"Impact study analysis of W4C Project – Phase I operational at Chanderi, Madhya Pradesh on the completion of one year of the project."

PROJECT DETAILS:

Study Name	*"Impact Study Analysis of W4C Project – Phase I operational at Chanderi district in the state of Madhya Pradesh on the completion of one year of the project."*
Project Name	Wireless for Communities (W4C)
Implemented by	Digital Empowerment Foundation
Funded by	Internet Society (ISOC)
Focus Area	Community-empowered approach to connecting rural communities through wireless community

Contents

INTRODUCTION

Digital Empowerment Foundation (DEF) and the Internet Society (ISOC) have launched a joint project called "Wireless For Communities" (W4C) in late 2010. The project aims to provide a holistic, community-empowered approach to connecting rural communities to the Internet. The motivation for the W4C project by ISOC and DEF is twofold. One is to totally democratize the availability of connectivity and enable access to information at the will of citizens outside urban centres – and remote rural areas in particular; second is to address the lack of content, product and services originating from rural areas which affects the economy from percolating to the bottom of the pyramid. Pervasive connectivity will ensure that localized content and services are not only encouraged but also facilitated and produced – the sum of which will contribute linguistic and cultural diversity, help build the rural economy and bring the next billions online.

PROJECT BACKGROUND

In developing countries, the wireless connectivity has been emerged as one of the inexpensive technologies to bridge the connectivity gap in remote areas. These wireless technologies have created much interest on the part of the international-development community.

For example, in India, even with mobile penetration, the tele-density in rural areas are still less than 40 percent, and Internet connectivity is a far cry. The reason has mostly been the issues around last mile connectivity. On the other hand, last mile wireless connectivity has the potential to resolve the issue of prohibitive cost of deploying conventional wired infrastructure in remotest areas of the country.

In order to address these issues, and connect remote and underserved regions of the country, last year, the Digital Empowerment Foundation (DEF) and the Internet Society (ISOC) initiated a joint project called "Wireless for Communities" (W4C) which utilises low-cost Wi-Fi based equipment to connect and empower rural and underserved communities. The motivation for the W4C project by ISOC and DEF is twofold. Firstly, to totally democratize the availability of connectivity and enable Internet accessibility to information in rural parts of the country, secondly to address the issue of lack of content product and services originating from rural areas which affects the economy from percolating to the bottom of the pyramid.

PROJECT FEATURES

- Training of Trainers programme
- Deployment of Wireless Networks in rural locations
- Conclave/Summit to discuss best practices, lessons learnt, and discussing issues from both a technical and policy perspective

PROJECT OBJECTIVES

The objective of the project is to give the trainee a basic understanding of networking and specifically wireless network, configuration of Radio device as Access Point and as a client. Also manage, maintain and monitor a small wireless ISP with following features:

- Broadcast a network of internet and create an environment of better security (WEP/WPA, MAC authentication)
- Create different kind of user according to rate, time and volume.
- Secure the network of different kind of malicious virus.
- Monitor the traffic daily, weekly, monthly and yearly and maintain accordingly.

PARTNERS AND ORGANIZERS

The 'Wireless for Communities (W4C)' has been initiated by Digital Empowerment Foundation (DEF) and the Internet Society (ISOC) with a support from regional partners.

- ***About DEF:*** Digital Empowerment Foundation (DEF), a Delhi based not-for-profit organization, registered under Societies Act XXI of 1860 in the year 2002, working with a mission to create economic and commercial viability using means of Information, Communication and Technology (ICT). Since its inception in December 2002, DEF has engaged itself into number of activities while pursuing its mission and objectives of ICT delivery and promotion in India.

- ***About ISOC:*** The Internet Society (ISOC) is a nonprofit organisation founded in 1992 to provide leadership in Internet related standards, education and policy. ISOC is dedicated to ensuring the open development, evolution and use of the Internet for the benefit of people throughout the world.

PREAMBLE OF CHANDERI W4C PROJECT

Nestled in the Vindhyachal range and situated in the Bundelkhand region of Madhya Pradesh, the town of Chanderi is composed of a labyrinth of lanes full of archaeological remains that bear testimony to its long and eventful past. Chanderi can best be described as a rural town with an urban consciousness. Populated with 40,000 people, the town is majorly dominated by weavers and artisans. There are more than 3000 families who are involved in weaving and almost all of these household would have at least 1-2 hand looms. Moreover, power looms are not allowed in Chanderi to protect the artisans for their livelihood, and Chanderi also got its GI (Geographical Indication) tag recently, which protects their creation as unique and thus to earn better price for being original.

DEF has already marked its presence at Chanderi through its information resource centre, called as CIRC. Thus, it was decided to utilize this centre and make it fully wireless networked. The Chanderi Weavers Information Resource Centre (CWIRC) is being operational from about 2 years and has been serving the entire 40,000 population of Chanderi including 13 Schools and more than 50 Panchayats. Thus, CWIRC was selected for conducting the ToT and also to do the deployment of the Wireless Mesh Network.

CHANDERI W4C TRAINING

At the initial phase of the project, DEF selected 10 people from local region to provide the ToT programme and the training on basic understanding of the wireless networking. These are:

a. Fundament computer
b. Internetworking basic
c. Basic network topologies
d. The OSI Reference models
e. Ethernet networking
f. Ethernet cabling
g. TCP/IP Protocols
h. IP Addressing
i. Subnetting, Variable Length Subnet Masks (VLSMs), and Troubleshooting TCP/IP
j. IP Routing
k. Wireless Standard
l. Radio Physics
m. Radio Link

n. Radio device configuration
o. User account creation
p. Security (WEP/WPA, MAC authentication)
q. Troubleshooting wireless network

CHANDERI WIRELESS MESH SET UP

At Chanderi, DEF decided to make CWIRC centre as the base, covering 20-30 kilometers of the region with a support of establishing one relay station and five point-to-point nodes. Through this setup, DEF covered 30 schools of the region and more than 50 panchayats to provide the connectivity.

CHALLENGES

- Duration was too short for setup of wireless network and training, and was suggested that if ToT or Community Workshop are being done along with deployment then the duration should be 10-15 days;
- Too much time consume for find perfect location for node;
- And too much time consume in infrastructure setup like GI pipe installation, power backup setup and earth setup.

IMPACT ANALYSIS

Impact of the TOT Programme

a. The ability and qualification of all the ToTs were mix. DEF able to create 10 trained people from the ToT programme. At the end of training, all trainees were able to do train on the following:

      i. They could make all kind of cabling;

      ii. They could do the link analysis between two nodes;

      iii. Configure the radio (Mikrotik and Engenus) as Access Point, Client and as Mesh;

      iv. Configure the Mikrotik Router as DHCP Server, Router, and Hotspot server;

      v. They could create the user profile of different varieties and connect the client with Security (WPA/WEP) and Mac authentication.

b. Four out of 10 people have emerged out as wireless trainers who used as resource persons for implementation wireless mesh network in the next phase of the project. Those trainers provided wireless implementation training in Baran and Tura.

c. *Among the high level ToTs Soumyakant Sahoo and Shahid Ahmad have come out as solid trainer cum deployers. For the second phase of the wireless network deployment, these trainers have provided the wireless network deployment training programme and also with the assistance of other experts deploy the whole network.*

   - *Vijay Roy from Baran district, who joined Wireless network ToT programme in Chanderi, has now established two CIRC centres at his district, and will be a part of ToT programme during deployment of wireless network at Baran district.*

d. Those trainers also used as resource persons for conducting training at other locations like Chamba and Tehri Garwal in Uttarakhand.

   - Two of the ToT participants who had joined the ToT from North East India and Uttarakhand have also planned to deploy wireless networks in each of their areas. For example, Jadumoni Boro is involved in deployment of Wireless Network in Sonapur Community Information Resource Centre of DEF. And, Rajender Singh Negi from Chamba, Tehri Garhwal in Uttarakhand, is ready to have a network deployed in Chamba, which is undergoing implementation.

e. Provided wireless networking awareness programmes among the community members of the Chanderi and especially those who have had experience of availing other training programme from CWIRC centre.

f. The trainers are now also able to manage and maintain the wireless mesh network.

ii.   Impact of the Wireless Mesh Network Setup

1. Before the deployment of the wireless mesh network, the centre was majorly facing the connectivity issue because of inconsistent Internet connection. The deployment of the wireless network provided seamless connectivity to the centre and enabled it to be accessible by local people of the region.

2. 13 schools and more than 50 Panchayats, and now even local shops of Chanderi are utilizing the facility of Internet connectivity, which was not available earlier. Out of 13 schools, 11 schools, including one girls' school has been provided internet access through dedicated node to its computer labs. DEF has also provided 2 Netbboks each to all the schools connected with wireless internet facilities.

3. A cybercafé operational at the market of Chanderi, has been provided the wireless internet connectivity with dedicated node. It must be noted that in the population of 40,000 people in Chanderi, there has not been even a single cyber café. Ironically Chanderi, besides being known for its silk weaving "Chanderi Sarees" also known for its heritage and significant tourists visit Chanderi. Now, with reliable internet access, the cyber café is serving the tourists well.

4. There are two Madrasas (Religion Education Centre) recognized by government, situated in Chanderi, which never had experienced ICT lab and internet connectivity, are now experiencing free and open knowledge through internet access using the netbooks provided by DEF.

5. The government public health centre at Chanderi has a telehealth facility provided by DEF and Media Lab Asia, which is now have seamless connectivity that has enabled the tele-health services and consultant doctors directly linked to senior doctors in district headquarter hospitals, located in Ashok Nagar of Chanderi. Every day, at least 20-30 patients are referred by local doctors to go for tests or examinations like ECG, BP, Blood Sugar, use of

digital stethoscope and all the reports including photo and scanned prescription of the patients are sent to district Headquarter hospitals for referral suggestions. All these activities happen in real time and have been serving at least 10-25 patients a day depending on availability of electricity. Patients were found extremely happy that now they have option of telemedicine services.

6. Chanderi ki Awaaz is a community radio which broadcasts from Chanderi serving the community up to 10-15 kilometer. They have also been suffering from the lack of reliable internet access. Recently, they have also got the access from wireless network of Chanderiyaan.

7. At Chanderi, there are 13 schools, which never had computer and connectivity was one of the major concern for these schools. The deployment of wireless mesh network provided seamless connectivity and DEF provided computers to these schools from their end, so that students and teachers can access internet.

8. The W4C project also facilitated Chanderiyaan Project, another project of DEF to support handloom weavers of the region, able to create their own e-Commerce platform for showcasing and trading of their products
9. The set up also resolved the connectivity issues of weavers' community, and now they are able to interact with its customers not only in India but also in abroad for trading of their products using Skype and e-Mail.

iii.   Key Factors of Wireless Community

Photo Gallery

ToT Training Session at Chanderi, Madhya Pradesh

Wireless Mesh Set up at Chanderi

Handloom weavers at Chanderi Weavers Information Resource Centre (CWIRC)

Cyber café at Chanderi

Girls at school accessing internet facility at their school

ToT Trainers' Certificate Programme

Media Coverage of the Programme

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