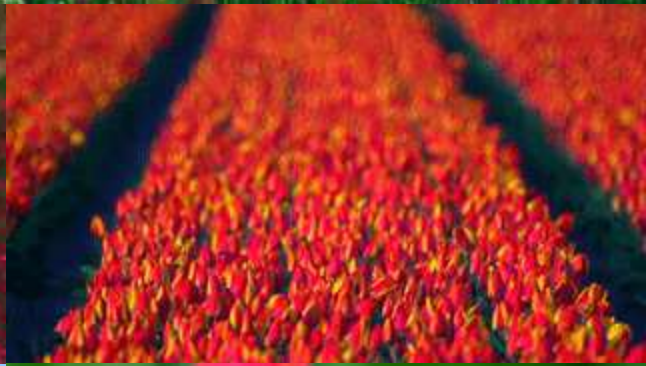


GeoEye/EyeQ

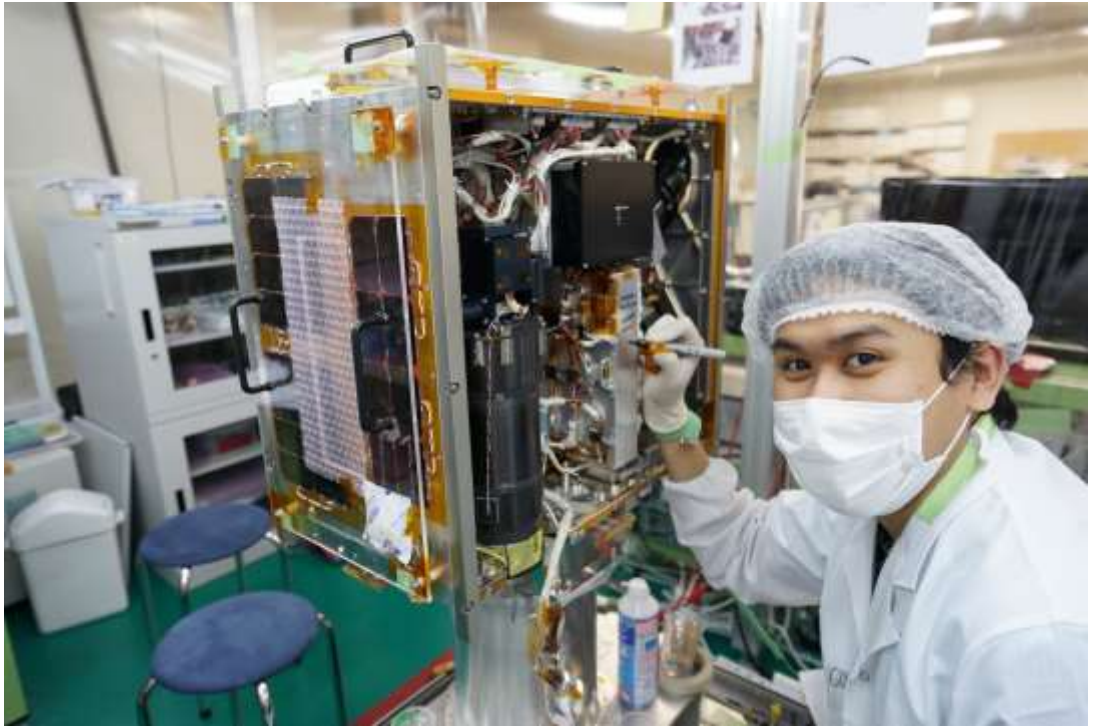
GeoEye/EyeQ

NYTimes.

They say, a picture is worth a thousand words,

*But **experience**, now that's a million words.*

Ariston Gonzalez

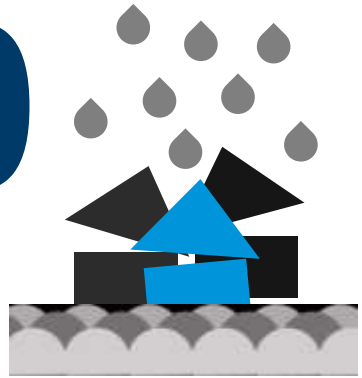


- Aerospace Research and Engineering background

PHILIPPINES

4th Most disaster-Prone country

20 average typhoon visit yearly



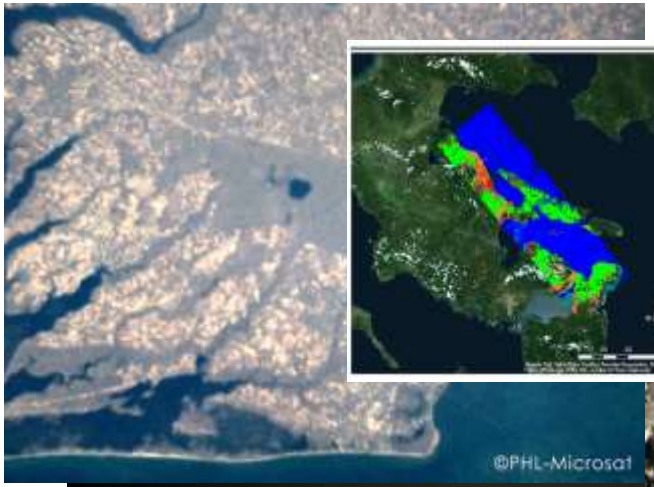
PACIFIC RING OF FIRE

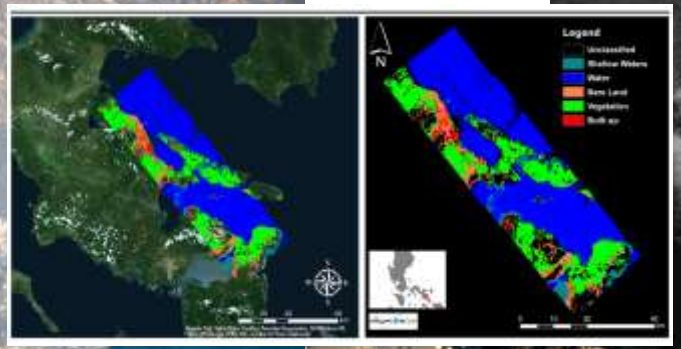
United Nations Office for Disaster Risk Reduction (UNISDR)

Amadore, L. "Socioeconomic impacts of extreme climatic events in the Philippines". November 25, 2005. http://www.adrc.asia/nationinformation.php?NationCode=608

DIWATA-1

© JAXA/NASA


©PHL-Microsat


Legend
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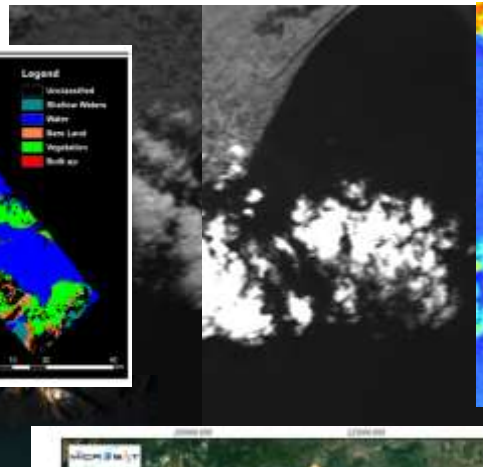
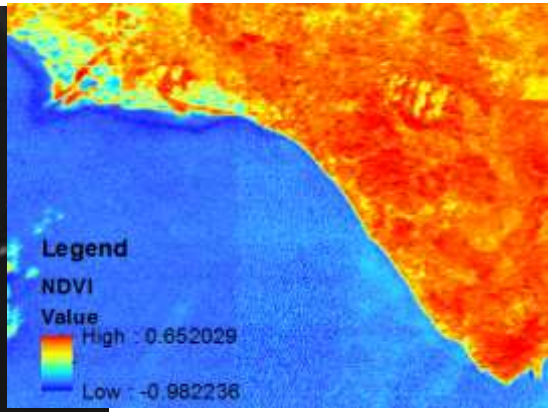
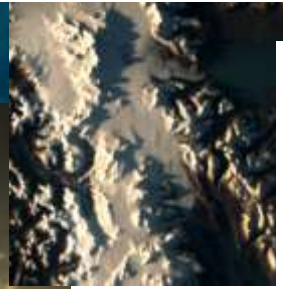
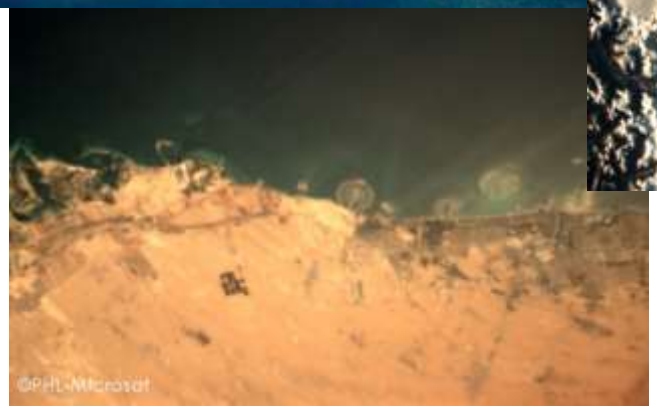



Legend
NDVI
Value
High : 0.652029
Low : -0.982236

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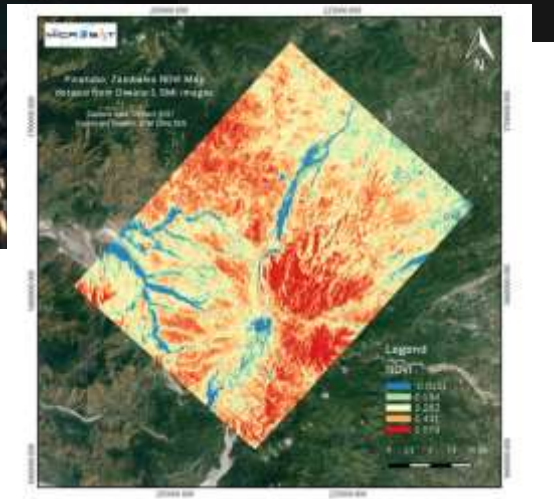

N
Legend

ADARNA
AEROSPACE

Why *do we do this?* DATA

Data saves **Time.**

Data saves **Resources.**

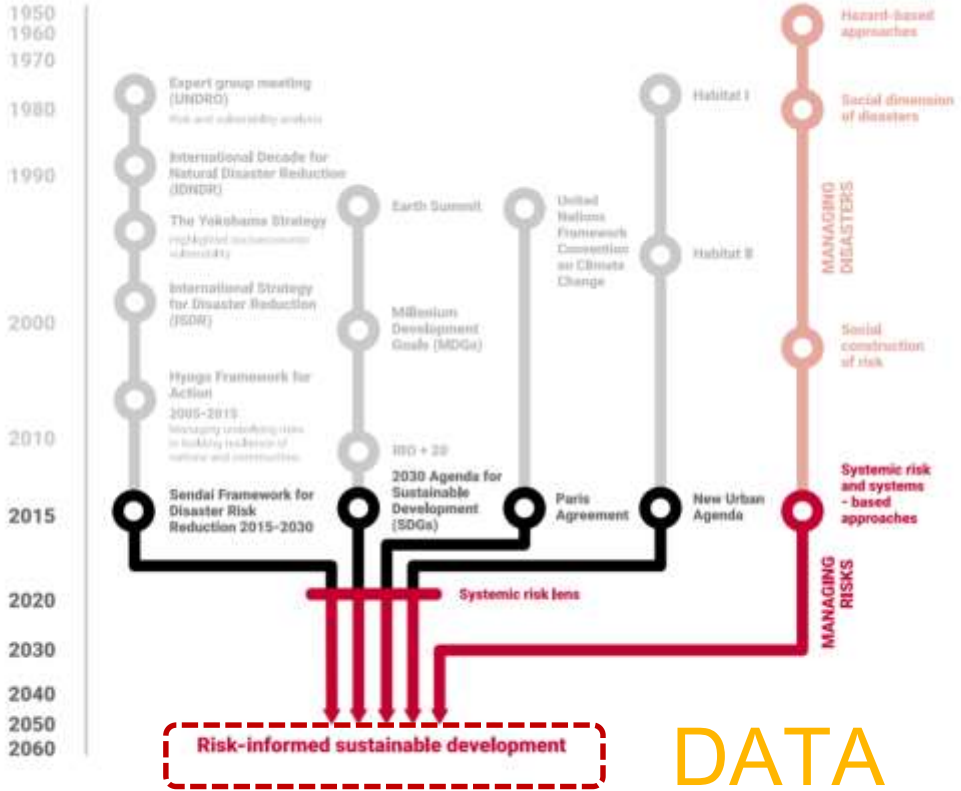
Data saves **lives.**

MISSION

*Help our organizations be fully **prepared** for any disasters **through satellite data**, **remote sensing**, and **realistic immersive training simulations**.*

*This way they are more **efficient**, **productive**, and **resilient**.*

Figure 1.1. Risk reduction – a journey through time and space



DATA

(Source: UNDRR 2019)

1 (United Nations General Assembly 2015a)

Risk and the context of hazard, exposure and vulnerability

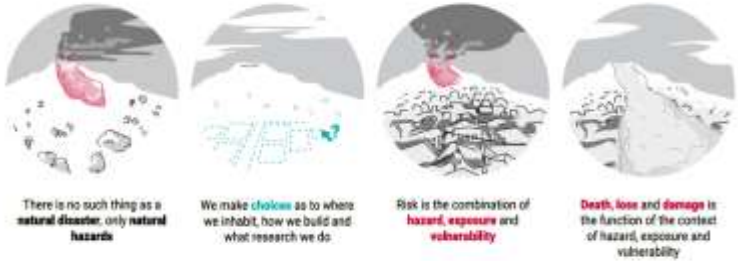
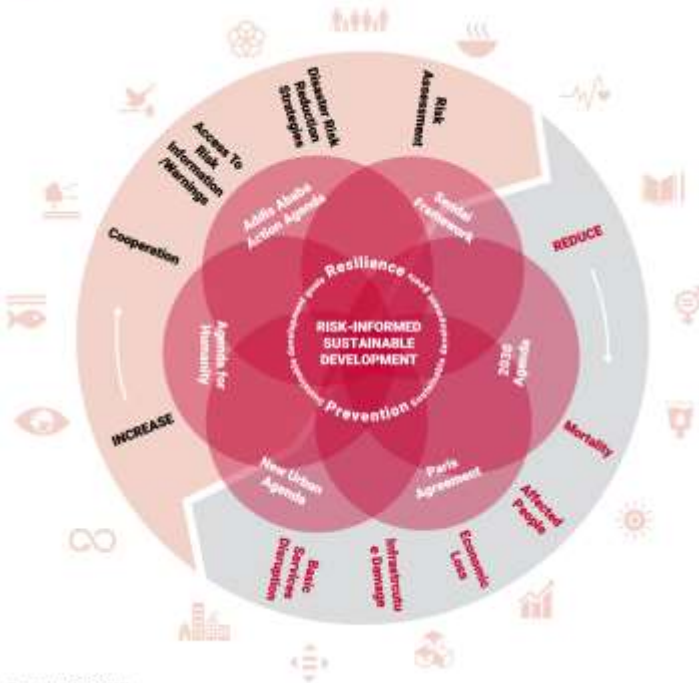


Figure 1.2. Risk-informed sustainable development



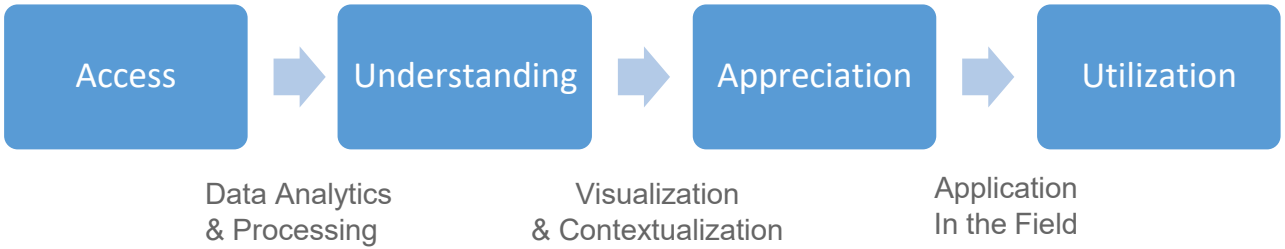
(Source: UNDRR 2019)

Problem:

Even though a lot of data is available,

many disaster responders

struggle with data utilization



Barriers to Data Utilization

EXPERTISE Barrier

Converting Level 0 (Raw) data to useable data requires experts, and applying the processed data for disaster management would require technically inclined users assisted by experts

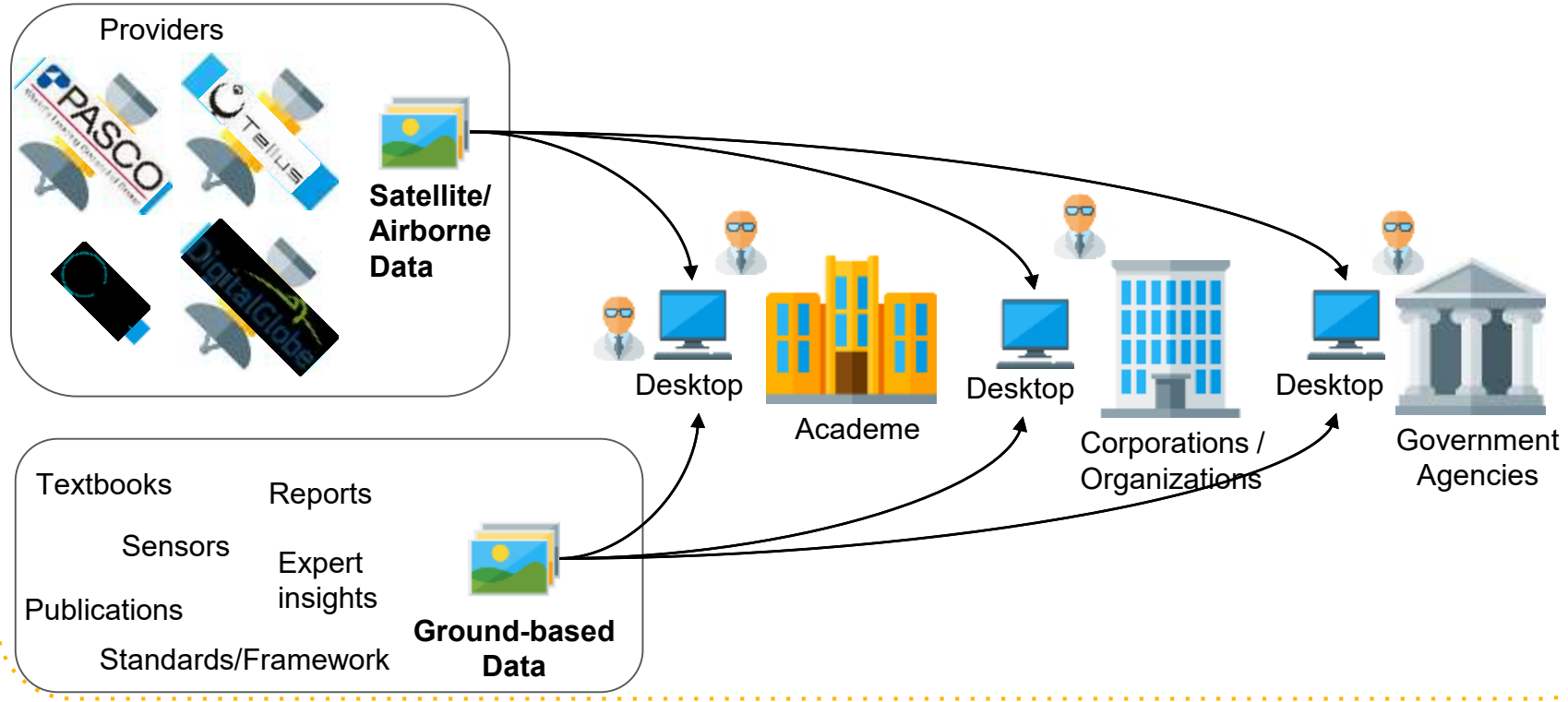
TECHNICAL Barrier

Interpreting and appreciating the processed data typically require specialized equipment and software

SCALABILITY Barrier

Disaster management involves at least hundreds, and even up to thousands of manpower to conduct training, perform rescue operations, and drive rehabilitation initiatives

Data Ecosystem (Present)



Data Ecosystem (Before Disaster)

Satellite/ Airborne Data

??

Desktop

Corporations / Institutions / Organizations

Specialized Experts:
Engineers
Scientists
Researchers

Maps + Graphs + Paper Documents

Intended Users:
Ground Responders
Disaster Operations Manager
Logistics Coordinators

Textbooks
Reports
Sensors
Expert insights
Publications
Standards/Framework

Ground-based Data

Imagine an earthquake is happening, take cover!

Disaster Preparedness Training (Typical)

Philippines **Japan**

Sources: https://www.researchgate.net/figure/Activities-to-prepare-the-pamphlets-of-tsunami-earthquake-by-volunteers-in-Japan_fig2_285613910
https://www.pdrf.org/preplab/

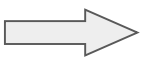
Data Ecosystem (During Disaster)

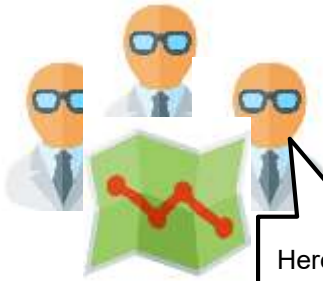
Satellite/ Airborne Data

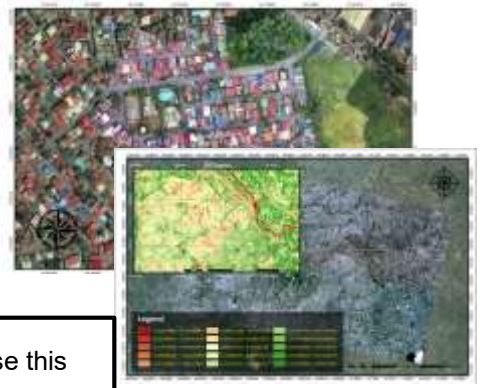
Desktop

Corporations / Institutions / Organizations

Specialized Experts:
Engineers
Scientists
Researchers





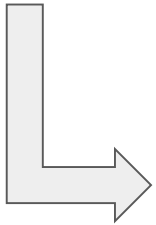


Here! Use this

Maps + Graphs + Paper Documents

Ground-based Data

Traditional Data Pipeline



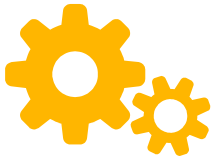
??

Intended Users:
Ground Responders
Disaster Operations Manager
Logistics Coordinators

Geodetic Engineers
Field Officers
Researchers

Maps + Graphs +
Paper Documents

Evolving Landscape of Disaster Management



Fast growing network and reach

Data Driven Decision making

Disaster unfolds in a non-linear manner

USER PAIN

*"I have a **forecasting** problem."*

*"I have a training **consistency** problem."*

*"I have a reach and **scalability** problem."*

*"I have a disaster **scenario accuracy** problem."*

Solution:

RS:AR

Remote Sensing *in* ***Augmented Reality***

Data Insights

Geospatial AR

Crowdsourced Data

From the movie “Avatar”

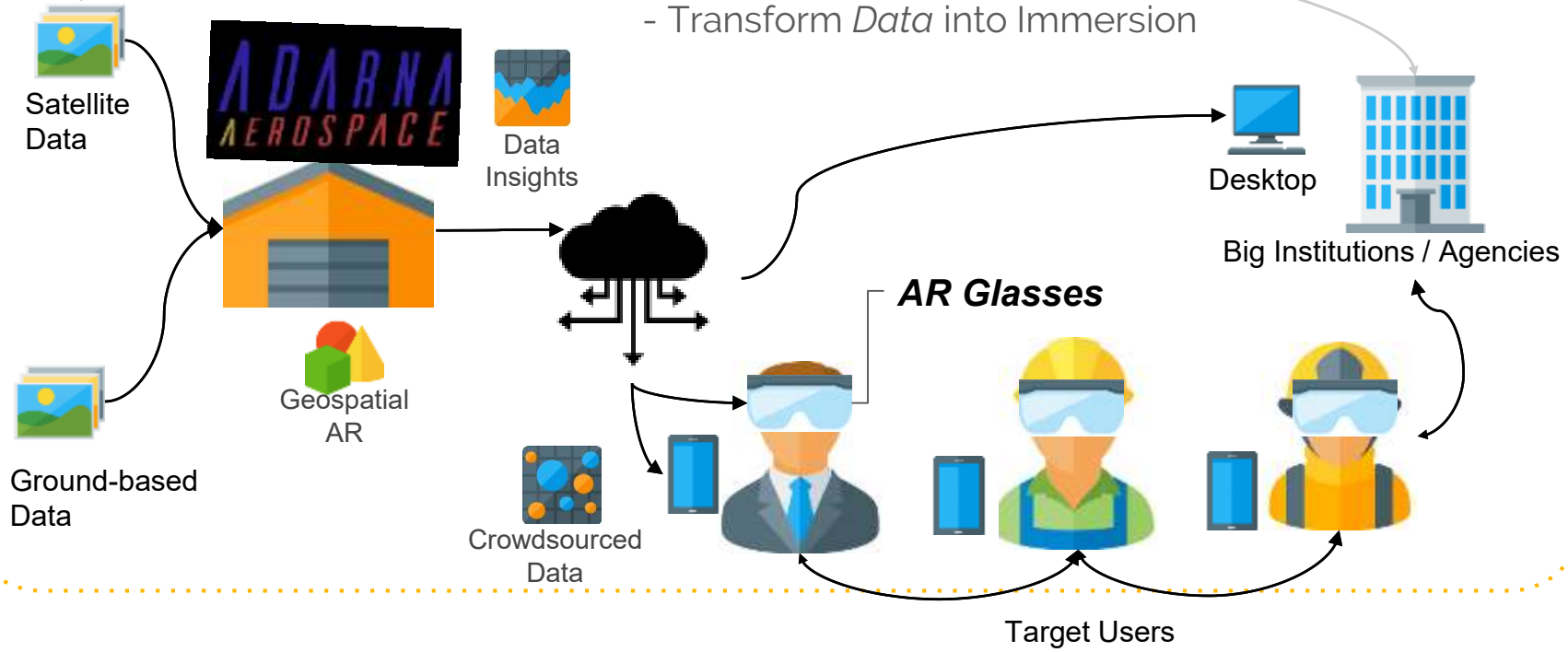
From the movie “Iron Man”

Microsoft HoloLens

Training and Preparedness (with RS:AR)

Remove the barriers:

- Put the *Experts* into Devices
- Transform *Data* into Immersion



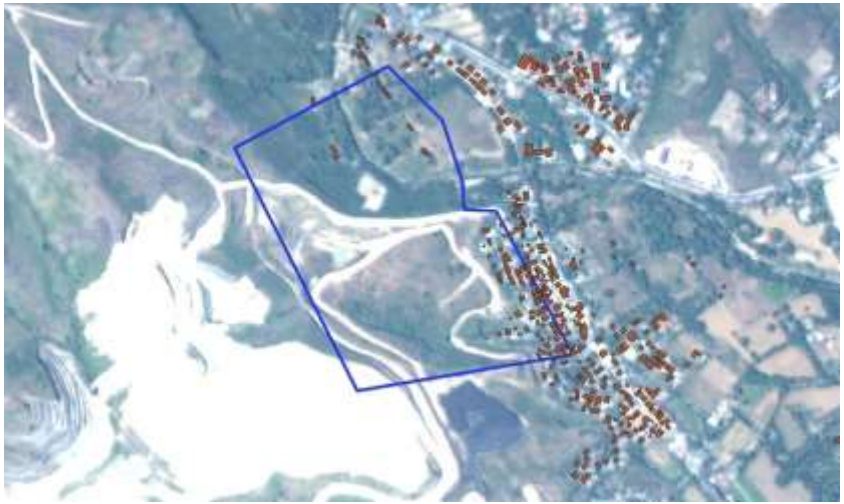
Disaster Management

It is common to use satellite data to show post-disaster conditions.

But a ground response team would still require experts on the field.

Data Insights

Landslide identification on Naga, Cebu



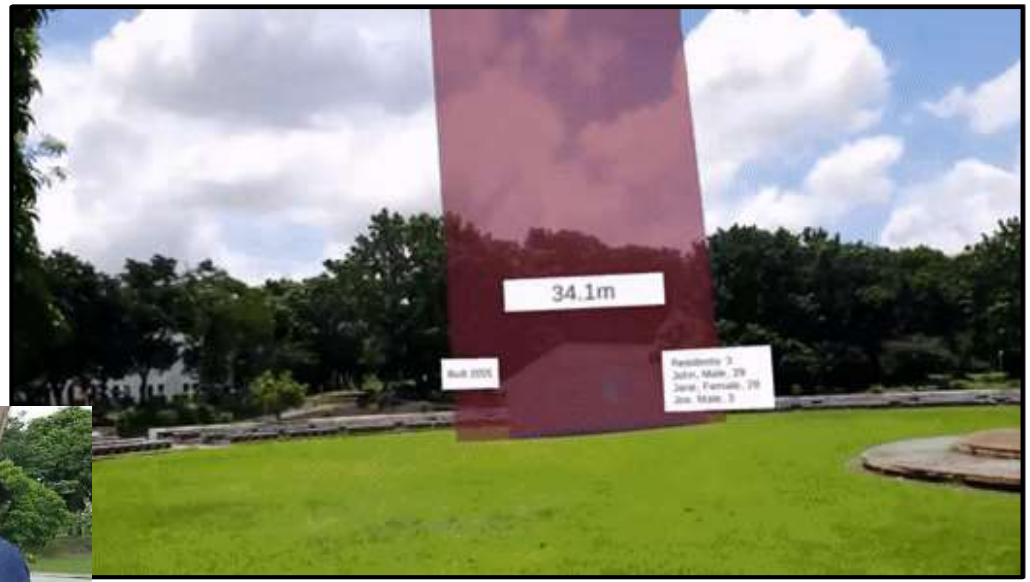
(20 September 2018)

(21 September 2018)

Disaster Management

With immersive technologies, we can directly **empower** ground response units, even without an expert.

Geospatial AR



Flood Planning

In this prototype demonstration, we are showing the flood visualization on a residential area, using satellite data re-projected into Augmented reality.

Geospatial AR

Conduct operations and planning anywhere.

Urban Flooding Scenarios

Escalating Fire and Evacuation Scenarios

Currently Engaging with:

CDRC CITIZENS' DISASTER RESPONSE CENTER

CITY OF BAGUIO 1909

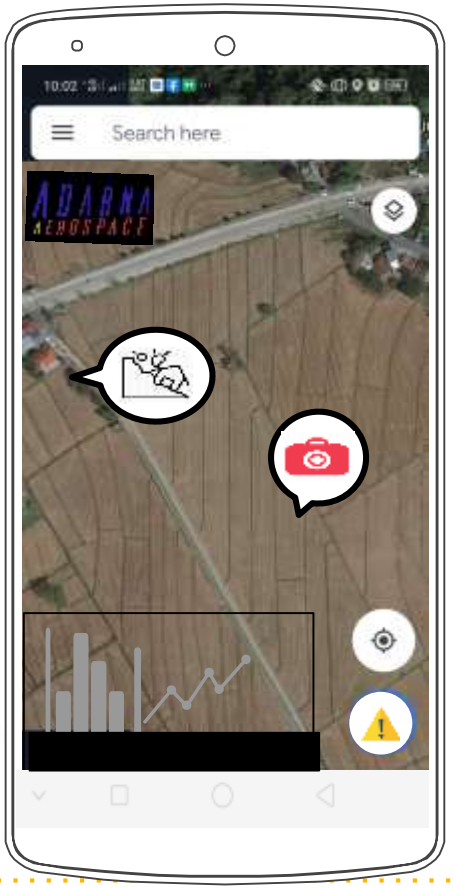
LUNGSOD NG MARIKINA 1630 · PILIPINAS · 1996

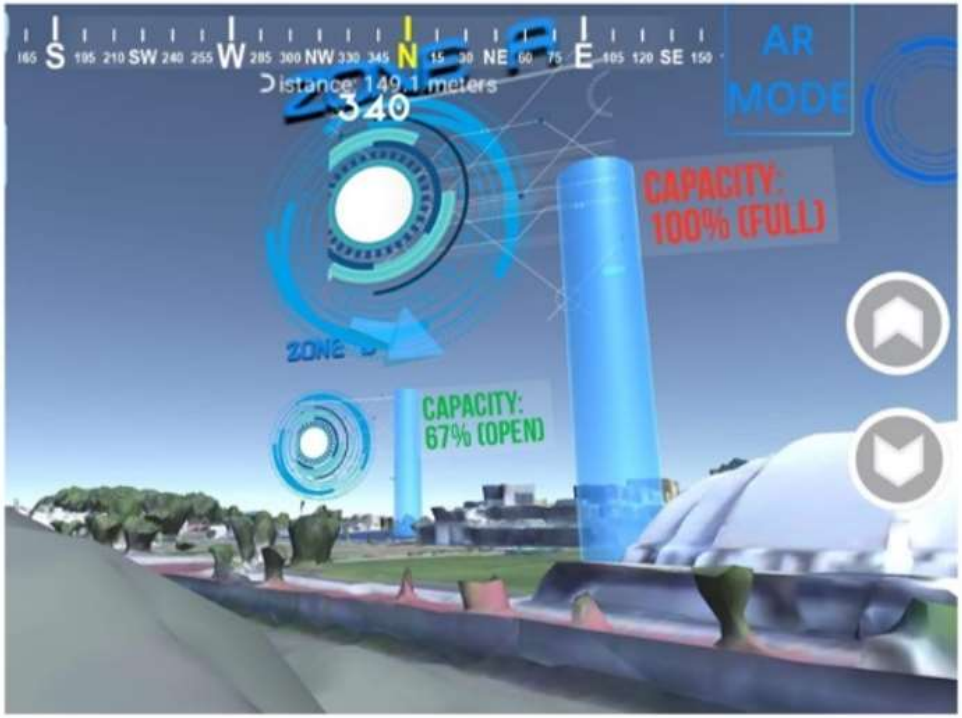
CDRC
CITIZENS'
DISASTER
RESPONSE
CENTER

Crowdsourced Data

+

Data Insights





RS:AR

Remote Sensing in Augmented Reality

Not just a visual tool..

but a collaborative,
informative,
immersive,

..extension of our senses

RS:AR, a better way to be resilient

From:

- **Delayed Utilization of Data**
- **Inaccurate Data**
- **Ineffective training method**
- **Gut-feel forecasting**
- **Independent operations**

To:

- **On-demand stream of information**
- **Up-to-date and relevant**
- **Strategic & Immersive Preparedness**
- **Data-driven forecasting**
- **Community-involved management**

*“Resilience isn’t just an outcome, it’s a **process**.”*

- A. Gonzalez
Adarna Aerospace

The Team

Ariston Gonzalez
- Launched two microsatellites into Low-Earth orbit
- Satellite Guidance systems
- MS Aerospace Engineering from ***Tohoku University***

Juan Paolo Espiritu
- Satellite BUS development
- Immersion Tech Developer
- Science Educator
- MS Aerospace Engineering from ***Tohoku University***

ADARNA AEROSPACE

Lizbeth Joyce Daluz
- Software/Test Developer
- Electronics Engineer
- Former Technical Patent Specialist *(Osaka, Japan)*

Benjamin Jonah Magallon
- Satellite Payload development
- Remote Sensing Scientist
- Geodetic Engineer
- MS Cosmoscience from ***Hokkaido University***

S-Booster 2019

Finalist from ASIA Round

Using ***satellite data*** *and*
augmented reality
to save lives.

ADARNA AEROSPACE

*Using **satellite data** and **augmented reality** to save lives.*

We are looking for:

Early adopters
Institutional Users
Partners

Contact us:

ARISTON GONZALEZ

www.adarna.xyz
ariston@adarna.xyz
+639991155006
+639174326112