Annual Progress ICT-TRG 2014-15

"E-SOLUTIONS FOR COMMUNITY USING LOW-COST WI-FI"

Team Lead: Prof. Dr. Sajjad Mohsin

Meeting of COMSATS' Thematic Research Group on Information and Communication technologies (ICTs).

ORGANIZED BY: COMMISSION ON SCIENCE AND TECHNOLOGY ON SUSTAINABLE DEVELOPMENT IN SOUTH

HELD ON: DECEMBER 14TH 2014

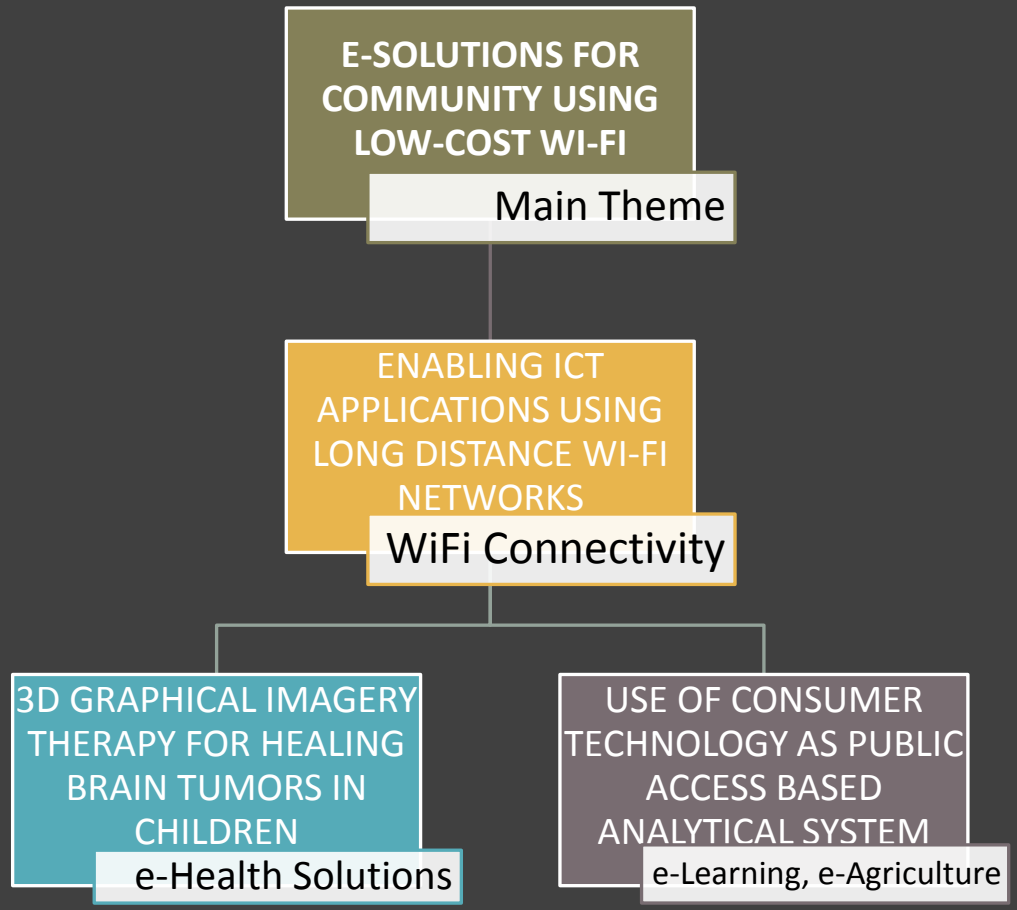
Participants

- **Dr. Imtinan E. Qureshi, Executive Director COMSATS**
- Mr. Tajammul Hussain, Advisor (Programmes), COMSATS
- Prof. Dr. Sajjad Mohsin, Team Lead & Dean, Faculty of Information Sciences and Technology (FIST), COMSATS Institute of Information Technology (CIIT), Islamabad, Pakistan
- Dr. Mahmoud Farfoura, Royal Scientific Society (RSS), Amman, Jordan
- Dr. George Oreku, Tanzania Industrial Research and Development Organisation (TIRDO), Dar-es-Salaam, Tanzania
- Dr. Shervin Amiri, Iranian Research Organization for Science & Technology (IROST), Tehran, Iran
- Mr. Abdeen Elsiddig Elkhedir, Industrial Research and Consultancy Centre (IRCC), Khartoum, Sudan
- Dr. Ahashan Habib, Bangladesh Council of Scientific and Industrial Research (BCSIR), Dhaka, Bangladesh
- Prof. Dr. Mostafa Khedr, National Research Centre (NRC), Cairo, Egypt
- Dr. Alassance Diop, University Alioune, Senegal
- Dr. Osama, Morocco
- Dr. Adio Taofoki Akinwale, Nigeria
- Mr. Ruwan Weerasinghe, Sri Lanka
- Dr. Zafar Iqbal, CIIT Pakistan
- Dr. Majid Iqbal
- Ms. Sadaf Sajjad

Research Theme

- Participants selected to continue the main research theme titled **'e-Solutions for Community using Low-cost Wi-Fi'.**
- Under the theme group has targeted establishment off Wi-Fi connectivity and e-Health solutions, which is now in implementation phase.
- Whereas the group also agree to work on e-Learning and e-Agriculture.

Flowchart of the Theme



Wi-Fi Connectivity Enabling ICT Applications Using Long Distance Wi-Fi Networks

- Focal Person:
  - Dr. Majid Iqbal, Assistant Professor, CIIT,
- 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
    - Desirable data rates
    - Easier reach to far flung rural areas
    - Less maintenance overheads

Progress

- Initial phase of the project, performance evaluation and testing of the long distance Wi-Fi equipment was carried out in Rural areas.
- Finalizing the deployment site and applications is in-progress.
- Joint collaboration with COMSATS Internet Service (CIS) on their running Tele-health Projects

Sr. No.	Tele-Health Center	Number of Residents	Number of schools with highest grades	Occupation of the Residents
1	Basic Health Unit, Gokina	35000	High Schools (Boys & Girls)	Government and overseas employed
2	COMSATS Tele health clinic Golra Shareef, Tehsil & District Islamabad	12000	High Schools (Boys & Girls)	Government employed
3	Basic Health Unit, Dagai District Swabi	37000	High Schools (Boys & Girls)	Government employed and formers
4	BHU Wahdat Colony, Quetta	40000	High Schools (Boys & Girls)	Government employed

e-Health Solutions: 3D Graphical Imagery Therapy For Healing Brain Tumors In Children

- **Focal Person**:
  - Mrs. Sadaf Sajjad, Assistant Professor, CIIT.
- **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.

Progress

- 3D Graphical Imagery Therapy game has been developed which has enabled children to visualize the battle scenes against tumours.
- Initially the 3D GIT game was PC built game
- Later on Android version was released and could be downloaded from Google Play by the name “MANAY”.
- Hospitals oncology wards, doctors and paramedics have been engaged in encouraging children to play the game.
- Project was successfully completed
- Project funded by National ICTR&D, for Rs.11,558,112/- for period of 18 months

e/m-Teaching-Learning Solutions: using consumer technology as public access based analytical system

- **Focal Person:**
  - Dr. Zafar Iqbal, Principle Scientific Officer, CIIT, Islamabad.
  - Unanimously agreed upon in the 2nd ICTS Meeting.
- **Idea:**
  - In developing part of the world (e.g., in COMSATS's member states) the purchasing as well as maintenance of dedicated Lab instruments such spectrophotometers is normal unaffordable.
  - Consumer technology such as mobile phones are widely available, and current generation of standard mobile phones has several capabilities, which makes it a good choice to be used as public access based analytical system.
  - The focal person is pioneer of this concept, e.g., obtained his PhD in same discipline, and as the main author has several publications in high ranked journals with overall impact factor ~ 18.

e/m-Teaching-Learning Solutions: using consumer technology as public access based analytical system (continued)

- **Focal Person:**
  - Dr. Zafar Iqbal, Principle Scientific Officer, CIIT, Islamabad.
  - Agreed upon in the 2nd ICTS Meeting.
- **Idea:**
  - Aim is to perform versatile scientific analysis in diverse perspectives, including teaching-learning in the areas of basic sciences (e.g., physics chemistry, biology etc), consumer point of purchase analysis to confirm safety and authenticity of foods and beverages, promotion of pervasive health-care culture etc. The measurement principle is based on followings:
    - Measurement and analysis of light absorbance, reflection, refraction and scattering, when phone screen will serve as controllable light source, and front camera as the data collector in images format. Images evaluation methods shall be used to characterize investigated materials/phenomena by their physical and chemical properties.
  - Proposed project timeframe is 36 months
    - Five different aspects will be covered by COMSATS's member states

Progress and Task Distribution

Task	Responsibilities	Work Plan & Schedule
Concept oriented e/m teaching-learning (Pakistan)	Persons: M Umair, and Ali Zahir Role: Experiments' designing, and relevant applications development, and lab work supervision	Time frame: 36 months Estimated cost: Pak rupees 12 million Milestone: by the end of June 2015, experiments in physics, chemistry, and biology shall be performed.
Pervasive healthcare culture (Iran, Egypt and Senegal)	Persons: Dr. Shervin Amiri, Dr. Mostafa Khedr, and Dr. Alassance Diop Role: development of social awareness, designing of support systems, and applications to diagnose problem and to monitor health	Time frame: 36 months Estimated cost: Pak rupees 15 millions Milestone: working strategy, identification and designing of appropriate support systems, and basic level Android/Symbian based applications shall be ready by the end of June 2015.
Consumer point of purchase analysis to confirm safety/authenticity of foods and beverages (Morocco, Tanzania, and Sudan)	Persons: Dr. Osama, Dr. George S. Oreku, and Mr. Abdeen Elsiddig Elkhedir Role: Identification of potential areas and development of relevant applications and support systems	Time frame: 36 months Estimated cost: Pak rupees 10 millions Milestone: working strategy, implementation plan, and basic level Android/Symbian based applications shall be ready by end of June 2015.

Progress and Task Distribution

Task	Responsibilities	Work Plan & Schedule
E-agriculture (Bangladesh, Nigeria , Egypt, and Sri Lanka)	Persons: Dr. Ahashan Habib, Dr. Adio Taofiki Akinwale, Dr. Mostafa Khedr, and Mr. Ruwan Weerasinghe Role: Identification of potential areas e.g. w r t seeds quality and water purity as well as its suitability for various crops	Time frame: 36 months Estimated cost: Pak rupees 06 millions Milestone: basic plan and working strategy together with the basic level Android/Symbian based applications shall be ready by the end of June 2015
Information security (Jordan)	Person: Dr. M E Farfoura Role: Interaction with entire team to develop applications as needed	Time frame: 36 months Estimated cost: pak rupees 1 million Milestone: Plan shall be ready by June 2015

Possible Outcomes of the project

- Promotion of concept oriented education and science culture
- Creation of fresh opportunities in the areas of teaching-learning and R&D, particularly for women, the deprived communities of our society
- A reasonable enhancement in the national GDP is expected
  - In form of agro-products growth, environmental protection or revenue generation E-health in form of pervasive health-care culture
- e-Agriculture in form of confirming the seed quality by mobile phones before seeding
- In home-land security e.g. detecting possible threats from the distance using mobile phones

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.