Executive Summary

eHealth - the use of information and communication technologies in healthcare for improved health outcomes

mHealth - mobile health, sub-domain of eHealth: using mobile phones for practice of medicine; delivery of public health services for improved health outcomes.

While we emphasize mHealth, projects in all areas of eHealth are in the scope of this Project Force.

In May-June 2014, I was visiting Bhutan under the Overseas Expert programme of Bhutan Innovation and Technology Center at Thimphu TechPark. Earlier, I visited Kathmandu University. In 2010-12, I was a member of Advisory Committee of SEACOOP, an initiative to strengthen ICT research between Southeast Asia and Europe. This mHealth Project Force has been inspired by my SEACOOP experience, and feedback I received during mHealth seminars and discussions with academic and professional staff in those countries.

IT and mobile technology in particular open novel ways to deliver healthcare services with a potential to improve health outcomes. This is particularly true in developing countries where there is shortage of doctors, many people live in hard-to-reach by road areas, but telecom infrastructure is almost everywhere, with ~80% of population using mobile phones.

Objective: mHealth Project Force will help participants build mHealth research & development capability, and then identify and implement mHealth strategies that can benefit Asia Pacific countries.

This is an invitation for you to join mHealth Project Force network

The corner stones of the proposed mHealth Project Force are identifying an impactful health problem in one of the participating countries, defining a Pilot Project, building an international network of collaborators, securing a research grant, conducting a Pilot and then scaling the results to large populations and other participating countries.
Who should join mHealth Project Force?
You may not have an existing expertise or on-going research activities in mHealth. Not many universities around the world have established mHealth research, but topics related to mHealth such as user- and environment sensing, HCI or telemedicine have become popular, with plenty of funding and prestigious forums to publish results available.

Consider joining the mHealth Project Force if you and some of colleagues at your department have a serious intention to work on mHealth (or: eHealth in general).

How to join mHealth Project Force?
Send your request/questions to Stan Jarzabek: stan@comp.nus.edu.sg www.comp.nus.edu.sg/~stan

Current Participants in mHealth Project Force Asia-Pacific

<table>
<thead>
<tr>
<th>Institution</th>
<th>Representative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department of Computer Science and Engineering, Kathmandu University</td>
<td>Manish Pokharel <a href="mailto:manish@ku.edu.np">manish@ku.edu.np</a></td>
</tr>
<tr>
<td>College of Science and Technology, Phuentsholing, Bhutan</td>
<td>Tshering Dema <a href="mailto:tsheringdema@cst.edu.bt">tsheringdema@cst.edu.bt</a></td>
</tr>
<tr>
<td>Graduate School of Information Science and Technology, Osaka University</td>
<td>Teruo Higashino <a href="mailto:higashino@ist.osaka-u.ac.jp">higashino@ist.osaka-u.ac.jp</a></td>
</tr>
<tr>
<td>College of Computer Studies, De La Salle University, Manila, Philippines</td>
<td>Raymund Sison <a href="mailto:raymund.sison@delasalle.ph">raymund.sison@delasalle.ph</a></td>
</tr>
<tr>
<td>Department of Information Systems, Universiti Teknologi Malaysia</td>
<td>Noorminshah A Ahad <a href="mailto:noorminshah@gmail.com">noorminshah@gmail.com</a></td>
</tr>
<tr>
<td>Department of Electrical Engineering, Udayana University, Indonesia</td>
<td>Linawati, <a href="mailto:linawati@unud.ac.id">linawati@unud.ac.id</a></td>
</tr>
<tr>
<td>Department of Informatics, Faculty of Information Technology, Institut Teknologi Sepuluh Nopember - Surabaya (ITS Surabaya)</td>
<td>R V Hari Ginardi <a href="mailto:hari@its.ac.id">hari@its.ac.id</a></td>
</tr>
<tr>
<td>Department of Computer Science, National University of Singapore</td>
<td>Stan Jarzabek <a href="mailto:stan@comp.nus.edu.sg">stan@comp.nus.edu.sg</a> (coordinator)</td>
</tr>
</tbody>
</table>

What will happen next?
The following steps outline the action plan and the scope of mHealth Project Force:

1) Set up an international network of mHealth stakeholders in Asia Pacific countries including academic researchers, healthcare practitioners and policy makers, and telecommunication representatives.
2) Set up mHealth Research Labs at academic institutions in participating countries (if none exists)
3) Start research and training at Labs in mHealth methods and technologies
4) Identify healthcare problems on government priority list in your country, and shortlist problems that can benefit from mobile support
5) Discuss shortlisted problems with other labs participating in mHealth Project Force; Team up with mHealth Research Labs in other countries who wish to work on a similar problem
6) Define the goal, scope and mHealth methods for a Pilot Project to be conducted in one of the participating countries
7) Invite international collaborators in areas where you need expertise
8) Apply for research funds to one of the international agencies supporting mHealth projects in developing countries (examples below); Should local funds be available, a more extensive preliminary study could be done first. Research grants are competitive, and already demonstrated initial results will strengthen our chances in competing for project funding.
Why focus on mHealth?

Mobile phones can disseminate healthcare education and information to people who do not have easy access to doctors. Mobile phones can connect patients and doctors in-between face-to-face sessions in the clinic. Medical treatment can be more effective if doctors understand better how patients are doing in-between face-to-face sessions with a doctor. Advanced forms of mHealth apps can help doctors remotely monitor patients receiving treatment, improving the overall efficacy of health services. Mobile phones with self-monitoring and user sensing capabilities can collect patient data in real-life situations, providing useful and timely feedback to the doctor. Based on the feedback, the doctor can monitor the progress of the therapy, and the patient’s compliance to the recommended course of treatment; identify early risks (e.g., of heart failure); prevent relapse; monitor the impact of newly prescribed medications on patient’s condition, adjust the dosage of the medication or change the medication in case of side-effects. All the above can be done before the patient’s next visit to the clinic.

The following [2-minute video](#) by PWC summarizes motivation and status of mHealth.

Bhutan example:

Bhutan is rapidly setting up a robust telecommunication infrastructure, including mobile services and wireless connectivity at the remote locations using TV white spaces technology. Large population of Bhutanese people has mobile phones. Still, many people do not have an easy access to doctors. Mobile- and web-based solutions to disseminate healthcare education to hard-to-reach populations living in mountainous areas and to connect them to health givers could be useful. Such solutions could also enhance the e-Governance infrastructure, helping connect government and citizens, in managing emergency situations, among many other applications.

Ideas for a Pilot mHealth Project: Dissemination of Healthcare Education

The pilot will test and demonstrate the feasibility and usefulness of mHealth. Pilot will deliver a simple but fully operational mHealth solution that will be applied and evaluated on a small scale.

For the pilot project, we might consider dissemination of healthcare education and medical alerts to hard-to-reach populations living in mountainous areas via SMS texting. The pilot would focus on a specific group of people, addressing important problem(s) of that group such as:

1) Addressing the problem: “Not Knowing” what’s available to people: Dissemination of general information about healthcare services and insurance available to people, social and medical assistance for elderly, etc.
2) Prevention of spreading the diseases in high risk areas; in areas affected by certain diseases (e.g., caused by contaminated water), providing instruction how to avoid the risks
3) Educating people how to early recognize the symptoms of a disease in high risk areas
4) Once symptoms are observed - what should I do next?

Technical means

Dissemination of healthcare education and medical alerts (and mHealth solutions in general) may involve a combination of mobile and web technology.

1) One-way SMS texting from the centre to people; health hotlines
2) SMS texting system for two-way communication between healthcare centres and people.
   a) Flexible system to distribute SMS messages for different groups of people
b) Web-based system to collect, classify, and store SMS replies from people related to certain issue and making them available to healthcare workers who can reply to individuals or to groups of people

3) Setting up Interactive Voice Response (IVR) systems providing general information about healthcare services and specialized contents to health problems in a given area

4) Setting up E-Centres with content customized to a given area to educate people in using technology to connect them to eGovernment services (including healthcare)

5) Setting up advanced interactive two-way telecommunication systems connecting people with healthcare givers. This can include mobile phones as well as E-Centres that allow a doctor to remotely examine the patient’s condition via a dedicated PC station equipped with a suitable web site, voice/video connectivity (Skype), and sensors to examine patient’s symptoms (e.g., changes on the skin), and measure his/her heart rate, temperature, breathing or blood pressure.

6) Educational apps and web sites

The goal and scope of a pilot project will be worked out with government and healthcare representatives. A specific population and health problem to be addressed in the pilot project will be selected based on the government priorities.

**Resources for the pilot project**

Duration: The pilot project will take ½ - 1 year.

Manpower: Two programmers, PCs, office space and mobile phones for experimentation.

**Project funding**

There are many international agencies that provide funds for projects in developing countries. They particularly favor projects that use mobile technologies to improve healthcare delivery. Among agencies with relevant funding schemes are International Development Research Centre (IDCR) in Canada, National Institutes of Health in USA, United Nations Foundation Innovation Working Group (IWG) Catalytic mHealth Grant Program, World Bank or Rockefeller Foundation.

As an example, below is a summary of the new grant scheme from National Institutes of Health (NIH) in area of advancing mHealth *Mobile Health: Technology and Outcomes in Low- and Middle-Income Countries (LMICs).*

NIH grant scheme favors mHealth projects focused on important health problem in LMIC, with intention of building local mHealth research capability.

The quotes below are from the NIH mHealth grant announcement:

This grant scheme “encourages research projects that focus on the adaptation, optimization and evaluation of mHealth tools or interventions to prevent, diagnose, manage and treat chronic diseases.”

“The project should address a well-defined LMIC need and should be appropriate for use in that setting”.

“The program encourages collaborations among researchers in fields such as behavioral science, engineering, computer science, business, medicine and public health.”

“Applicants may request up to $125,000 direct costs per year for up to two years.”

“Applicants are required to propose partnerships between at least one U.S. institution and one LMIC institution. According to NIH, program directors/principal investigators may be employed in either a U.S. or LMIC institution, but should plan to build capacity in mHealth research in the LMIC institution”

“The project should plan to build capacity in mHealth research in the LMIC institution.”

--- The End ---