

PROGRESS REPORT

Information & Communication Technologies (ICTs)



COMSATS Institute of Information Technology



Presentation

BACKGROUND

Meeting of COMSATS' thematic research group on information and communication technologies (ICTs).

Organized By: Commission on Science and Technology

Held On: April 19-20, 2011,

Participant

- COMSATS Institute of Information Technology (CIIT), Pakistan (Lead Centre)
- *Mr. Oladejo Olutunji* Principal Programmer, National Mathematical Centre (NMC), Nigeria
- *Mr. Shadi Al-Asfeh* Systems Analyst Royal Scientific Society (RSS), Jordan
- *Dr. Abdul Hanan bin Abdullah* Dean Faculty of Computer Science & Information System, Universiti Teknologi Malaysia (UTM), Malaysia



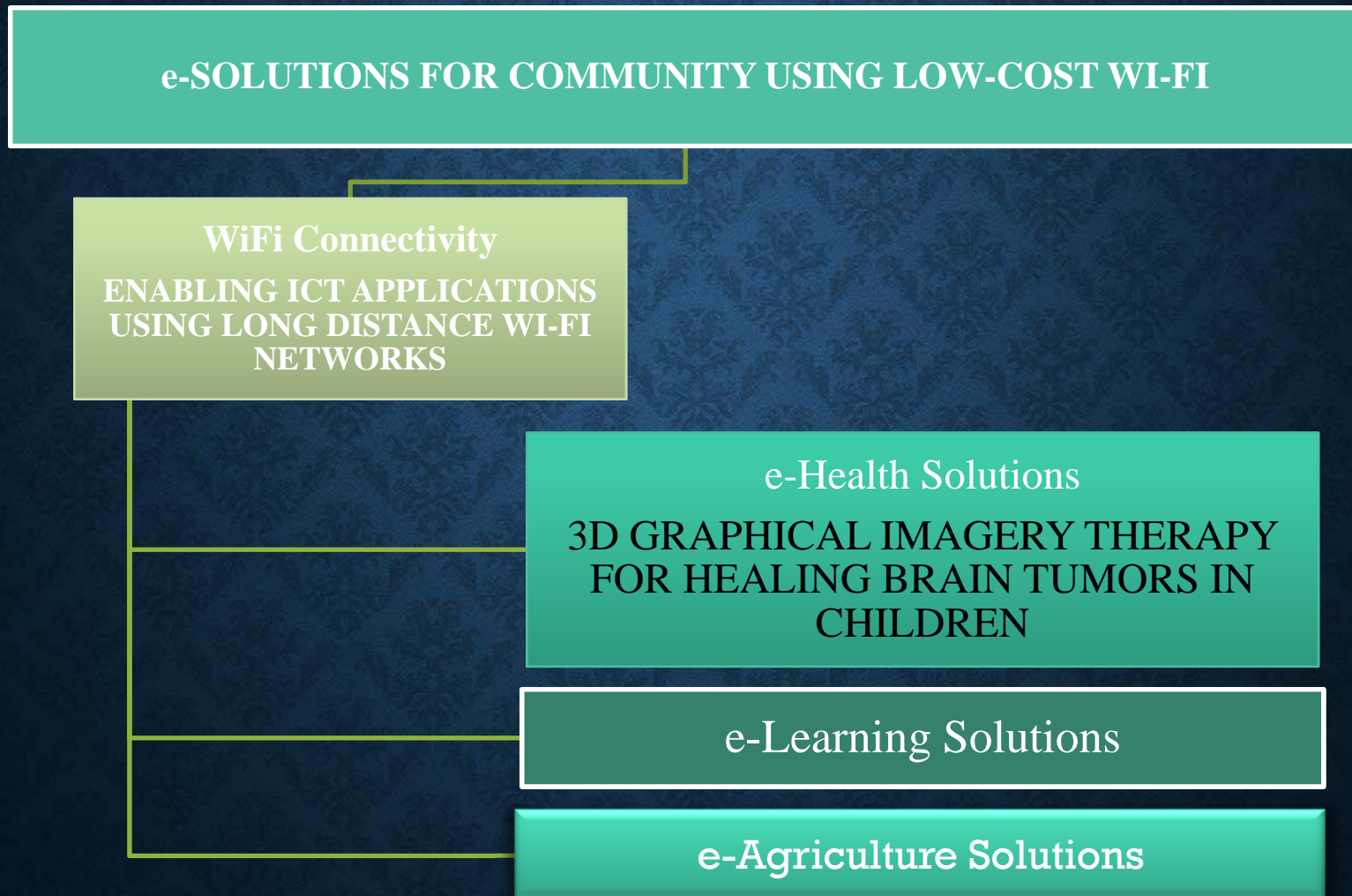
BACKGROUND

Research Theme

- Participants selected a main research theme to be undertaken by the Group, titled **‘e-Solutions for Community using Low-cost Wi-Fi’**.
- Under the theme group has initially targeted establishment off Wi-Fi connectivity and e-Health solutions.
- Whereas the group also agree to work on e-Learning and e-Agriculture.



FLOWCHART OF THE THEME

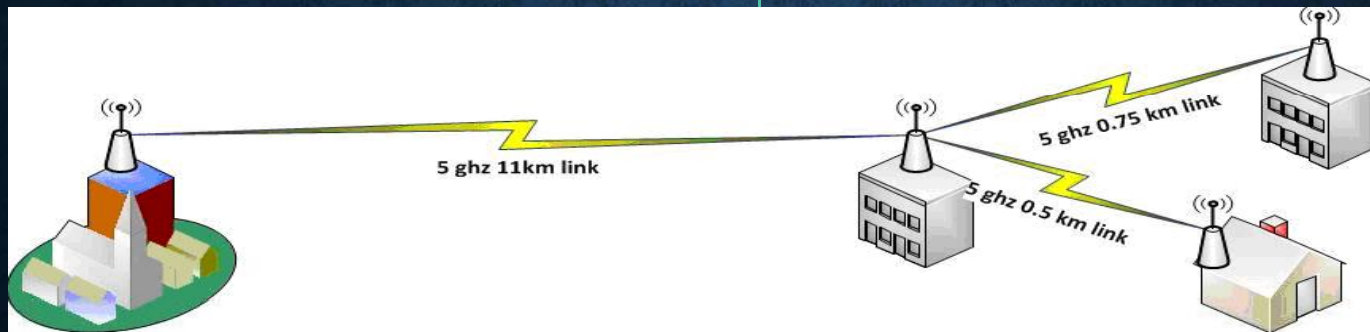




WiFi Conectivity

Enabling ICT Applications Using Long Distance Wi-Fi Networks

- **Idea:** Solutions for challenging rural and underserved environments through building affordable, robust and reliable ICT systems.
- By providing cheap connectivity between developed and remote areas, illiteracy, health problems and poverty can be alleviated.
- Wi-Fi is the most suitable option:
 - Affordable costs
 - Easier reach to far flung rural areas
 - Desirable data rates
 - Less maintenance overheads



WiFi Conectivity

Enabling ICT Applications Using Long Distance Wi-Fi Networks

Progress

- Current prototype deployment is made by deploying the stations at an aerial distance of 2.2 Km.
- We can now reach the distance of 10 km, 20 km up-to 50 km.
- This project is complete and we can easily deploy & could facilitate any member state country if they want to utilize this facility for the far flung areas or mountainous terrain.

WiFi Conectivity

Enabling ICT Applications Using Long Distance Wi-Fi Networks

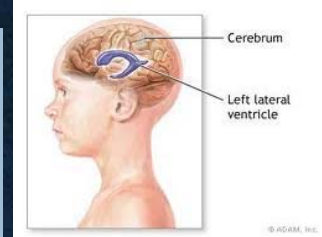
Salient Features

- Intelligent Quality of Service: priority is to multimedia traffic for seamless streaming.
- Long distance: Capable of transmitting over long distance at high rate (100+ Mbps over 70+ Km)
- Highly scalable: Depending on the available budget low to high value equipment can be bought that make these solutions scalable
- Software based configuration and monitoring
 - Network Maps
 - Monitoring device status
 - Real-time link utilization report
 - Firmware up-gradation
 - Managing group of devices
 - Task scheduling
 - Spectral width adjustments
 - Multi-Language support

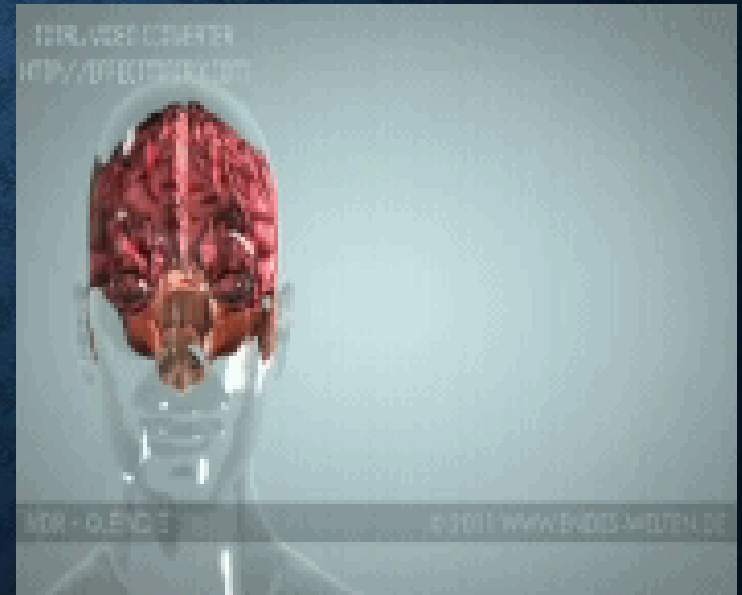


e-Health Solutions

3D Graphical Imagery Therapy For Healing Brain Tumors In Children



- **Idea:** Curing brain tumor in children by Image Therapy/Psychological Therapy through video games.
- Three dimensional animated graphical representation is a tool which can be used to facilitate the guided imagery sessions in children with brain tumors.
- 3D animated imagination in form of PC game for children with brain tumors will provide the explanation of - how the tumors can be attacked by the immune system within their bodies.
- Immune cells are used as the weapons against tumors.



e-Health Solutions

3D Graphical Imagery Therapy For Healing Brain Tumors In Children

Progress

- The project is funded by ICT R&D Funds, Ministry of IT Government of PAKISTAN
- The final version of the game completed & can be downloaded from <http://ww3.comsats.edu.pk/3dgit/>
- Its Android version is also completed and could be downloaded from Google Play by the name MANAY
- This could be dubbed in any Languages (e.g. Persian, Arabic, French, Chinese etc.
- We can train any member state country in deploying it as well as developing these kind of therapeutic games.

Trailer of Completed Therapy Game Manay (The Protector)

**A 3D
GRAPHICAL IMAGERY
THERAPY**

e-Learning Solutions

Augmenting Traditional Learning by Using e-Learning



- **Idea:** Making best possible use of existing specialized faculty in the developing countries through developing e-Learning framework for low-cost specialized knowledge dissemination.
- Develop and assess effectiveness of courses.
- The project components include:
 - IT augmented learning material
 - lecture efficacy monitoring
 - Artificial Intelligence techniques
 - video conferencing
 - online examinations



e-Learning Solutions

Augmenting Traditional Learning by Using e-Learning

Progress

- Recently one of our faculty member has joined us after completing his PhD in e-Learning and he will spearhead this project.
- We have been in negotiation with few private entities and will jointly start this project with them.
- Options is open for all the participating countries to work on development of computer-assisted learning environments for adult basic education keeping in view the theoretical foundation of learning processes.



e-Learning Solutions Core Products and Services

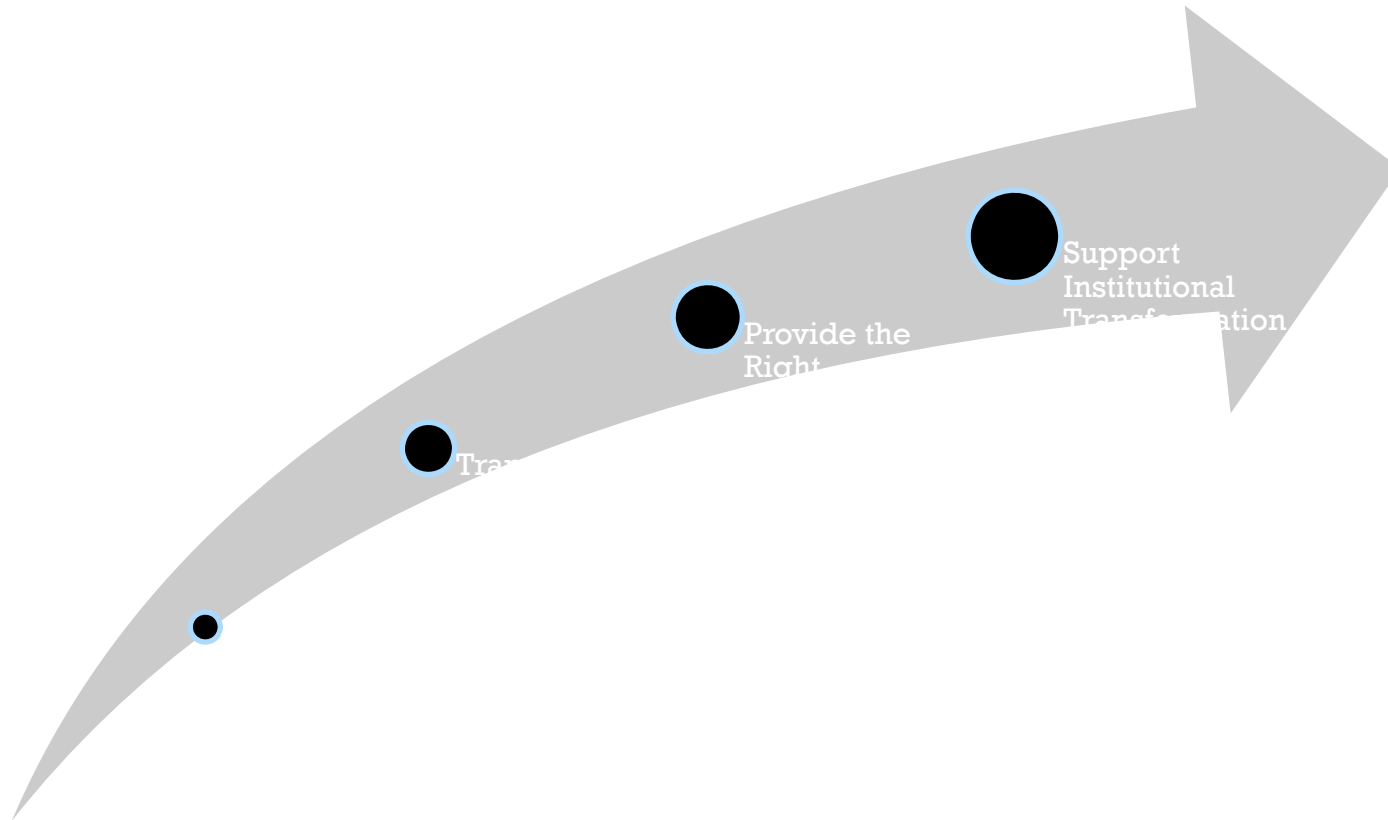
**Online University Management System
(CUOnline)**

**ICT Enabled Distance Learning Platform
(Learning Management System)**

Digital Courseware Development



e-Learning Solutions CIIT Virtual Campus Technology Wing



e-Learning Solutions C U Online



Provides an online automation of all major university processes under one umbrella



Web based anytime anywhere access



Prompt **educational & Operational** reporting for administration



Modules to handle tasks from Admission to Graduation.



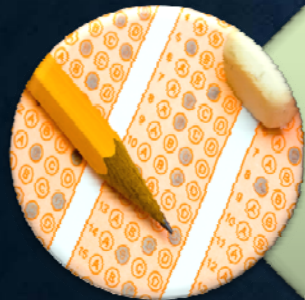
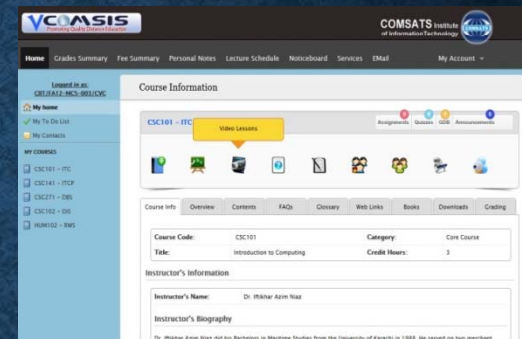
e-Learning Solutions

Learning Management System (LMS)

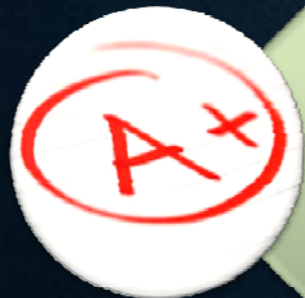
ICT based Distance Education



Video Lectures, Lecture Notes, Discussion Boards, Live online Sessions



Online Quiz, Assignments, Sessional Exams



Result Notification, Feedback, Monitoring Reports etc.

e-Learning Solutions

Infrastructure and Learning Content Development



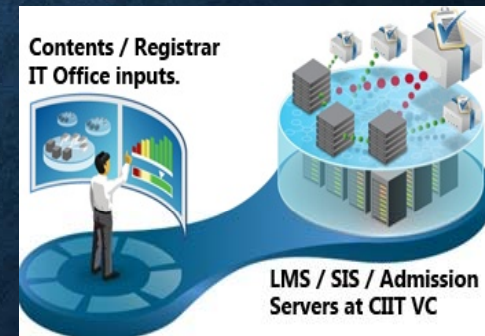
Capacity Building for
Online Courseware
Development, Lecture
capturing



Infrastructure design and
development for IT enabled
learning environments



Increased outreach of
educational services, Better
global presence



e-Agriculture Solutions Precision Agriculture



- **Idea:** Farmers' low access to appropriate technologies and state of the art research and innovation is the key challenge to the developing countries agriculture sectors.
- Precision Agriculture as optimizing crop production.
- Wireless Sensor Networks (WSNs)
 - Better spatial and temporal resolution of data
 - cheaper costs

e-Agriculture Solutions Precision Agriculture

Progress

- The progress is slow of this project as the priority was not given to it. The TRG-ICT is in need of active collaboration in this project.



INTERNATIONAL CONFERENCE FRONTIERS OF INFORMATION TECHNOLOGY

- Every year it is held in December at Islamabad. In collaboration with IEEE & ACM.
- This year it will be held on 17th-19th December
- <http://www.fit.edu.pk>
- Researchers from COMSATS member countries are welcome to participate.



FUTURE DIRECTION

- The major projects under this group on Wi-Fi, e-Health and e-Learning have been completed and a comprehensive progress report on each is given here
- These projects are on the verge of growth and extension and after detailed deliberation with the projects' focal persons it is positively articulated that these projects are ready to be launched at large scale. Further, we are also progressing although slowly but steadily on "Precision Agriculture" and are involving industry specialists in order to finish efficiently and effectively this task.
- A meeting of ICT Thematic Group is scheduled during December 17-19, 2014 to discuss the achievements and to invite opinions from various experts on the accomplishments.



Thank You

