Digital Mapping of Polio using Android based Smartphone, GPS and Satellite based Information

An Integrated Approach

International Conference on Space
12 – 14 November 2014 in Islamabad, Pakistan

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Sequence of Presentation

- Introduction
- Situation in Pakistan/Motivation
- Objective & Study area
- Methodology
- System Modules
- Results
- Conclusion
- Acknowledgement
- Questions
Introduction

Polio is among the most contagious and epidemiologic infections, in some cases affecting the human nervous system & causing severe paralysis.
Situation in Pakistan/Motivation

Despite the importance of polio vaccination, people in some remote rural areas of Pakistan are either unaware or skeptical, of its benefits and effectiveness, mostly due to lack of education/misinformation.

According to UNICEF “polio remains actives in ten countries and only three countries have endemic polio transmission – Nigeria, Pakistan and Afghanistan. In February 2012, India was removed from the WHO list of endemic countries. 

(http://www.unicef.org/immunization/polio/) dated: 08 September 2014
Objectives & Study area

To identify Polio high risk union councils and districts in Sindh province

To target specific areas for polio immunization activities and campaigns

Allow polio workers to send social profile data (refusals, schools, mosques etc.) to the system along with their location information.
The system includes the following three modules:

1) Smartphone Application

2) Web Portal

3) Web GIS
System Modules

1) Smartphone Application

- Questionnaire-based application via smart phones
- Determination of location of social profile via GPS smartphone receiver.
- Store and Forward capability to overcome limited availability of internet data in rural areas
- Sending of the information to the server via mobile internet connectivity
System Modules
System Modules

2) Web Portal

a) Web portal

i. Central location for information management/control, display and analysis

ii. User Authentication, Authorization and Management:
   - Mobile (Smartphone) User:
   - Map (GIS) User
   - Admin User:

iii. Social Profile data Management

iv. User Activity

v. Data Archive

vi. Daily Activity

vii. Application Errors

viii. Maps (Web GIS)
System Modules

OUR MISSION
POLIO FREE PAKISTAN

Controls

**TABLES**
Landmarks data sent by the field teams

**META TABLES**
Application supporting data

**USER ACTIVITY**
View all user activities

**DATA ARCHIVE**
Take the database backup

**APPLICATION SETTINGS**
Set the system data and variables

**MAPS**
Display maps and landmarks

**DAILY ACTIVITY**
Display the data inserted on the present date

**ERRORS**
View errors logged into the system

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Web Portal Snapshot
System Modules

3) Web GIS (Maps)

a) Web GIS module of the system to access information on the basis of Union Council levels.

b) Contains all the base line data:
   I. Base map (external source),
   II. Union Council boundaries,
   III. Run-time information of social profiles
## Results & Discussion

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<tr>
<th>S.No</th>
<th>Social Profile</th>
<th>Total No.</th>
<th>Supporter(s)</th>
<th>Non-Supporter(s)</th>
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<td>168</td>
<td>167</td>
<td>01</td>
</tr>
<tr>
<td>02</td>
<td>Influencers</td>
<td>170</td>
<td>170</td>
<td>00</td>
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</table>

Result Statistic date: 05 September 2014
Results & Discussion

Mapping of high risk area using field surveys by DHCSOs.

The collected data is analyzed and consolidated by UNICEF administrators.

The team use this information to perform polio vaccination campaigns.

The administrators disseminated analysed information to concerned authorities by UNICEF regional health coordination teams and Ministry of Health Sindh.

Consequently the web portal, Smartphone application and web GIS are useful tools to eradicate polio.
Conclusion

This system is supporting polio eradication using a real-time high risk area mapping system is developed by SUPARCO in line with UNICEF Pakistan.

The system helps polio workers to collect data, target specific areas for immunization using digital mapping technology.

The system is currently facilitating relevant authorities for undertaking effective polio vaccination campaign in Pakistan.
Acknowledgement
Questions & Thank You