ICT Implementation for E-Health in South-East and South Asia

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1 Introduction

ICT is the study of developing and using technology to process information and aid communication. E-health refers to health services and information delivered or enhanced through the use of ICT. The new challenge is to improve health care services locally, regionally, and worldwide by using the services that ICT provides. Here, an overview of the existing policies will be described, thereafter different existing projects in the SAARC and ASEAN regions will be described. With the help of user analysis, the proposed model will then be described. Finally, the justification of the proposed model will be done from various points of view.

1.1 Existing Policies

Besides the national IT/ICT policies, E-ASEAN Framework initiated in November 2000, aims for the liberalization of trade in ICT products and services and the promotion of investments in the production of ICT products and in the provision of ICT services in this sector. The E-ASEAN initiative establishes a region-wide approach to making comprehensive use of information and communications technologies in business, society and the government. In SAARC there is no such framework but different countries have different national IT/ICT policies (draft of the final version) but only some counties are in harmony with their policies [1].

<table>
<thead>
<tr>
<th>Country</th>
<th>Policy/Plan/Vision of Countries</th>
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<tbody>
<tr>
<td>India</td>
<td>IT Action Plan – IT for all by 2008</td>
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<tr>
<td>Nepal</td>
<td>IT Policy 2000 (Draft IT Policy 2004)</td>
</tr>
<tr>
<td>Korea</td>
<td>e-Korea Vision 2006</td>
</tr>
<tr>
<td>Indonesia</td>
<td>ICT Policy Framework, 5 Year Action Plan</td>
</tr>
<tr>
<td>Myanmar</td>
<td>Four areas of ICT Legal framework: Electronic Transaction Law (Cyber Law), Rules and Regulations and ICT Related Laws, Myanmar Computer Science Development Act, Communications Law</td>
</tr>
<tr>
<td>Philippines</td>
<td>E-Philippines ITECC Strategic Roadmap 2003</td>
</tr>
<tr>
<td>Singapore</td>
<td>Infocomm 21 Master plan</td>
</tr>
<tr>
<td>Thailand</td>
<td>IT2010</td>
</tr>
<tr>
<td>Malaysia</td>
<td>VISION 2020</td>
</tr>
</tbody>
</table>

Table 1: IT/TCT Policies/Plans/Vision of Countries
1.2 Related Projects

There have been significant Pilot Projects [2] related to the facilitation of the Information Infrastructure like the ASEAN Regional Internet Exchange or ARIX, Coke e-Learning Community Centers; facilitation of e-commerce like ASEAN eTourism Portal, WeASEAN.com etc; Capacity Building and e-Society like ASEAN Educators Online, e-Entrepreneurship etc; and e-Government. There is lack of projects related to e-health and infrastructure development. In the SAARC region, only India has some good telemedicine, tele-health related projects giving services to the users but the other SAARC countries only have the policies and no such significant projects.

Teleconsultation via an eHealth Portal, India
One of the Pilot Projects - “Teleconsultation via an eHealth Portal”. The idea was conceived in 2001 and got underway in 2003 with creation of an e-health web-based portal hosted on a server PC (Mercy College Hospital). Its aim was to support health systems in one state in India using ICT. Medical officers and patients accesses the web-portal forms and passes comments and suggestions among each other.

HealthNet Nepal
Commenced on July 2004, wide variety of information resources related to health in Nepal can be accessed from the web portal maintained by HealthNet Nepal [3]. These resources include databases, full text journals, health statistics, seminar reports, technical reports and Ph.D. and Masters Degree thesis. Health related consultancy services are also provided via email, etc.

Multi-purpose Community Telecenters
(MCT: Thailand, Vietnam, Mongolia, etc.) – One major objective is to educate people and to enrich living standards through tele-education, tele-medicine and other applications using the Internet via Wireless LAN and Wi-Fi technologies (Kenji Saga, 5 February 2004, Jakarta, Indonesia) [4].

Development of ICT Based Telemedicine System for Primary Community Health-Care in Indonesia (November 2002) [5]
Aims for developing PC-based medical stations and conduct field testing (recording & reporting, improved diagnosis, limited tele-consultation, tele-coordination, and tele-education) in at least eight locations and utilization of existing internet technology.

A Community-based Child Injury Surveillance System: Rapid Data Collection Using (Short Messaging Service (SMS), Philippines (January 2004)
Aims for the injury control and implemented in a poor village as a pilot project. This project proposes a reporting system having three main components: a short messaging system for reporting child injuries, the training of village health workers on injury surveillance, and a web-based graphical presentation system of injury data for decision makers. SMS has been chosen because of its widespread penetration in the Philippines and its wireless capabilities.

1.3 Patients Flow
Various statistics show that patients from various countries travel to other countries/cities in order to get quality treatment.
This is mainly due to the lack of sophisticated devices and well experienced doctors in developing nations. A brief survey of some of the hospitals in Thailand revealed that there is increasing competition for international patients both from several players in Thailand and also from Singapore, Malaysia, and India.

**Bumrungrad International Ltd**
The annual report 2004 of the Bumrungrad International Ltd. [6] Show the patient Domestic and International Patients flow as

![Figure: Patients flow in 2004 at Bumrungrad International Ltd](image)

**Bangkok Hospital**
According to Bangkok hospital website [7] (as of August, 2005), more than 100 nationalities benefit from the services that this hospital offers.

**Ramkhamhaeng Hospital**
Apart from providing excellent treatment services, [8] this hospital has specialized personalized services for all the international visitors, like escorting to the hospital from the airport, and escorting the clients back to the airport for their departure.

### 1.4.1 User Requirements
The present situation of E-health in most of the developing nations in the ASEAN and SAARC regions, and the flow of patients to developed countries for treatment suggest that one of the major demands of the people in the developing countries is the access to quality health techniques provided in some developed countries. But, most of them cannot afford the expenses that would occur to fly to such cities. So, the major requirement here is to come up with a solution that allows people to access remote health care facilities with minimum expenses possible.

### 2 Proposed Solution
HSN is the proposed model for the implementation and development of e-Health services in the SAARC and ASEAN region. This is based on the extranet based architecture (using Virtual Private Network) unlike public Internet and local WAN. There will be secure communication between the end parties and also this network will be capable of handling multimedia information. The main characteristic of this architecture is the secure connection – communication between the business partners is secure and will support the business to business model. There may be different hop stations at the hospitals and health centers of each country and they need to connect to our central server, and register and/or authenticate themselves so that they can get benefit as well as provide services to the patients via the HSN Network.
Any health care center or hospital that cannot meet the minimum requirements stated by HSN cannot be a part of the network. For example, if a health care center needs to transfer real time video images of the patient to a remote hospital, they should be able to have enough bandwidth connection in order to be able to receive the service. Similarly, the center should be willing and able to install compatible hardware and software necessary for the communication to work.

Figure: HSN System Architecture.

The main role of HSN is to play the managerial role for providing coordination among the other stakeholders. For example, each health care center will have legal, technical, financial contracts with the HSN only – not with the health care centers that are part of the network. The HSN added value to healthcare chain could be split into four main actors of care process: Hospitals, Doctors, Citizens, and Governments aiming to:

- Increase the treatment’s effectiveness and quality of care.
- Reduce patient period in hospital.
- Reduce personnel costs.
- Reduce management costs.

2.1 Stakeholders and their Interests
Some of the possible stakeholders can be:

<table>
<thead>
<tr>
<th>Who/Target Stakeholder</th>
<th>What/ Info</th>
<th>Purpose/What they want</th>
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</thead>
<tbody>
<tr>
<td>WHO/ADB like Organizations</td>
<td>Investment Detail</td>
<td>Monitor/ Invest the project</td>
</tr>
<tr>
<td>Project Group/ Steering Committee</td>
<td>Project Progress Detail</td>
<td>Develop and control the project</td>
</tr>
<tr>
<td>Hospitals/ Health Service Providers</td>
<td>Service Information</td>
<td>Register/ Provide Services</td>
</tr>
<tr>
<td>Governments/ International Bodies</td>
<td>Project Objective</td>
<td>Monitor/ Invest in the project</td>
</tr>
<tr>
<td>Any Expert group</td>
<td>Technical Details</td>
<td>Provide recommendation for</td>
</tr>
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<tr>
<th>Patients</th>
<th>End Consumers</th>
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<tr>
<td></td>
<td>Utilize Health Care Services</td>
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Table 2: Possible Stakeholders

3 Project Justification

HSN will be take care of most of the managerial responsibilities so that hospitals and health service providers don’t need to pay much attention on the project tracking and control mechanism, status report, project checkpoint and risk avoidance, quality assurance, etc. By utilizing the existing telecommunication and Internet infrastructure, HSN provides the healthcare service from one country to other countries.

The country that connects to HSN can improve its healthcare services to its people without the need to improve its own healthcare service infrastructure. By using HSN, some healthcare services can be provided to countries which do not have enough technology or resources. The residents can get advanced healthcare services without going to another country, which can save cost of traveling and processing, as well as decrease the risk of patient’s life due to traveling. Since none of the competitors provide such type of E-Health service, there is a huge market potential in the ASEAN and SAARC regions. Therefore HSN will be a winning idea for the concerned parties.

Acknowledgement

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References

5. http://www.ksg.harvard.edu/iip/stp305/Fall2000/paua.PDF