Feasibility Study of Integrating Human Dimension and Human Security in a Disaster Management System: Integrating eBayanihan and SHEREPO

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Disaster Risk $\equiv$ Hazard $\times$ Vulnerability Capacity

#0–1
ICTs for DISASTER focus on Hazards
(By Computer Science, Social Computing and Technology)

Nationwide participatory web-mobile disaster management system（e-Bayanihan）
ROLE OF INFORMATION COMMUNICATION TECHNOLOGIES (ICT) in DISASTER RESPONSE

From RESPONSE to PREPAREDNESS
BAYANIHAN

Bayan = country
Community
Togetherness
Helping one another
Community based volunteerism

Online Community Based volunteerism
Crowdsourcing of Disaster information
OBJ#1: Reporting Tool
OBJ#1: Reporting Tool
OBJ#1: Reporting Tool
MAPS

OBJ#1: Reporting Tool
OBJ#1: Reporting Tool
OBJ#1: Reporting Tool
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OBJ#1: Reporting Tool
OBJ#1: Reporting Tool
## OBJ#1: Reporting Tool

### New Barangay Profile

#### Disaster Risk Reduction & Preparedness

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does the barangay have a written disaster risk reduction plan?</td>
<td></td>
<td></td>
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<tr>
<td>Does the barangay have a disaster/emergency response team?</td>
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<tr>
<td>Does the barangay have any of the following disaster/emergency response equipment? (check means Yes)</td>
<td></td>
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<tr>
<td>Rubber Boats</td>
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<td>Flashlights</td>
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<tr>
<td>Handheld Radios</td>
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<tr>
<td>Others (specify)</td>
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</tr>
<tr>
<td>Medicines/ First Aid Supplies</td>
<td></td>
<td></td>
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<tr>
<td>Rain Gear (coats, boots)</td>
<td></td>
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<tr>
<td>Life vests</td>
<td></td>
<td></td>
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<tr>
<td>Emergency/ Service Vehicle</td>
<td></td>
<td></td>
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<tr>
<td>Megaphone</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### During the past 3 years, how many times have these events occurred?

<table>
<thead>
<tr>
<th>Event</th>
<th>Typhoon</th>
<th>Tsunami</th>
<th>Armed Conflict</th>
<th>Moot Layoff</th>
<th>Closure of Large Firm</th>
<th>Closure of Many Small Firms</th>
<th>Opening of Large Firm</th>
<th>Opening of Many Small Firms</th>
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</thead>
<tbody>
<tr>
<td>Flood</td>
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<td></td>
<td></td>
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<tr>
<td>Drought</td>
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<tr>
<td>Earthquake</td>
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<tr>
<td>Volcanic Eruption</td>
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<tr>
<td>Landslide</td>
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</tr>
</tbody>
</table>

#### Evacuation Centers

<table>
<thead>
<tr>
<th>Does the barangay have designated evacuation centers?</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Add Evacuation Center

<table>
<thead>
<tr>
<th>Name</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
OBJ#1: Reporting Tool
OBJ#1: Reporting Tool
HOW DOES eBAYANIihan WORK?

OBSERVE  REPORT  VISUALIZE

SMS based application
SMS Service for Feature Phones

HOW TO REPORT A DISASTER


Example: POST flood, urgent, Loyola Heights, Quezon City, hanggang tuhod
SMS Service for Smart/Android Phones

1. Turn on or keep off “requires immediate response?” by sliding toggle button

2. Fill-in required details
   a. Barangay
   b. City or Municipality
   c. Additional information

3. Click on the “SEND” button
Smart Phone Application
REPORT

- NOT URGENT
- URGENT

keyword...

location...

additional information...

SEND
Disaster Risk = Hazard $\times$ Vulnerability Capacity

#0–2
ICTs for DISASTER focus on Vulnerability,
(By Human Security and Nursing Science)
Paradigm of Nursing

Cure

Health

Environment

Food

Water

HUMAN SECURITY MEASURES

now or never
‘Disaster Risk = Hazard * Vulnerability / Coping Capacity’
Health Issue and Vulnerability

Review of Nursing Research on Great East Japan Earthquake Disaster

**Global**
- Information confusion
- Operational coordination

**Population**
- Chronic disease
- Medication
- Under-nutrition
- Pressure ulcer
- ADL decline
- Hygiene management
- Evacuation of outpatient

**Individual**
- Hypothermia
- Pneumonia
- Emergency delivery

**Hospital**
- Active listening
- Medical assistance
- Psychological care

**Community**
- Evaluation of living environment
- Article management
- Needs assessment

**Shelter**
- Dispatch relief squad
- Multiple cooperation

**Vulnerable**
- Pregnant woman
- Elderly
- Dementia
- Alien
- Stranded commuters
- Survivor in small evacuation center

**Digital divide**
- Time
- Reconstruction
Vulnerabilities of Information and Care needs

Isolation from Information

Access

Sherepo Ebayanihan

No device to Access Talk with only same idea

Contents

Support

Save the baby

Elderly

Child

Resources

High IT Literacy。

Can not read

手段がある

i.e. Foreigner

手段がない
<Past Achievements>
Immediate Needs Based

Nurses
- Approx. 19.3 million nurses over the world
- 1,537,813 nurses in number of employed in Japan

Education and Training
- 234 universities offer nursing degrees
- Continuous education for Disaster Relief Nurses

Research
- Japan Society of Disaster Nursing
- WHO CC for Nursing in Disaster and Health Emergency Management
- World Society of Disaster Nursing

Challenges & Tasks
Long-term, Social Problem-Solving beyond Organizational Level

- Long-term Recovery Plans
- Community-based Disaster Reduction Plans
- Seamless & Continuous Support
- Comprehensive approaches to individual, family, and community problems
- Policy Proposal from Empirical Evidences
- Change Organization-Centeredness
- Review Disaster Ethics
- Experimental & Innovative Practices

Massive Human resource But No Bird’s Eyes
If users cannot use any communication tool (internet) in their shelter, the information is stored on the phone and then submitted whenever there is internet connectivity on the phone.
Use case in EOC

Rescue teams carry out actions depending on the situation

Situation of Food

Situation of Medication

Official Reports

Trend

0: No Problem
2: Operation
5: Serious
4: No roof
3: Once a day

Food
Water
Clothe
Shelter
Sanitation
Medication
Safety
Feasibility Study of Integrating Human Dimension and Human Security in a Disaster Management System: Integrating eBayanihan and SHEREPO
Subjects

Purpose
• Get information of the current situation related to human security, food shelter, drinking water, supplies, sanitary conditions, etc.
• For specified/permanent shelters as well as temporary shelter

Intended users
Reporter (Information Provider)
• Shelter administrator, evacuees, reporting user, relief, etc..
Receiver (Information Consumer)
• NPO support planners, such as disaster prevention and departments of government.

Assumed available situations
• Up to 2 weeks after the catastrophe happened
• Information before evacuees support system is stabilized.
#1-1: LESSON-LEARNED FROM DISASTER
MARIO SHEREPOPO VISITS MANILA
SHEREPO Visit to Manila

September 21, eBayanihan-SHEREPO representatives visited a barangay in Novaliches, Quezon City in the aftermath of Typhoon Mario. In the afternoon, the group went to Fort Santiago in Intramuros, Manila for a taste of Filipino history.
Survey results from data collected during Typhoon Mario

Local Barangay staff were contacted by phone and explanatory meetings held at Barangay offices. Five shelter managers were interviewed; they received 325 individuals and 30 families;
# 1-2 FOCUS INTERVIEW WITH FIRST RESPONDER AT THE TIME OF TYPHOON YOLANDA
公衆衛生の視点で見る創傷リスク高い足の外傷多い診療の構造化絶え間ない患者地元の外傷処置の未熟さ衛生状態保持困難病院の未稼働モノ、ヒト不足医療活動ニーズ調整

急性期外科的処置のみで撤収新規外傷患者の減少創部洗浄の指導ニーズアセスメント

通常診療のフォローTB再燃リスク

下痢患者発生乳幼児の脱水感染症予防地域ナースやボランティアへの研修心のケア

村落への巡回診療

飲料水の運搬井戸水を煮沸して飲用井戸水の使用雨水でしのぐ飲料水の不足タブレット配布にて雨水の利用コーラ配給

盗難、暴力的な犯罪発生

コミュニケーション状態不安定

避難所の情報はなかったトイレは数回に一度流す屋根のあるところに住む自分で家の修復自宅に住み続ける使える物を使う倫理ではなく生存が優先タクロバンでの医療活動が多

犯罪情報

治安が悪いという情報

水や食料の安定≒安全か日本人が入っているかが安全の指標場所による治安の違い

場所による治安の違い

クラスターミーティングへの参加

クラスター会議への出席

食糧援助あり

看護と公衆衛生のマッチング

All Environment Food Non-Food Water Health Needs Assessment Cluster Meeting Information of Shelter Amount of Food Drinking Water Stockpile & Distribution Place of Activity Satisfaction (Water + Food) → Peace？ Nutrition Balance Continuity of usual care Exacerbation of Infection Diseases

Disparity of Security

Public Health

Communication state instability

Disaster Occurrence Time Reconstruction

Individual

Human resource

Skill Level of local Staff

Equipment

Dehydration Diarrhea

Mental Health Care

Training of Local Professionals

Water purification

Cooking methods

Place of activity

Amount of Food

Drinking Water

Shelter or Home

toilet
#2: DEMONSTRATION OF SIMULATION USING DISASTER SCENARIOS

eBayanihan – SHEREPO Training and Workshop in Japan (November 2014)
Highlights: Lessons Learned

• Simulation Training
  - Define Roles (add Roles eg. need to assign community leader in shelter management when using online communication)
  - Understand how system will be used by different groups
  - Decision points are important in Simulation (e.g. who will make the final decision)

• Simulation Lecture
  - Phases
  - Disaster management should also consider how to manage wellness of the first responders
Highlights: Lessons Learned

- Field Trip
- Simulation Training
- Simulation Lecture

• City is an exemplar of how we should do things in the Philippines
  - Proactive/Preventive Approach (breakwater, shelters, evacuation plans, signs)
  - Health Sector is an active part of Disaster Management

Question:
How will eBayanihan x Sherepo be helpful in this proactive approach?
- Preventive measures
- Risk Mapping / Exposure Mapping
#3: TRIAL INTEGRATION EBAYANIHAN AND SHEREPO
Proposed eBayanihan x Sherepo
Content Themes (Rapid Assessment)

Questions:
1. Is the list complete?
   (source of power, signal, communication, road access not part of 7)
2. Levels/Scale – define
3. What is expected interpretation?

Elements of Rapid Assessment
- Food
- Water
- Clothes
- Accommodation / Shelter
- Sanitation
- Medical Treatment
- Safety
- Others
Content Access (User Interface)

- What content to gather?
- How to design?
  - Universal colors
  - Universal understanding
  - Localization
  - Devices
  - Mode of sending information (e.g. sms)
Content Form  
(Access to existing Materials)

- Content to relevant information is important
- eBayanihan x Sherepo should provide this information

How to shorten information
Quick and Easy access
No cognitive overload (not much processing)
In just one click (not two, not three)
Language Translation validation
Localization
ICT Infrastructure and equipment

Questions:
1. SMS data vs Smart data
2. What is our back up if communication lines go down?
3. Engineer wearable gps
4. Use of satellite phones

• Very crucial as information will ride on the infrastructure
Access modalities

Questions:
1. What information is needed by institution
2. What information is needed by individual

• Institutional or Individual
Content Delivery

Questions:
1. From experience, when does communication line go down?
2. How much content can be placed on a local phone?

• Offline or online
#4: FEASIBILITY STUDY SIMULATION IN TACLOBAN
The Tacloban City Deployment of eBayanihan–SHEREPO started with a presentation by Ma. Regina Estuar, PhD of Project eBayanihan and Sakiko Kanbara of SHEREPO to Hon. Alfred Romualdez, City Mayor of Tacloban, Leyte.
The presentation was followed by Hon. Romualdez’s sharing of the city’s experiences at the wake of Typhoon Haiyan (Yolanda) and how the city has since worked towards recovering from the said disaster. Dr. Estuar and Dr. Kanbara also responded to the mayor’s questions regarding the systems (eBayanihan and SHEREPO).
After the presentation to the Mayor, the team commenced the training and simulation workshop with the participants, which include members of TACRU (Tacloban City Rescue Unit), a Tacloban CDRRMO representative, a TOMECO–PNP representative, City Health Office representatives, and barangay officers (captains and treasurer) from Brgy. 5-A and Brgy. 95.
The attendees participated in the simulation exercise which allowed them to experience using the combined eBayanihan and SHEREPO web tools. This exercise was followed by an open forum through which the participants shared their sentiments about the combined tools and how these can be further enhanced.
Still using the simulation action cards provided, the participants successfully created and updated 5 shelter profiles using the SHEREPO tool on eBayanihan.
The simulation action cards provided sample data that the participants used to create shelter profiles using the SHEREPO tool. The participants added to the sample data to fill in the rest of the shelter profile form (e.g., location).

<table>
<thead>
<tr>
<th>Shelter Information</th>
<th>Water</th>
<th>Sanitation</th>
<th>Medication</th>
<th>Food</th>
<th>Clothing</th>
<th>Safety &amp; Protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shelter Name</td>
<td></td>
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<tr>
<td>Tast Shelter 1 - School (Arcallana)</td>
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<tr>
<td>Shelter Type</td>
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<tr>
<td>School</td>
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<tr>
<td>Reporter Role</td>
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<tr>
<td>Evacuee</td>
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<tr>
<td>Shelter Capacity</td>
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<td>Complete</td>
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<tr>
<td>Total Male Evacuees</td>
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<td>10</td>
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<td>Total Female Evacuees</td>
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<tr>
<td>Relief Agency/NGO Managing Shelter</td>
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<tr>
<td>CSWDO</td>
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<tr>
<td>Region</td>
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<tr>
<td>EASTERN VISAYAS</td>
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<td>Province</td>
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<tr>
<td>LEYTE</td>
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<tr>
<td>City/Municipality</td>
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<tr>
<td>TACLOBAN CITY</td>
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<tr>
<td>Barangay</td>
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<tr>
<td>Barangay 69</td>
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</tr>
</tbody>
</table>
Using the simulation action cards provided, the participants successfully posted 12 CitReports on eBayanihan, all of which are visualized on the Map.
The training and simulation workshop concluded with the presentation of certificates of participation as well as eBayanihan tokens for the participants.
The eBayanihan–SHEREPO team likewise presented Hon. Romualdez with tokens of appreciation for having accommodated both projects in Tacloban City.
## Result

<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>CONTENT</th>
<th>USEABILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Confidentiality</td>
<td>Adaptability to local</td>
<td></td>
</tr>
<tr>
<td></td>
<td>community</td>
<td></td>
</tr>
<tr>
<td>BEST FEATURE</td>
<td>Health Sector – SHEREPO</td>
<td>Translation to top 10 dialects</td>
</tr>
<tr>
<td></td>
<td>First Responders –</td>
<td></td>
</tr>
<tr>
<td></td>
<td>eBayanihan</td>
<td></td>
</tr>
<tr>
<td>IMPROVEMENT/</td>
<td>Demographic Info on:</td>
<td>Cross-posting</td>
</tr>
<tr>
<td>RECOMMENDATIONS</td>
<td>1.  High Risk</td>
<td>Printed version of reports</td>
</tr>
<tr>
<td></td>
<td>2.  PWD</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3.  Children below 5 y.o.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4.  Pregnant</td>
<td>Open-ended reports</td>
</tr>
<tr>
<td></td>
<td>5.  Senior Citizens</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mobility</td>
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<tr>
<td></td>
<td>Levels</td>
<td></td>
</tr>
</tbody>
</table>
REVISIONS
### New Report

**Shelter Reports**

<table>
<thead>
<tr>
<th>Date</th>
<th>Name</th>
<th>Barangay</th>
<th>Municipality/City</th>
<th>Province</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feb 11, 2015 05:34 PM</td>
<td>Palo Elementary School</td>
<td>Salvacion</td>
<td>PALO</td>
<td>LEYTE</td>
<td>View Report</td>
</tr>
</tbody>
</table>

Showing 1 to 1 of 1 entries
Chat
# Forms

## New Shelter Report

<table>
<thead>
<tr>
<th>Disaster Shelter / Evacuation Site</th>
<th>Water Provision</th>
<th>Sanitation &amp; Hygiene</th>
<th>Health Services</th>
<th>Food Items</th>
<th>Not Food Items</th>
<th>Protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shelter Name</td>
<td></td>
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</tr>
<tr>
<td>Shelter Type</td>
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<tr>
<td>School</td>
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<tr>
<td>Reporter Role</td>
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<tr>
<td>Evacuee</td>
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</tr>
<tr>
<td>Shelter Capacity</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Unknown</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Male Evacuees</td>
<td></td>
<td></td>
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</tbody>
</table>

| Region                           |                |                      |                 |            |               |            |
|                                  | Select a Region|                      |                 |            |               |            |
| Province                         |                |                      |                 |            |               |            |
| City/Municipality                |                |                      |                 |            |               |            |
| Barangay                         |                |                      |                 |            |               |            |
View
Success

• Integration of two systems
• Outreach to affected area
• Collect information of survivor
• Useful for first responder of health sector
Note: Way forward

• Integration of the data
• Visualization to decision make
• Sustainability
• Continuous monitoring pre-disaster
• API to government system
• Find out offline area
• Prioritize the vulnerable place
Possible Research Collaboration

Non – Technical Paper

• *Creating a Framework for Disaster Simulation
• Understanding Roles of Persons and Information in Disaster
• Cultural Differences and Similarities in Understanding Disaster Icons (share transcultural nursing)
• *Creating Meaningful Information from Human Security Data in ebayanihan x Sherepo
• *Measuring UX from Simulation

Technical Papers

• Systems Integration Between Two Disaster Management Systems
• Visualizing Human Security and Disaster Events
• Creating Predictive Models on Human Security during Disaster Events
• Datamining Disaster Information in Japanese Language
• Pre-allocation of Resources on Disaster (Tactical and Logistical) – eg. Delivery systems
  – eg. Donor system
• System Validation of ebayanihan x Sherepo
Achievements

1. Sakiko Kanbara, Satoru Yamada, Miho Watanabe, Ngatu Rogers, Satomi Kubota, Yoko Nakayama, Sayumi Nojima, Hiroko Minami, Disaster Nursing on The Great East Japan Earthquake Disaster from Published Articles in Japan Society of Disaster Nursing March 2011–August 2013, World Disaster Nursing Science,


3. S. Kanbara, K. Hiramoto, M. R. J. E. Estuar, Y. Ishimine, Y. Nakayama, S. Nojima, Development of Application for Shelter Information Sharing on Health Security and Disaster Nursing, 19th World Congress on Disaster & Emergence Medicine (WCDEM)

Invited to UNWCDRR Public Forum in Sendai

Asia Disaster Resilience Forum 2015 – Building ICT-enabled Disaster Resilient Societies in Asia from the grassroots

Organized by World Bank –
Next plan (FY 15-16)

• Installed by international NPO (J/P)

• Development of tool kit of simulation gaming education

• Propose next design
Operational framework for the future is under consideration, though implemented by Shelter Report team.

Infrastructure such as cloud ensure by company contribution

The planned response training

To ensure stability, Twitter changes to the API for outgoing

Adapted into "shelter status report" format of local governments

Set of training mode
# Philippine Ateneo Team

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Degree and Field</th>
<th>Specialization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ma. Regina Justina E. Estuar</td>
<td>Associate Professor</td>
<td>PHD Social Psychology</td>
<td>Data Mining, Mobile Applications, Social Computing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MS Computer Science</td>
<td></td>
</tr>
<tr>
<td>Marlene M. De Leon</td>
<td>Technical Specialist</td>
<td>PHD Computer Science</td>
<td>Text Social Computing, Project Management</td>
</tr>
<tr>
<td>John Boaz Lee</td>
<td>Technical Specialist</td>
<td>MS Computer Science</td>
<td>Social Network Analysis</td>
</tr>
<tr>
<td>John Owen Ilagan</td>
<td>Web Developer</td>
<td>MS Computer Science</td>
<td>Web Developer</td>
</tr>
<tr>
<td>John Sixto Santos</td>
<td>Web Developer</td>
<td>MS Computer Science Student</td>
<td>Web Developer/Data mining</td>
</tr>
<tr>
<td>John Noel Victorino</td>
<td>Research Assistant</td>
<td>MS Computer Science student</td>
<td>Mobile web Programming</td>
</tr>
<tr>
<td>Jhoanna Isla</td>
<td>Web Developer</td>
<td>MS Computer Science Student</td>
<td>Web programming</td>
</tr>
<tr>
<td>Maria Dianne Santos</td>
<td>Graphics Designer</td>
<td>BA Information Design</td>
<td>Graphics Design</td>
</tr>
<tr>
<td>Barbara May</td>
<td>Project Staff</td>
<td></td>
<td>Communications, Logistics, Documentor</td>
</tr>
</tbody>
</table>
Philippine Partner Agencies

- Project NOAH (Nationwide Operational Assessment of Hazards) – Dr. Mahar Lagmay, University of the Philippines
- Project AGOS by Rappler.com – Maria Ressa
- Office of Civil Defense (OCD)
- National Disaster Risk Reduction and Management Council (NDRRMC)
- Department of Science and Technology (PCIEERD–DOST)
- Department of Local and Interior Government (DILG)
- National Anti-poverty Commission (NAPC)
<table>
<thead>
<tr>
<th>Name</th>
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<th>Role expectation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sakiko Kanbara</td>
<td>Ph.D(Med.)</td>
<td>Disaster Nursing</td>
<td>Coordinator</td>
</tr>
<tr>
<td>Sayumi Nojima</td>
<td>D NSc.</td>
<td>Family Nursing</td>
<td>Consultation</td>
</tr>
<tr>
<td>Satoru Yamada</td>
<td>Ph.D(Eng.)</td>
<td>Nursing Management</td>
<td>System Coordinator</td>
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<tr>
<td>Yoko Nakayama</td>
<td>Ph.D(Ns.)</td>
<td>Psychiatric Nursing</td>
<td>Field work</td>
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<tr>
<td>Ngatu Rogers</td>
<td>Ph.D(Med.)</td>
<td>Public Health</td>
<td>Field work</td>
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<tr>
<td>Miho Morosawa</td>
<td>Master Student</td>
<td>Nursing</td>
<td>Field Work</td>
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<tr>
<td>Megumi Nishigawa</td>
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<tr>
<td>Masanori Osaki</td>
<td></td>
<td></td>
<td>Web Design</td>
</tr>
<tr>
<td>Kenji Hiramoto</td>
<td>University of Tokyo</td>
<td></td>
<td>Consultation</td>
</tr>
<tr>
<td>Masanori Hidaka</td>
<td>Infocom</td>
<td></td>
<td>Coding Sherepo</td>
</tr>
</tbody>
</table>
Japan Partner Agencies

• University of Tokyo
• Keio University
• National Institute of Health
• Infocom
• Eyes, Japan
• Fixer
• Heart Beats
• Automation. jp
THANK YOU

Maraming salamat
ありがとうございます。

THANK YOU