



UN Public Administration Programme

Division for Institutions and Digital Government
UN Department of Economic and Social Affairs (UNDESA)



Leveraging ICT Innovations for Disaster Risk Reduction

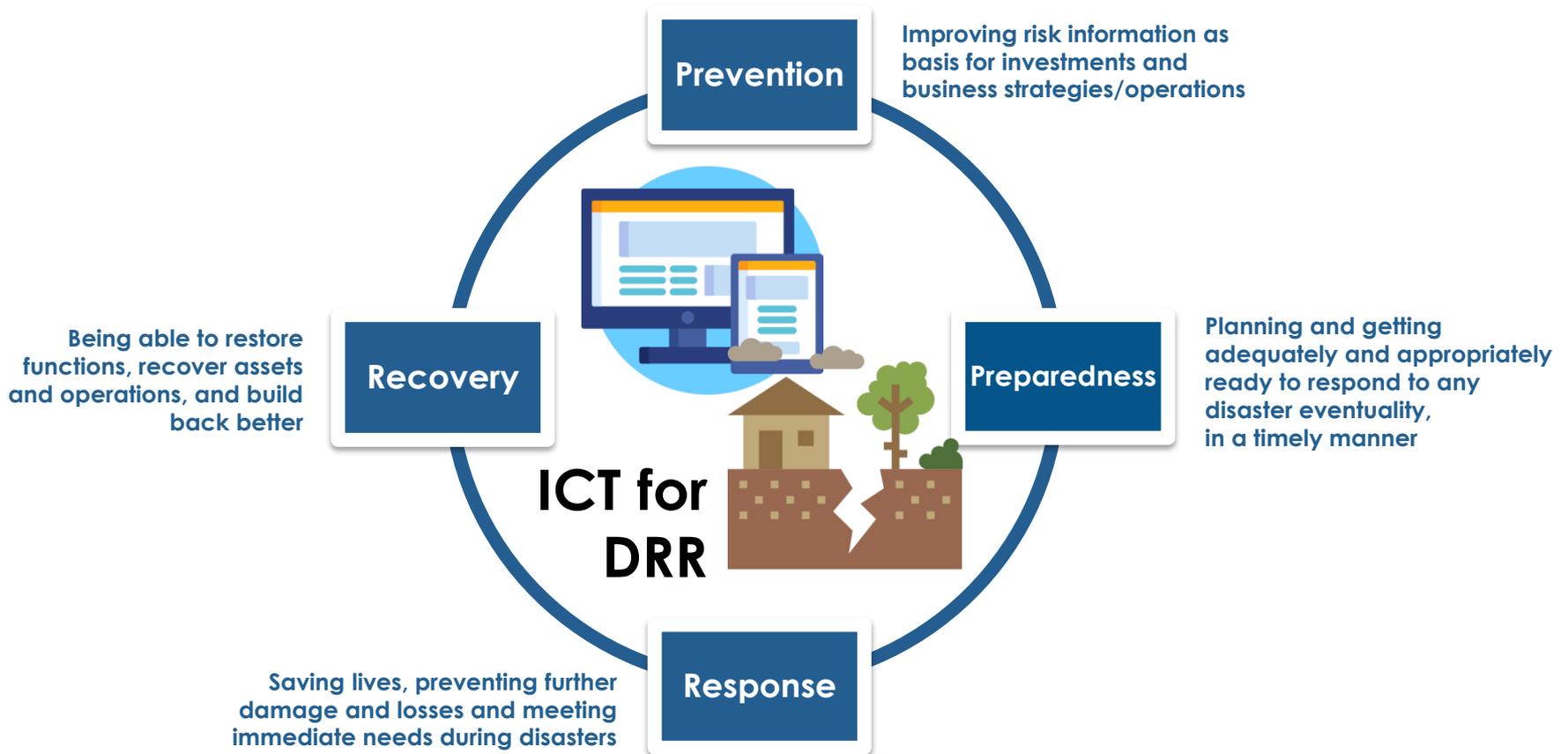
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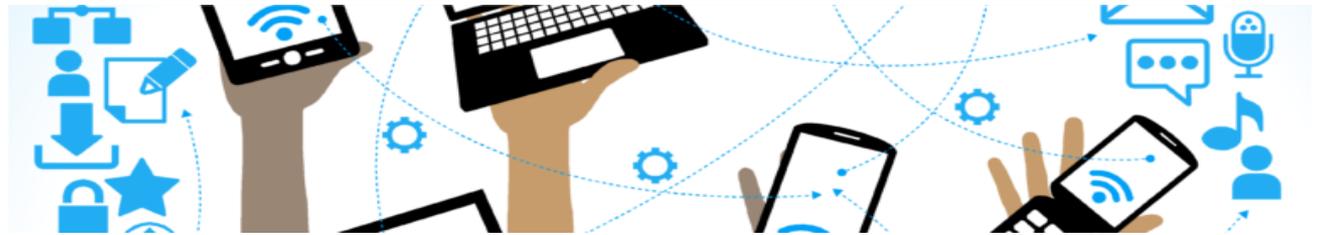


The Role of ICT in Disaster Risk Reduction

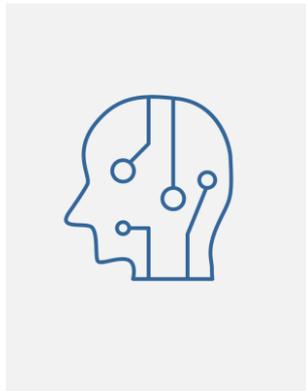




Frontier Technologies for DRR



**Open
Government Data**



**Artificial
Intelligence**



**Geographic
Information
System**



Blockchain



**Unmanned
Aerial Vehicle**



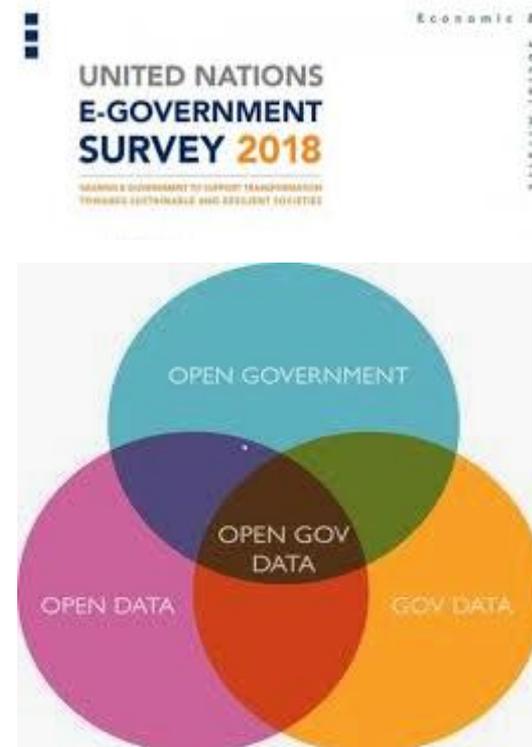
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Open Government Data (OGD)

Government information which is **proactively disclosed** and **made available online for everyone's access**, reuse and **redistribution without restriction**

Two main elements of OGD:

- **Government data:** any data and information produced or commissioned by public bodies.
- **Open data:** data that can be **freely used, re-used** and distributed by anyone, only subject to (at the most) the requirement that users attribute the data and that they make their work available to be shared as well.



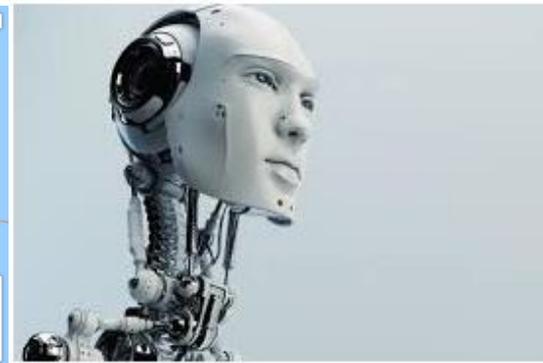
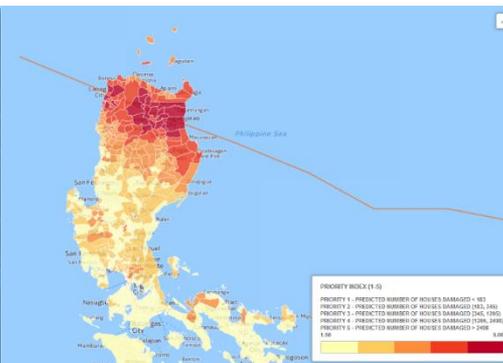


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Artificial Intelligence (AI)

Artificial Intelligence refers to “a set of **computer science techniques** that enable systems to perform tasks normally requiring human intelligence, such as **visual perception, speech recognition, decision-making and language translation**”. Includes, (IoT), fixed, broadband, cloud computing, and big data.

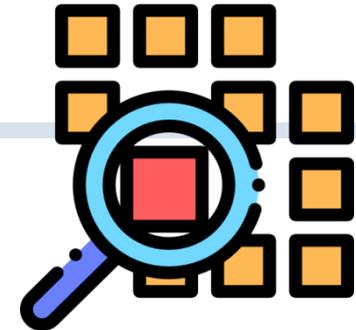
AI prediction of Typhoon Impacts in Philippines



<https://progrss.com/connectivity/20161202/artificial-intelligence-disaster-philippines/attachment/priority-index-disaster-artificial-intelligence/>
https://www.google.co.kr/search?biw=1024&bih=662&tbn=isch&sa=1&ei=0J1rW73zF82g-Qbmxo-4CA&q=AI&oq=AI&gs_l=img.3...2887.5841.0.6622.0.0.0.0.0.0.0.0...0...1c.1.64.img..0.0.0...0.v8y5ueugh7E



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Big Data and Analytics

- Governments provide a large variety of programs and services, which both produce and require massive amounts of data, often unstructured and increasingly in real-time.
- **Big data** analytics can improve efficiency and effectiveness across the broad range of government responsibilities, by improving existing processes and operations and enabling completely new ones.
- Numerous sources of data not just from specialized sensors, but also **human activity data** such as data from mobile phone operators, as well as online/social media activity such as Twitter, can provide timely information of relevance to disaster recovery as well as DRR.



Big Data continued

Big Data+IoT Case: Indonesia “PetaBencana.id”

- A tool that combines data from hydraulic sensors with citizen reports over social media and civic applications, including via Twitter, to produce real-time flood maps in Jakarta
- In 2016, the project's Twitter feed for Jakarta (@PetaJkt) had more than 50 000 followers and received nearly 10 000 tweets providing flood information to the platform
- The Jakarta branch of the National Disaster Management Agency (Badan Nasional Penanggulangan Bencana – BNPB) partners with academia – the project is led by the Urban Risk Lab at MIT – the non-governmental organisation (NGO) PetaBencana.id



<http://www.oecd.org/gov/innovative-government/embracing-innovation-in-government-indonesia.pdf>

https://www.google.co.kr/search?q=PetaBencana.id&hl=en&source=lnms&tbn=isch&sa=X&ved=0ahUKewjiz4PMuvTcAhVMOBwKHX11DiAQ_AUICygC&biw=1128&bih=635#imgrc=t-PW_b5WxFEaGM:



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Blockchain for DRR

The **blockchain is a digital ledger of transactions** that is distributed, verified and monitored by multiple sources simultaneously. Traditionally, ledgers have enabled and facilitated vital functions, with the help of trusted third parties such as financial institutions and governments. These include: ensuring us of who owns what; validating transactions; or verifying that a given piece of information is true”.





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Geographic Information System (GIS)

- GIS is a vital application for **transforming images generated through remote sensing to an information system** that can be used to produce interactive maps, conduct spatial analyses, present results in a variety of ways, and manage the data.
- The use of GIS and remote sensing have allowed **a more comprehensive mapping of disaster risks** to better support decision-making and improve coordination among agencies.
- **For mitigation**, GIS can be used to identify high risk areas and prioritize them for mitigation activities.
- **For preparedness**, GIS can be used to identify evacuation routes, shelters outside the hazard zone, and resources available (people, equipment, supplies) in the area and its vicinity that can be mobilized in the event of a disaster.
- **For response**, GIS is useful in prioritizing areas for search and rescue, and planning the route for evacuation, delivery of relief supplies and medical assistance. In recovery, GIS can be used to plan reconstruction.
- Some of the challenges of using GIS include **the lack of trained personnel**; difficulties in **exchanging data between different systems**; and the quality and detail of the data required by GIS analysis.



Climate change & Disaster Preparedness: The Philippines Case: Project Noah

Project NOAH (Nationwide Operational Assessment of Hazards)

- Department of Science and Technology (DOST) in 2012.
- It is a disaster risk reduction and management tool works to raise Filipinos' awareness of natural hazards.
- **The goal is to provide high-resolution flood hazard maps of 18 major river basins in Philippines.**
- Advanced disaster science research + assessment of hazards.
- Results are developed into accessible tools that are relevant for local government units, community leaders, policy makers, planners, and families to prevent and mitigate disasters.





The Philippines Case: Project Noah (cont.)



- Timely storm surge advisories in affected localities
- Local-barangay hazard maps
- **Apps and tools that make disaster preparation easier**

UNISDR: "This time **last year over 1,400 people died on Mindanao in a similar event** but this time big improvements in the early warning systems have saved many lives. **More than 167,000 people have been evacuated to shelters.**"

Typhoon Bopha in 2012

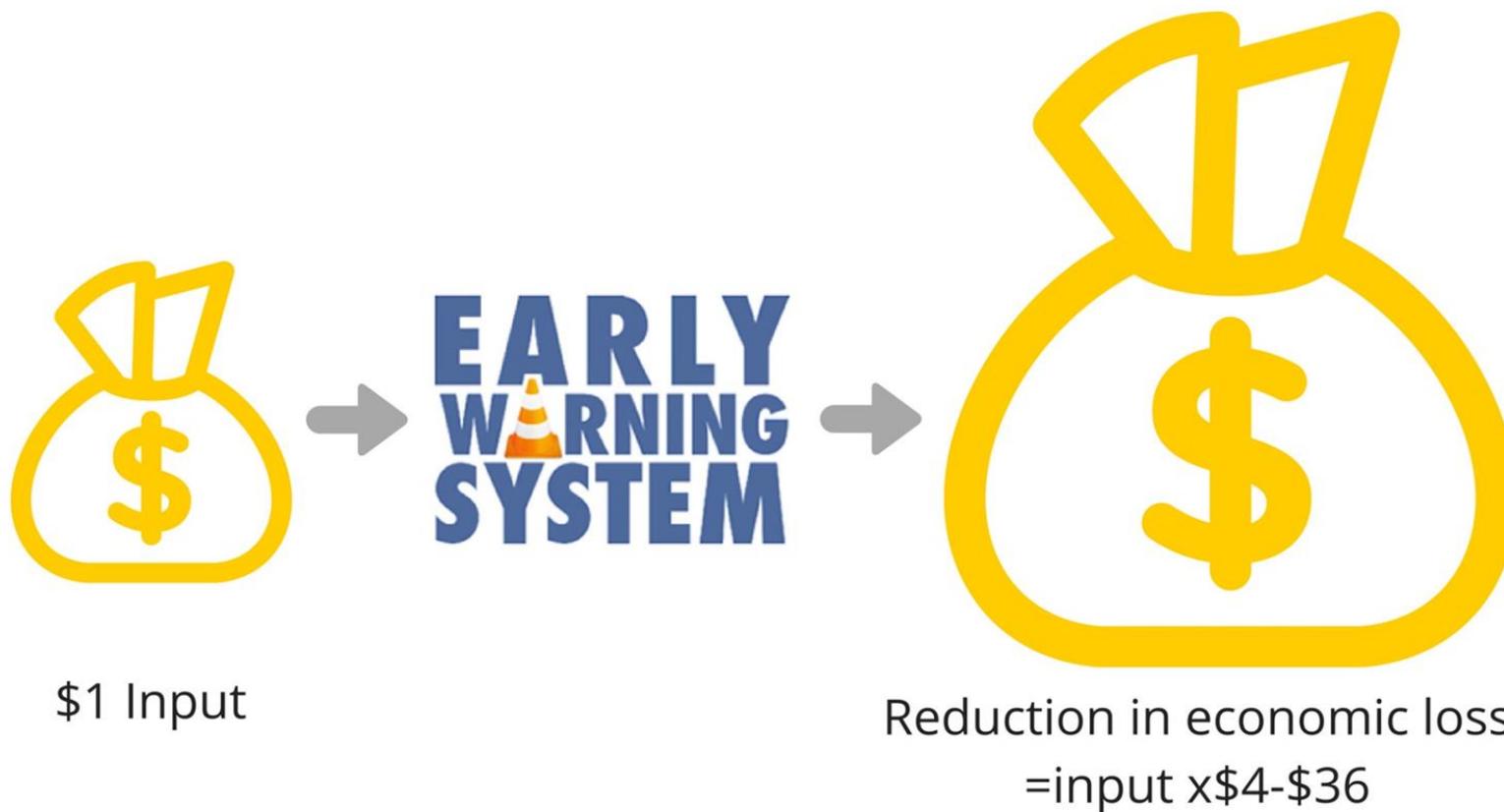


Disaster Preparedness: Sensor Detection for Early Warning: Sahana

- **Sri Lanka Disaster Management Initiative, Sahana,**
- Created in aftermath of the **2004 tsunami**
- **Sahana is used to help track families and coordinate work among relief organizations. Deployed in over 25 countries**
- Sahana is a **free open-source software**, consisting of a series of integrated **web-based disaster management applications**.
- It automatically collates, aggregates, and calculates data, and provides situation and needs assessment in real-time.
- Sahana fills a **unique niche** in the toolkit of **emergency and disaster response**
- Sahana EDEN is the **world's most popular open-source information management system** for disaster and humanitarian aid management. With over **20 modules**, it can support all phases of emergency cycle.



Sensor Detection for Early Warning: #PreventionPays





*“there is no ubiquitous approach to enhancing technology transfer – the suite of measures for addressing barriers, and facilitating successful technology transfer, is typically **community specific**”*

-- UN, 2012



Exercise – Risk Informed Tech Trx in Practice

- 1. Working Groups – Think of the best technologies?**
- 2. Choose a Technology you would like to use to strengthen Disaster Risk Reduction *DRR and Resilience**
- 3. Identify the Challenges, Risks, Solutions by going through the Checklist**
- 4. Present your technology transfer *How to Scenario***



Thank You