



Vanessa Gray

Telecommunication Development Bureau, ITU

# Digital technologies & disaster management

Mobile

Drones

Big Data

Internet of  
Things

Robots

Blockchain

Social  
Media

Artificial  
Intelligence

# Drones

- Preparedness: monitoring volcanic activity in order to determine when warnings should be issued
- Response: delivering equipment to locations where ground-based transportation has been disrupted
- Recovery: photographing disaster areas for damage assessments

## Drones for disaster mapping and damage assessment in Vanuatu

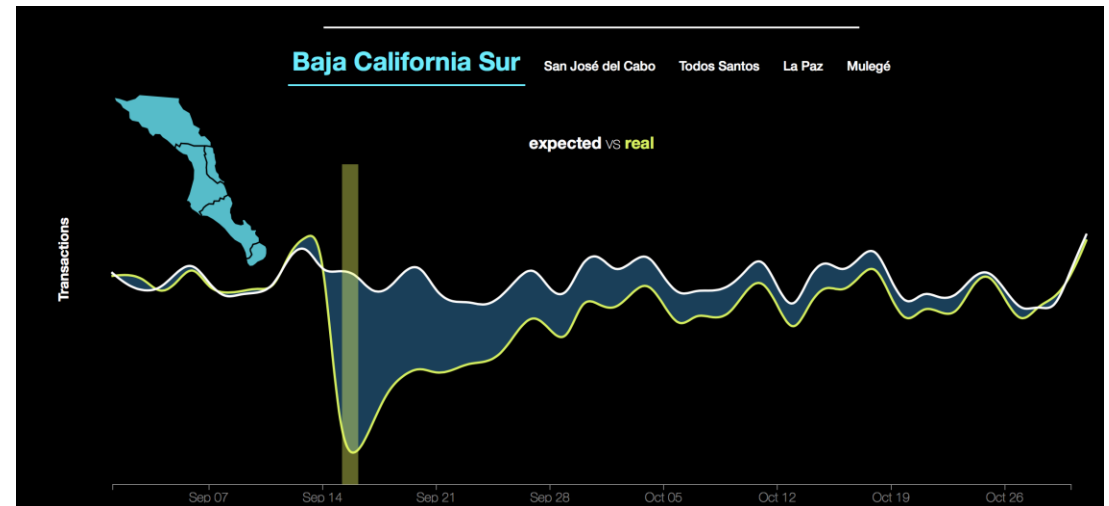


Note: Red structures are heavily damaged, blue structures moderately damaged, and yellow structures undamaged.  
Source: Matt Irwin, "Mapping Cyclone Pam's destruction with drones."

# Big Data

- Cellphone big data to monitor population movement
- Analysis of social media communications during disasters to identify threats
- Financial transactions to monitor economic activity during and after a disaster for targeted support

## Financial big data during hurricane Odele in Mexico

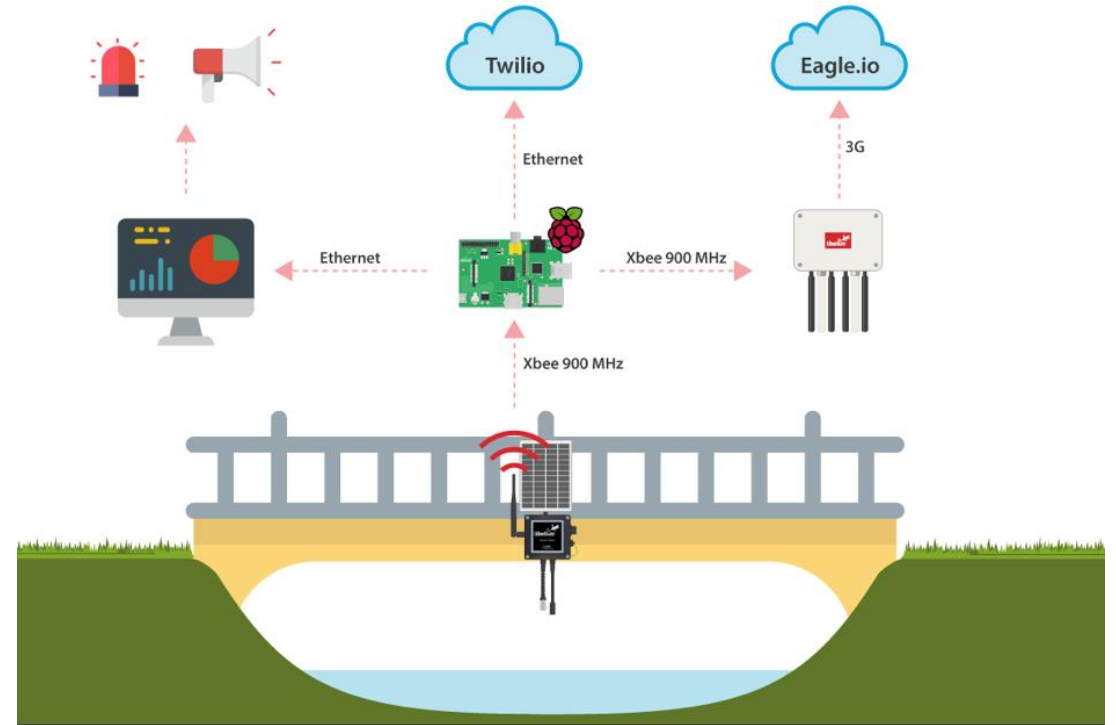


Source: BBVA Data & Analytics (<https://www.bbvadata.com/odile/>)

# Internet of Things

- Sensors sending alerts about potentially dangerous situations: fires, floods, earthquakes etc

## IoT for river flooding control in Colombia



Source: Libelium (<http://www.libelium.com/early-warning-system-to-prevent-floods-and-allow-disaster-management-in-colombian-rivers/> ).

# Artificial Intelligence

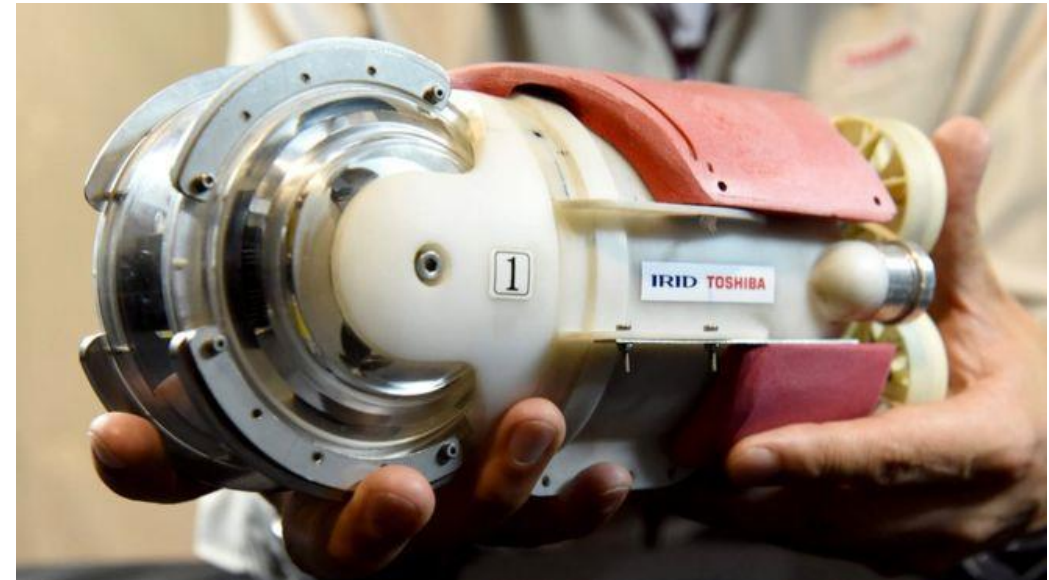
- Tremendous potential for disaster management
- Mapping tools
- AI for detecting and possibly predicting earthquakes



# Robots

- Robots research in areas where humans cannot go
  - Searching rubble
  - Detecting sounds, filming and carrying infrared carbon dioxide sensors to detect survivors
  - Assess damaged buildings or contaminated areas

No job for humans – little sunfish searches Fukushima reactor in Japan



Source: BBC.

## Social Media

## Crowd-sourcing Crowd-funding

- Sharing information, videos and links
- Donating information & money





Blockchain

Crowd-funding

- Improving data sharing and information control during disasters
- Donations in cryptocurrencies

# Key findings

## **Examples illustrate how disruptive technologies today are**

- refining processes by spreading critical information more quickly
- improving understanding of the causes of disasters
- enhancing early warning systems and damage assessment
- adding to the knowledge base of the social behaviours and economic impacts

## **Application of disruptive technologies to disaster management vary in pace, scope and impact:**

- Social media, drones and IoT are increasing in use
- Big data, robots and AI remain largely experimental

# Recommendations

- Systemization and standardization to improve the application of disruptive technology interventions.
- **Reach** of digital technologies must be factored in to disaster management strategies.
- A **global repository** featuring information how digital technologies are being applied for disaster management to raise awareness and understanding.
- **Partnerships** with the private sector and academia are critical for understanding and applying digital technologies.
- Scaling disruptive technologies is essential to have widespread impact and be reasonably affordable.
- Training is indispensable for the disaster community to understand how to properly deploy new and emerging digital technologies.
- Legal ramifications of technological research and interventions for disasters need to be understood.