



# Integrated Rural Health Information System

## The ROAD Project

(Rural Organ for Access to Development)

### EXECUTIVE SUMMARY

In the last decade, technological innovations have led to the rapid development of applications for the enhancement of human life and its value, much of this advancement still largely remains limited to certain areas of the world, creating what we refer to as the Digital Divide.

In addition, the rapid growth and development in areas of the telecommunication industry has given the opportunity for the easier deployment of other technologies, irrespective of geographic distance, but again such technological advancements remain mainly accessible to urban areas of advanced and developing nations, leaving others far behind, creating what we refer to as the Digital Access Divide (DâD).

The Rural Organ for Access to Development (The ROAD Project) is an initiative that bridges the DâD by providing rural populations in less developed nations access to these technological innovations and advancements as well.

Traditionally, "rural" projects are considered to be non-profit generating endeavors, but such is not the case with the ROAD project. ROAD was designed to create an atmosphere for sustainable business development, in the field of healthcare, education, agricultural, banking, information and telecommunication services which will empower development schemes of government and non-government machineries, to create a viable, visible and sustainable access mechanism for continued development of rural population, as new technologies evolve.

The first industry of concentration for the ROAD project is rural healthcare.

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## EXECUTIVE SUMMARY - Cont'd

The healthcare industry of developing countries is itself in a state of illness. There are some promising 'bits' like increasing awareness among populations as well as massive government and non-government initiatives, but there are also some distressing 'dots' like such as the lack of coordination amongst various parties that contribute to the healthcare industry, the absence of health information systems and disoriented management mechanisms. This illness is visible enough in urban areas, which is just the tip of iceberg compared to the situation in rural areas. The gap existing between healthcare services of developed and developing nations is further widened between healthcare services of urban and rural areas of developing countries.

The Telemedicine Reference Center Ltd. (TRCL) of Dhaka Bangladesh has taken a giant step towards implementing a rural health system in certain developing countries under the ROAD project, named IRHIS - Integrated Rural Health Information System. Even so, the IRHIS program will serve <10% of local morbid population, which is <0.5% of total population surrounding one rural medical center.

- IRHIS provides a comprehensive system of medical services through
- (i) integration of healthcare industry segments,
  - (ii) creation, positive management and distribution of health information, and
  - (iii) the infusion of acquired expertise from urban to rural areas through a rural information management system by intelligent & low-cost use of telecommunication and computer technologies.







# Integrated Rural Health Information System

## Mission

To harness the advanced efficiencies and capabilities of current medical, information, and communications technologies to improve the delivery and affordability of health care, both primary and specialized, in rural populations.

## OBJECTIVES

- Meet basic and primary health care needs of rural communities
- Deliver expert medical services to rural doctors, nurses, healthcare aids
  - Provide network-based tele-diagnostic services
  - Assure timely intervention into disease processes
  - Provide an intervention resource for disease
- Increase awareness for safe motherhood and childhood
  - Improve patient compliance; reduce drug abuse
- Improve delivery and administration of prescription drugs
- Deploy each Rural Center at a startup cost <US \$10,000
- Provide support resources to rural medical professionals to improve services
  - Elevate the rural economy by:
    - reducing frequency and costs of travel for medical purposes
    - reducing morbidity rate and healthcare costs
    - improving productivity







# Integrated Rural Health Information System

## OWNERSHIP & SPONSORSHIP MECHANISM OF RURAL MEDICAL CENTERS OF IRHIS

The overall ownership and maintenance of the IRHIS, with the exception of the rural medical centers themselves, will belong to the IRHIS central management. TRCL has arranged financing and management for the establishment and operation of the IRHIS program through various arrangements with financial institutions from both local and international sources along with partnership arrangements with medical institutions and organizations as well as healthcare technology companies. As a result, Telemedicine Reference Center Ltd. (TRCL) of Dhaka will have significant management control on IRHIS along with its local and foreign investors and partners.

The IRHIS program will finance up to US\$ 10,000 for establishment of each rural medical center under a soft-loan mechanism. The financing program of IRHIS will cover the proper equipment, software, training and maintenance of the medical centers. The cost of renting or constructing a single rural medical center facility is the responsibility of the local owner and operator of that rural medical center of IRHIS, which is estimated to be less than US\$ 5,000 per center.

A definitive selection process is in place to identify local candidates for owners of rural medical centers, with priority given to newly graduated (MB BS) licensed physicians, who would be willing to locate and operate the center in their own locality. An open invitation will be given for nation-wide selection of local operators. However, on a case to case basis, some operators will be chosen based on prior experience and exposure in healthcare industry.

**The total cost of ownership of a rural medical center is less than US\$ 5,000, which is approximately 1/3rd cost of center establishment.**

### **SPONSORING A RURAL MEDICAL CENTER:**

There are three categories of sponsorship of a rural medical center, these are:

1. Non-resident Bangladeshis from USA, UK, Canada, can sponsor establishment of the center in their own local areas in Bangladesh;
2. Corporate sponsorship &
3. Individual sponsorship.

*For details please contact the  
management of IRHIS  
program.*





## BASICS OF IRHIS

The Integrated Rural Health Information System (IRHIS) has five distinct processes, namely,

1. **Integration** Process;
2. **Intelligent** Process (or Process Portal);
3. **Physical** Process (or Warehouse & Distribution Network);
4. **Delivery** Process of Deliverables; and
5. **End Users**;

### ***Integration Process:***

To provide efficient medical services at the rural medical centers, a broad network of consulting physicians is essential. About 10% - 15% of teleconsultation patients will be referred to **previously designated tertiary medical facilities in Metropolitan cities** for advanced care, and as a result, appropriate facilities are to be arranged for timely care of referred patients from rural centers. A significant number of human samples will arrive in the Dhaka main facility for advanced **diagnostic services**, so, an advanced pathological laboratory is absolutely necessary. An **imaging facility** is an optional necessity in order to provide comprehensive services to loyal patients to rural healthcare program. In addition, there is a demand for medical consultation services from **international medical experts** for critically ill patients and to deal with complex patient illnesses or circumstances. Bangladeshi patients spend US\$ 300 Million each year traveling abroad for expert medical services. These patients may use teleconsultation services if physicians of USA, UK, India, Singapore, etc. are included in to the physician network. Integration of theses above-mentioned physical and information processes are maintained through intelligent software in process portal.

**Pharmaceutical products, laboratory supplies, maintenance** of technical items of rural medical centers require efficient **procurement, supply chain and distribution mechanism**, again these are organized and integrated through intelligent central software of the process portal – ***the Nucleus of IRHIS***.

### ***Process Portal***

The integrated processes involved in IRHIS are maintained by a hybrid of multiple portals, which we call the Federated Portal. The portals involved are (i) **the Enterprise Information Portal (EIP)**; (ii) **the e-Business Portal - Extranet**; (iii) **the e-Marketplace Portal**;

(iv) **the ASP Portal**; (v) **the WAP Portal**;

(vi) **and the Public (Internet) Portal**;





### *Physical Process*

The physical processes of the ROAD project are divided into 5 distinctive levels or stages. These are:

- 1. Head Quarters (HQ):** The control center of all operations. The process portal, telecommunication facility, distribution center, and other support services will be located at Head Quarters along with the control and operations center. Two six storied building of 50,000 square feet of space is being renovated as per the design and needs of the IRHIS program, which will include a state-of-art physician practicing chamber for 70 physicians, a training center for medical professionals, as well as other support facilities.
- 2. Point of Assembly (POA):** These are the facilities that will receive goods and supplies to meet the operational needs of the system. Independent packaging systems will re-pack products into specific units as designed by the HQ. All products either in original or re-packaged quantities will be labeled with customized bar-codes. For the initial phase, one (1) POA facility in the Tejgaon Industrial area of Dhaka city has been established.
- 3. Point of Distribution (POD):** These are strategic points depending on the transportation network of the concerned region. Six (6) POD physical facilities, including one in Dhaka division, will be set up to receive and deliver products to and from POTs. The future expansion of the IRHIS system includes a referral hospital facility of 50-100 beds under each of 6 division based POD.
- 4. Point of Transaction (POT):** This is the heart of the entire system also called the "Access Point", and houses (i) the rural health center, (ii) the pharmacy, (iii) the laboratory, (iv) the telemedicine facility, and the administrative system. The IRHIS program has set up 3 such facilities and will complete establishment of 50 such centers in rural areas of Bangladesh by June 2004 and an additional 150 centers by September 2005.
- 5. Field Medics (FM):** Either Nurses, paramedics, or village doctors. They are the mobile work force of the POTs. Their main activities include; medical follow-up house calls, selling pharmacy products, collecting samples for laboratory, etc. Each rural medical center will employ 2-5 Field Medics based on salary plus commission basis.

### **Delivery Process of Deliverables**

The deliverables of the IRHIS system are: (i) Onsite medical consultation by licensed local physician; (ii) Referral Electronic Medical Consultation with IRHIS National & International Physician Network; (iii) Diagnostic Services; (iv) Pharmacy Services; (v) Imaging Services; (vi) Mobile Field Services; (vii) Rural Health Insurance Program; and (viii) Awareness Programs;

### **End Users**

Although our target market is the rural populations of developing nations, our services are also designed to act as a B2B. In other words, IRHIS facilitates interactions and transactions between medical professionals, health insurance providers, diagnostic, and hospital facilities and as a result provides a service to a market which was originally unavailable. In another way, IRHIS may be regarded as a HMO, thus our major clients are (i) rural medical centers, (ii) general practitioners, (iii) field medical personnel, and (iv) retail pharmacy outlets as well as individual patients.





## SERVICES OF IRHIS

### 1. Onsite Medical Consultations by Licensed Physician:

A Licensed Physician (MB BS), usually the owner of the rural medical center will consult a maximum 40 patients in a day and will work 6 days/week. This is a service which will be paid for by the patient to the local physician, who will retain all income generated from this segment of the IRHIS program. The regular fee for each medical consultation is equivalent to < 1.00USD. The following categories of medical cases will be seen by local physician:

- (i) Primary healthcare services;
- (ii) Minor trauma cases;
- (iii) STDs & HIV;
- (iv) Follow-through care to chronic patients;
- (v) Immunization;
- (vi) Mother & Child Care;
- (vi) Patient Registration & Identification;
- (vii) Electronic Medical Record (EMR);

### 2. Referral Electronic Medical Consultation with IRHIS National Physician Network:

Rural Licensed Physicians, in addition to providing primary healthcare services, will prepare telemedicine data, based on the IRHIS protocol, for following categories of medical cases:

- (i) Hypertension;
- (ii) Cardiac Patients;
- (iii) COPD including Asthma Patients;
- (iv) High Risk Pregnancy;
- (v) CVD;
- (vi) Orthopedics;

*The fee for referral electronic medical consultation is a maximum of US\$ 5.00*

### 3. Referral Electronic Medical Consultation with IRHIS International Physician Network:

A vast network of international physicians is being developed in the USA, the UK, and India for the IRHIS program and will be available for both physicians of Bangladesh origin as well as foreign nationals. All physicians under this program shall have their own account with IRHIS, which includes storage capabilities for their patient information as well as access to clinical decision support amongst other things. When needed, the IRHIS will be able to provide their expert consultative opinions to medical cases. Participation is voluntary and a fee will be payable against each consultation. Many physicians of Bangladeshi and foreign origin have expressed their sincere interest to provide free consultation services to rural population and options to avail such opportunity for poor patients will be kept in IRHIS.





**SERVICES OF IRHIS****4. Diagnostic Services:**

- (i) Rapid testing services by available test kits;
- (ii) Human sample collection system to send samples to Reference laboratory for advanced diagnostic tests;
- (iii) Blood Sugar;
- (iv) Urine Sugar;
- (v) Pregnancy;
- (vi) Stool R/E;

**5 Pharmacy Services:**

IRHIS includes a nationwide pharmacy retail chain management system, which is controlled from the HQ of IRHIS. This system will ensure a proper supply of prescription and non-prescription standard pharmaceutical products throughout the IRHIS as well as provide clinical decision support when prescribing and dispensing drugs to patients.

**6. Imaging Services:**

Imaging services will include X-Ray, Ultrasonography, Echocardiography, CT, etc. These services will be available in Divisional IRHIS facilities during the initial phase. There are plans to have X-Ray and Ultrasonography services in each rural center at a later stage.

**7. Mobile Field Services:**

Each rural medical center has two or more Field Medics, which can be Nurses, paramedics, or village doctors, and are the mobile work force of the center. Their main activities include; medical follow-up house calls, selling pharmacy products, collecting samples for laboratory.

**8. Rural Health Insurance Program:**

Jointly with a local health insurance company, IRHIS will offer health insurance products and services to the rural population. At present, health insurance programs are being developed under the IRHIS project.

**9. Awareness Programs:**

IRHIS, jointly with government, NGOs and international donors, will conduct and deliver awareness programs and workshops through mass media, printed publications, digital and online education projects. Customized awareness campaigns and products are being developed for patients of each rural medical center including drug information products and services.





**IRHIS PROGRAM**

## Of The ROAD Project

(Rural Organ for Access to Development)

**ABOUT US****COMPANY**

Telemedicine Reference Center Ltd. (TRCL) of Dhaka, Bangladesh was established and registered as a limited liability company in Bangladesh on 17th Day of October, 1999. Long before its registration in Bangladesh, since 1996 the company was operating as a private company in New York City, USA under the ownership of its founder **Dr. Sikder M. Zakir**. TRCL has done numerous research and development activities with pioneering telemedicine technology companies of USA, Canada, UK, Japan, and India.

In September 25, 2001 TRCL started the first International Telemedicine link in Bangladesh through Second Opinion Software, LLC of Los Angeles, CA with the University of Nebraska Medical Center / Nebraska Health System (UNMC/NHS) of Omaha, NE, USA.

**PEOPLE**

The people behind such technology development, program design, market research and above all appropriate deployment of telemedicine technology based healthcare services programs, require strong international networking among scientists, developers, and managers. TRCL enjoys cooperation from all over the world and such international resources have put TRCL in to the fore front of scientific medical development in Asia and as well as in rest of the world.

**PARTNERSHIP**

TRCL has continued its development initiatives through strong partnership with medical institutions, biomedical engineering companies, device and software manufacturers, telecommunication technologists, financial institutions among many others, which have allowed TRCL to successfully develop a unique healthcare system for rural populations of the developing countries, named IRHIS (Integrated Rural Health Information System).





## Contacting TRCL

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