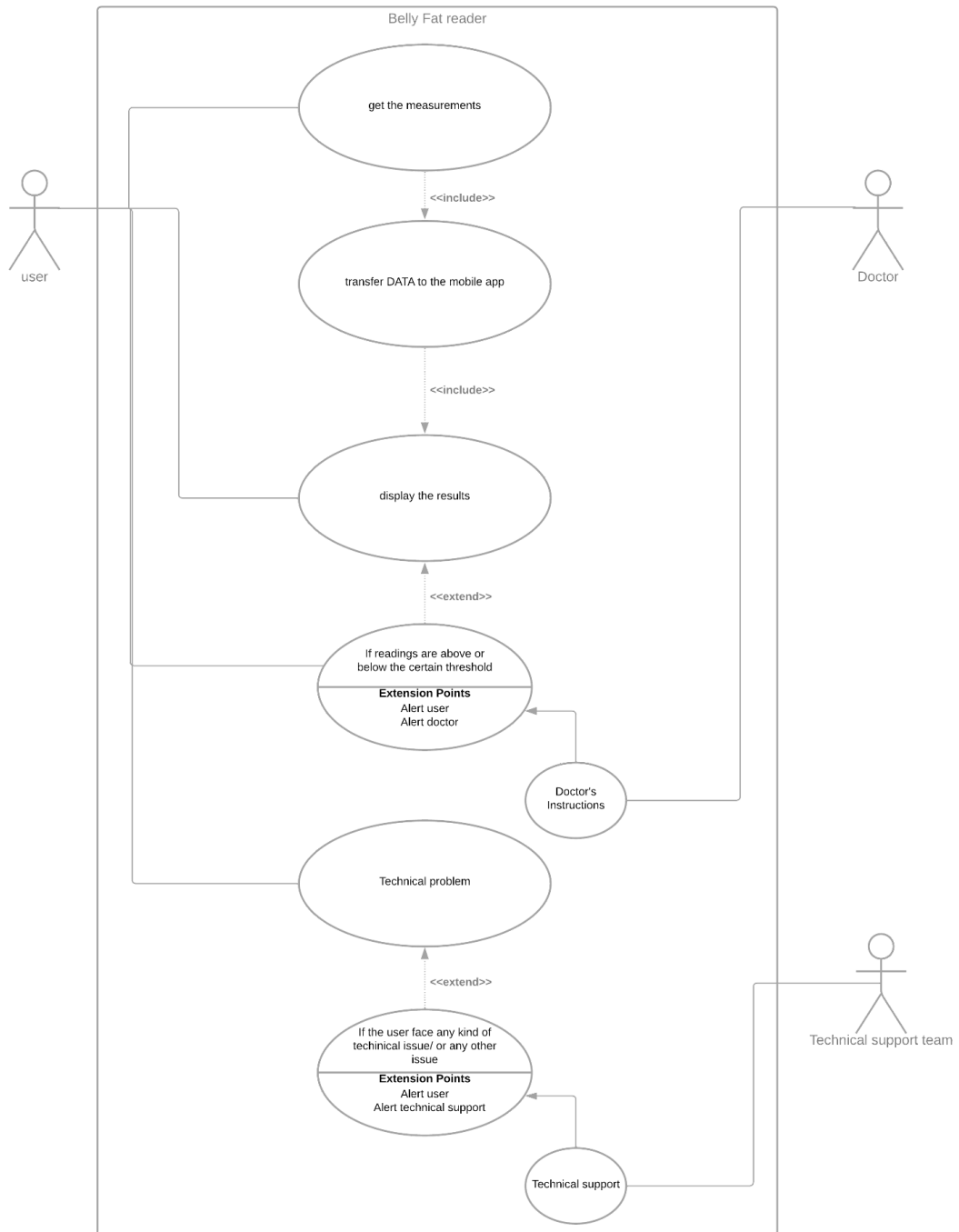
  The device itself cost 100€

  1. Basic version (app): comes free with the device
  2. Pro version (app): users can buy in order to gain BFT readers' full potential.
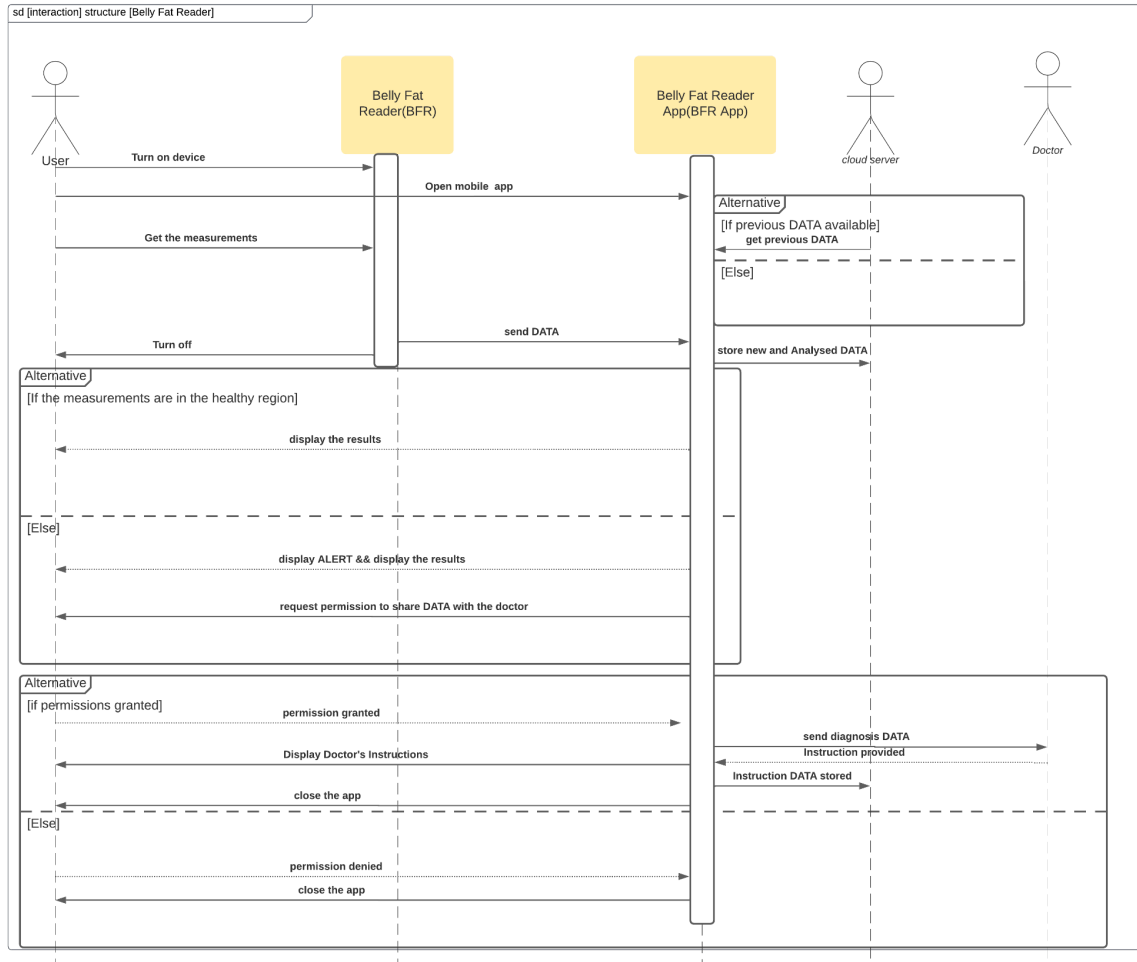
     A yearly subscription of 50€: Doctors' medical assistance, belly fat forecast, free device repair, etc...

  3. Registered doctors/ fitness trainers can earn money through medical assistance to the patients.

Models

req [requirement] structure [Belly Fat reader subsystem]

<<Requirement >>
The device shall be able to ,
1.detect belly fat level
2. sync with the mobile device
3. updateble

<<Requirement >>
the microcontroller shall be able to process and send data from Bluetooth

<<Requirement >>
Mobile device shall be able to recieve data from BFR ,access data from cloud or internal storage of smart phone

<<Requirement >>
Cloud
sould be able to store DATA comming from the smart phone

<<Requirement >>
Update
The app can be able to update through Internet

<<Requirement >>
Doctor
should be able to comminucate with the doctor

<<Requirement >>
Technical support
should be able to comminucate with the technical support team

<<Requirement >>
NIR sensor
Battery
Bluetooth
microprocontroller
RGB LED

<<Requirement >>
Bluetooth
WIFI or celluer DATA
Mobile APP
Internal storage

<<Requirement >>
Storage
Security

<<Requirement >>
Internet connection

<<Requirement >>
Internet connection
ability to make a phone call

<<Requirement >>
Internet connection
ability to make a phone call

uc [model] structure [Belly Fat Reader]

Belly Fat reader

get the measurements

<<include>>

transfer DATA to the mobile app

<<include>>

display the results

<<extend>>

If readings are above or below the certain threshold

Extension Points
Alert user
Alert doctor

Doctor's Instructions

Technical problem

<<extend>>

If the user face any kind of techinical issue/ or any other issue

Extension Points
Alert user
Alert technical support

Technical support

user

Doctor

Technical support team

sd [interaction] structure [Belly Fat Reader]

User

Belly Fat Reader(BFR)

Belly Fat Reader App(BFR App)

cloud server

Doctor

Turn on device

Open mobile app

Get the measurements

Alternative

[If previous DATA available]
get previous DATA

[Else]

send DATA

store new and Analysed DATA

Turn off

Alternative

[If the measurements are in the healthy region]

display the results

[Else]

display ALERT && display the results

request permission to share DATA with the doctor

Alternative

[if permissions granted]
permission granted

send diagnosis DATA
Instruction provided

Display Doctor's Instructions

Instruction DATA stored

close the app

[Else]

permission denied

close the app

Hardware specification

RGB LED: Only one RGB LED is enough to indicate Turning on, Turning off, pairing with a smartphone, taking the measurements, and indicating if the battery is low when installing a software update functions.


Blue (blinking)	(device turned on), entered pairing mode
Blue(steady)	Connected to the smartphone via Bluetooth (normal state)
Green(blinking), for 3s	Measurement taking, will go back to the steady blue state. That means the measurement has been taken, synced with the app and went back to the `normal state'
Red (blinking)	Battery low
Red (steady)	Device is charging
Green (steady)	Fully charged
yellow(blinking)	Device is updating

Push-button: Push-button will be needed to turn on/off the device, to take the measurements

ESP32 microcontroller: The reason to use this specific microcontroller is it is so cheap, it has a built-in Bluetooth Modular
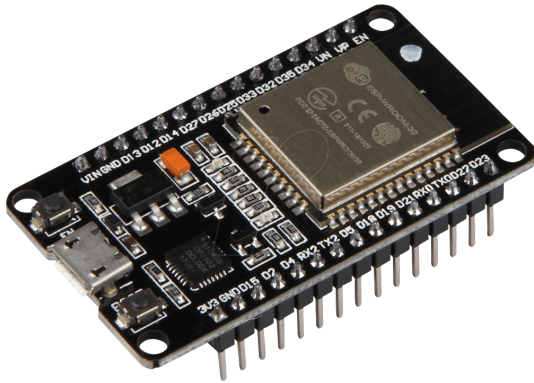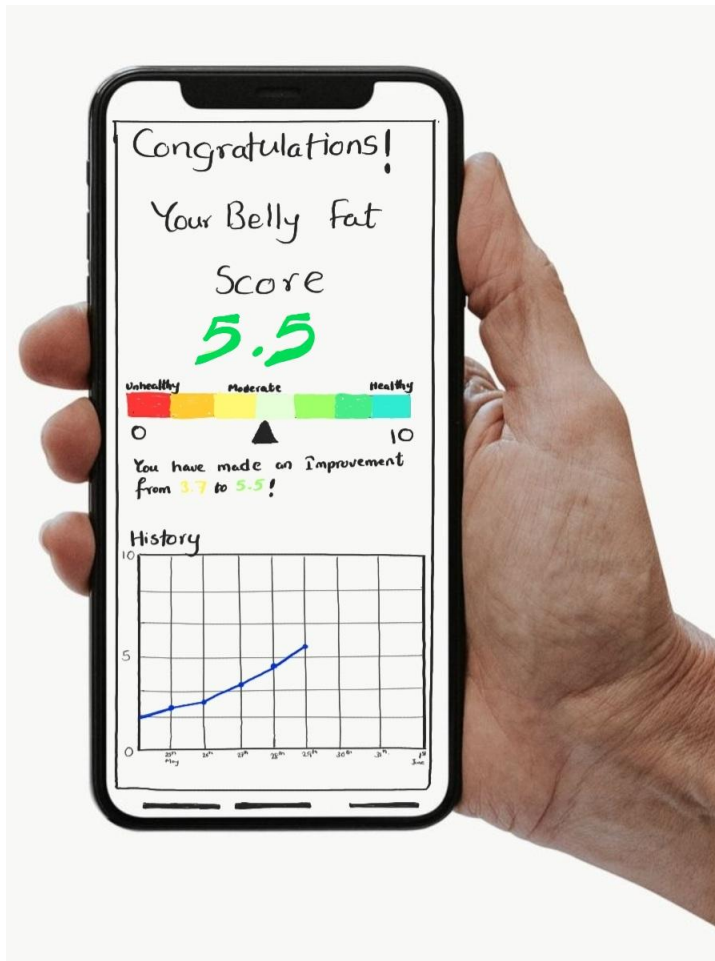

NIR Sensor (Qwiic AS726X): Low cost, uses I²C protocol, Low gate count, only need two pins to implement

Battery: LiPo Battery: No need for a voltage regulator, micro USB port to charge the battery
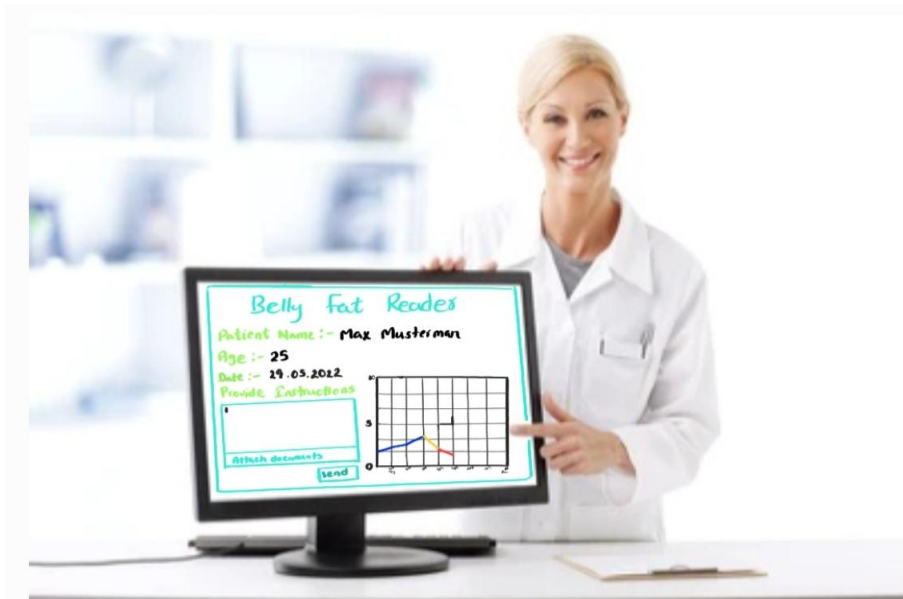

User interface
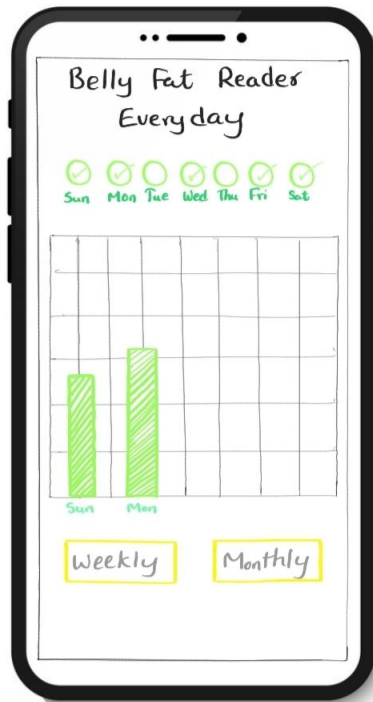

You can see this UI after taking your measurement.

If The user's belly fat level is high.

The user can contact his/her doctor

Weekly/monthly Report

Belly Fat Reader
Everyday

| ⊘ | ⊘ | ⊘ | ⊘ | ⊘ | ⊘ | ⊘ |
| Sun | Mon | Tue | Wed | Thu | Fri | Sat |

Sun   Mon

Weekly   Monthly

Update Your device

⊘ device Connected.

75%

Device is updating