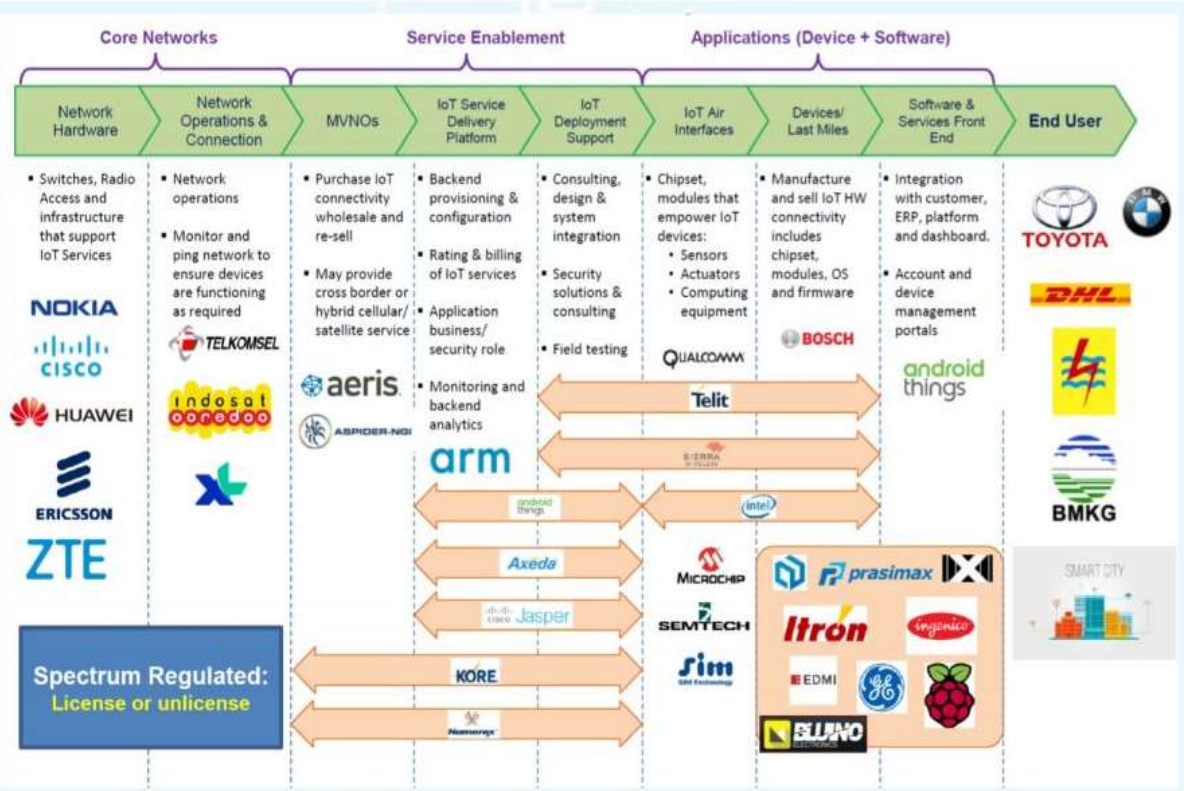
Intro to :

20 Mei 2020

Indonesia Ecosystem



- **Telkom DDS, Antares**
- **Telkomsel**
- PT KAI (Balai Yasa SinTel)
- PT. Bhinneka Putera Digdaya
- Kersen Informatika
- **LIPI**
- **CASA Farm**
- BOSCH
- IEEE Indonesia Section
- **IEEE ComSoc Chapter**
- **IEEE SPS Chapter**
- **IEEE IoT Initiative**
- **IPv6 Forum**
- **Indonesia IoT Forum (ASIOTI)**
- **DiLo Bpp**
- **UnRi**
- **STIKOM Pelita**
- **Udayana**
- **UnSri**
- **ITTS**
- Decodex
- **SJT**
- XL-Camp
- **SKKNI**

Workshop/Pelatihan/FGD 2018

Out Line

- Visi Misi
- Fokus
- Collaboration

Telkom University

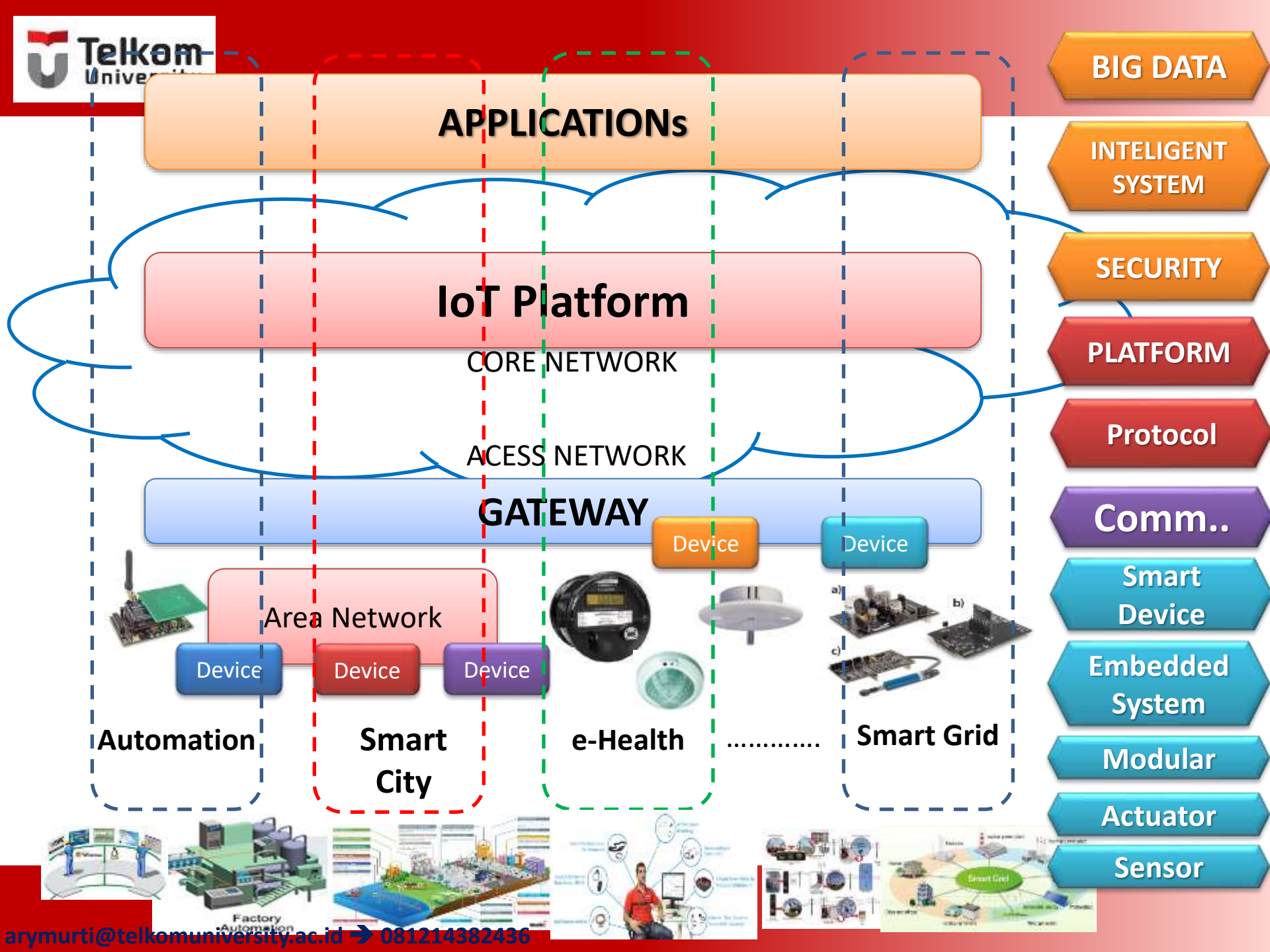
Telkom University IoT Center

VISI

Menjadi **pusat penelitian** dan **implementasi** terkemuka di Indonesia yang berfokus pada **Internet of Things** dan **Teknologi pendukungnya** yang senantiasa mampu mengadaptasi tuntutan **global**.

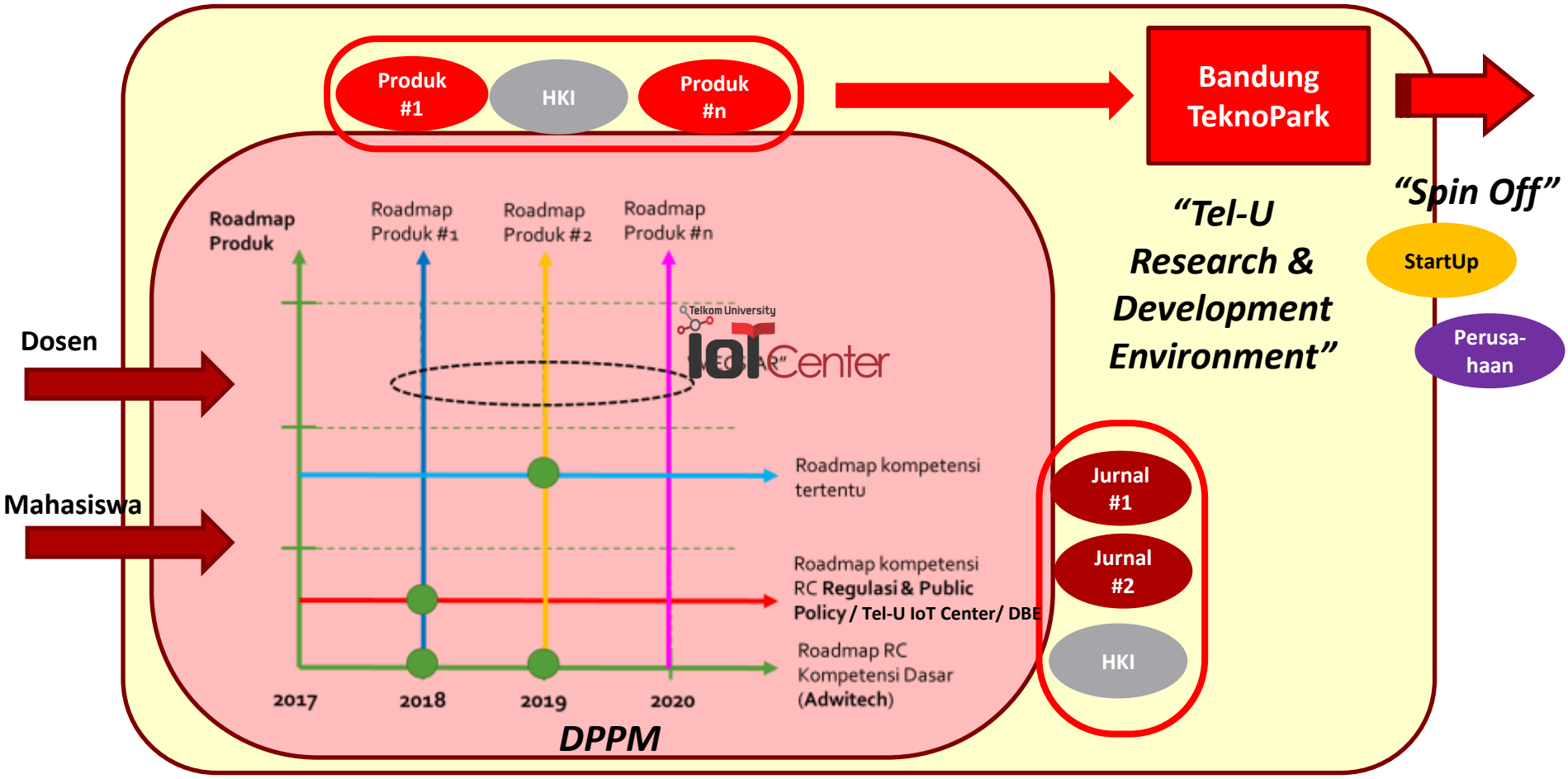
MISI

1. Menyelenggarakan **pengkajian** serta **pengembangan** ilmu pengetahuan dan teknologi yang **berfokus pada IoT**.
2. Mengembangkan **produk-produk IoT** sesuai kebutuhan pasar.
3. Melayani jasa **penerapan Teknologi IoT**.
4. Menyelenggarakan **pendidikan, pelatihan dan Seminar** Internasional di bidang IoT.



arymurti@telkomuniversity.ac.id → 081214382436

Input, R&D Environment, Output, and Spin Off



Posisioning RC IoT berdasarkan TKT*

AdWiTech
Fundamental, Hightech

Telkom University IoT Center
Fundamental, Applied, Practical

Bandung Tekno Park
Business, Start-up, Market

Spin Off

Start up

"Lingkup fakultas"

"Lingkup universitas"

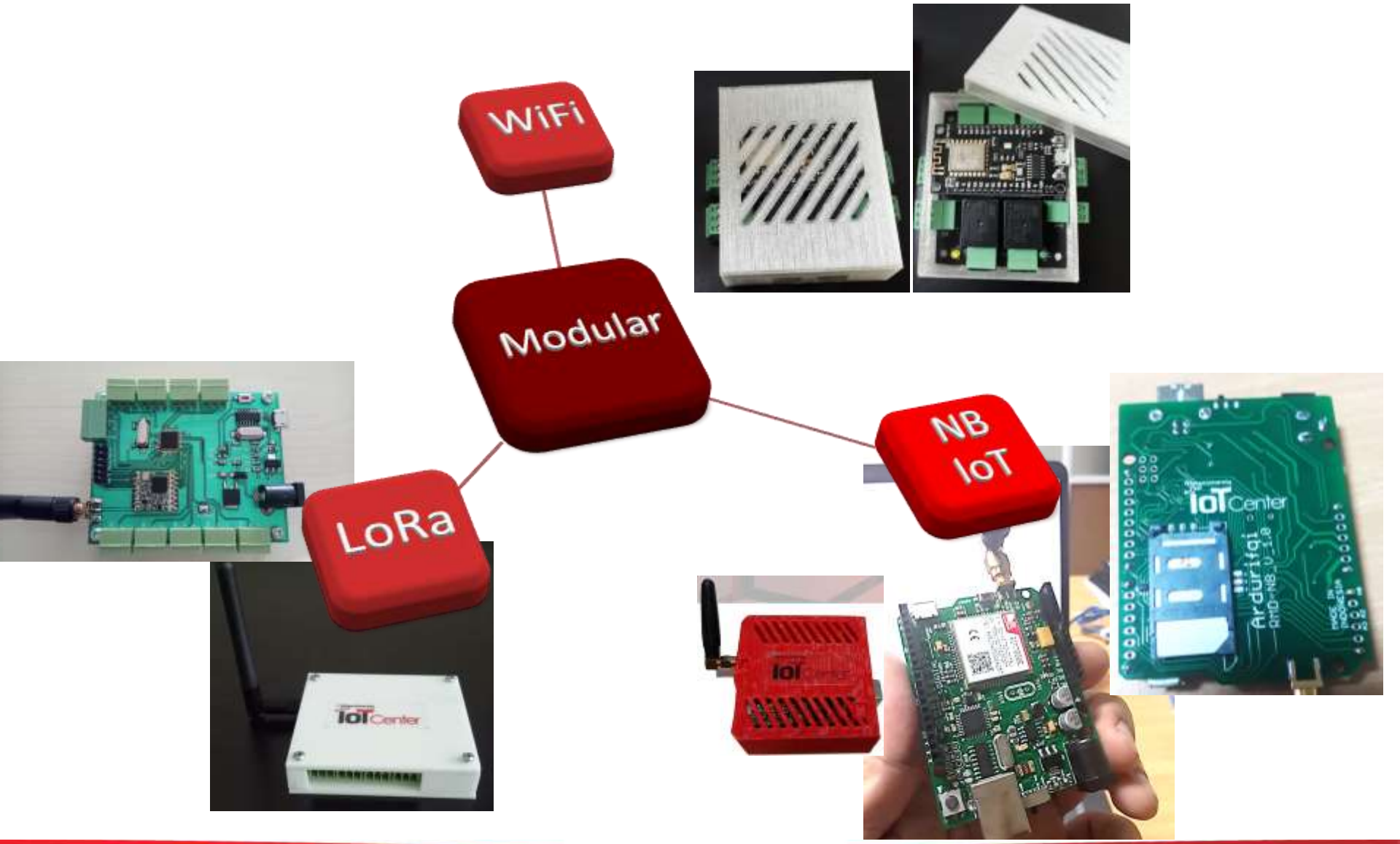
* TKT = Tingkat Kesiapan Teknologi = *Technology Readiness Level* (TRL)

Out Line

- Visi Misi
- **Fokus**
- Collaboration

Research Focus : Product & Implementation

Product



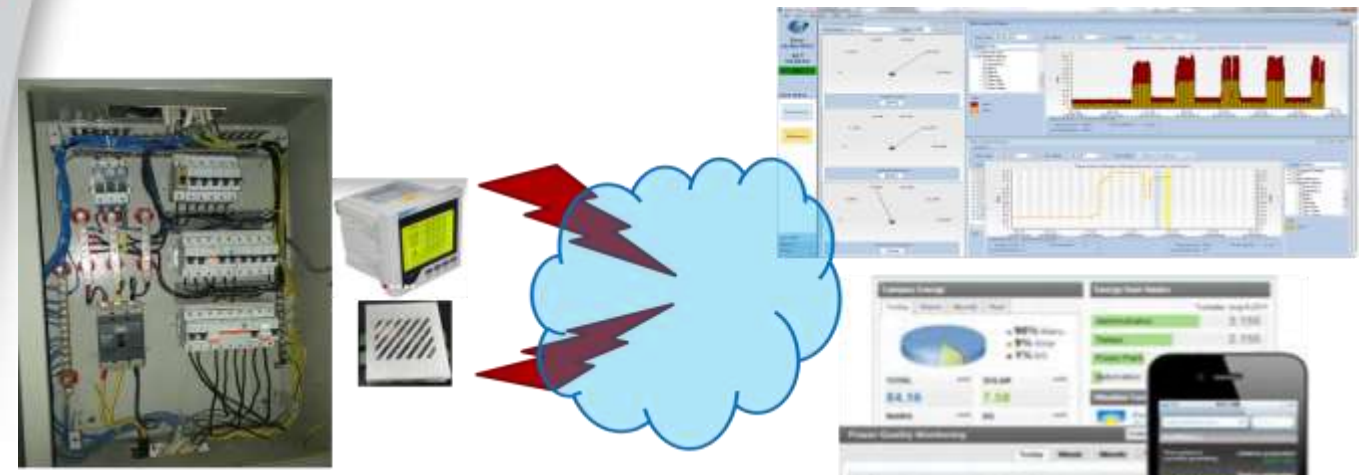
	Nama Produk	Info Produk	Foto Produk
	LORA MODULE	- Frequency : 920 - 923 MHZ - Power : 1.8 - 5.5 VOLT - Bandwidth : 35.84 KHZ - EEPROM : 1 KB - Transmit Power : 10.035 DBM - High Sensitivity : DOWN TO -148DBM - PIN I/O : 23 WITH 6 PINPWM - Flash Memory : 32 KB - COMPATIBLE WITH 3.3 VOLT - PORT I/O READY PLUG AND PLAY	
2	NB IOT MODULE	- Frequency : 900/1800 MHZ - Power : 3.0V - 4.3V, TYP: 3.8V - Bandwidth : 452 MHZ TO 2200MHZ - Operating Temperature : -40°C TO +85°C - Downlink : 34 KBPS - Uplink : 66 KBPS - PORT I/O READY PLUG AND PLAY	
3	Wi-Fi IOT MODULE	- Power : 2.5 - 3.6 VOLT - Operating Current : 80 MA (AVERAGE VALUE) - Operating Temperature : -4 OC ~ 125 OC - Power Amplifier : 24 DBM - Wi-Fi Direct : (P2P / POINT-TO-POINT), SOFT-AP /ACCESS POINT - PORT I/O READY PLUG AND PLAY	

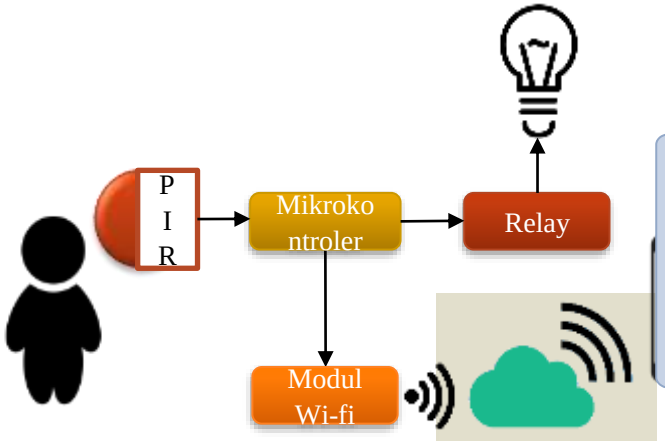
LORA GATEWAY

6	LORA GATEWAY	- LoRa modulation technology - Sensitivity down to -142.5 dBm - Maximum link budget 162 dB - SX1301 base band processor - Supply voltage 5V - Output power level up to 23 dBm - GPS receiver (optional) - Range up to 15km (Line of Sight) - Range of several km in urban environment - Ethernet interface: LAN interface - Frequency band : L: 398MHz~525MHz, and H : 803Mhz~930Mhz - GPS receiver (optional) - Supply Voltage (VDD) 5.0 - 5.5V - Operating Temperature -40~ + 85°C - RF Input Power - 15 dBm	

SOLVE-IT

Energy Monitoring System





Fitur Aplikasi :

- Autentifikasi
- Informasi kelistrikan (V, I, PF, P, Q, S)
- Penggunaan energi listrik (per menit, jam, hari, minggu, bulan)
- *Clustering beban*
- Kendali beban listrik

Muhammad Ary Murti (TE, FTE)
Asep Suhendi (TF, FTE)
Casi Setianingsih (SK, FTE)

ENERGY MANAGEMENT SYSTEM

- Operating Voltage : 220 VAC
- LENGTH : 24.5 cm
- WIDTH : 14.5 cm
- Support 3 Phases Energy Meter
- LCD Display
- Communicate with Wi-Fi
- Monitoring On Web Dashboard
- Monitoring On Android Apps
- Display : Energy, Power Current, Voltage, Power Factor
- Real time Data
    - (V, I, PF, P, Q, S)
    - Penggunaan energi listrik (per menit, jam, hari, minggu, bulan)
    - *Clustering beban*

Kendali beban listrik

Intelligent Power Management System

IoT
Device

IoT
Platform

IoT
Device

Web
User

Mobile User

Monitoring	Control
1.Standard	1.Manual
2.Clustering	2.Automatic
3.Prediction	3.Scheduling
	4.Priority
















Behaviour Energy Efficiency System KNN (2018) [B]

Sistem Monitoring dan Clustering Penggunaan Listrik K-Means (2019) [F]

Kendali Beban Elektronik Algoritma Priority Queue (2019) [H]

Pemodelan Prediksi Banjir ANN (2017) [A]

Prediksi Banjir RBF dan IoT (2018) [D]

Prediksi Pola Pencemaran Air Sungai ANN (2018) [C]

Sistem Kendali dan Manajemen Beban Listrik (2019) [I]

kWh Meter Berbasis Internet Of Things (IoT) (2019) [G]

Sistem Otomasi Pada Fasilitas Umum Berbasis IoT (2019) [L]

Artificial Intelligence

Hardware

IoT Platform

IPMS
Intelligent Power Management System

Dashboards Penggunaan Energi Listrik (2019) [K]

Server IoT Sistem Pemetaan Penggunaan Listrik (2019) [E]

Intelligent Power Management System

2019

- Power Monitoring System
- Smart Room (Manual+Auto)
- Mobile Apps
- WiFi

2020

- AI for Energy Management System (EMS)
- Clustering (K-Means)
- Priority Algorithm
- WiFi/LoRa

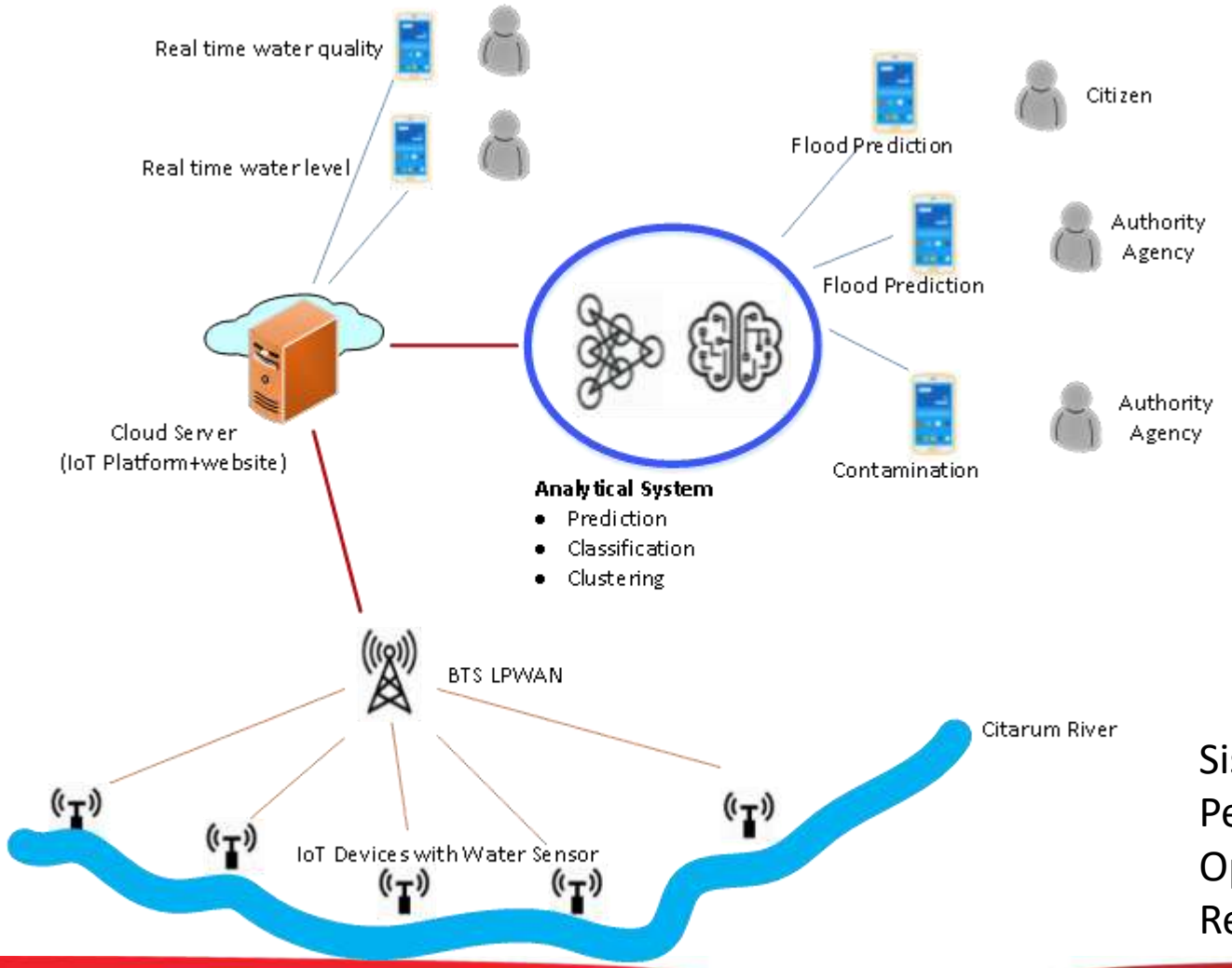
2021

- EMS
- Auto Scheduling (KNN)
- Prediction (ANN RBF)
- WiFi/LoRa/NB-IoT
- Feasible Study

2022

- EMS : Monitoring and Controlling Powered by AI
- Marketing
- Production

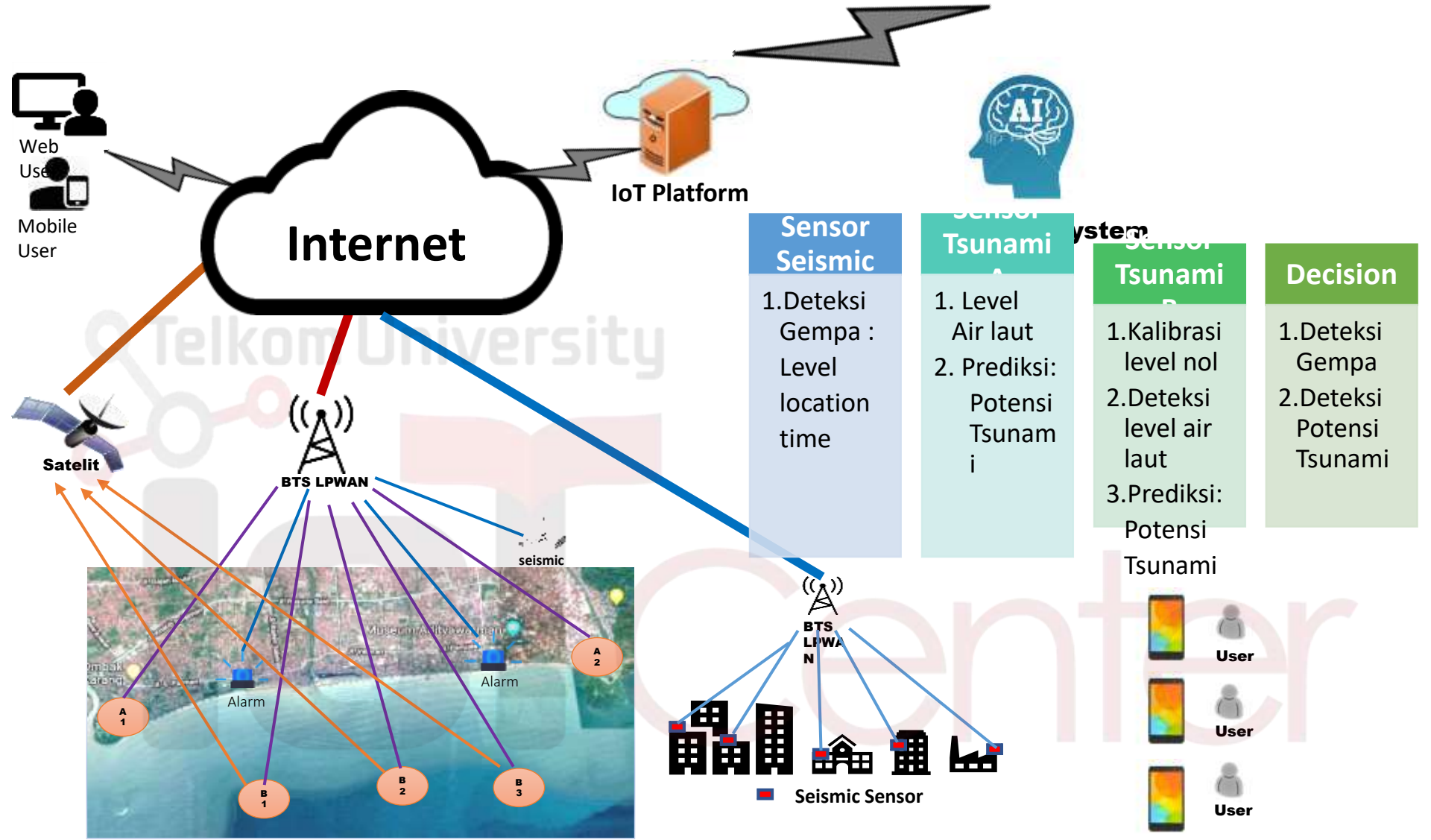
Environment Monitoring

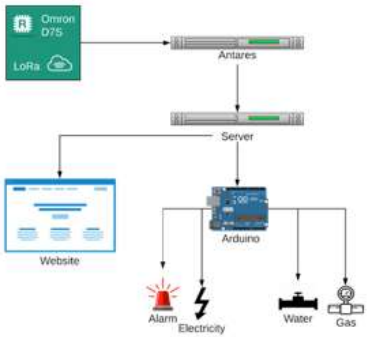


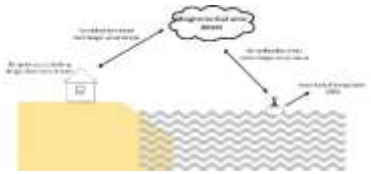
Sistem Pemantauan dan Pengontrolan Real Time untuk Optimalisasi Produksi pada Reaktor Biogas

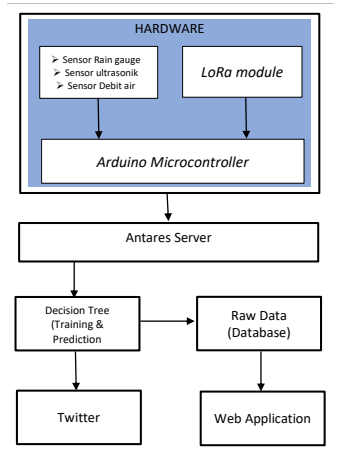
MODUL IOT SENSOR BANJIR DAN KUALITAS AIR

8	MODUL IOT SENSOR BANJIR DAN KUALITAS AIR	- Power Supply voltage : 3.0 - 4.3 V - Transmitting Power : GSM / GPRS Power, Edge Power, LTE Power - Antenna : GSM / LTE main antenna, GNSS antenna - GNSS : GNSS Engine, Protocol NMEA - SMS : MT, MO, CB, Text and PDU Mode, SMS Torage : SIM card and ME (Default) - Audio - USB 2.0 - Include Modul LoRA WAN	


Web User
Mobile User
Internet
IoT Platform
AI
Satelit
BTS LPWAN
seismic
Alarm
Alarm
A 1
A 2
B 1
B 2
B 3
BTS LPWAN
Seismic Sensor
Sensor Seismic
1.Deteksi Gempa : Level location time
1. Level Air laut
2. Prediksi: Potensi Tsunami
Tsunami
1.Kalibrasi level nol
2.Deteksi level air laut
3.Prediksi: Potensi Tsunami
Decision
1.Deteksi Gempa
2.Deteksi Potensi Tsunami
User
User
User







Earthquake Warning System Using KNN (2019)

Sea Wave Detection System Android - KNN (2019)

Sea Wave Detection System Web - Decision Tree (2019)

Flood Warning System Web – Decision Tree (2018)

Prediksi Banjir RBF dan IoT (2018)

Behaviour Energy Efficiency System KNN (2018)

Sensor Ketinggian Muka Air (2018)

Sensor Gempa (IoT) (2018) [G]

Modul Komunikasi LoRa - IoT (2018)

Modul Komunikasi NB - IoT (2018)

Sistem Deteksi Dini Ketinggian Air Laut (2018)

Artificial Intelligence

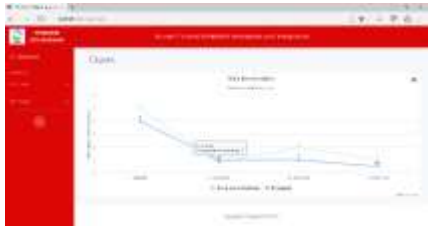
Hardware

IoT Platform

COLLECTIVE INTELLIGENCE EARTHQUAKE AND TSUNAMI

Dashboards Sea Wave Detection System Android(2019) [K]

Sea Wave Detection System Web (2019) [E]



ROAD MAP

2019

- Sensor Gempa,
- Sensor tide gauge.
- konektifitas LPWAN LoRa, NB-IoT
- Simulasi pengujian AI
- TKT : 3 dan 4

2020

- EWS Gempa dengan AI
- Deteksi level air pantai
- Buoy : Sensor dan power
- Pengembangan server untuk Integrasi sistem
- Pembuatan aplikasi peringatan dini gempa.

2021

- Uji Lapangan
- CI untuk kalibrasi
- CI deteksi potensi tsunami
- Pembuatan aplikasi peringatan dini Tsunami
- TKT : 6

2022-2023

- Penambahan jumlah node sensor
- Implementasi sistem sensor di lapangan
- Pengembangan sistem deteksi tsunami untuk wilayah pengamatan berbeda
- Pengguna aplikasi yang lebih banyak secara bersamaan.
- Pengujian ketahanan dan kehandalan sistem.
- TKT : 7 dan 8

SOLVE-IT
Perangkat Industrial IoT untuk PLC Omron

PLC Omron CP series

Fitur Aplikasi :

- Mobile Apps
- Website
- Sistem ANDON (penampilan status line produksi)
- Perawatan mesin, prediksi gangguan,
- Peningkatan efisiensi kerja
- Efisiensi konsumsi energi listrik.

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Casi Setianingsih (SK, FTE)

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Aloisius Genza Pratama	1102161062 (TE, FTE)
Muhammad Fahri Ikhsan	1102160132 (TE, FTE)
Rahmat Syamsudaris	1102160318 (TE, FTE)

Telkom University

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INDUSTRIAL IoT ENABLER FOR PLC

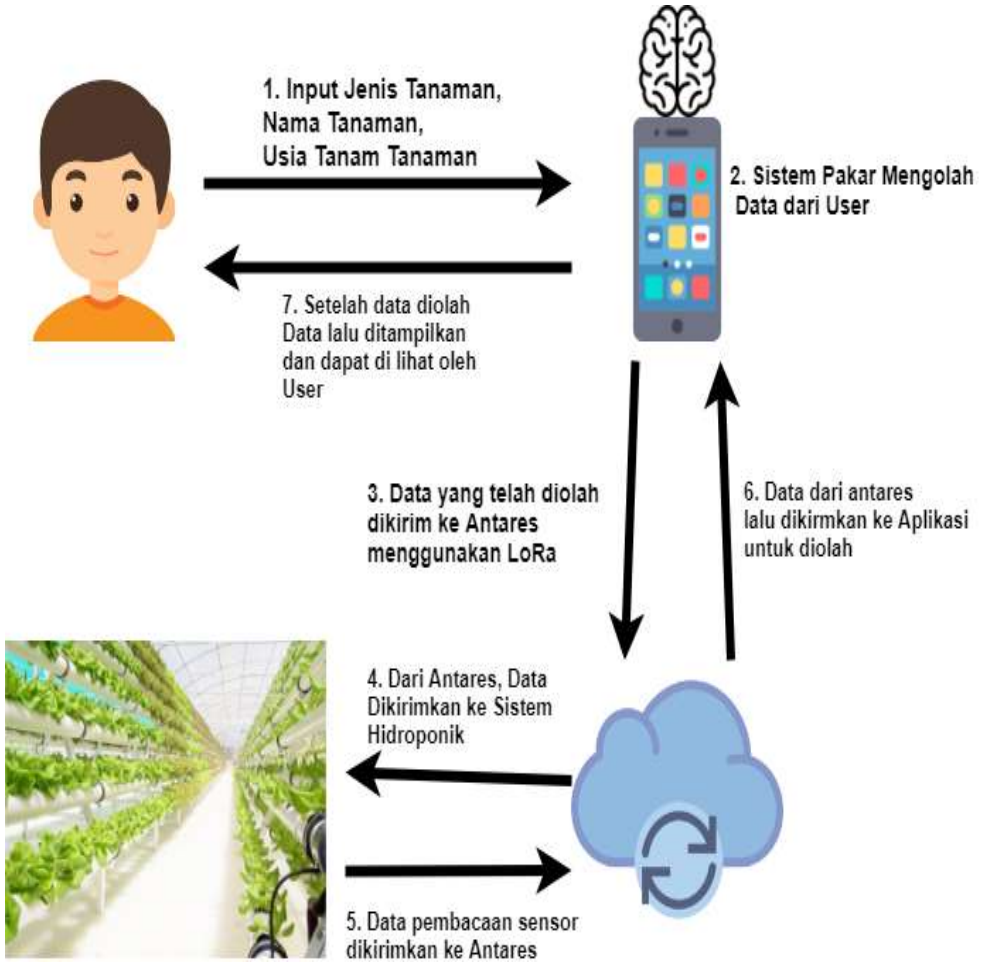
Easier Way to Implementing Industrial IoT in One Device

Features

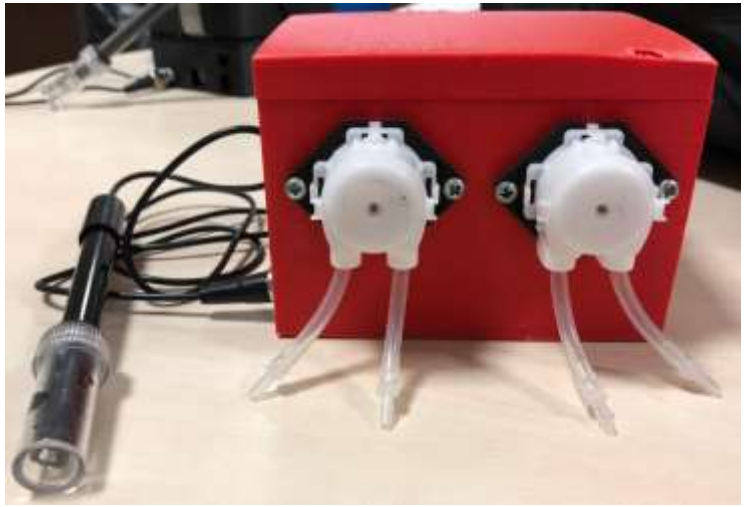
- One Time Setup
- Easy to Use with Preconfigured Program
- Length 104 cm, Widht 69 cm
- Real Time Data Monitoring
- Android Apps Included
- Operating Voltage 220 VAC
- WiFi Connectifity
- Industrial Grade

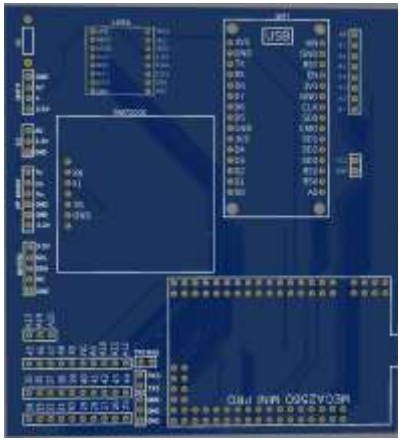
Android App

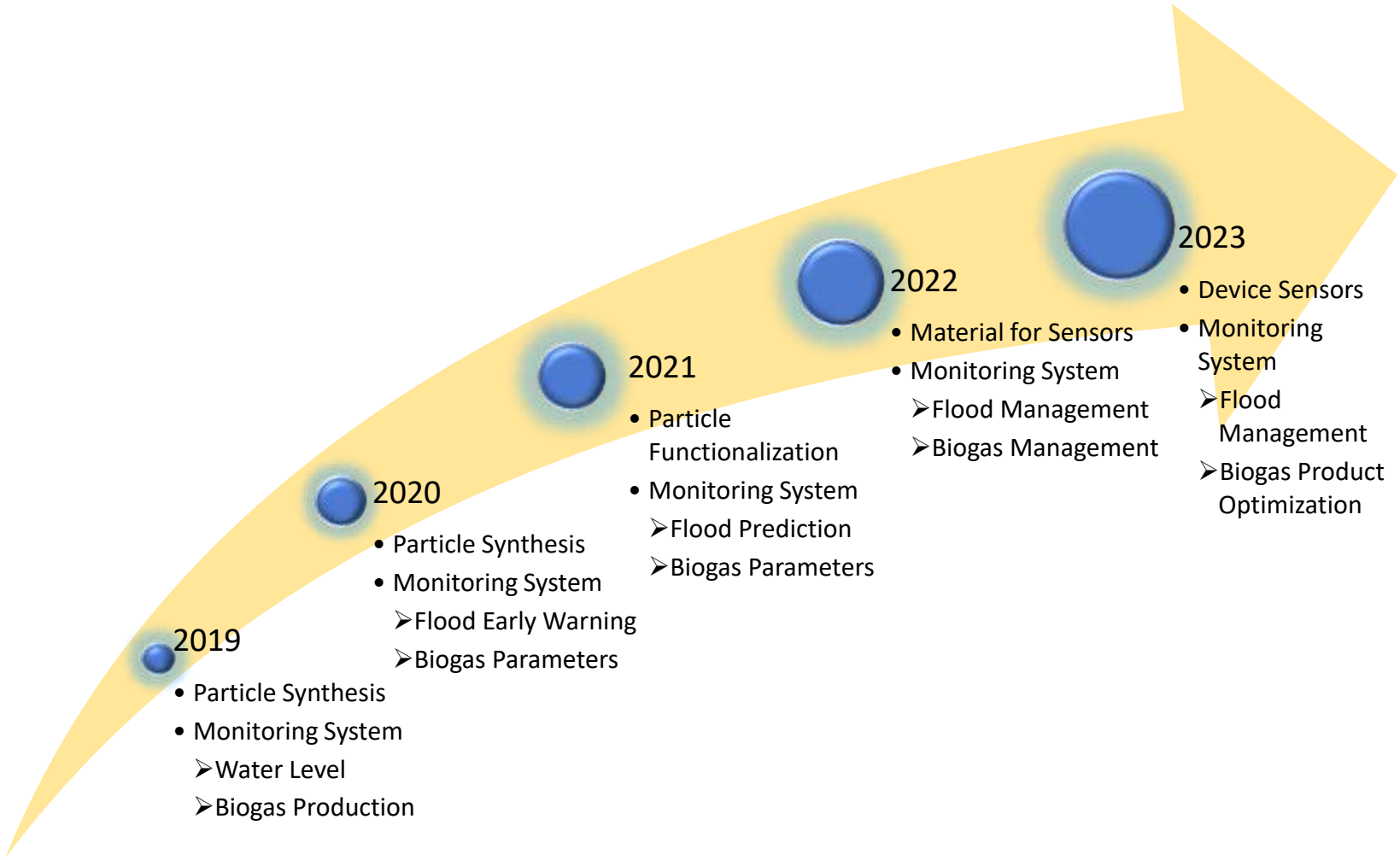
e-Hydroponic



E-Hydroponic



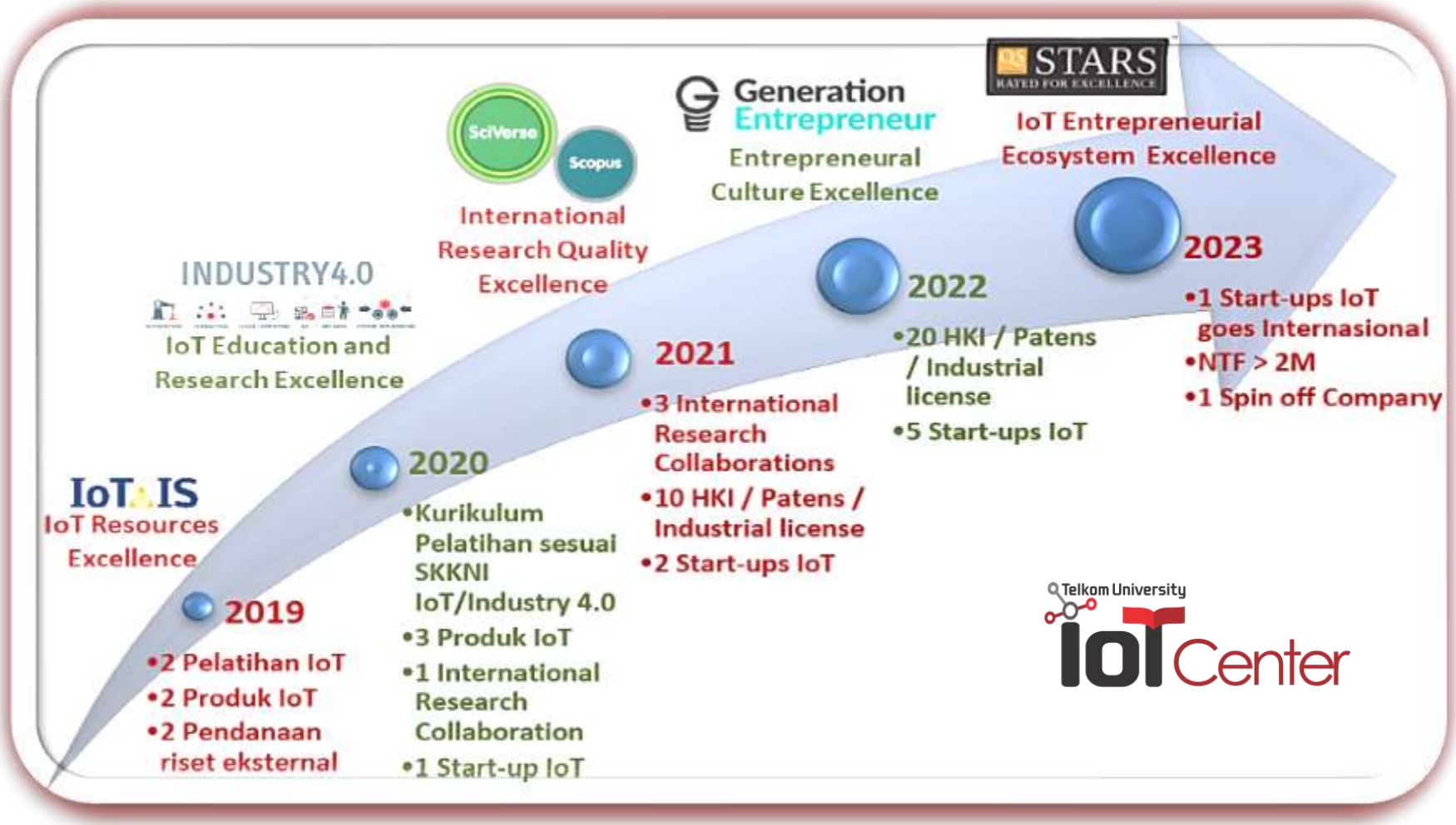



2019
• Particle Synthesis
• Monitoring System
➢Water Level
➢Biogas Production
2020
• Particle Synthesis
• Monitoring System
➢Flood Early Warning
➢Biogas Parameters
2021
• Particle Functionalization
• Monitoring System
➢Flood Prediction
➢Biogas Parameters
2022
• Material for Sensors
• Monitoring System
➢Flood Management
➢Biogas Management
2023
• Device Sensors
• Monitoring System
➢Flood Management
➢Biogas Product Optimization

Out Line

- Visi Misi
- Fokus
- **Collaboration**

RENSTRA RC IoT 2019-2023



Strategic Planning

Penelitian	Pelatihan	Produk	Project
• Support u/ Dosen dan mhs • Product Oriented • PTUPT • PPTI • Insinas • Kerjasama Internasional	• SKKNI IoT • LSP • Hand on IoT - WiFi • Hand on IoT - LoRa • Hand on IoT - NB-IoT • PCB+Solder • Programming • Application • Artificial Intelligence	• Siap Jual • Networking • Produksi • **Marketing** • EMS • e-Hidroponik • EWS : Gempa, Tsunami, Banjir • Room Automation	• Conference • Solution • Integrator

The IEEE 2018 International Conference on Internet of Things and Intelligence System

Prof. Latif Ladid
(University of Luxembourg)

Prof. Igor V. Kotenko
(ITMO University, St. Petersburg, Russia)

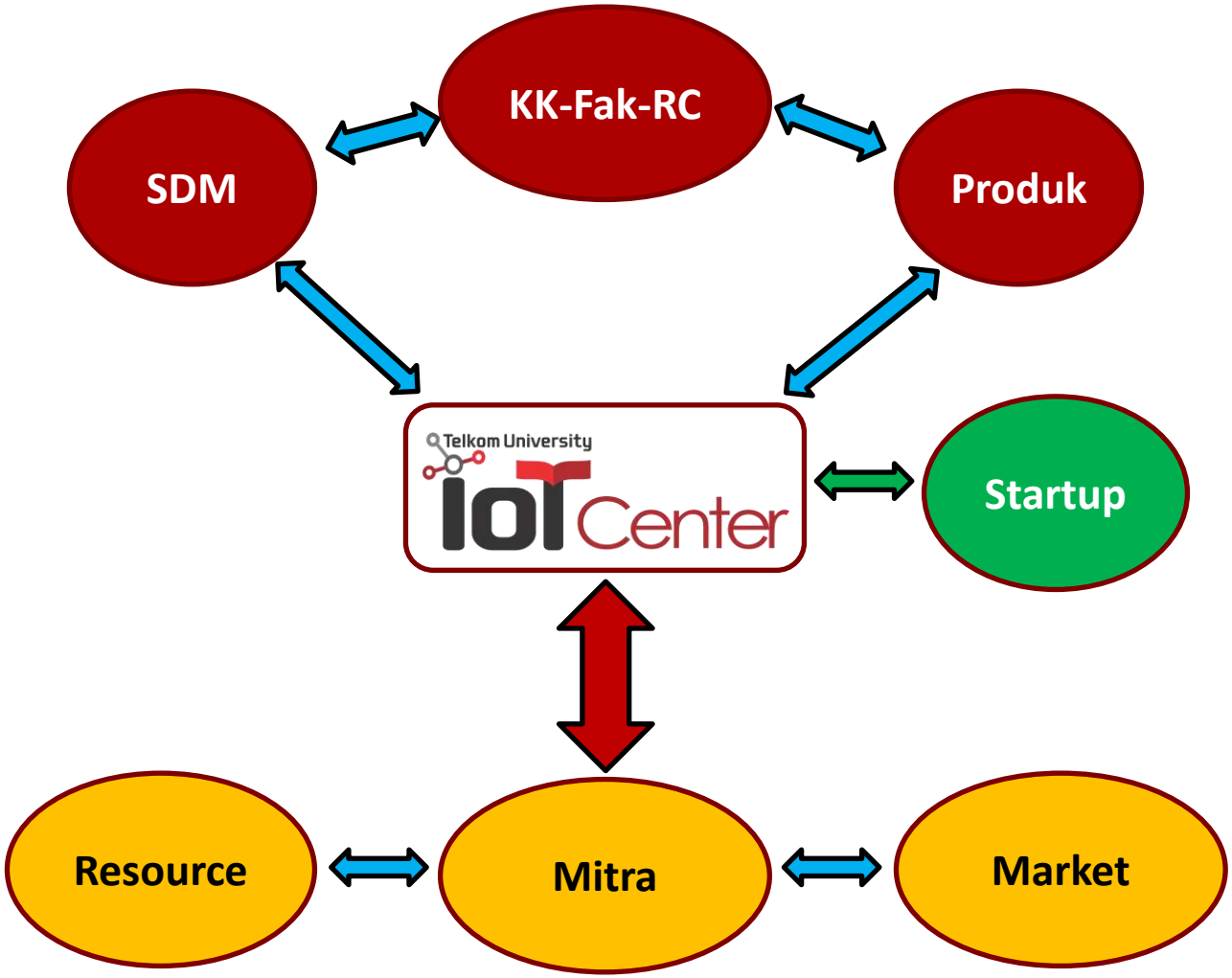
Oliver Tian
(Singapore Industrial Automation Association)

The 2019 IEEE International Conference on Industry 4.0, Artificial Intelligence, and Communications Technology

Prof. Thomas Magedanz (Fraunhofer Institute)
Prof. Ninoslav Marina (Rector of UIST Macedonia)

a) Participation in research projects
b) Participation in conferences
c) Participation in cultural programs
d) Participation in joint academic programs (degree and non-degree)
e) Participation in professional development programs and trainings
f) Exchange of faculty members
g) Exchange of students

Strategic Planning




Telkom University
IoT Center
Terima Kasih
Never-ENDing
Together Nurturing The Future