

MIKS GARJĀNS

# PORTFOLIO

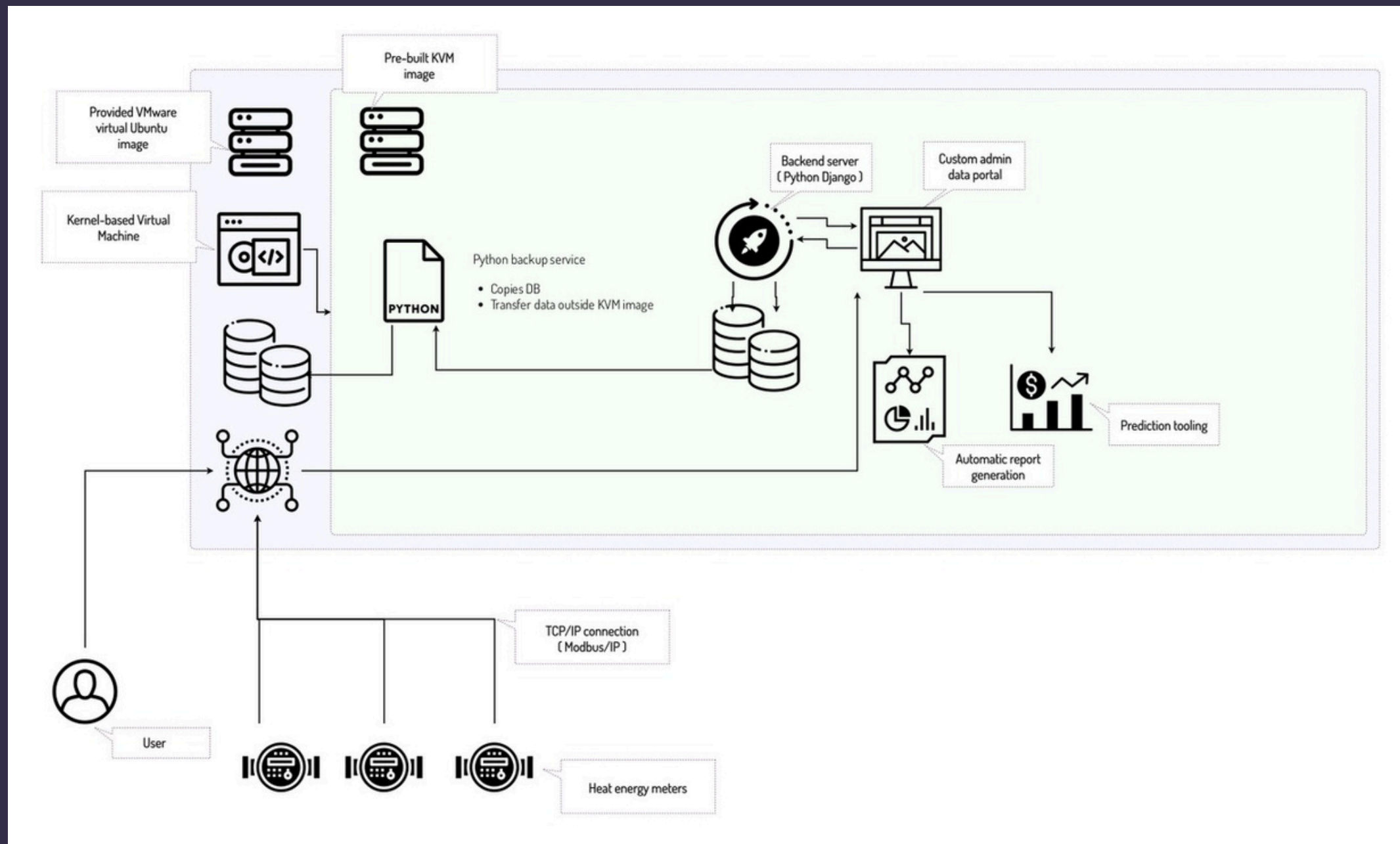
Python, Django, Docker, Hardware design

# AGENDA

- DJANGO WEB APPLICATIONS
- TELEMETRY DATA INFRASTRUCTURE
- HARDWARE DESIGN
  - LINUX SINGLE BOARD COMPUTERS
  - IOT ESPRESSIF SYSTEMS ESP32
- TOOL SET

# WEB DEVELOPMENT

Energy monitoring system

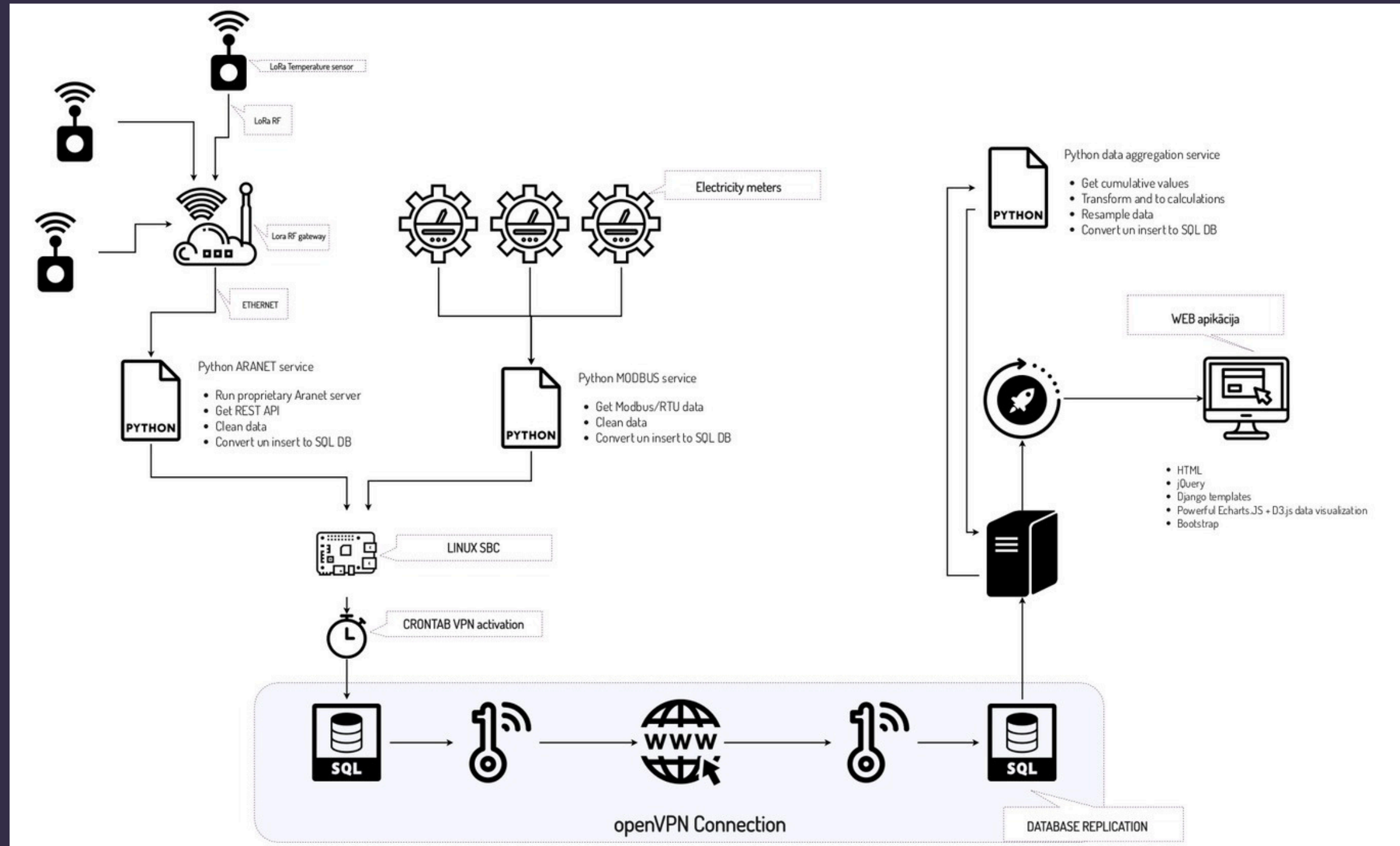


- **BUSINESS NEGOTIATION**
- **SYSTEM ARCHITECTURE**
  - SYSTEM DEPLOYMENT
  - REDUNDANCY PLAN
    - KVM VIRTUALIZATION IMPLEMENTATION
  - REMOTE CHECK-UP DESIGN
  - DATA AGGREGATION SERVICE DESIGN
- **DJANGO BACK-END DEVELOPMENT**
  - REPORT GENERATION
  - APP LEVEL DATA AGGREGATION
- **PROJECT COORDINATION**
- **UX/UI DESIGN**
- **LOW FIDELITY UI SKETCHES**
- **FRONT-END TASK DELEGATION**

Miks  
Garjāns

# WEB DEVELOPMENT

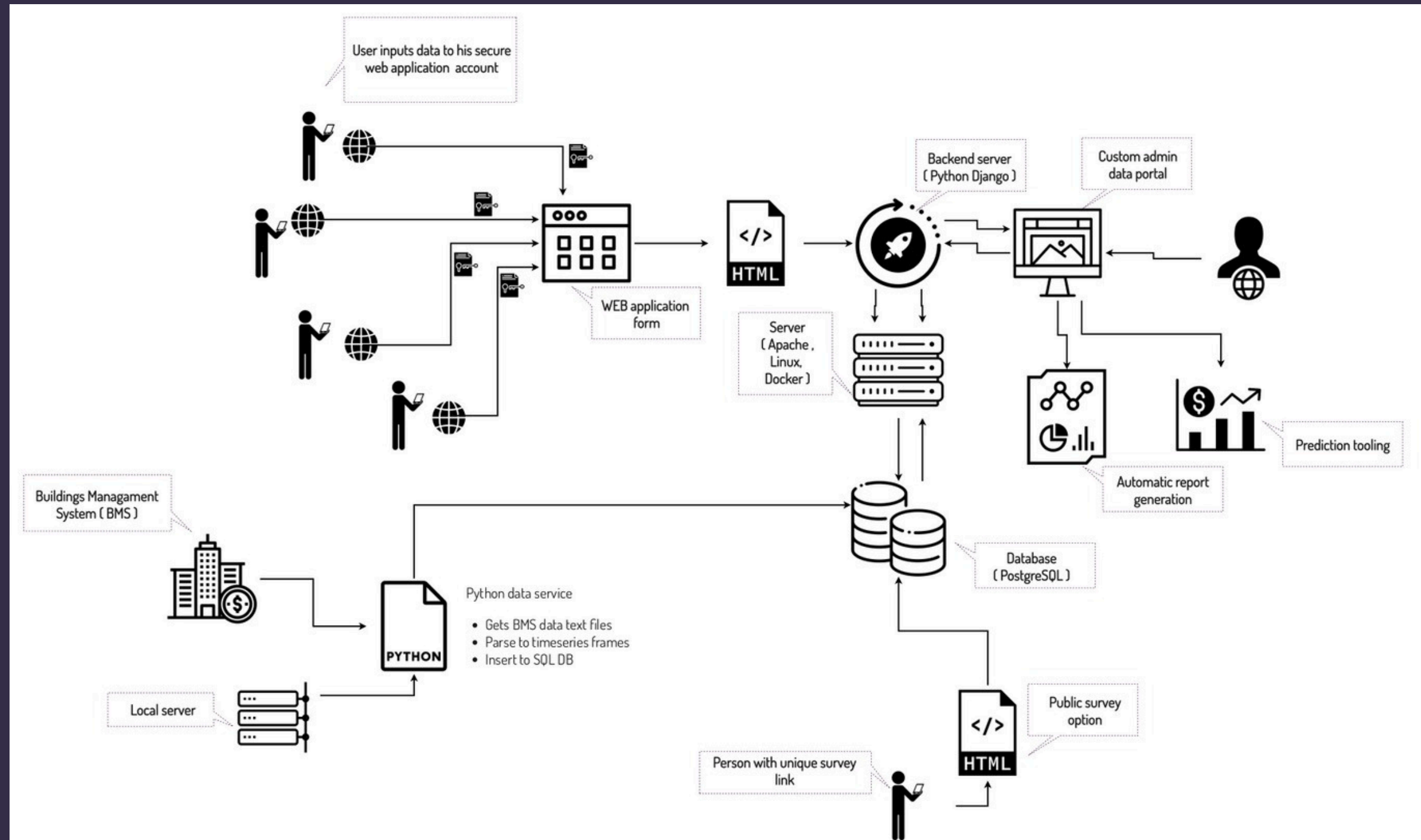
Centralized energy monitoring system for 5 education facilities



- **BUSINESS NEGOTIATION**
- **SYSTEM ARCHITECTURE**
  - **OPENVPN SERVER CONFIGURATION**
- **DATABASE REPLICATION**
- **SYSTEM REDUNDANCY DESIGN**
- **DJANGO BACK-END DEVELOPMENT**
- **PROJECT COORDINATION**
- **UX/UI DESIGN**
- **LOW FIDELITY UI SKETCHES**
- **FRONT-END TASK DELEGATION**
- **DATA CONCENTRATOR HARDWARE DESIGN**
- **RASPBERRY PI BASED SOLUTION**
- **ARANET API INTEGRATION**
- **METBOX.COM API INTEGRATION**
- **RS485 METER PROTOCOL INTEGRATION**
  - **SO IMPULSE RECEIVER BOARD DESING**

# WEB DEVELOPMENT

Centralized data collection for 34 facilities

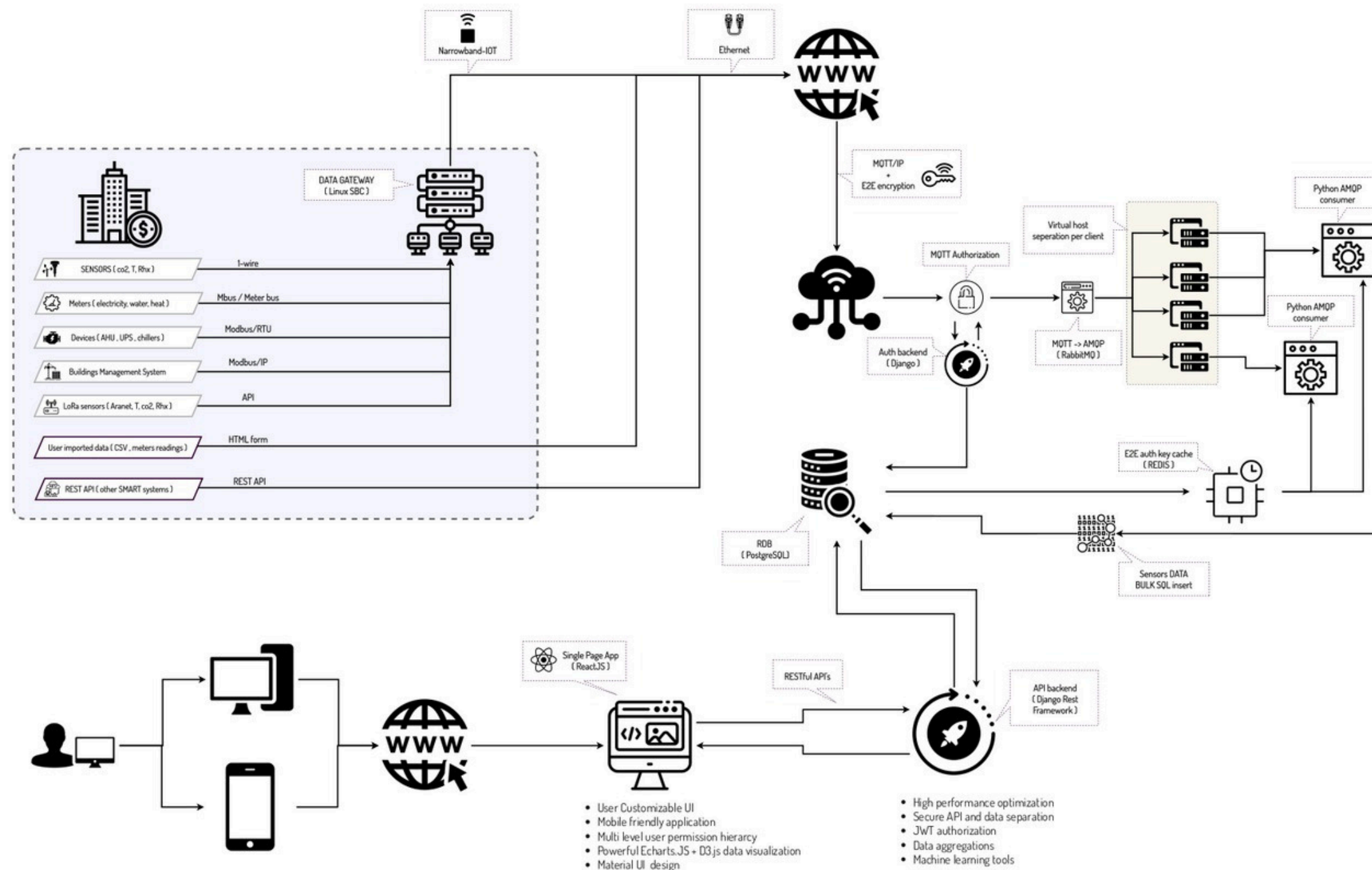


- **BUSINESS NEGOTIATION**
- **SYSTEM ARCHITECTURE**
  - EXISTING BMS SYSTEMS INTEGRATION TO THE WEB APP
- **DJANGO BACK-END DEVELOPMENT**
  - MULTIPLE USER VIEW DESING
  - DATA AGGREGATION
  - REPORT SYSTEM
- **PROJECT COORDINATION**
- **UX/UI DESIGN ASSISTANCE**
- **LOW FIDELITY UI SKETCHES**
- **FRONT-END TASK DELEGATION**
- **DATA CONCENTRATOR HARDWARE DESIGN**



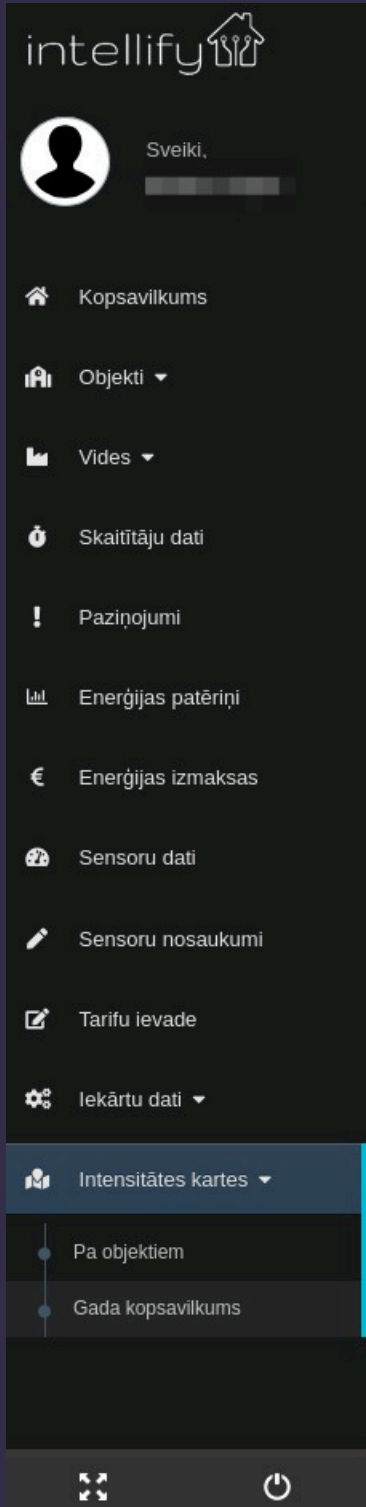
# WEB DEVELOPMENT

Scalable energy monitoring cloud solution



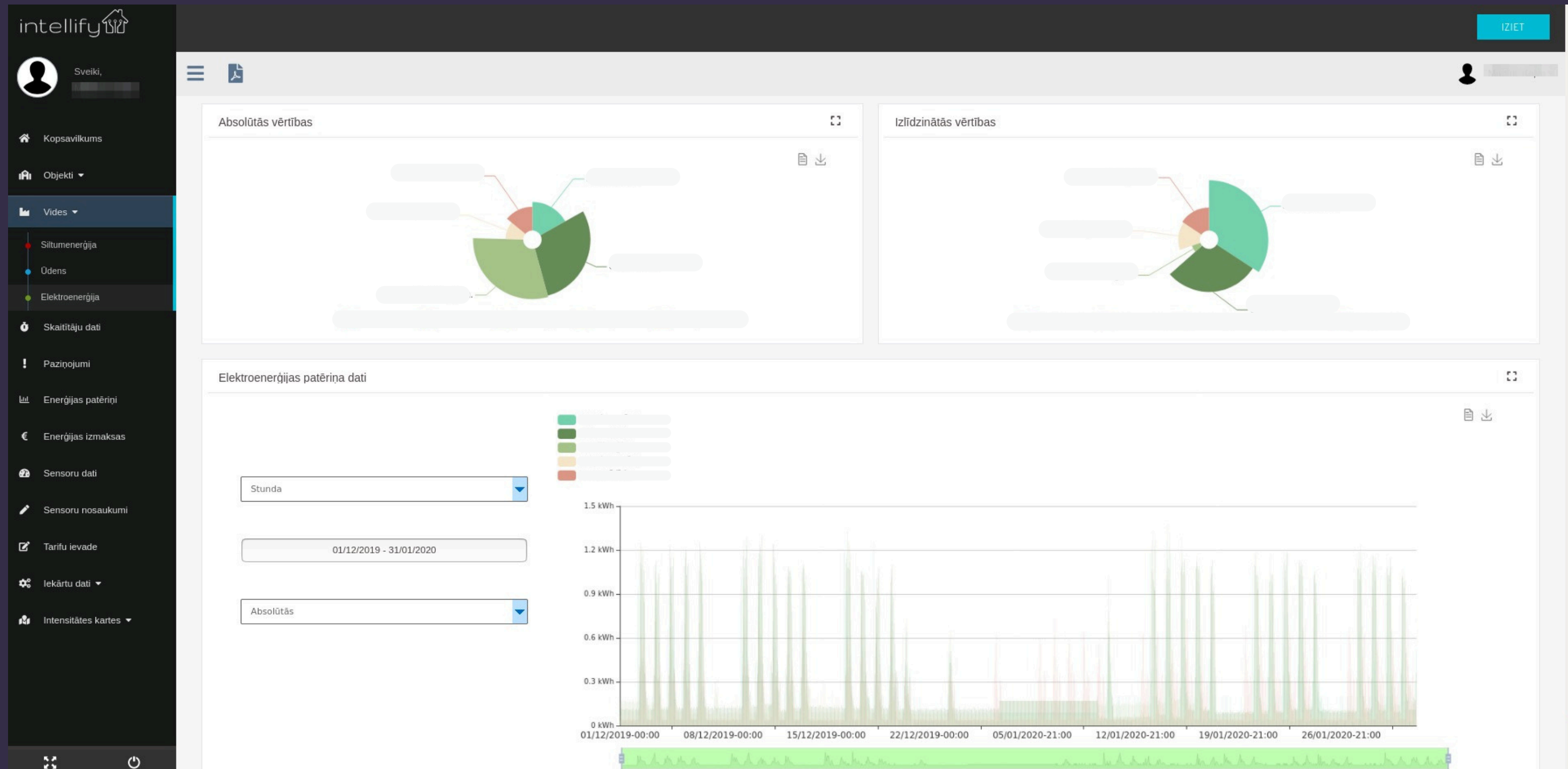
- **CAPABILITY TO USE WIDE RANGE OF IOT DEVICES**
- **CAPABILITY TO IMPORT DATA VIA OTHER METHODS**
- **SYSTEM ARCHITECTURE**
  - STANDARDISE IOT PROTOCOL IMPLEMENTATION (MQTT)
  - END2END ENCRYPTION DESIGN (CHACHA20)
  - DEVICE ACTIVATION HANDSHAKE DESIGN
  - MQTT CLIENT AUTHORIZATION DESIGN (DJANGO BACKEND, REDIS CACHE)
- **MULTIPLE USER PERMISSION LEVEL DESIGN**
- **UP TO 1000 MESSAGES PER SECOND RECEIVING CAPABILITIES (RABBITMQ)**
- **SCALABLE DESIGN SOLUTION**
- **DJANGO BACK-END DEVELOPMENT**
  - DJANGO REST FRAMEWORK TOOLING
  - CRUD REST API DESIGN
  - JSON WEB TOKEN AUTHORIZATION
  - READY FOR REACTJS SPA
- **PROJECT COORDINATION**
- **UX/UI DESIGN ASSISTANCE**
- **LOW FIDELITY UI SKETCHES**
- **FRONT-END TASK DELEGATION**

# Screens



# WEB DEVELOPMENT

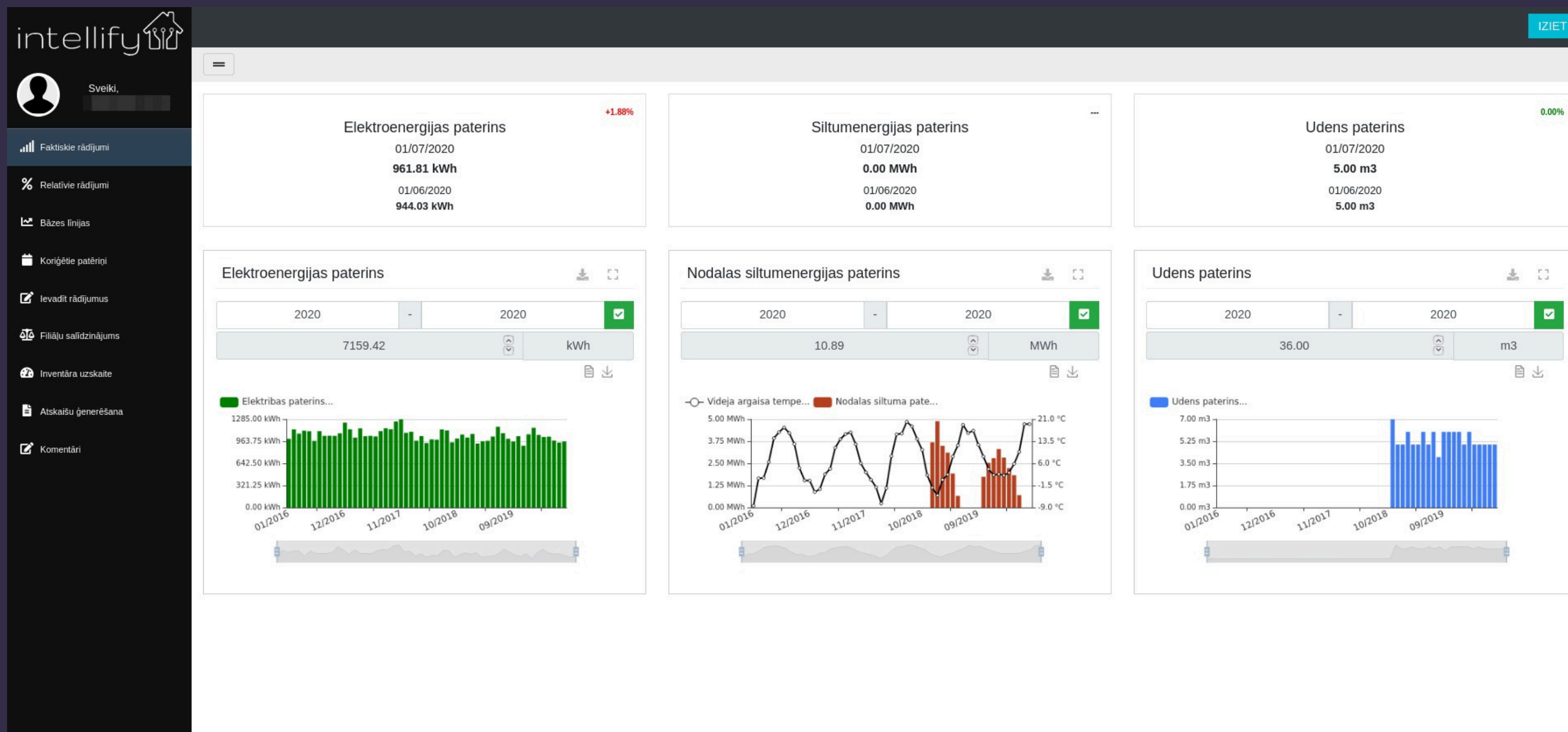
Screens





# WEB DEVELOPMENT

Screens



# WEB DEVELOPMENT

Screens

intellify

Sveiki,

Faktiskie rādījumi

Relatīvie rādījumi

Bāzes līnijas

Koriģētie patēriņi

Ievadīt rādījumus

Filiāļu saīdinājums

Inventāra uzskaitē

Atskaišu ģenerēšana

Komentāri

IZIET

Skaitītāju rādījumu ievade

Kopēt

CSV

Pievienot jaunus rādījumus

Datums	Siltuma skaitītāja rādījums	Kopejais elektrības paterins	Udens skaitītāja rādījums	Ievadīts	Rediģēt
07/2020	37.5180		642.0000	31/07/2020	
06/2020	37.5180		637.0000	30/06/2020	
05/2020	37.5180		632.0000	03/06/2020	
04/2020	36.8160		627.0000	05/05/2020	
03/2020	34.9890		622.0000	06/04/2020	
02/2020	32.7600		617.0000	06/04/2020	
01/2020	29.9350		611.0000	29/01/2020	
12/2019	26.6280		606.0000	29/01/2020	
11/2019	23.8290		600.0000	29/01/2020	
10/2019	21.3000		594.0000	01/01/2016	
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08/2019	19.5600		582.0000	01/01/2016	
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06/2019	19.5600	1175.7100	572.0000	01/01/2016	

Rādīt 1. līdz 14. no 56 ierakstiem

Iepriekšējā

1

2

3

4

Nākamā

SIA "Intellify"

Rādījumu pievienošana

Tekošās vērtības:

Iepriekšējās vērtības:

\* Atzīmējiet mainīto skaitītāju attiecīgos rādījumus.

Datums:

08/2020

Datums:

07/2020

Udens skaitītāja rādījums:

642.0000

Udens skaitītāja rādījums:

642.0000

Kopejais elektrības paterins:

Kopejais elektrības paterins:

961.8100

Siltuma skaitītāja rādījums:

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Siltuma skaitītāja rādījums:

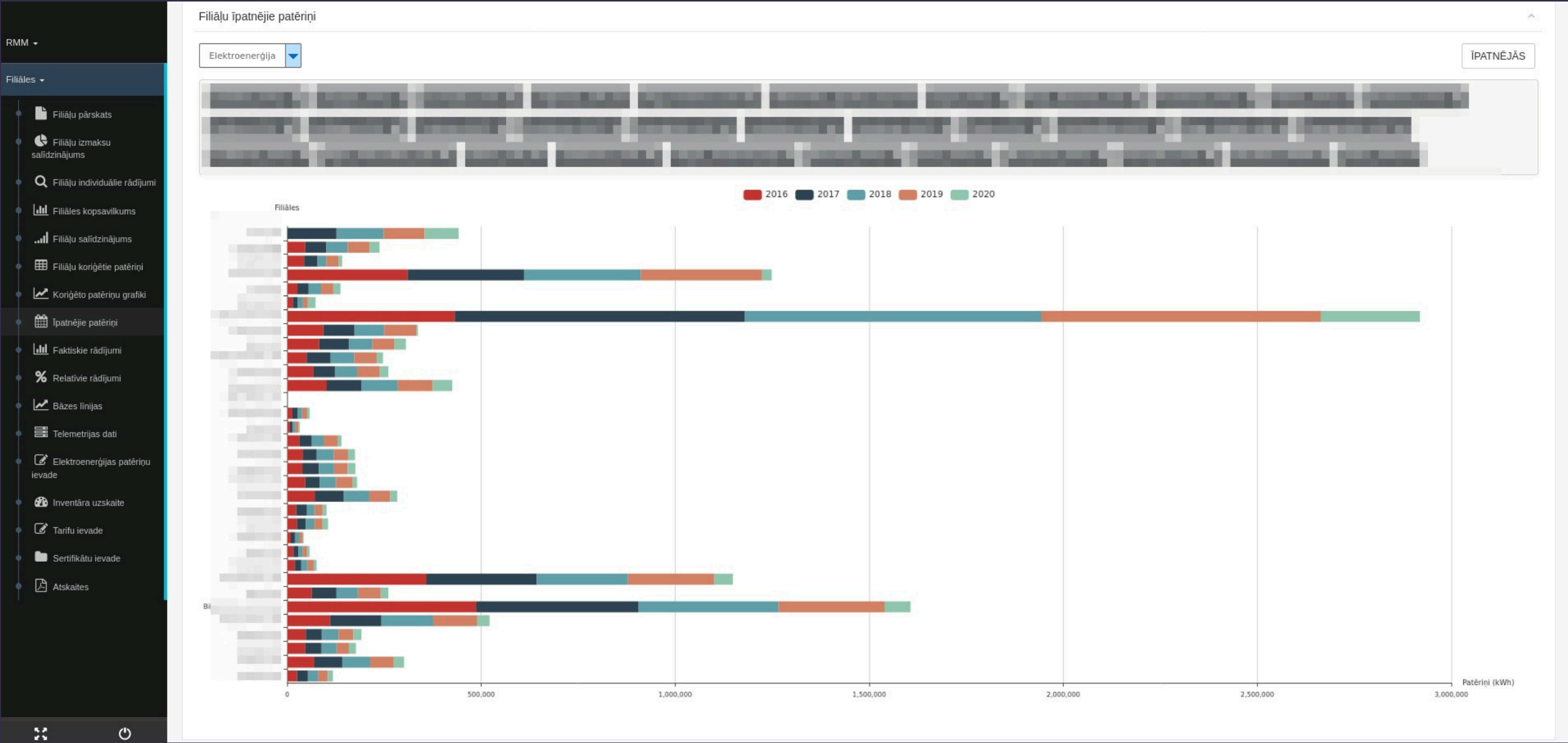
37.5180

Apstiprināt

Aizvērt

# WEB DEVELOPMENT

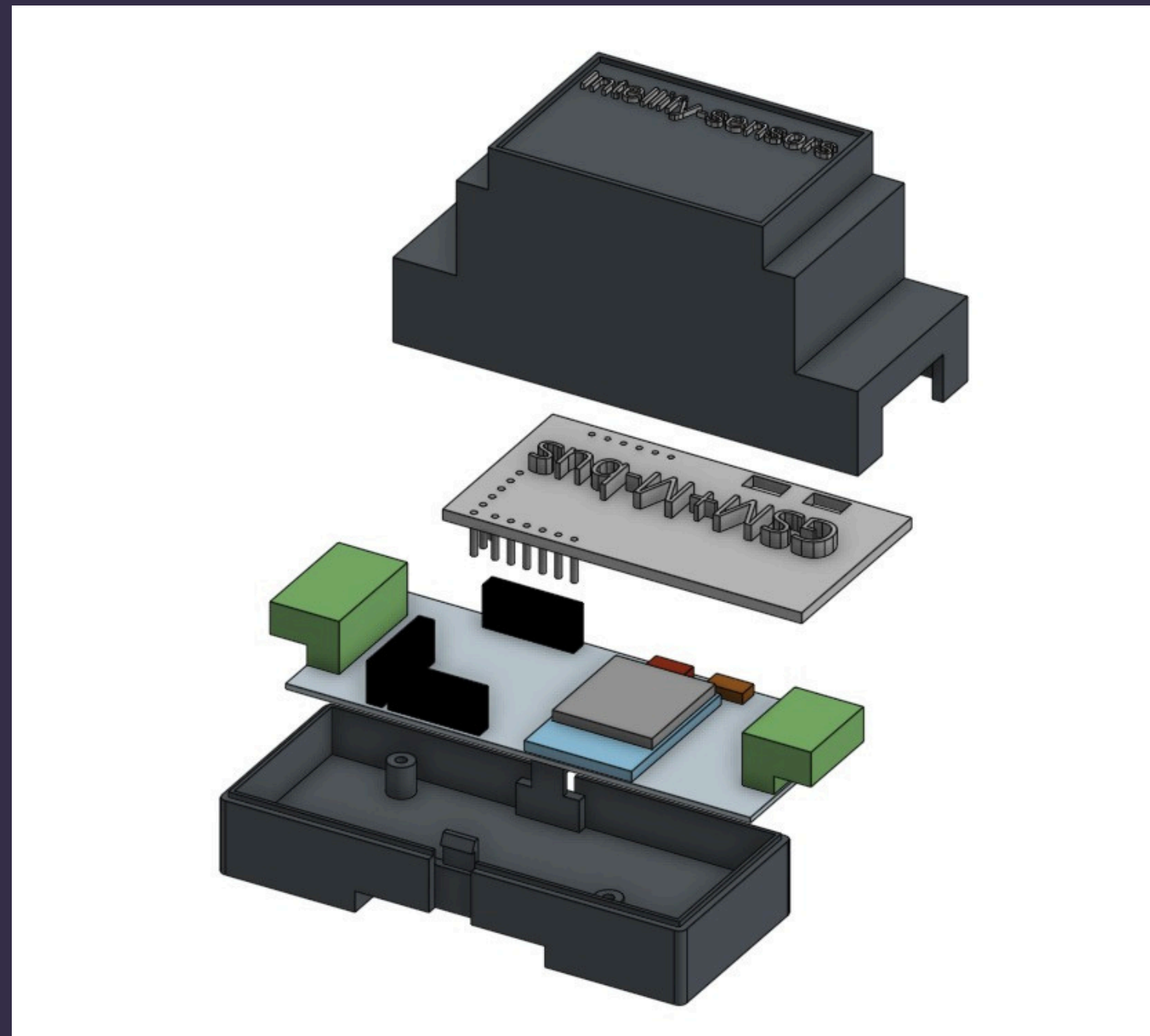
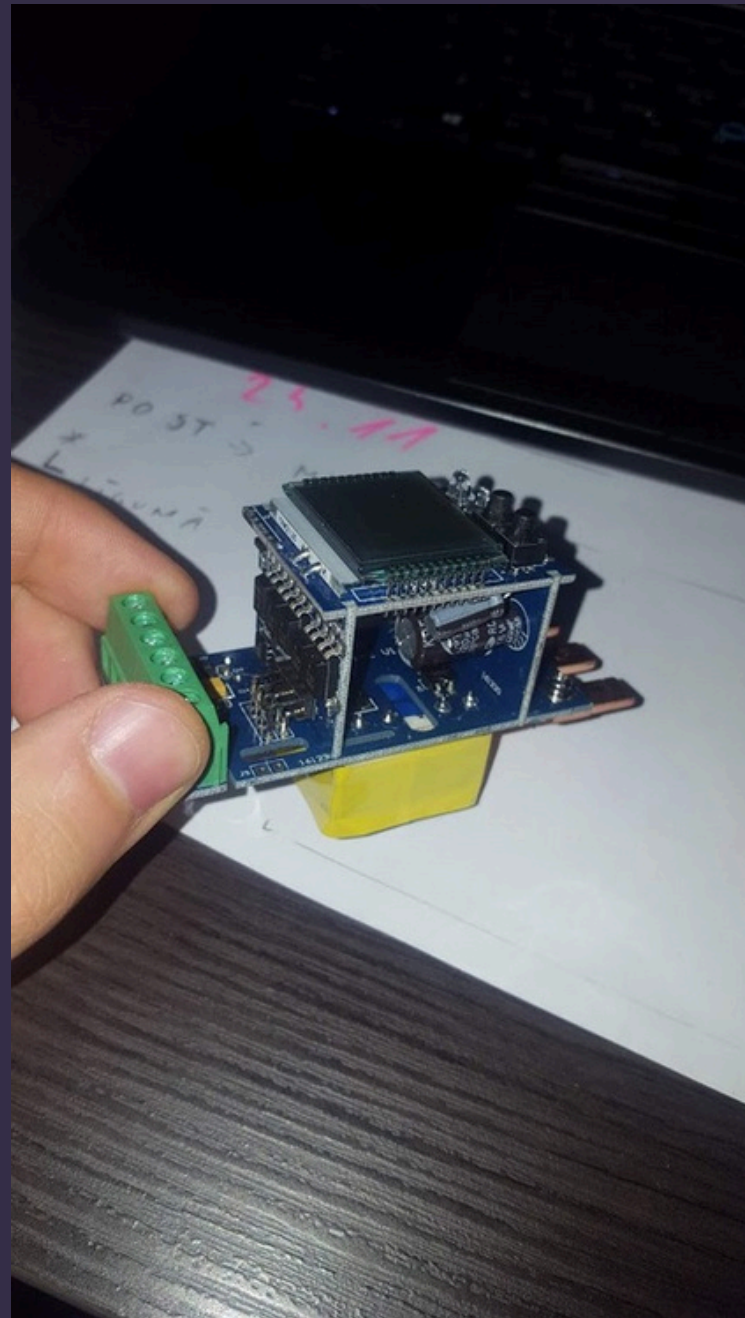
Screens



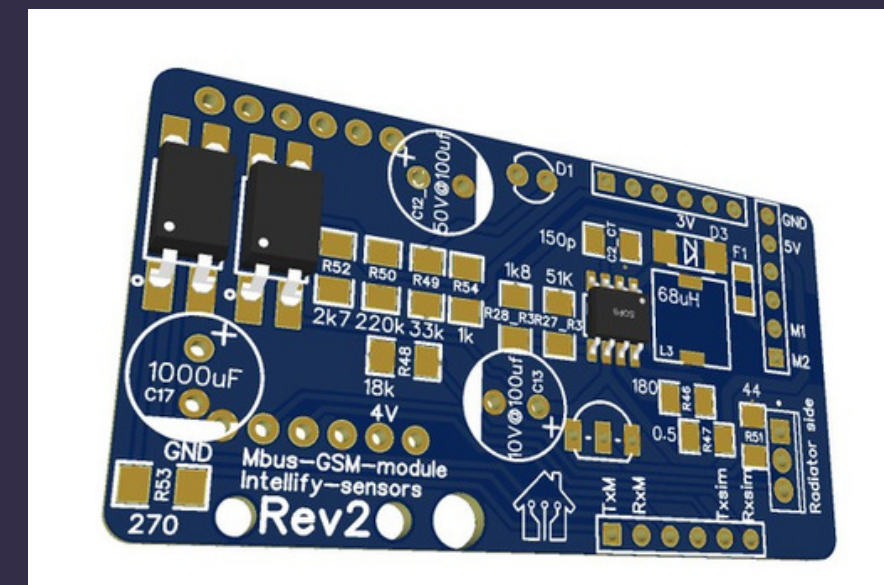


# HARDWARE DESIGN

Espressif ESP32 based modular data concentrator



- **HARDWARE DESIGN**
- **3D PRODUCT DESIGN**
- **LOW COST MANUFACTURING FOCUS**
- **C++ FIRMWARE DESIGN**
- **MODULAR DESIGN**
- **EXPANSION MODULE DESIGN**
- **GSM PCB DESIGN**
- **NB-IOT PCB DESIGN**
- **M-BUS PCB DESIGN**
- **S0 BOARD SCHEMATIC DESIGN**
- **WIFI HOTSPOT CONFIGURATION**
- **PORTAL IMPLEMENTATION**





# HARDWARE DESIGN

Raspberry Pi based data concentrator

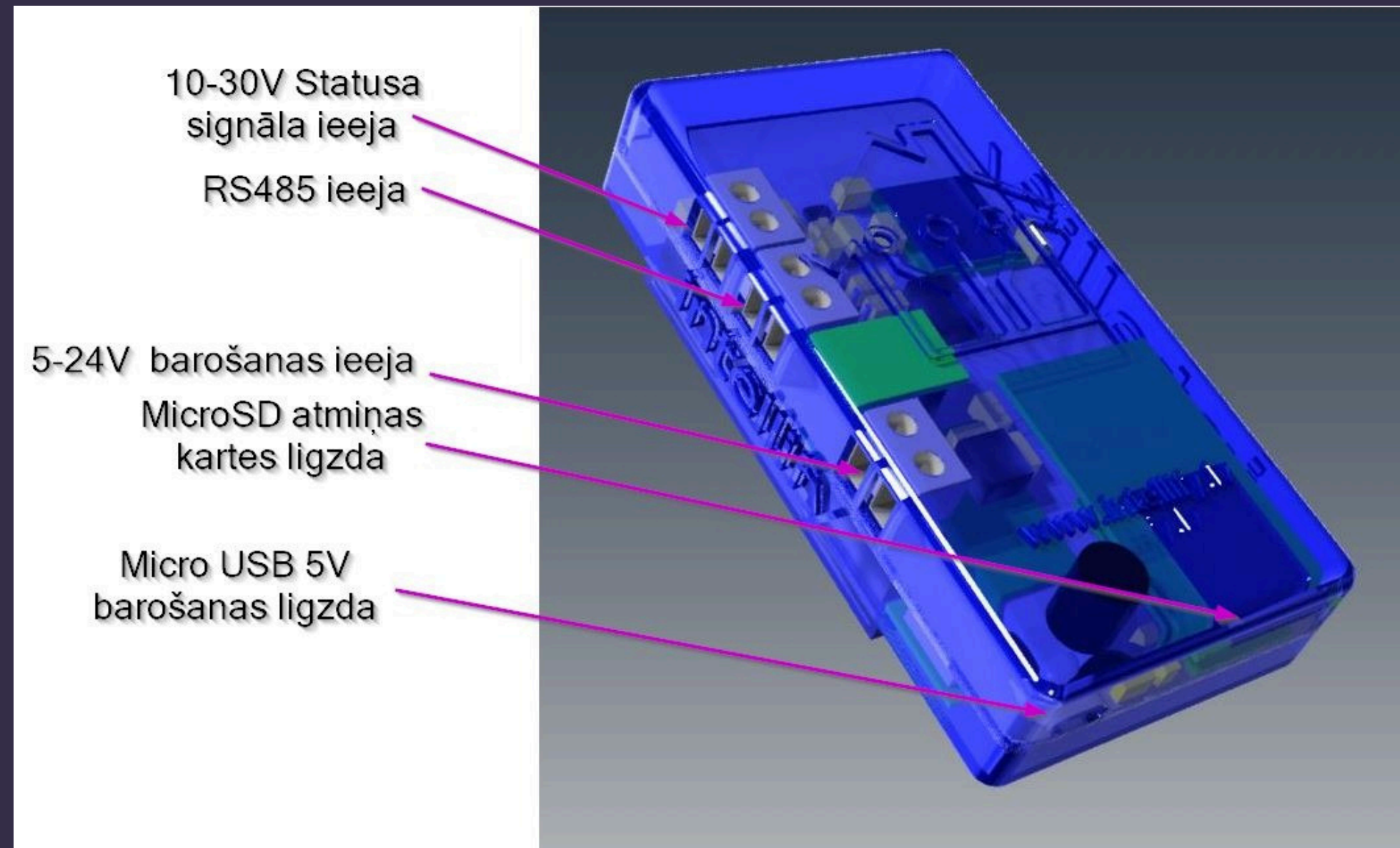


- **HARDWARE DESIGN**
- **HARDWARE CONSTRUCTION AND ASSEMBLY**
- **UPS SAFE POWER OFF IMPLEMENTATION**
- **M-BUS BOARD SCHEMATIC DESIGN**
- **S0 BOARD SCHEMATIC DESIGN**
- **POWER SUPPLY VOLTAGE MONITORING**
- **EMERGENCY POWER BACKUP IMPLEMENTATION**
- **LINUX FIRMWARE DESING**
- **OS OPTIMIZATION FOR SDCARD LONG-LASTING**
- **READ-ONLY FILESYSTEM IMPLEMENTATION**
- **DATA READING SERVICE DEVELOPMENT**
- **REMOTE ACCESS BUGFIX IMPLEMENTATION VIA OPENVPN**
- **M-BUS READING SERVICE DEVELOPMENT**



# HARDWARE DESIGN

LoRa telemetry system

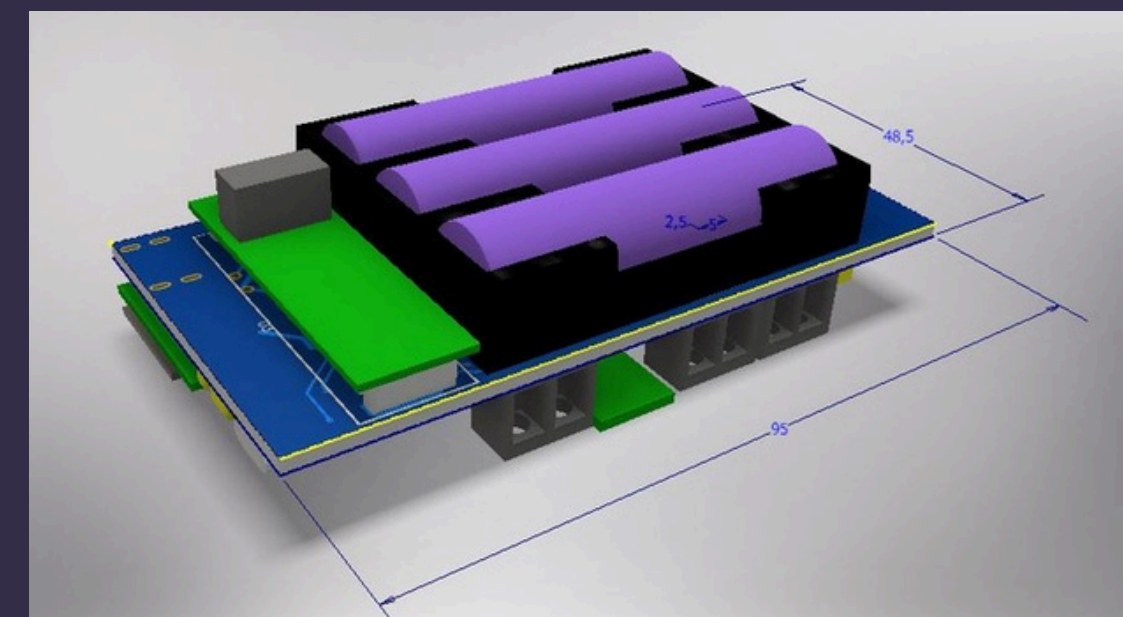
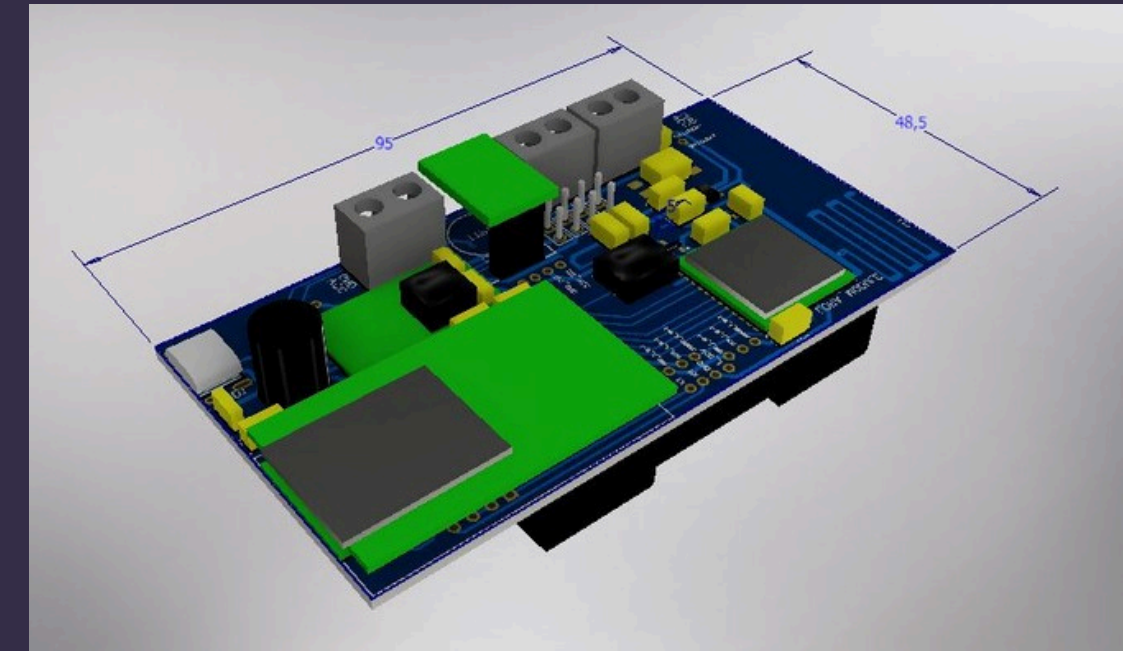
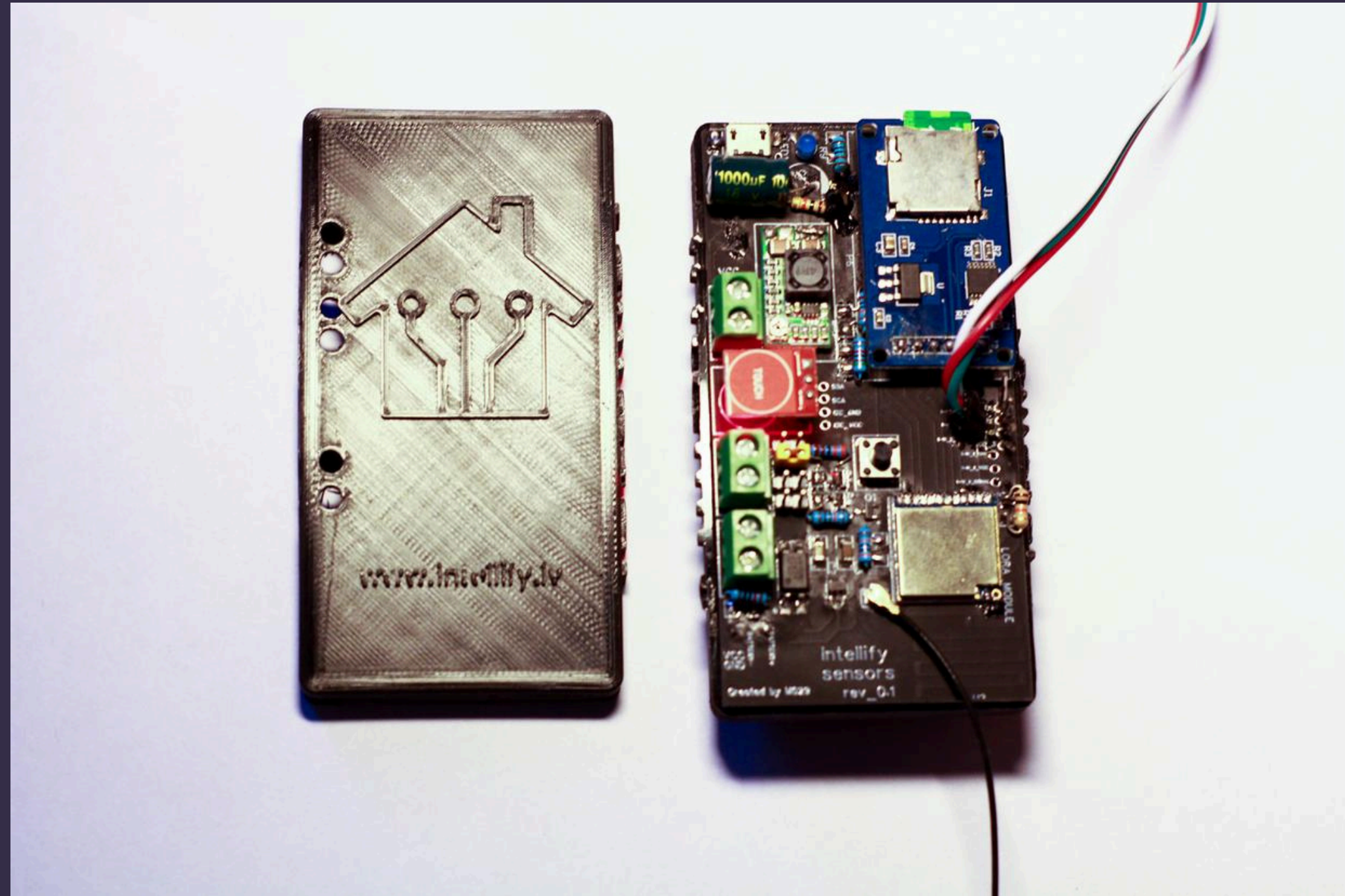


- UNIVERSITY FINAL THESIS  
THE ONLY THESIS IN 2019 RIGAS TECHNICAL UNIVERSITY ELECTRICAL ENGINEERING DEGREE VALUED WITH HIGHEST MARK - 10
  - RECEIVED LATVENERGO GRADUATION SPECIAL AWARD
- RECEIVER AND TRANSMITTER DESIGN
  - LOW POWER ESP32 MCU TRANSMITTER
    - SEMTECH LORA MODULE INTEGRATION
  - LOCAL SD CARD FOR DATA BACKUPS
  - AAA-BATTERY POWERED
  - DEEP SLEEP, LOW POWER MODES
  - RASPBERRY PI BASED RECEIVER
  - DESIGNED SPECIAL EXPANSION MODULE
- CALCULATION FOR ISM COMPLIANCE
- LORA PROTOCOL DEEP ANALYSIS
- MANUFACTURING COST ESTIMATIONS AND BOM
- TELEMETRY MESSAGE OPTIMIZATION
- PRODUCT 3D DESIGN



# HARDWARE DESIGN

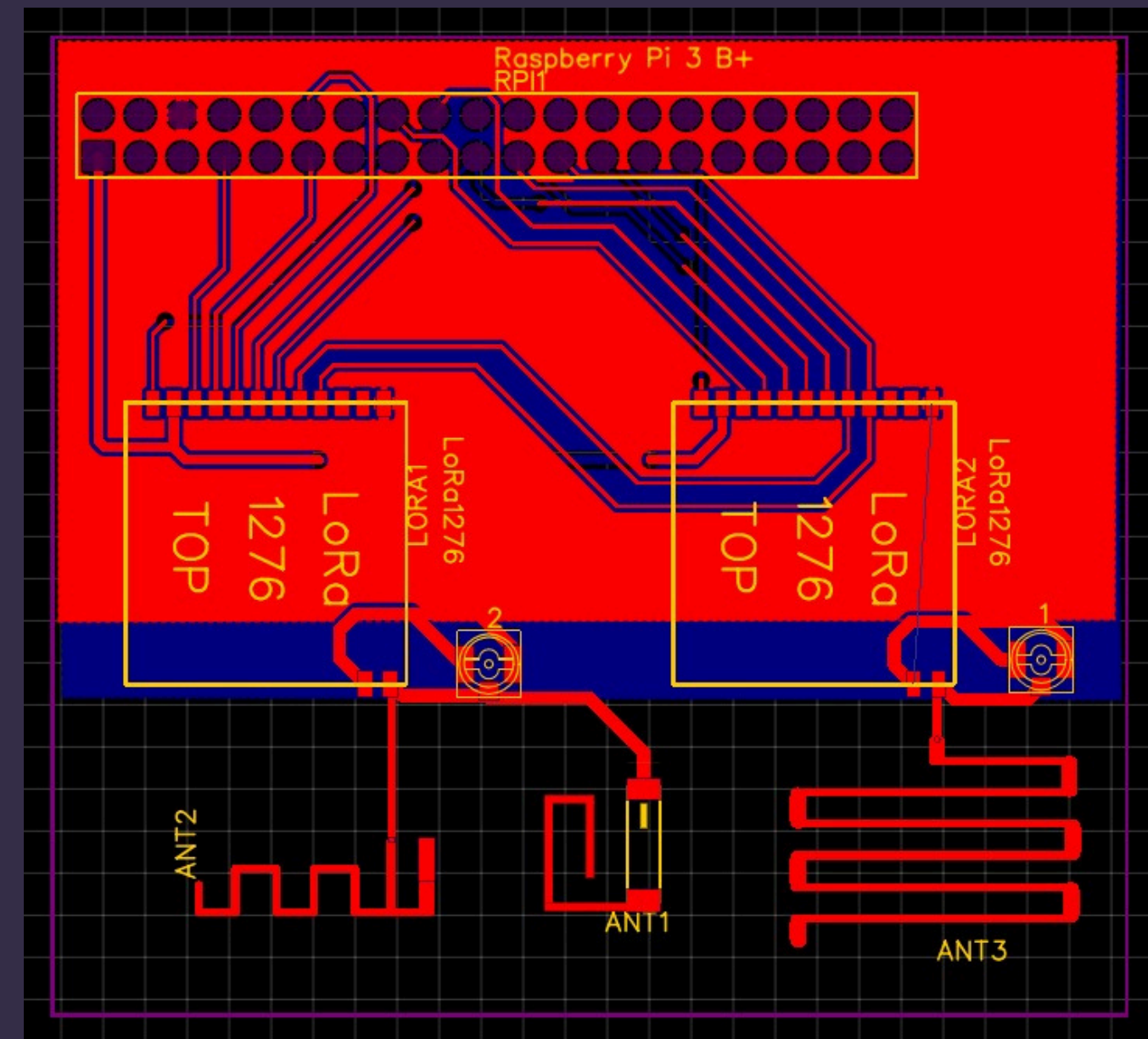
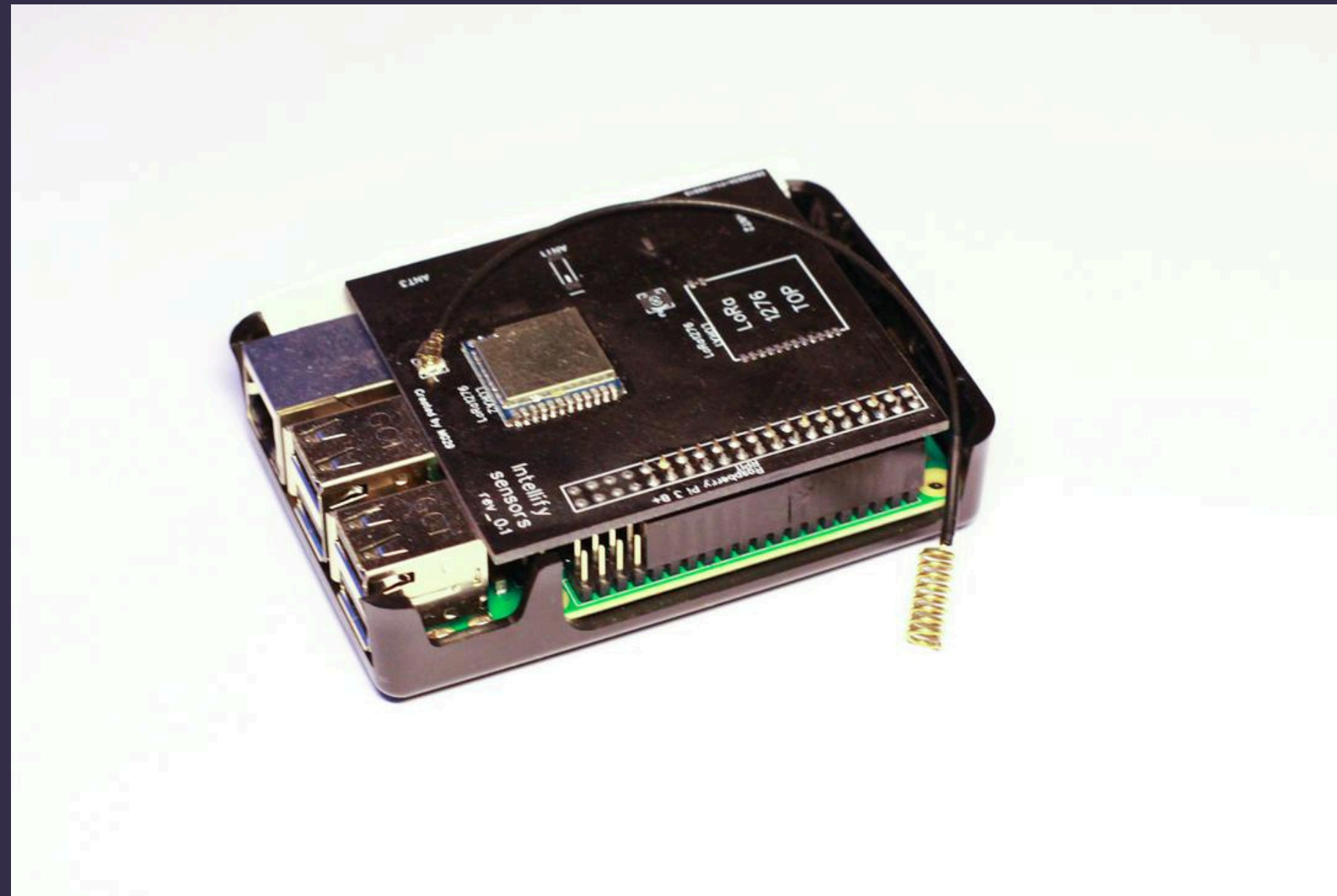
LoRa telemetry system , transmitter





# HARDWARE DESIGN

LoRa telemetry system , receiver





# DEVOPS

Expierience:

- OFFICE VPN SETUP
  - REMOTE ACCESS TO DEVELOPMENT ENVIROMENT
- LINUX OS SETUP
  - KVM VIRTUALIZATION SETUP
  - DOCKER IMPLEMENTATION
  - LINUX FIREWALL CONFIGURATION
- WEB APPLICATION DEPLOYMENT
  - APACHE SERVER CONFIGURATION
  - MOD\_WSGI
  - SITE ALIASING
  - VIRTUAL HOST CONFIGURATION
- TELEMETRY DATA AQUASITION
  - RABBITMQ DEPLOYMENT
- POSTGRESQL DATABASE SETUP
  - STREAMING REPLICATION DEPLOYMENT
  - CLUSTER SEPARATION

# TOOL-SET

Familiar with tools :

- CASUAL JETBRAINS PYCHARM USER
- LOVE TO GUI DATABASE INSPECTION TOOL LIKE DBEAVER
- FOR DAILY JOB ORGANIZATION LIKE TO USE LOCAL TAIGA.IO
- SMALL CHAT DO IN SLACK
- VERSION CONTROL AND COOPERATION DO VIA LOCAL GIT GOGS
- SOFTWARE CASUAL UBUNTU USER
- REALLY LIKE TO USE GOOGLE DOCS AND GOOGLE PRODUCTS
- SHUTTER IS MY FAVORITE BUG SUBMIT TOOL
- LIKE TO OPTIMIZE MY THROUGHPUT WITH BASH SCRIPTS