



**CLUSTER-BASED HEALTHCARE
GIS SYSTEM USING OPEN
SOURCE SOFTWARE**

Introduction to the Team

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Objective:

- To deploy Open Source Software Idea in Health Care Industry
- To assess geographic needs of the existing HealthCare System
- To incorporate spatial information such as satellite images, vector maps with attribute data
- To assure high availability of critical nature of healthcare systems
- To perform better analyses for evidence based decision making by GIS techniques



Open Source Softwares

- **Open source software (OSS)** is computer software for which the source code and certain other rights normally reserved for copyright holders are provided under a software license that meets the Open Source Definition or that is in the public domain.
- This permits users to use, change, and improve the software, and to redistribute it in modified or unmodified forms. It is very often developed in a public, collaborative manner.
- A report by Standish Group states that adoption of open source software models has resulted in savings of about \$60 billion per year to consumers. ^{[3][4]}



GIS (Geographic Information Systems)

- A **geographic information system (GIS)**, or **geographical information system** captures, stores, analyzes, manages, and presents data that is linked to location. Technically, GIS is geographic information systems which includes mapping software and its application with remote sensing, land surveying, aerial photography, mathematics, photogrammetry, geography, and tools that can be implemented with GIS software. Still, many refer to "geographic information system" as GIS even though it doesn't cover all tools connected to topology.



HA-Cluster Computing

- **High-availability clusters** (also known as **HA Clusters** or **Failover Clusters**) are computer clusters that are implemented primarily for the purpose of providing high availability of services which the cluster provides.
- They operate by having redundant computers or **nodes** which are then used to provide service when system components fail. Normally, if a server with a particular application crashes, the application will be unavailable until someone fixes the crashed server.
- HA clustering remedies this situation by detecting hardware/software faults, and immediately restarting the application on another system without requiring administrative intervention, a process known as Failover
- HA clusters are often used for critical databases, file sharing on a network, business applications, and customer services such as electronic commerce websites.



EpiInfo

- *Epi Info* is public domain statistical software for epidemiology developed by Centers for Disease Control and Prevention.
- Developed by the Centers for Disease Control and Prevention (CDC) in Atlanta, Georgia (USA), Epi Info has been in existence for over 20 years and is currently available for Microsoft Windows.
- The program allows for electronic survey creation, data entry, and analysis.

The screenshot shows the 'Anthropometric Data - nutchildren' window in EpiInfo. The interface is green and white. It includes a menu bar (File, Edit, View, Tools, Help) and a toolbar with buttons for '<', '>', 'New', 'Graph...', 'Grid', and 'Find...'. The main form contains the following fields and controls:

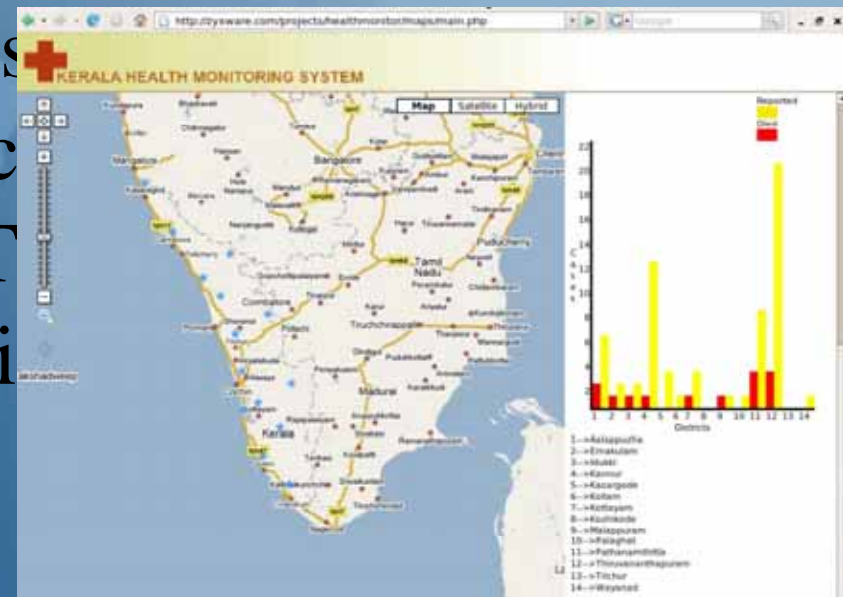
- ID Number:** '<' 106 '>' 'New' 'Graph...' 'Grid' 'Find...'
- Last Name:** 'Softpedia' **First Name:** 'Editor' **Sex:** Male Female **Birthdate:** '...' 'Graph...' 'Grid' 'Find...'
- Date of Measurement:** '<' 01-23-2009 '>' 'New'
- Age:** 'mos' [] 'yrs' []
- Height:** 'in' []
- Weight:** 'lbs' [] 'ozs' []
- Edema:**
- Mid Upper Arm Circum. (MUAC):** 'in' []
- Notes:** []
- Results - CDC/WHO 1978 Reference:**

	Percentile	Z-score
HT for Age:	[]	[]
WT for Age:	[]	[]
WT for HT:	[]	[]
Flag:	[]	[]
MUAC:	¹ Z For Age []	² Z For Height []

¹ Bull. WHO, 1997, 75: 11-18
² Bull. WHO, 1997, 75: 333-342

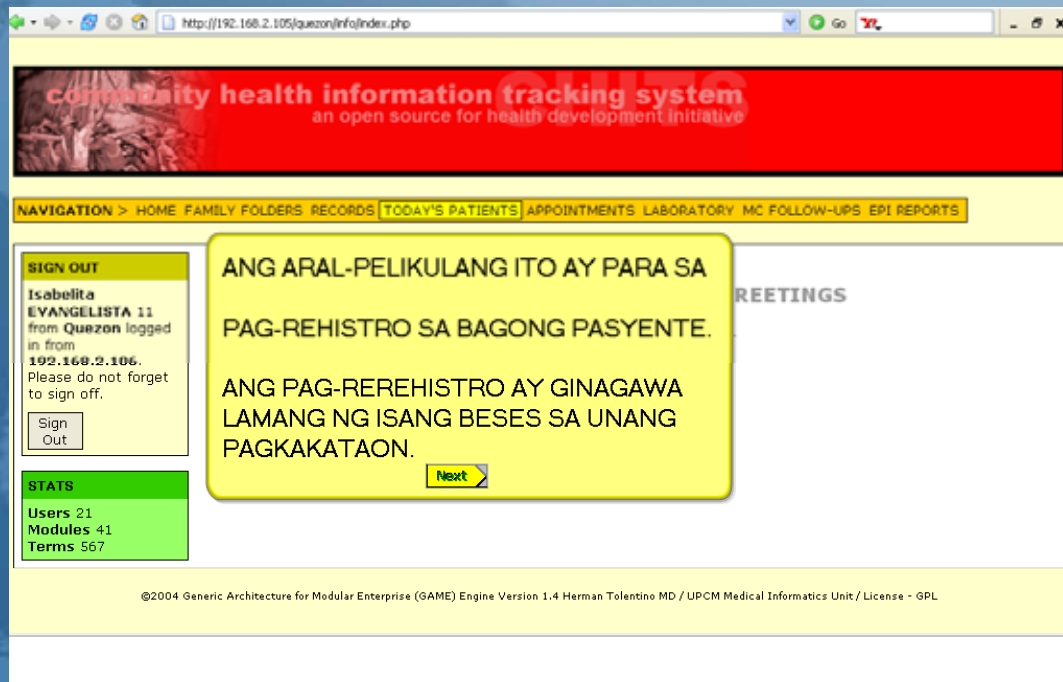
Zyxware Health Monitoring System

- Zyxware Health Monitoring System Real-time Monitoring of communicable diseases and presentation of the information on a map. This is a GNU GPL software written in PHP/MySQL and uses Google Maps API to track occurrence in a geographical region. The system is developed and maintained using Modern Web Technologies



CHITS (Community Health Information Tracking System)

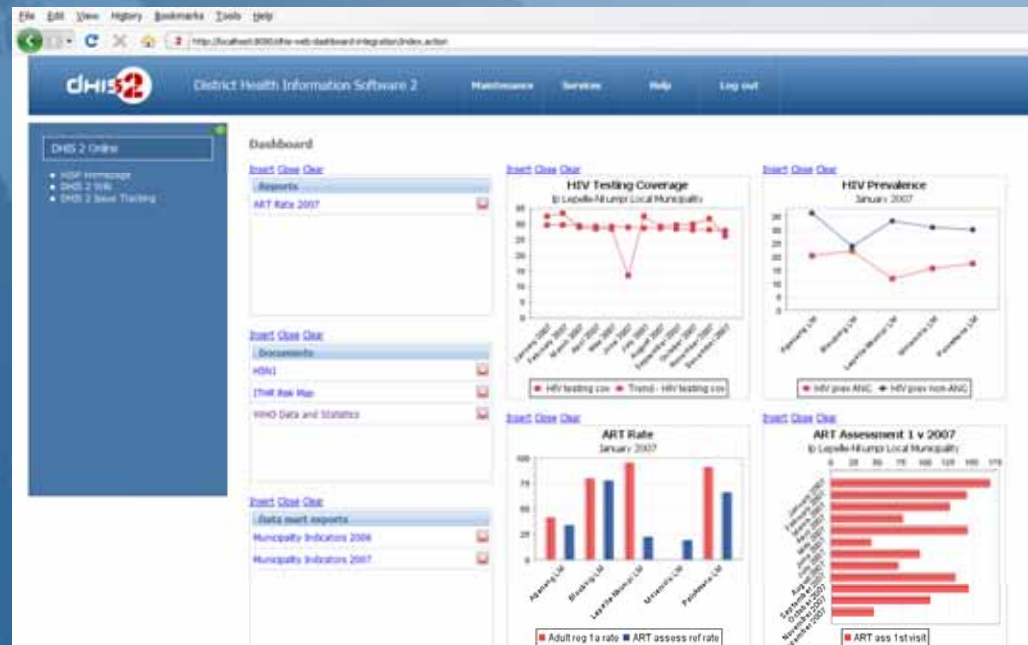
- Community Health Information Tracking System - EHR for public health community centres in developing countries



The screenshot shows a web browser window displaying the CHITS application. The browser's address bar shows the URL: `http://192.168.2.105/quezon/info/index.php`. The page features a red header with the text "community health information tracking system" and "an open source for healthy development initiative". Below the header is a navigation menu with items: HOME, FAMILY FOLDERS, RECORDS, TODAY'S PATIENTS (highlighted), APPOINTMENTS, LABORATORY, MC FOLLOW-UPS, and EPI REPORTS. The main content area is divided into several sections: a "SIGN OUT" box for user Isabelita EYANGELISTA 11, a "STATS" box showing 21 users, 41 modules, and 557 terms, and a large yellow box with a message in Tagalog: "ANG ARAL-PELIKULANG ITO AY PARA SA PAG-REHISTRO SA BAGONG PASYENTE. ANG PAG-REREHISTRO AY GINAGAWA LAMANG NG ISANG BESES SA UNANG PAGKAKATAON." with a "Next" button. The footer contains copyright information: "©2004 Generic Architecture for Modular Enterprise (GAME) Engine Version 1.4 Herman Tolentino MD / UPCM Medical Informatics Unit / License - GPL".

DHIS (District Health Information System)

- The **District Health Information System (DHIS)** is a highly flexible, open-source [health management information system](#) and [data warehouse](#). It is developed by the [Health Information Systems Programme \(HISP\)](#) project.
- The solution covers aggregated routine data, semi-permanent data (staffing, equipment, infrastructure, population estimates), survey/audit data, and certain types of case-based on patient-based data (for instance disease notification or patient satisfaction surveys).



Dicom 4j-apps

- An open source DICOM Java framework for viewing DICOM images



HL 7 Inspector 2

- HL7 analysis and validation tool



Epihandy

- Handheld survey/data collection application



RapidSMS

- RapidSMS is a communications platform for coordinating SMS, voice messages, IVR menus, and email with user and group management - developed by UNICEF



The background is a blue-tinted world map. On the left side, there is a circular inset showing a globe of the Earth with a blue and white color scheme. The globe is centered on the Americas. The text "That's It" is positioned in the center-right of the map.

That's It

And be careful that you might be tracked out. Because everything is possible with this technology.