



Implementation of Wireless Telecommunication System for Emergency Response on Mentawai Mega-thrust Disaster Relief Exercise 2014

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Background

- Natural Disaster such as Tsunami and Earthquake (Tectonic / Volcanic) cause big loss of human life as well as properties.
- In the area where big disaster such as: earthquake, volcano and tsunami occur, telecommunication system and electricity become very important during emergency response.
- Disaster often damages the telecommunication network and electric facilities. These facilities may not work properly after disaster. Meanwhile, the first 3 days after disaster are important time to save life.
- Disaster relief becomes very difficult due to this condition. Whereas first aid needs to be done as soon as possible. Therefore, reliable communication technology is needed in this situation.
- Rapid technology equipped with their own electric power and telecommunication system is needed for near real time rapid assessment

RAPID TIME R



TECHNOLGY FOR INVESTIGATION, MONITORING AND EVALUATION OF EMERGENCY RESPONSE

- Rapid Timeer is one alternative technology proposed to solve the problem
- BPPT in collaboration with Panasonic, propose the project that tested during Mentawai Mega-thrust Disaster Relief Exercise held on March 2014. This project aims to verify functionality of wireless communication system specifically designed to work without relying on conventional commercial communication networks and aim to verity necessity of specific frequency band for these system. It allows government / municipality to collect information from the disaster site, and can support information sharing among concerning parties.
- These equipments is expected to help government / municipality: 1) to grasp situation at disastrous site, 2) to share information among key person of the government / municipality at the disastrous site, 3) to secure the way of commutation.

MMDIREX 2014

Mentawai Megathrust Disaster Relief Exercise



- MENTAWAI MEGATHRUST DiREX 2013-2014, was the biggest disaster drill in Indonesia.
- Was held in April 2014.
- 18 Countries participated to this Exercise.
- BPPT collaborated with Panasonic Gobel Indonesia, build rapid timer
- It was tested during MMDirex 2014

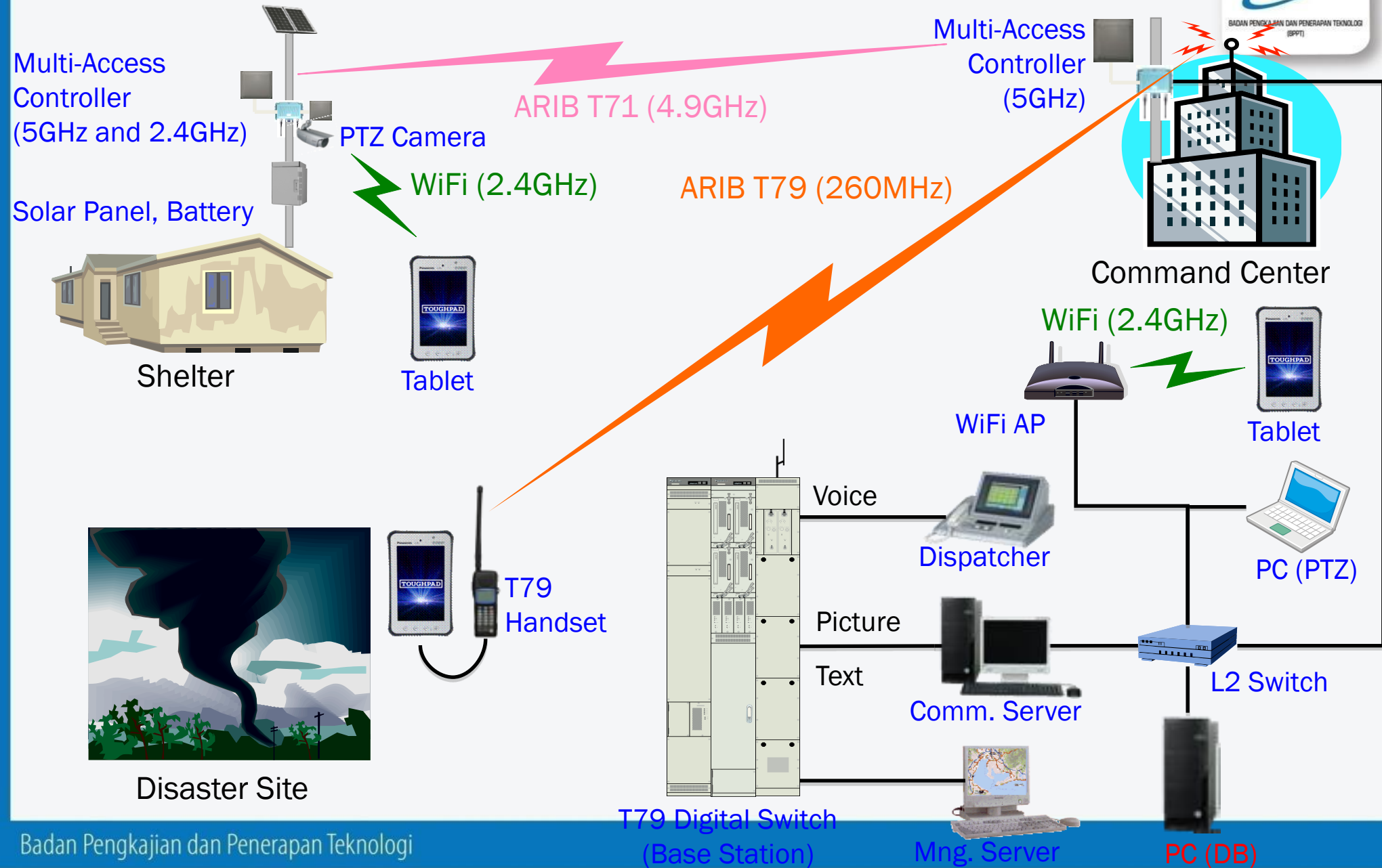
RAPID **TIME R**



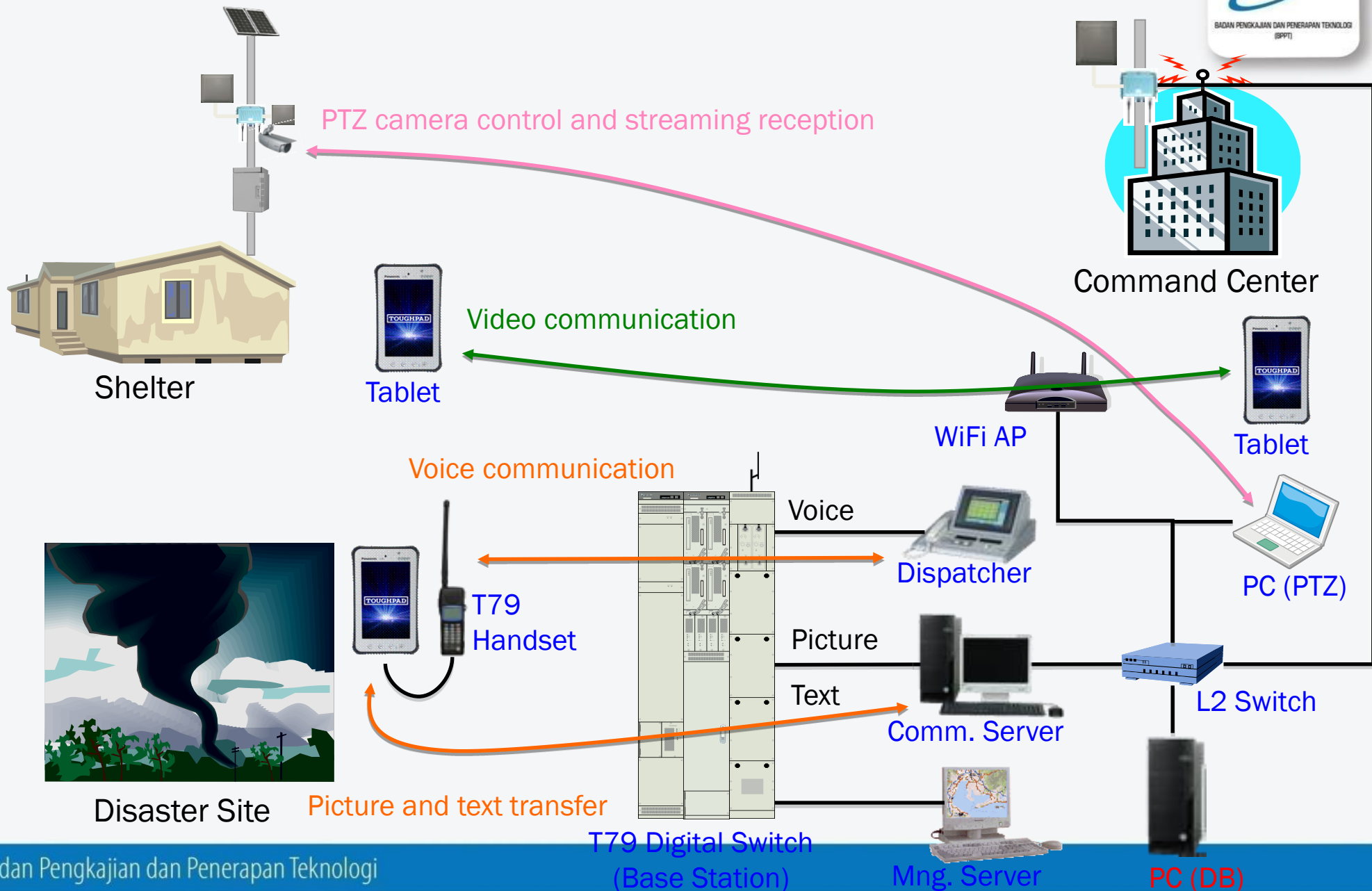
TECHNOLGY FOR INVESTIGATION, MONITORING AND EVALUATION OF EMERGENCY RESPONSE

- Rapid Assessment using radio communication as main communication system.
- Build Multifunction Technology. Used before and after the disaster.
- Complementing the conventional communication system that may be damaged during a disaster.
- Utilizing Radio Waves as telecommunications systems and Solar cells for electricity
- Off line mode. No need internet for map access and data communication

System Configuration



SYSTEM CONFIGURATION



- **Via ARIB T79 (260MHz Mobile Communication)**

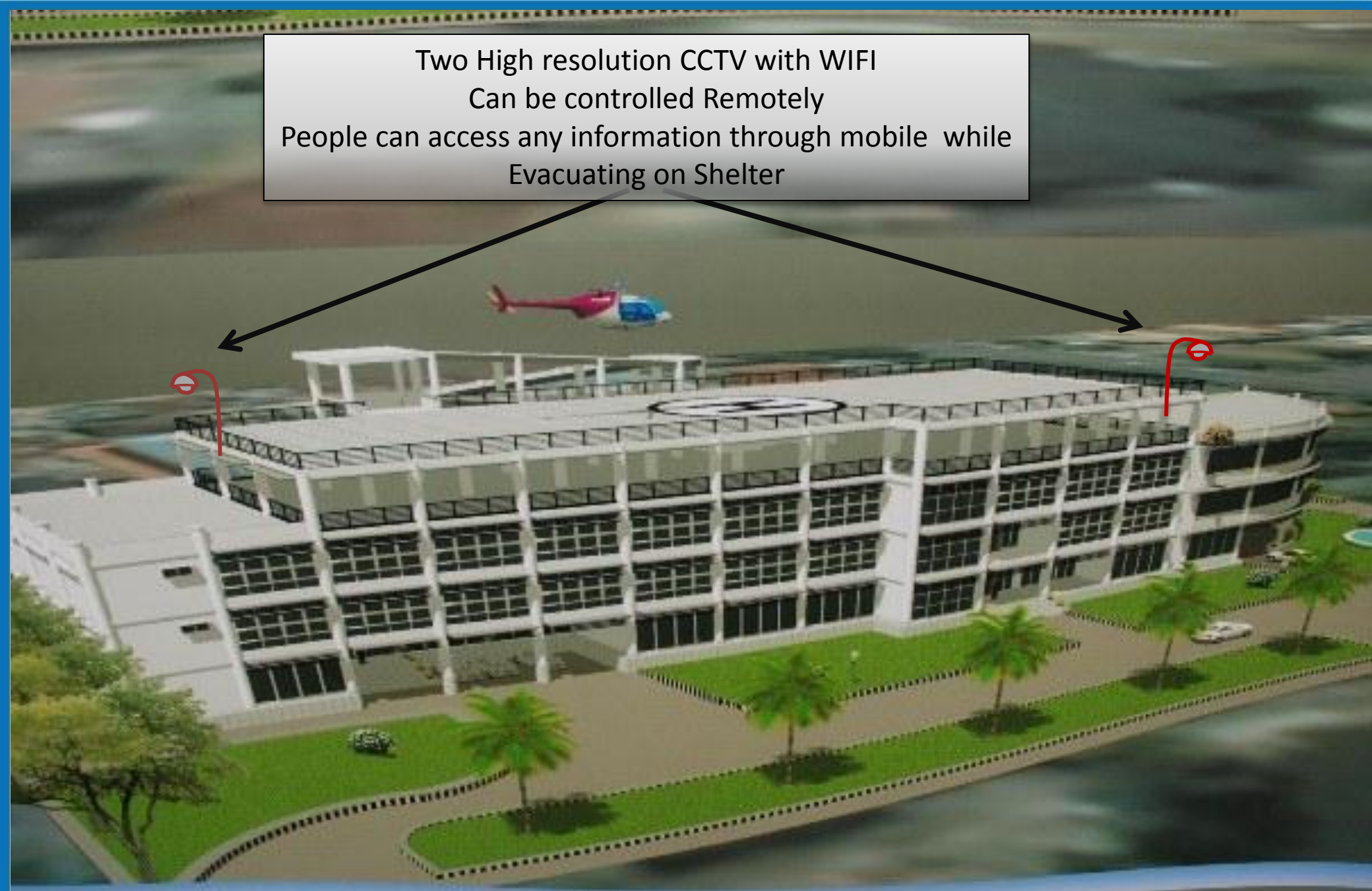
- All the equipment other than Android Tablet are displayed in Japanese
 - Panasonic shall prepare a user manual in English and shall offer training and practical assistance for BPPT
- All the equipment labeled in blue in the previous slide are prepared by Panasonic
 - A PC for DB is prepared by BPPT
- All the data related below are stored in a specified folder of the Communication Server
 - Still Image (with Latitude/Longitude if BPPT application supports)
 - Application Data (text format)
- The communication server is accessible from an external PC on a LAN
 - How to show the stored images and data depends on BPPT applications in an external PC
- The dispatcher records voice communication
 - No speech-to-text is supported and hence BPPT needs to do the conversion manually
- All the applications run on the Android Tablet is prepared by BPPT
 - Necessary information for application development shall be prepared by Panasonic until the end of November

- **Via ARIB T71 (4.9GHz Fixed Communication)**
 - All the equipment labeled in blue in slide no.2 are prepared by Panasonic
 - Application for PTZ camera control and streaming reception for PC are provided by Panasonic
 - An Android application for video communication such as Skype is prepared by BPPT

Equipment Installed during MMDIREX



Two High resolution CCTV with WIFI
Can be controlled Remotely
People can access any information through mobile while
Evacuating on Shelter





Monitoring Surrounding situation from Shelter



Rapid Mapping Equipment. Tablet connected to Handy Talky. Information about victim, condition after disaster, aids, can be sent to Crisis center by using radio (text and Image)



Clear Image, Can be used to monitor Tsunami event

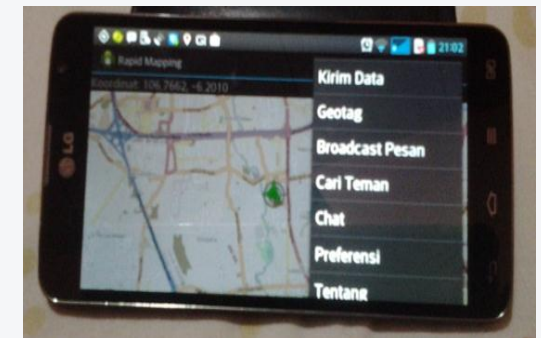
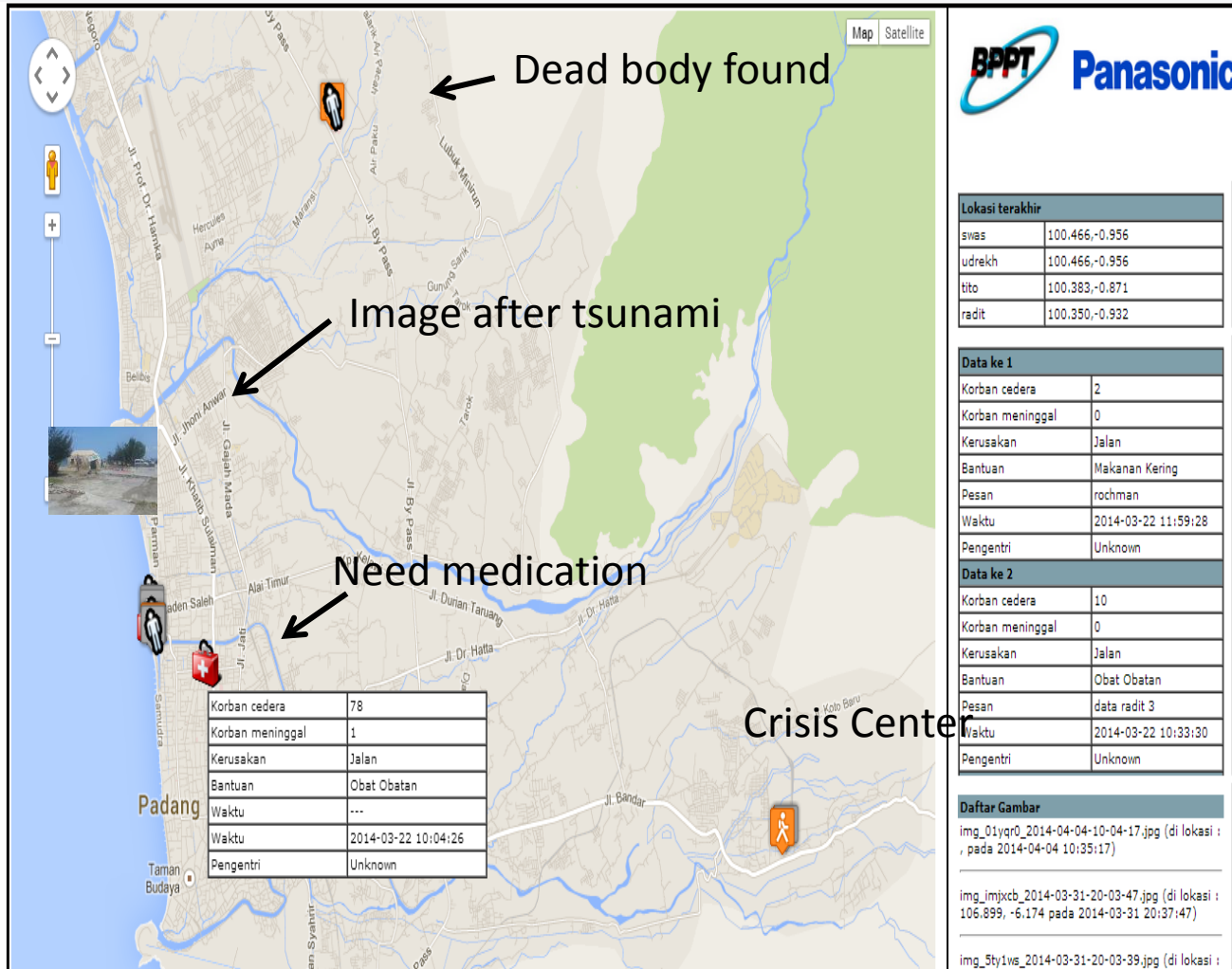
Demonstration
of Rapid Timer
to Vice
President
Budiono



【指令所】

Command Center, Semen Padang

Panasonic



TECHNOLGY FOR INVESTIGATION, MONITORING AND EVALUATION OF EMERGENCY RESPONSE (BPPT)

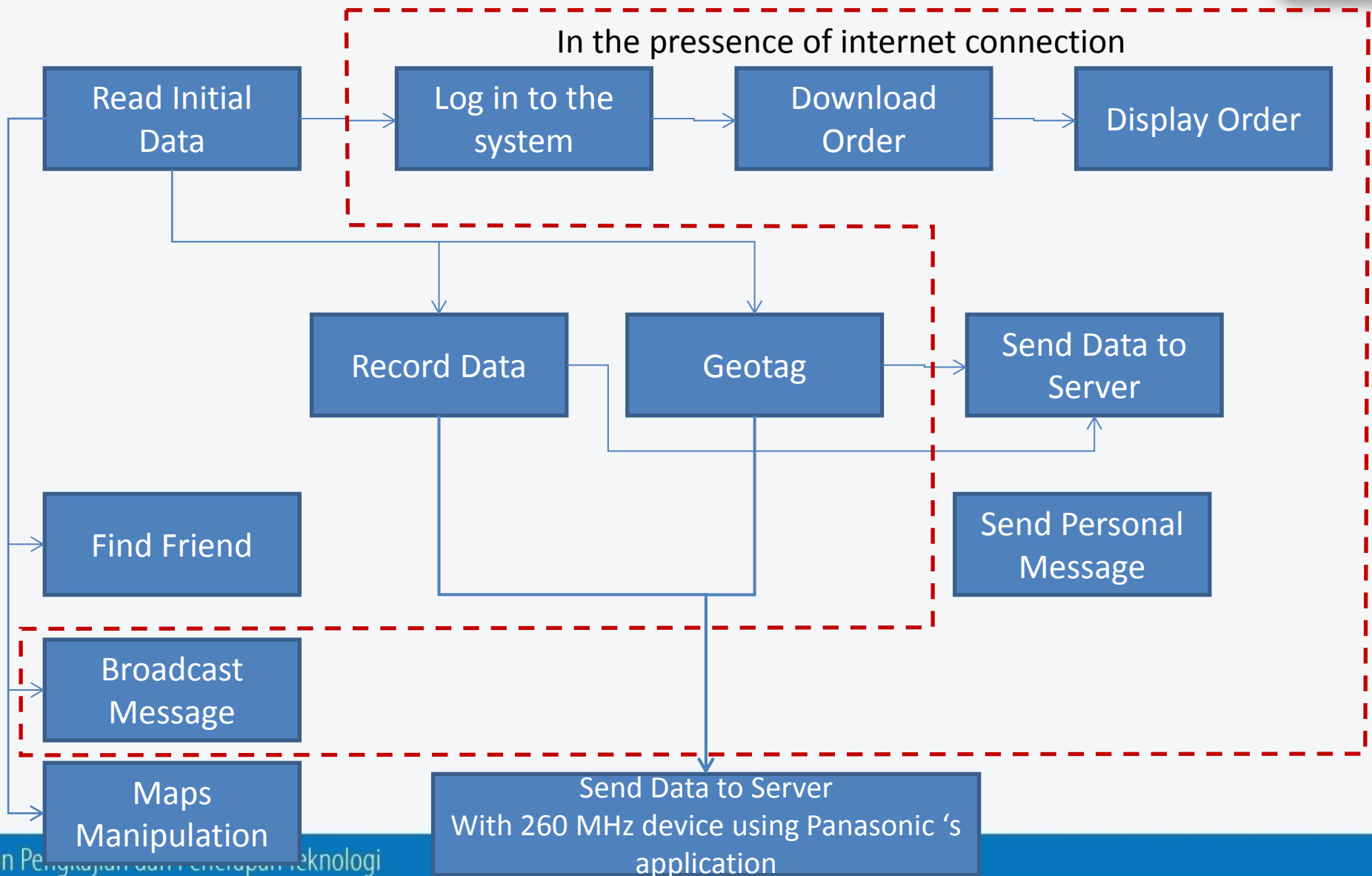
Specification

- ✓ Mobile phone application, built on Android 2.3 (minimum requirements)
- ✓ Offline map using OSM (Open Street Maps)
- ✓ SD Card or internal storage, minimal 500 MB
- ✓ Internet connection (optional) → transfer data (image or textual) to the server, transfer and synchronizing position (self and friends) to the server, synchronizing broadcasted message.
- ✓ Can be used simultaneously with Panasonic 260 MHz device by using Panasonic's application.

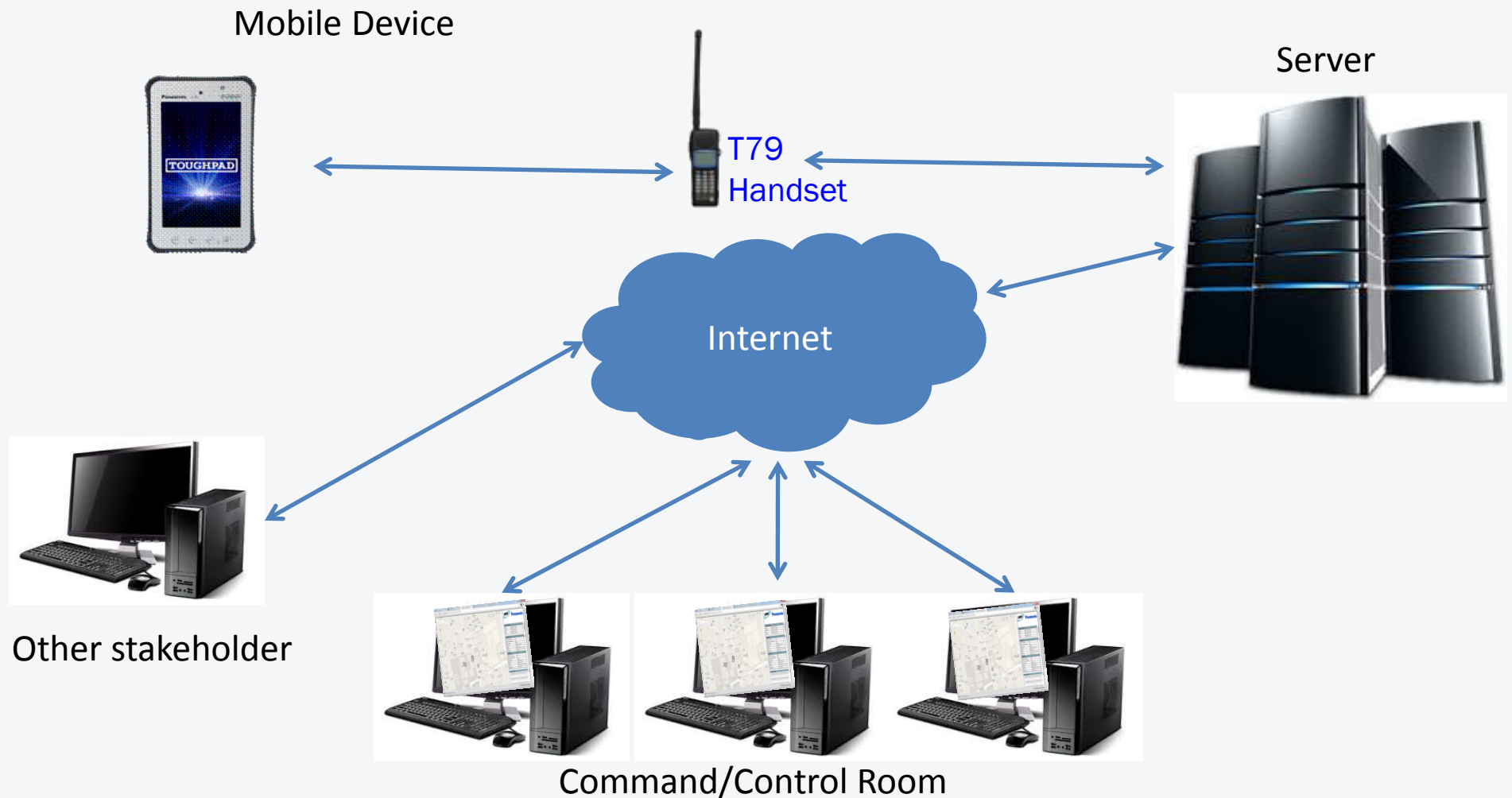
Features

- ✓ Customized recorded field, depending on the necessity of the goal of the data collection
- ✓ Geo-tagging, image with the world position attached to it
- ✓ Communication with other team member by way of texting message (if the internet connection is present and the user logged in to the system)
- ✓ Broadcasting message (if the internet connection is present and the user logged in to the system)
- ✓ Download order from the headquarter (position and requested order)

Process Flow



Data Communication Between Device and Server



Application Improvement

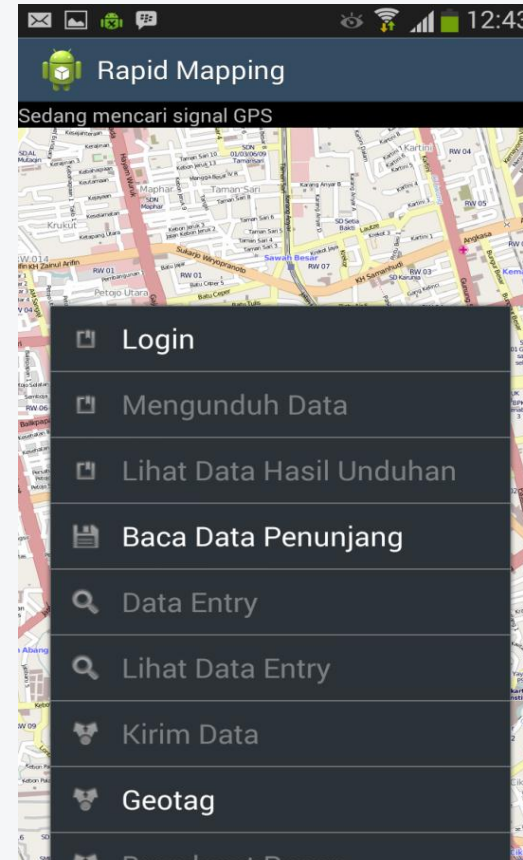
- ✓ Application of Rapid Timer could be used during MMDirex. However, improvement is needed.
- ✓ BPPT-Panasonic team worked together in Panasonic – Yokohama, in order to finalize the beta version of this application.
- ✓ Rapid Timer application finally could be improved.
- ✓ Data can be send with various size. Rapid timer can be used with Panasonic application perfectly.

Rapid Mapping GUI (Mobile Device)



Main Screen

User can manipulate the map view i.e zooming-in, zooming-out and panning by clicking the appropriate button or by dragging the finger to the desired destination

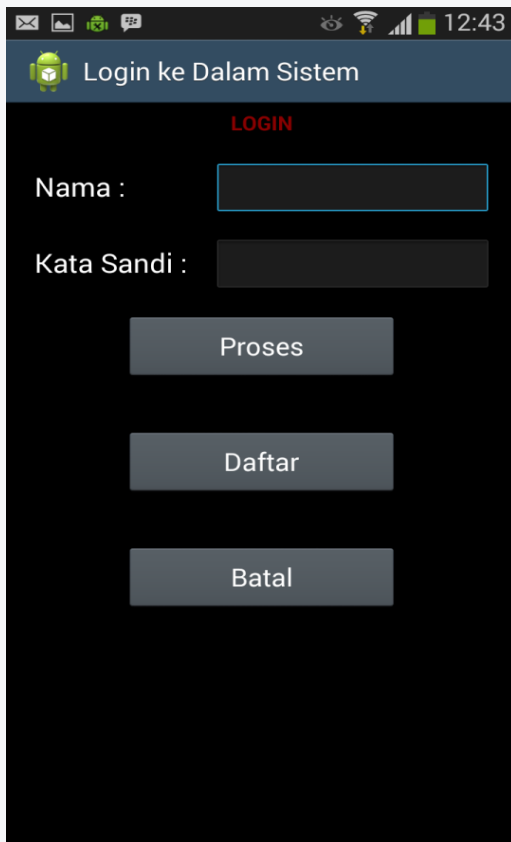


Menu Structure

Greyed out menu means that this menu is not applicable at this moment.

Certain menu becomes active when an action is successfully carried out (i.e. downloading data will become active after the user logging into the system)

Rapid Mapping GUI (Mobile Device)



Login ke Dalam Sistem

LOGIN

Nama :

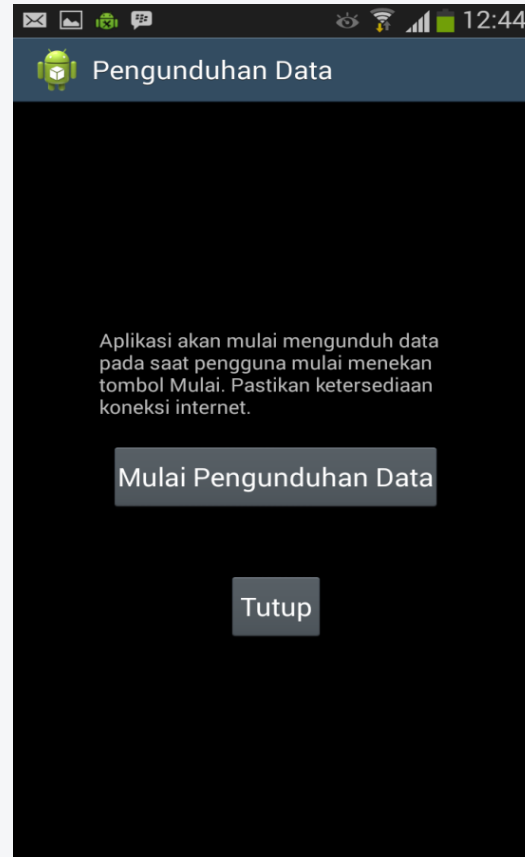
Kata Sandi :

Proses

Daftar

Batal

Login Page



Pengunduhan Data

Aplikasi akan mulai mengunduh data pada saat pengguna mulai menekan tombol Mulai. Pastikan ketersediaan koneksi internet.

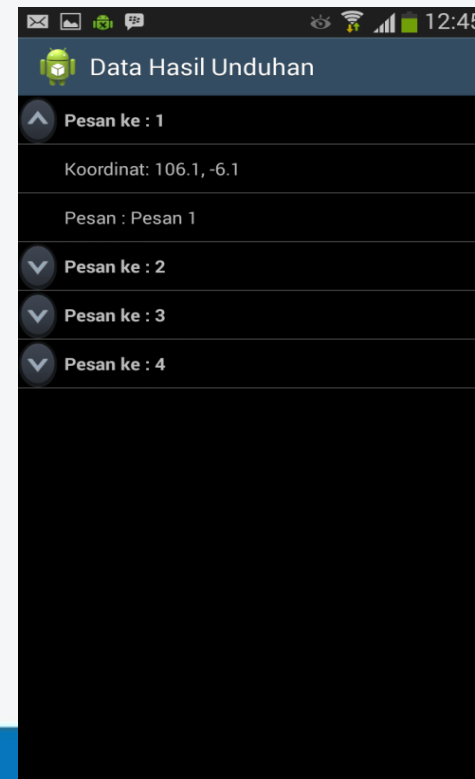
Mulai Pengunduhan Data

Tutup

Download Order Page

Orders will be received by the user after the downloading process is completed.

Orders will be given along with the position where the user should go.



Data Hasil Unduhan

^ Pesan ke : 1

Koordinat: 106.1, -6.1

Pesan : Pesan 1

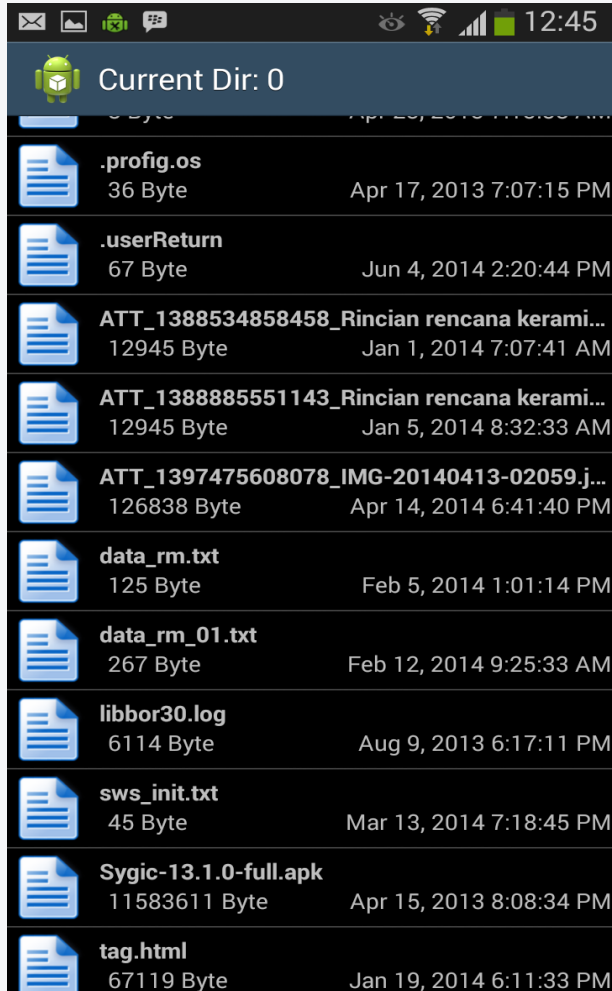
▼ Pesan ke : 2

▼ Pesan ke : 3

▼ Pesan ke : 4

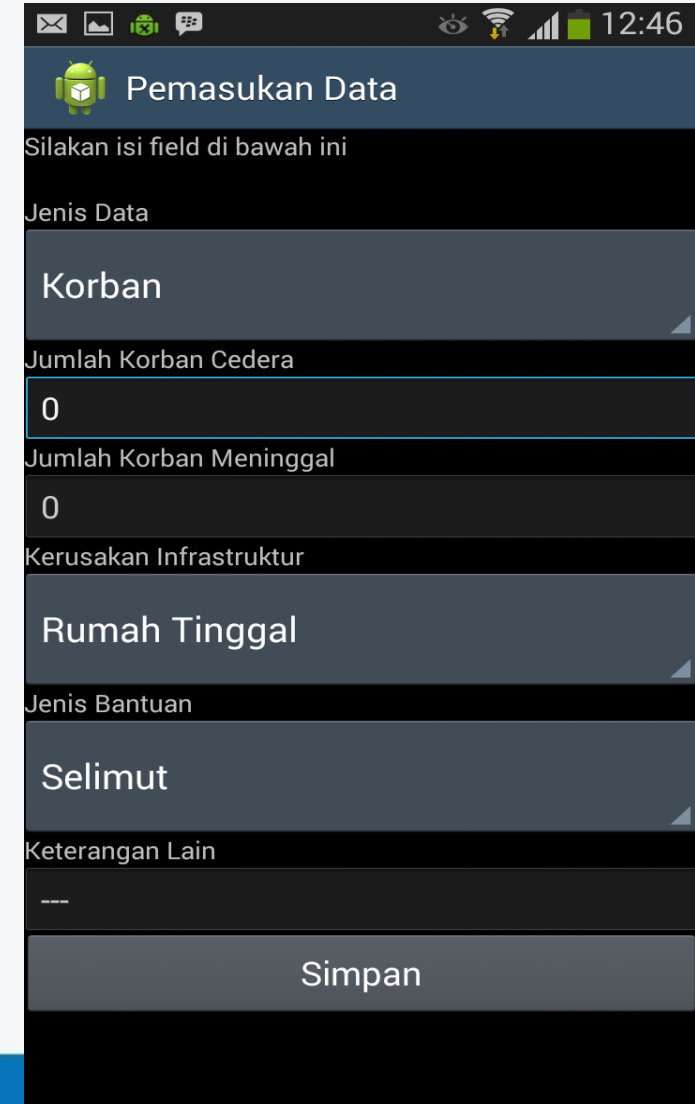
List of Order page

Rapid Mapping GUI (Mobile Device)



Reading Initial Data Page. Within this file a description what data should be recorded s saved

Data Entry Page



Pemasukan Data

Silakan isi field di bawah ini

Jenis Data
Korban

Jumlah Korban Cedera
0

Jumlah Korban Meninggal
0

Kerusakan Infrastruktur
Rumah Tinggal

Jenis Bantuan
Selimut

Keterangan Lain

Simpan



Panasonic



Conclusion and Recommendation

- Radio Communication is powerful technology for rapid assessment during emergency response.
- Various frequency is needed in order to send voice, image and data.
- Frequency allocation for disaster needs to be considered.
- Better improvement should be done, especially for sending image.
- This technology should be supported by reliable crisis center in every province.



Terimakasih!

merci
salamat
謝謝
grazie
thank
YOU
σας ευχαριστούμε
gracias