CHOIS: Enabling grid technologies for obesity surveillance and control

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NU Community Research Institute (NUCRI)

(http://nucri.nu.edu)

NUCRI is an outreach to the Community for National University

- HASTAC (higher education)/HASS grid
- National School Board (NCC/FRC)
- UC Humanities Research Institute
- K12 (AmeriCorps)
- ARTCA
- Illinois Department of Public Health
- NCSA/University of Illinois at Urbana-Champaign
- SmileHealthy, SIU, etc.

focused on digital technology need based Research for the community

CHOIS for obesity surveillance and control

Obesity: this metabolic disorder is often associated with an increased risk for developing a variety of serious health related conditions including social and emotional problems.

Recent study has shown that the maternal obesity may even cause a serious congenital heart defect to the new-born baby.

Gene	Disease	Chr.	Primary reference
ADRB3	Eating behavior	8	Cecil, et. al., 2007
ALOX5	obesity	10	Mehrabian, et. al, 2005.
ALOX5AP	obesity	13	Mehrabian, et. al, 2005.
C3AR1	obesity	12	Schadt, et. al., 2005.
FTO	obesity	16	Chu, et. al., 2008.
GAS7	obesity	17	Marchini, et al., 2005.
GPX3	obesity	5	Marchini, et al., 2005.
GK	obesity	X	Marchini, et al., 2005.
HSD11B1	obesity	1	Schadt, et. al., 2005.
INSIG2	obesity	2	Chu, et. al., 2008.
LACTB	obesity	15	Chen, et al., 2008
LPL	obesity	8	Chen, et al., 2008.
ME1	obesity	6	Marchini, et al., 2005.
PFKFB3	obesity	10	Jiao, et al., 2008.
PPARA	T2D	22	Schadt, et al., 2008.
PPARG	obesity	3	Kubota, et al., 1999.
PPM1L	obesity	3	Chen, et al., 2008.
TGFBR2	obesity	3	Schadt, et al., 2008.
ZFP90	obesity	16	Schadt, et al., 2008.

TABLE: Obesity related genes. More than a dozen genes have been identified associated with obesity.

The latest U.S. National Health and Nutrition Examination Survey documents that about one third of adults in the United States are now overweight/at-risk and another one third are obese. Recent survey also suggests almost 1/3 of children and adolescents are overweight or obese and 11.3% of children and adolescents are very obese.

The economic impact of this condition is staggering: in 2008, it has been estimated that more than 147 billion dollars were spent just in the United States for medical costs related to obesity and this estimation does not include the time lost from work.

obesity has become a major concern in US. The present administration under President Obama has recently established a task force on childhood obesity (White house, Office of the Press Secretary, February 09, 2010) to address this issue (White house, Office of the Press Secretary, February 09, 2010).

Development of effective surveillance, prevention, treatment and management strategies to address the health, social and emotional problems associated with overweight, particularly among school-aged children is very critical.

Legislation has been passed in several states including in Illinois to screen obese and at-risk children and involve them in wellness program with proper diet and regular physical activity.

BMI

CHOIS
Electronic Medical Record System
Supported by CI

Electronic Medical Record

By 2014, all the citizens should have an access to his/her Electronic Medical Record.

Communications of the ACM, Nov 2009, Vol 52 (11), 18-20.

EMR are widespread in Europe, Australia, and elsewhere, but only 4% of American doctors have a fully functional system.

New England J. med., 356, 24, June 14, 2007, 2527 – 34.

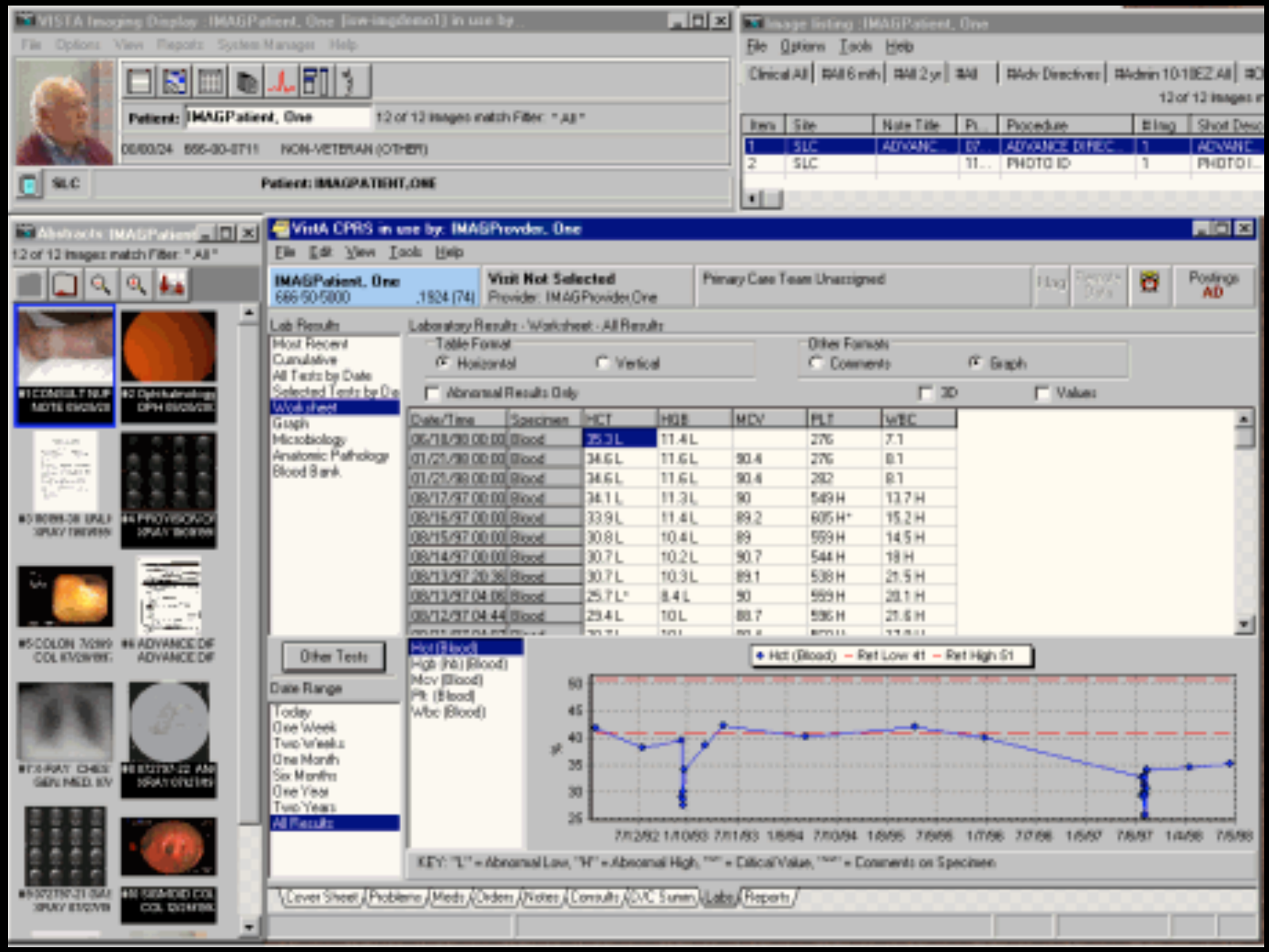
Implementing Electronic Medical Record

- Benefits are obvious
- Reduction of clerical errors
- Clinical-decision support
- Furthering medical research

- Economic Incentives to doctors
- Economic Incentives to Hospitals

- Regulations – HIPAA, FERPA
- Standards (HL 7, ISO, DICOM, etc.)
- Data Integration

Communications of the ACM, Nov 2009, Vol 52 (11), 18-20.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All Tests by Date
Selected Tests by Date
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Anatomic Pathology
Blood Bank
Laboratory Results - Worksheet - All Results
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Other Formats
Comments
Graph
Abnormal Results Only
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Values
Date/Time
Specimen
HCT
HGB
MCV
PLT
WBC
Other Tests
Date Range
Today
One Week
Two Weeks
One Month
Six Months
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Two Years
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Wbc (Blood)
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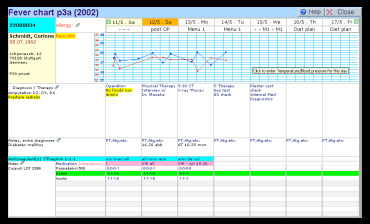
Meds
Orders
Notes
Consults
D/C Summ
Labs
Reports

Data Integration



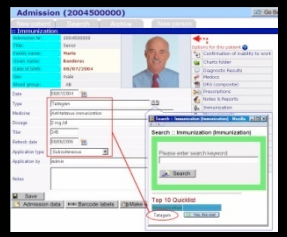
Electronic Medical Record

Hematology

Oral Pathology

Histopathology

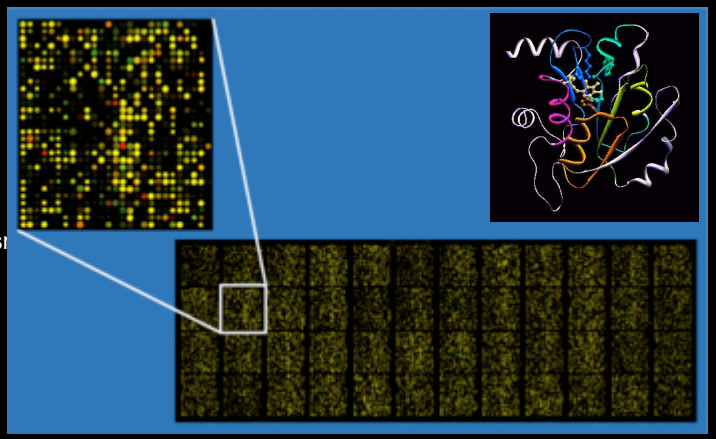
Blood tests



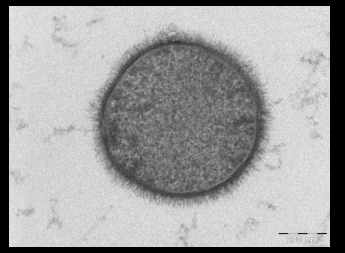
Electronic Healthcare Record

X-ray

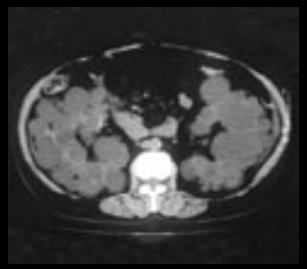
Image of acute arterial embolisı



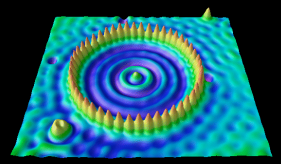
Microarray



Transmission electron microscopy

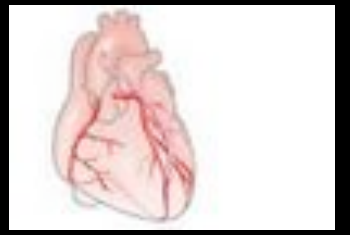


CT finding, **Epithelial carcinoma of the ovary**



Scanning Tunneling Microscopy

Atomic force microscope (AFM)



Heart surgery

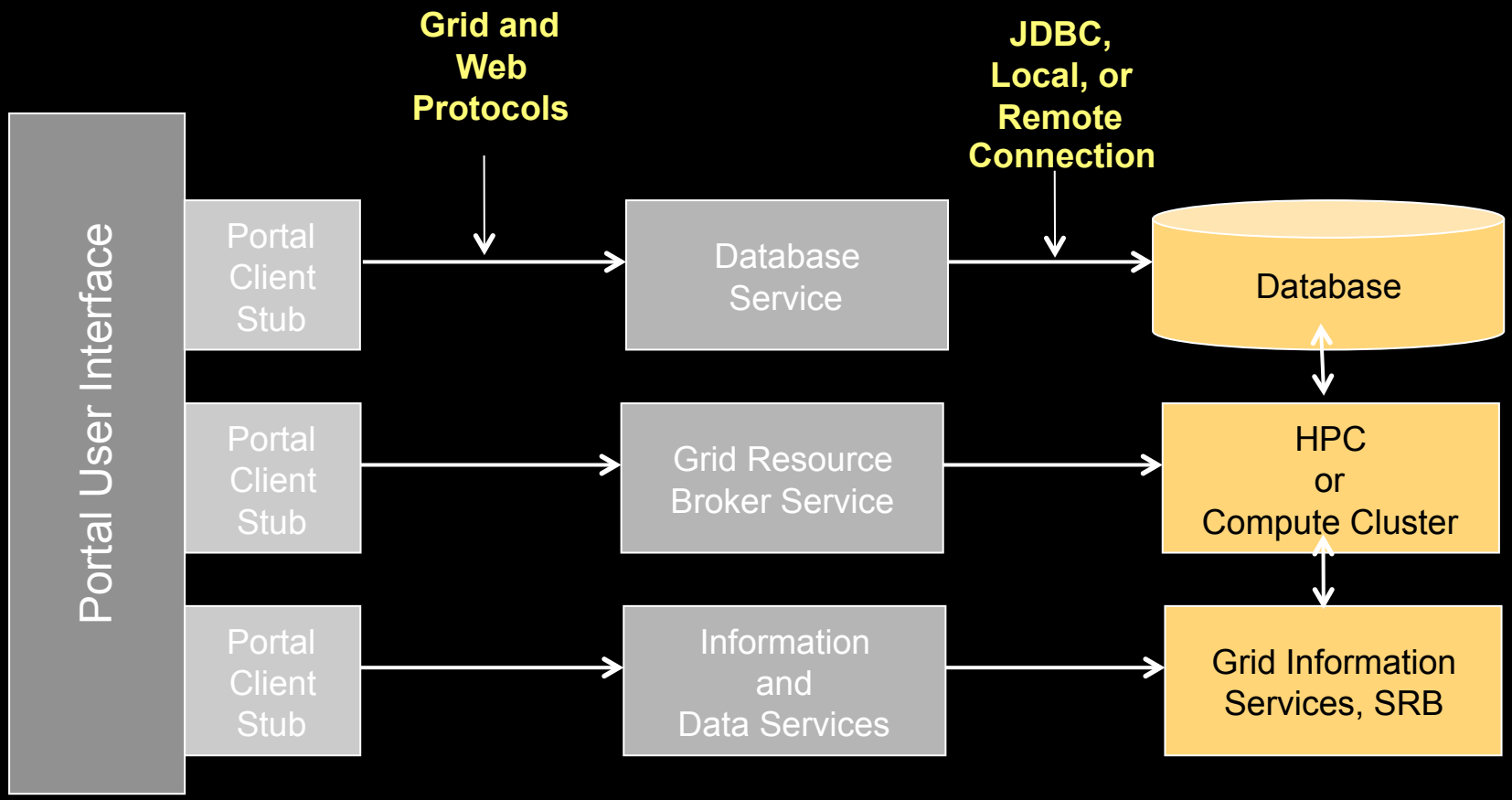
Electronic Devices for capturing the data

Echocardiography (EKG)

Smart Phone

Tablet-PC

Three-Tier Architecture



Three-tiered service oriented architecture is accepted standard for accessing Grid and other services

Distributed Grid and Web Services

Launch, configure And control

Application Interface

Workflow service

Grid Portals

App Instance

Open Grid Service Architecture Layer

Registries and Name Binding

Policy

security

logging

Data Management services

Account services

Reservations and Scheduling

Event/Mesg Services

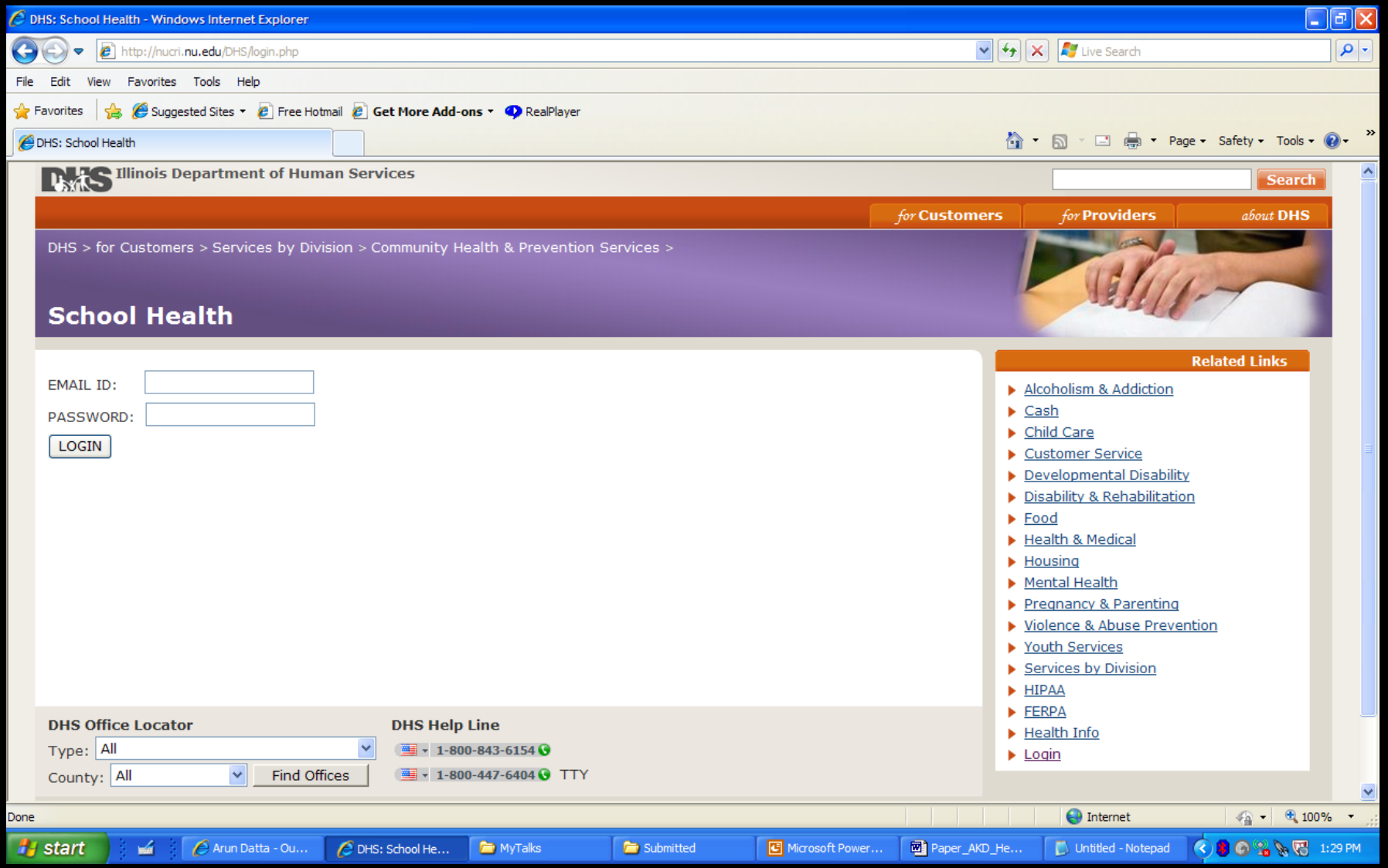
Administrating & Monitoring

Grid Orchestration

Open Grid Service Infrastructure (web service component model)

Resource layer

(slide by Dennis Gannon, modified)


DHS: School Health - Windows Internet Explorer
http://nucri.nu.edu/DHS/login.php
Live Search
File Edit View Favorites Tools Help
Favorites
Suggested Sites
Free Hotmail
Get More Add-ons
RealPlayer
DHS: School Health
Page
Safety
Tools
Illinois Department of Human Services
Search
for Customers
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about DHS
DHS > for Customers > Services by Division > Community Health & Prevention Services >
School Health
EMAIL ID:
PASSWORD:
LOGIN
Related Links
Alcoholism & Addiction
Cash
Child Care
Customer Service
Developmental Disability
Disability & Rehabilitation
Food
Health & Medical
Housing
Mental Health
Pregnancy & Parenting
Violence & Abuse Prevention
Youth Services
Services by Division
HIPAA
FERPA
Health Info
Login
DHS Office Locator
Type: All
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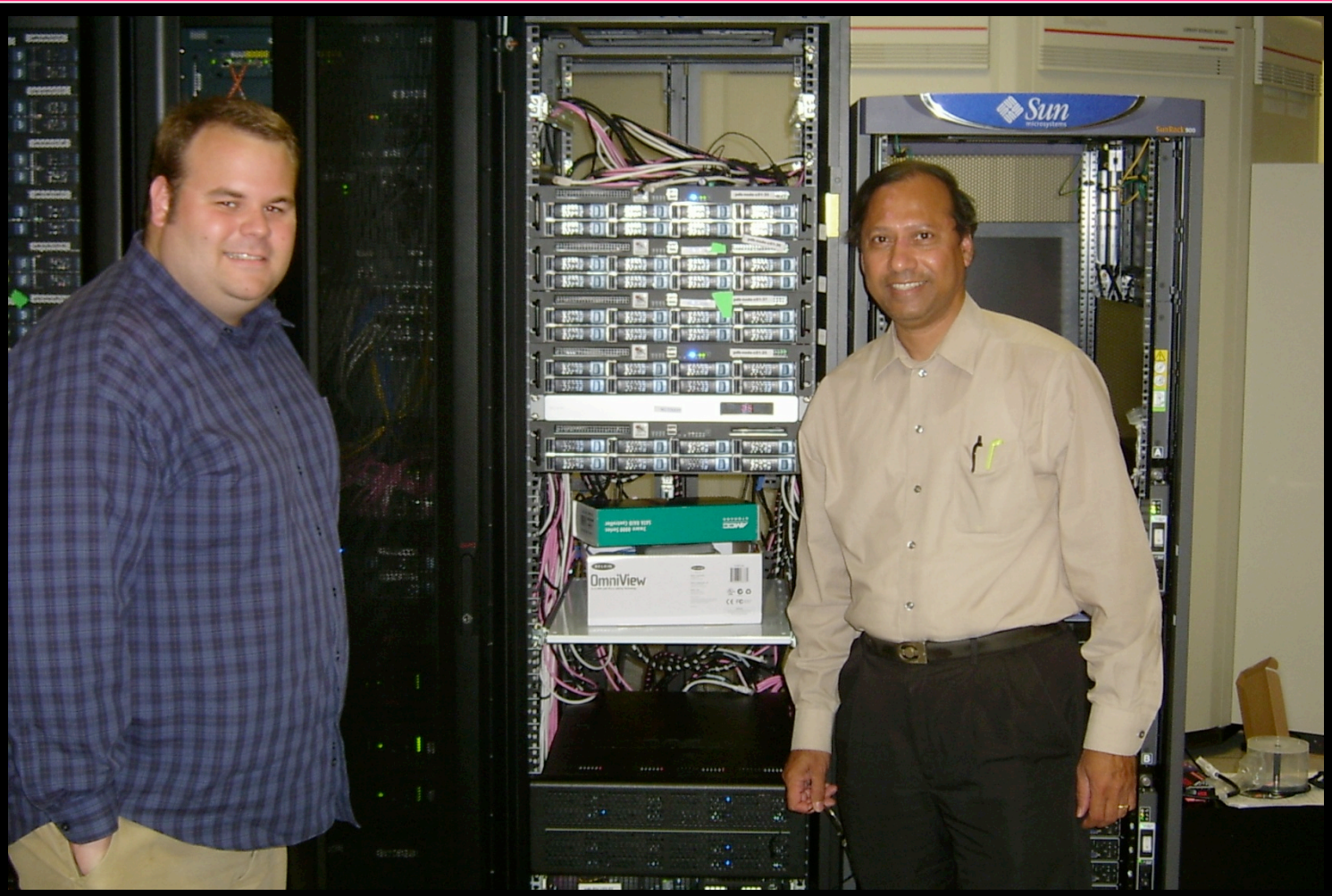
demo

CHOIS – *Child Health and Obesity Informatics System*

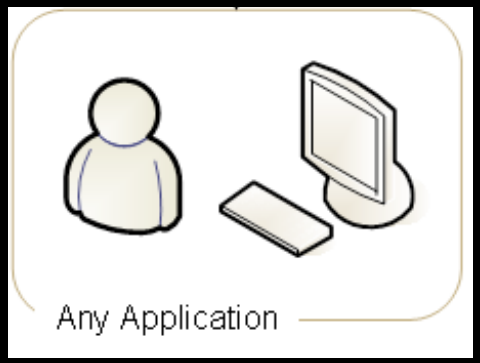
Features of CHOIS

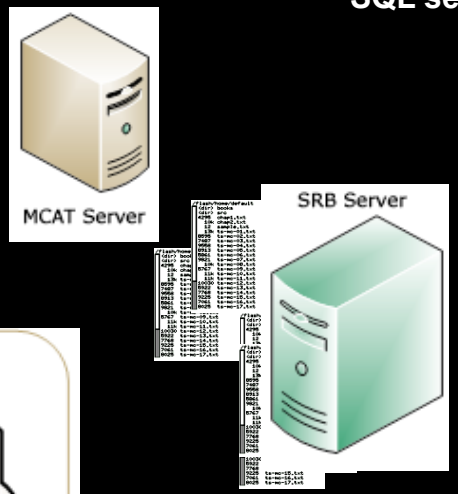
- Web based forms
  * BMI, Asthma, etc
  * Genomic info
- Combination of federated and central databases
- Reports are available from anywhere anytime
- Role based accessibility
- Regulatory compliance (HIPAA, FERPA)
- Mobile version is available
- CMS, *Drupal*
- Data integrator & DSS
  Cyberintegrator, MotifNetwork, etc.
- Alert system
- Cyberenvironments

Datagrid deployment



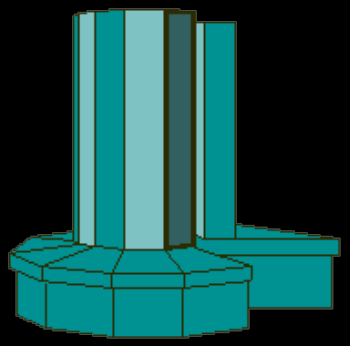
Visualization of SRB/iROD



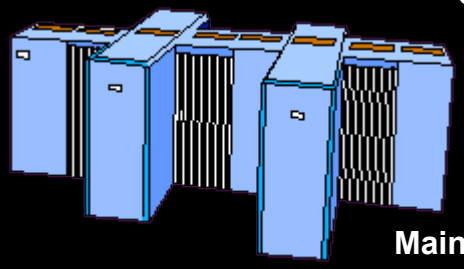


SQL server/Oracle/MySQL

Any platform
Distributed Server



Supercomputers



Mainframes

demo

Community Grid - Windows Internet Explorer
http://nucri.nu.edu/c-grid/index.php?login_val=yes
Live Search
File Edit View Favorites Tools Help
Favorites Suggested Sites Free Hotmail Get More Add-ons RealPlayer
Community Grid
Page Safety Tools
Community Grid
Enabling GRID Technologies for Community Research
Bringing the Community Together
Home Collaboration Events Newsroom
Home
Publications
Resources
FAQ & Help
Collaborators
Training
Contact Us
Exit
Community Grid
C-Grid, the Community Grid web portal is developed to store massive amount of health related data for further analysis by the community. Remote management of C-Grid infrastructure is done using eziRODS which is web-based application that act as a gateway for the community institutions and organizations to communicate with cyberinfrastructure using Grid Technology.
The objective of this web portal is for long-term data preservation, unified data access and share domain specific data amongst community members. The NUCRI Grid is a distributed computing deployment and data management system for sharing resources, data and computing power with other people who are in Grid community via the internet. It provides the collaborative data sharing and maintenance of distributed storage resource collections. The web portal has been uniquely created using PHP scripting language integrated with GRID using the Integrated Rule -Oriented Data System (iRODS). The iRODS acts as the middleware between Grid technology and User application, which helps to create, manage "virtual data collection" that can be stored on heterogeneous data resources across distributed network. iRODS is being used by data-grid as the underlying technology to share and mange large amounts of distributed data.
Explore C-Grid
Developed and supported by the National University Community Research Institute (NUCRI)
Done
Internet
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Arun Datta - O...
Community Grid...
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Clinic Code
Grade Level
Pre-K
K
G1
G6
G9
Student ID
Gender
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Height (inch)
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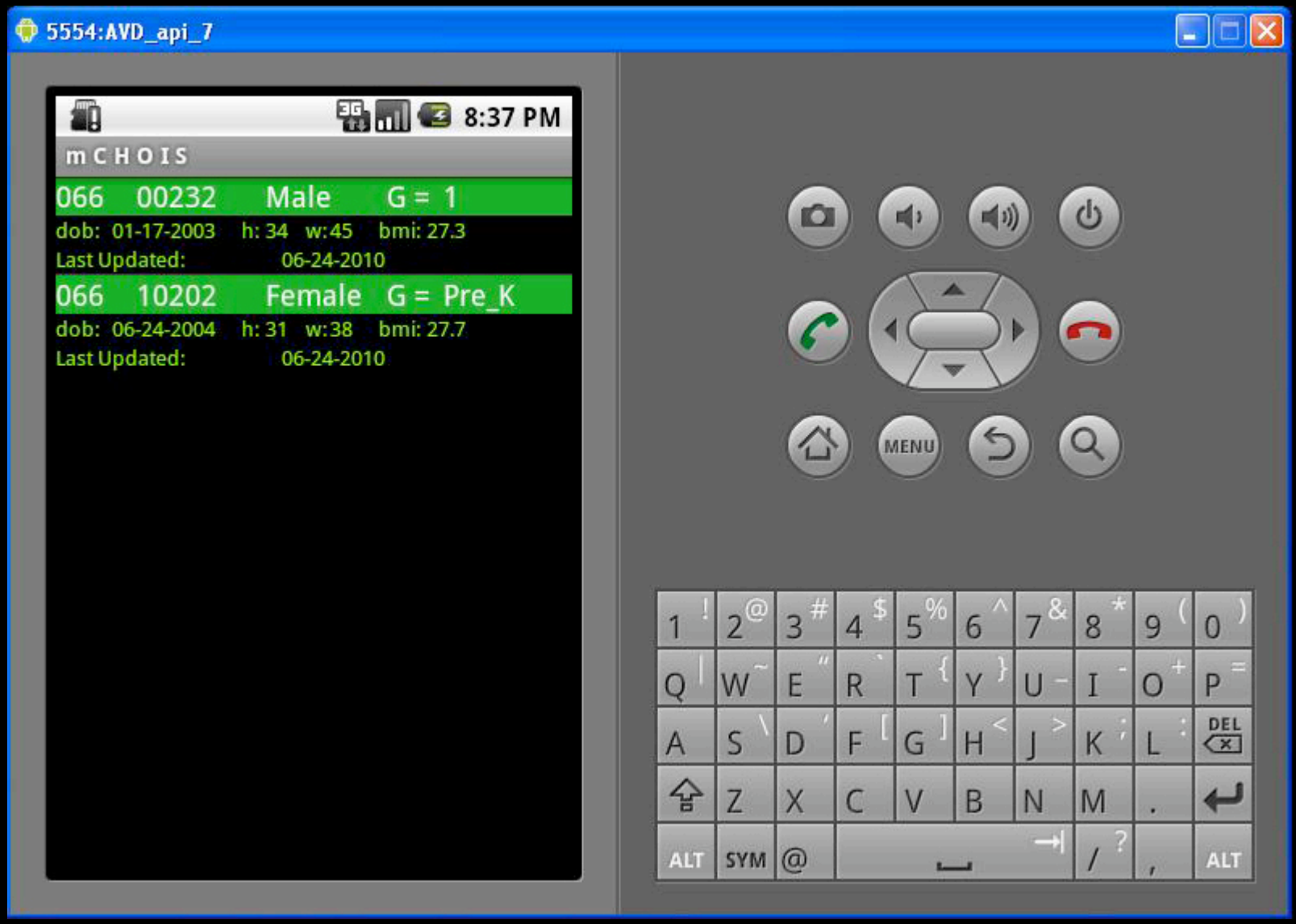
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Last Updated: 06-24-2010
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MENU
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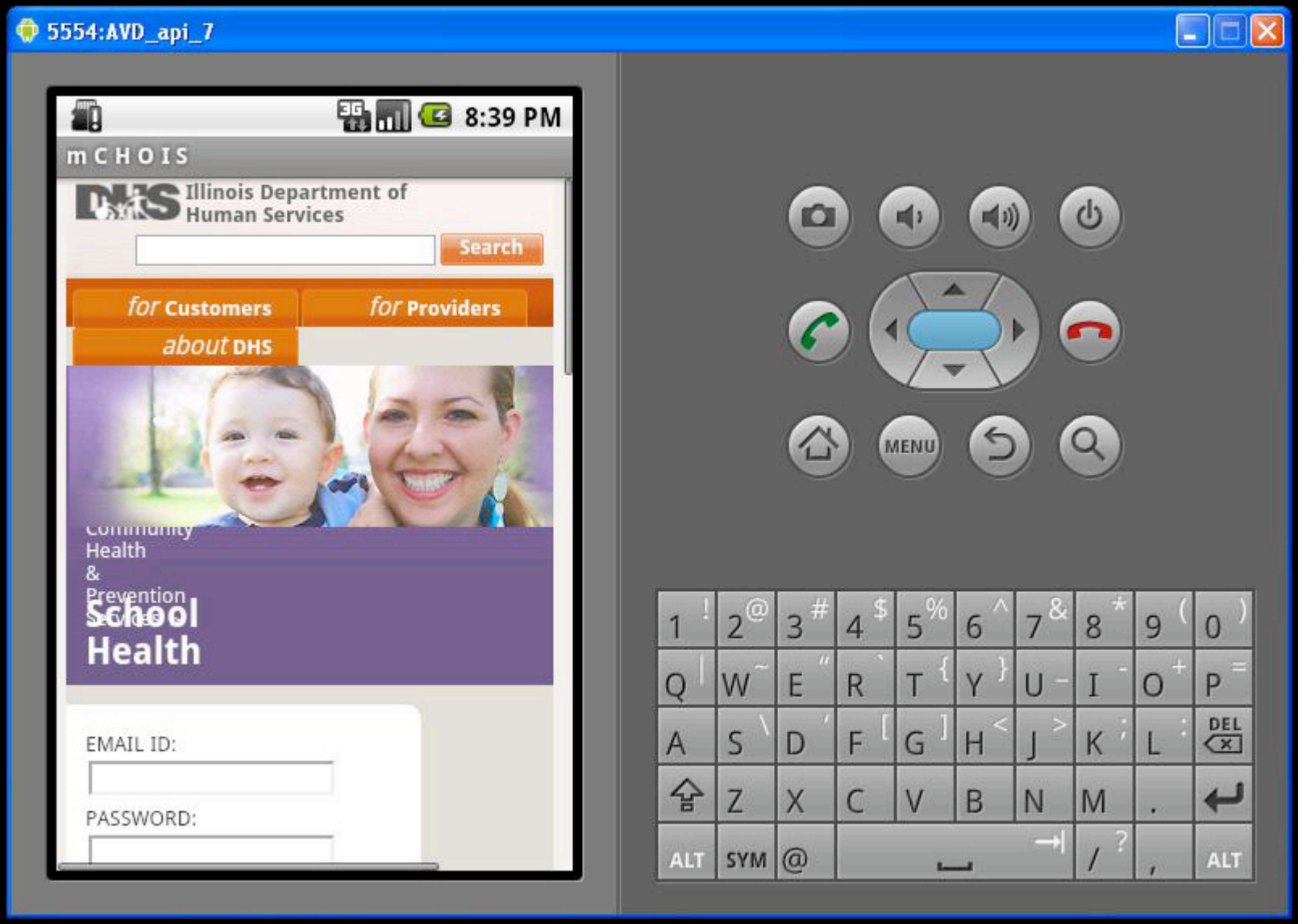
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Health & Prevention
School Health
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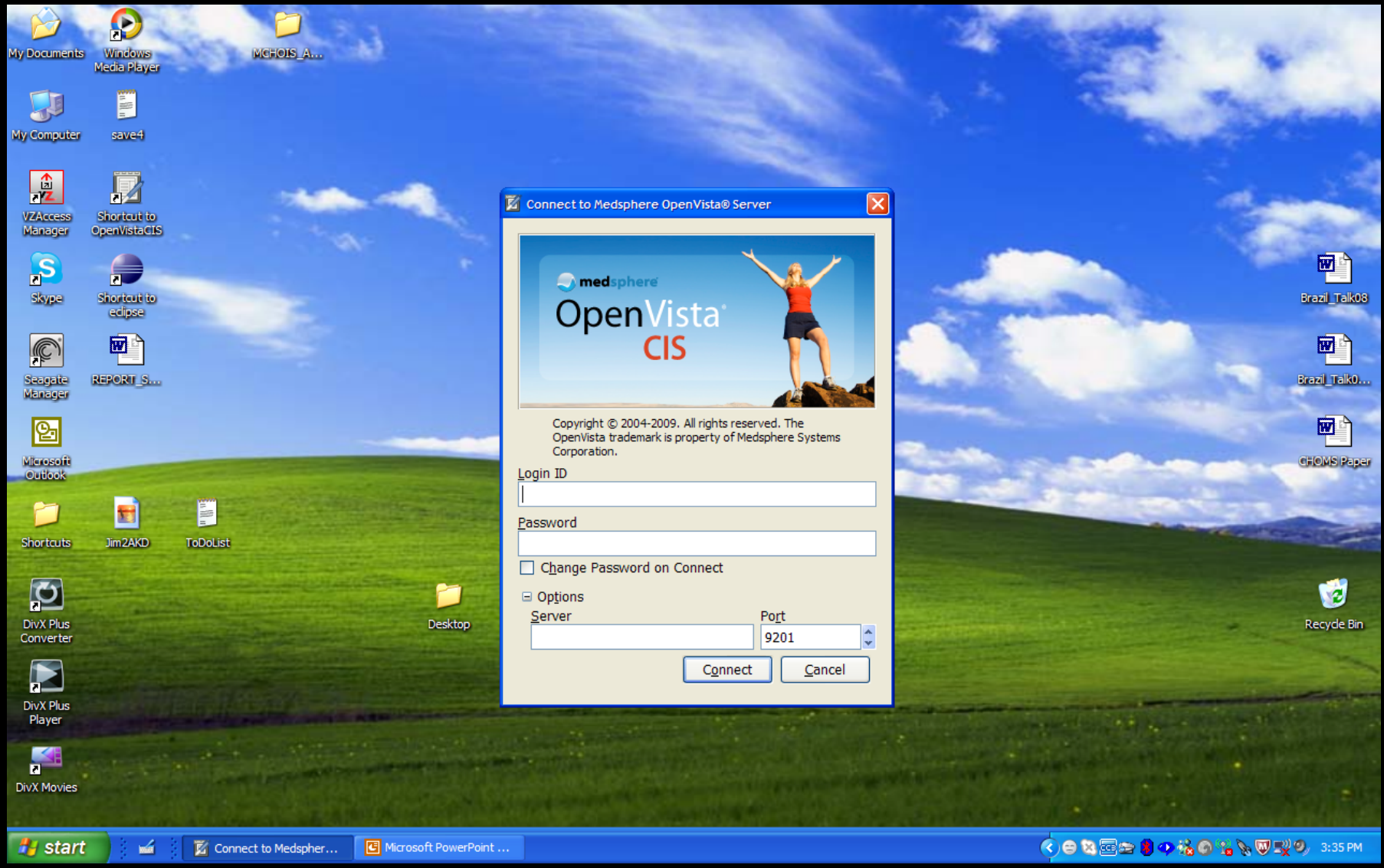
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Shortcut to OpenVistaCIS
Skype
Shortcut to eclipse
Seagate Manager
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Shortcuts
Jim2AKD
ToDoList
DivX Plus Converter
Desktop
DivX Plus Player
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Recycle Bin
Connect to Medsphere OpenVista® Server
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Copyright © 2004-2009. All rights reserved. The OpenVista trademark is property of Medsphere Systems Corporation.
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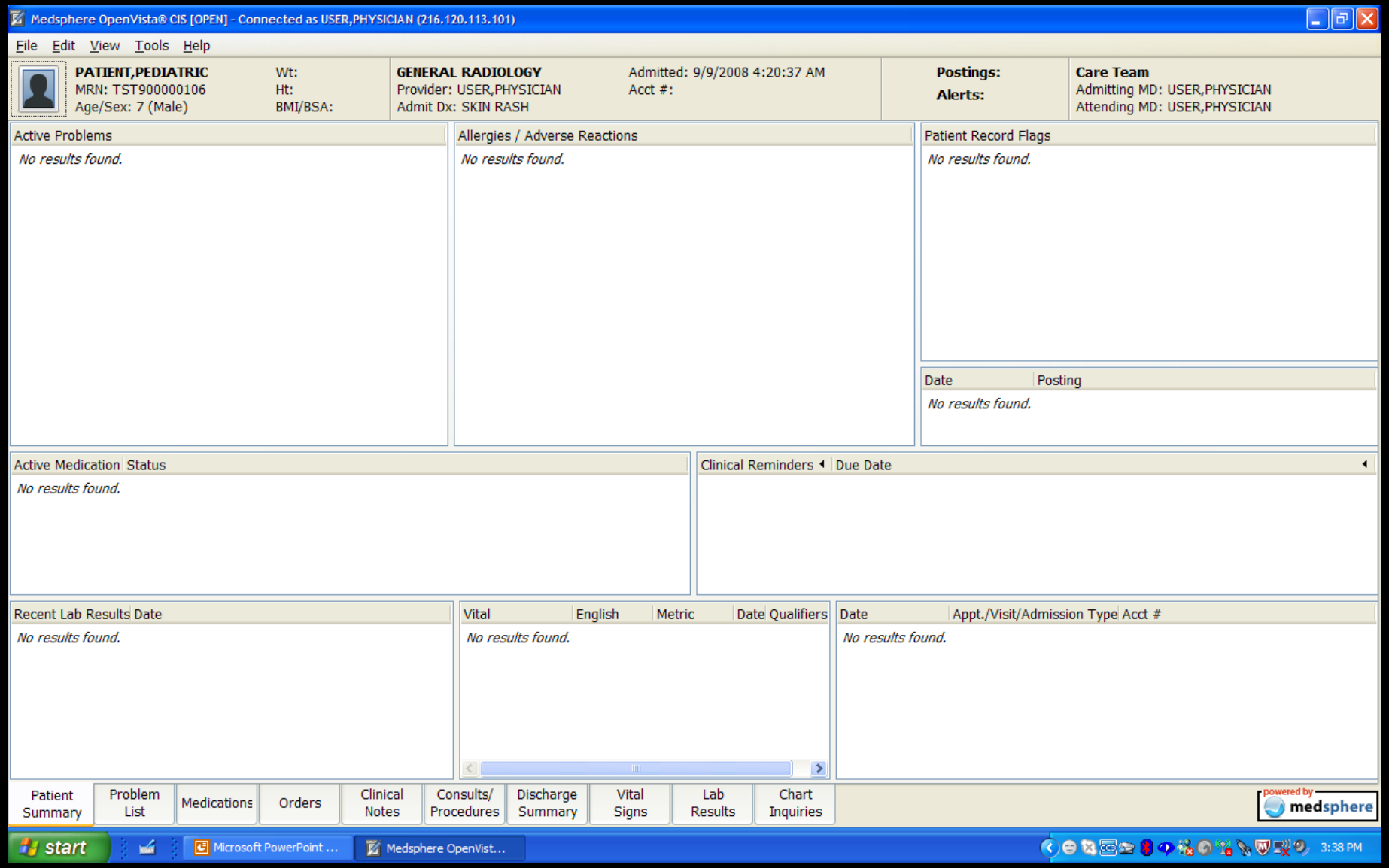
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Ht:
BMI/BSA:
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Provider: USER,PHYSICIAN
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Alerts:
Care Team
Admitting MD: USER,PHYSICIAN
Attending MD: USER,PHYSICIAN
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Allergies / Adverse Reactions
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Orders
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Consults/ Procedures
Discharge Summary
Vital Signs
Lab Results
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Access Grid/IOCOM

Thank You