Indian Institute of Technology, Bombay
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Course Project Report

Portal-cum-Blog on ICT for Disaster Management

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Abstract

The world has been prone to more and more disasters recently. In the Indian context, earthquakes in Gujarat and Kashmir, floods in Gujarat, Mumbai, Orissa, Bihar and Andhra Pradesh, and cyclones in the south-eastern region of India have caught the attention of government agencies and NGOs. The public at large recognize today that more efforts need to be directed towards disaster management. Although a lot of attention has been given to aspects of disasters like advocacy and community awareness, use of Information and Communication Technologies (ICT) in various phases of disaster management has received little focus. The aim of this project is to set up a one point information source for all the efforts related to use of ICT for disaster management.

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1 Introduction

It has been recognized that the world is more prone to disasters than it was a few decades ago. While people differ in their opinion as to why this is the case everyone agrees that more organized effort needs to be put in to handle various aspects of disaster management. The activities carried out as a part of disaster management have received a lot of attention and efforts are being made to professionalize them. However, one aspect that has failed to gather much attention is the use of Information and Communication Technologies (ICT) in various phases of disaster management. This despite that fact that ICT has the potential to play major role in making the disaster management related processes more efficient and more effective. This project is an effort towards popularizing use of ICT in disaster management activities.

This project aims to be a one stop source of informaion related to use of ICT in disaster management. As a part of the project we have designed and developed a portal-cum-blog that will track the activities going on around the world related to use of ICT in disaster management. Special attention will be given to India. The website currently provides an introduction to disaster managment followed by how ICT can be used in disaster management. Then the website provides detailed information about use of communication technologies in disaster response and use of communication technologies in early warning delivery with case studies for each scenario.

The next section provides information about disaster management. Section 3 gives an idea of how ICT can be used for disaster management followed by Section 4 which provides an overview of the website. Finally, Section 5 concludes the report while stating the future plans for hte website.

2 About Disaster Management

Disaster management consists of (a) disaster preparedness, (b) disaster response, and (c) disaster rehabilitation.

2.1 Disaster Preparedness

The term disaster preparedness refers to a bunch of activities taken up in order to decrease communities' vulnerability to various disasters. These activities include:

1. creating awareness among communities at risk
2. providing communication equipment that can be used in case of a disaster

3. executing mitigation projects like constructing flood retaining walls

4. creating bunkers around at-risk communities where food, shelter equipment can be stored. Such a facility can be of use for immediate response in case of a disaster

5. training members from the communities at risk in activities like disaster management, first aid, fire fighting, etc.

Note that we also include setting up of early warning systems as a part of disaster preparedness. Early warning systems essentially consist of two components:

1. Early detection/prediction of disaster: A disaster like flood, cyclone or tsunami can be predicted based on weather information or earthquake information. Meteorological departments of various countries can predict cyclones/floods 24hrs-48hrs before the event. An early warning system should be able to detect/predict such disasters as early as possible. Such early detection can help save a lot of lives.

2. Early warning delivery: Once a disaster has been predicted/detected, the information about the same needs to be delivered to the communities that are at risk. In countries where communication networks are not spread throughout the geographical area, early warning delivery can become difficult.

2.2 Disaster Response

The set of activities that are taken up after a disaster occurs forms the disaster response phase. The foremost activity that is conducted by any disaster response agency is disaster assessment. This activity requires collection of information from a variety of sources in order to assess the extent of damage done to life and property in the affected region. To attain as reliable information as possible assessment teams are sent on site to gauge the situation at hand.

The information collected during the disaster assessment exercise helps a humanitarian assistance agency to decide whether it would intervene. If the agency decides to intervene then an analysis exercise is taken up to identify root problem domains in the affected region. Such an analysis helps identify deficiency in which aspects among food, shelter, water, sanitation, public health, etc pose the highest risk to life in the affected region. This is followed by planning and implementation of the intervention.

Disaster response projects can last from a few weeks to a few years in time depending on various factors like needs of the affected community, political and socio-economic situation on ground, availability of funding for the project etc. The primary focus of disaster response projects is to

reduce mortality rates among the affected communities that have become prone to various hazards as a result of the disaster.

2.3 Rehabilitation

Rehabilitation is the exercise taken up after disaster response phase achieves its purpose. There is no distinct demarcation regarding end of response phase and beginning of rehabilitation phase. A rehabilitation project is usually a very long and slow process of taking the affected population back to their old way of life. The activities below are typically taken up as a part of rehabilitation project:

1. Construction/repair of shelter
2. Initiation of various economic activities to create job opportunities
3. Construction/repair of infrastructure, public transport, etc
4. Disaster preparedness activities to reduce impact in case of a future disaster

3 ICT in Disaster Management

This section introduces the general idea of how Information and Communication Technologies (ICT) can be of use in various domains of disaster management. Following is a list of ideas:

1. Development of a communication mechanism/technology that can allow voice and data communication for a rapid initial assessment team.
2. Development of a communication mechanism/technology during disaster response. Note that this is different from the network requirement for assessment team because the characteristics of the network required in both the situations are different. For example, an assessment team needs needs slow speed connectivity but more robust connectivity, whereas, during response speed requirements may be high and a few areas in the region with poor connectivity would not do much harm.
3. Development of a website such that this website will be a repository for all those who want information about a disaster when one does happen. Such a website can be useful for all those who have relatives in the disaster affected area. Such a website could also be useful for humanitarian agencies and donor agencies.

4. Tools for coordination between all actors (NGOs, government, community, etc). This can drastically improve the efficiency and impact of the response.

5. Setup of communication links/networks for quick delivery of early warnings in case a disaster has been forecast/detected.

Each of the ideas above have a variety of non-technical and technical challenges associated with it. This list is not meant to be an exhaustive list of ideas, but rather just a stimulator to entice the reader to explore these ideas, or may be even come up with one's own ideas.

4 Website Overview

The website has been created using a tool called dokuwiki. This tool is similar to mediawiki (the tool with which wikipedia has been constructed) except that it has been specialized for documentation purposes. The primary advantage of dokuwiki over mediawiki is that dokuwiki saves content of hte website in text files as opposed to a database. This allows us to construct a website without needing a database management system installed on the webserver. The original dokuwiki has been tweaked in several ways. First, with change in the template the looks of the website have been improved. Second, various plugins like blog and discussion have been added in order to improve the utility of the website. Finally, minor tweaks have been done to improve usability of the website. For example, a special link for feedback has been put on the top-right corner of the site for users to post feedback to the webmaster.

A snapshot of the home page of the website is shown in Figure 1. The website consists of two components, namely, the portal and the blog. The blog component has been enabled by simply adding a blog plugin to the original dokuwiki. As a result, the home page always shows the latest written blog. The left side of the website contains the navigation bar, which has a link to the blog archive. One can browse through, read, and search all the blogs from this page. A reader is also allowed to enter his comments on a blog. The portal component has information related to the following:

1. About disaster management

2. Use of ICT in disaster management

3. Use of communication technologies in disaster assessment

4. use of communcation technologies in early warning delivery

The feed back link takes the user to a page where he is allowed to (1) provide feedback that is visible on the webpage or (2) send feedback mail for which webmaster's email address is provided.

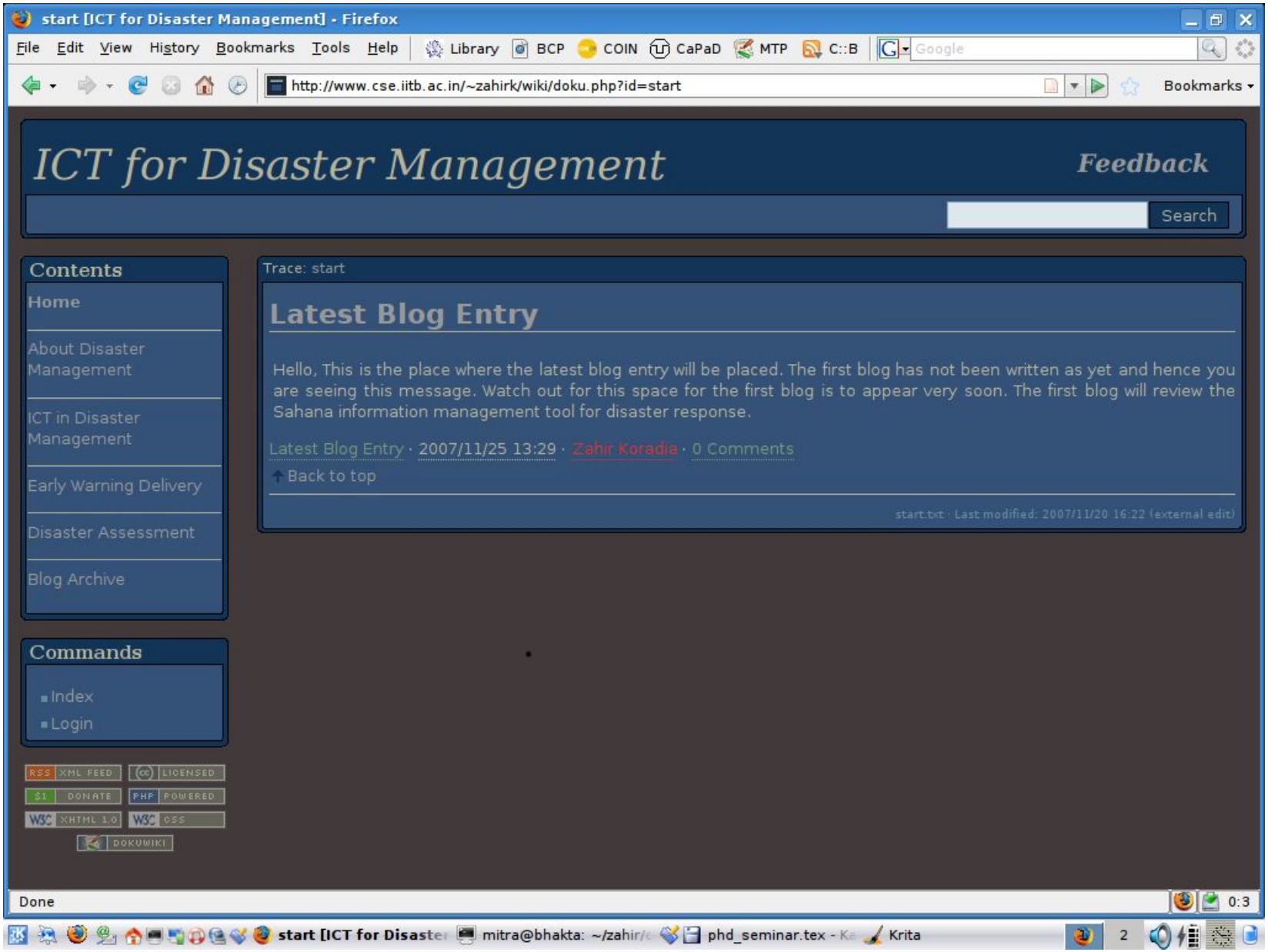

Figure 1: A snapshot of the website

5 Conclusion and Future Work

The portal-cum-blog developed as a part of this project aim to be a one stop source of information for efforts related to ICT in disaster management. The first steps towards this aim have been taken. However, for the site to achieve its aim the site needs to be maintained and several improvements need to be made to the site.

As a part of future work the following things need to be done:

1. Add a section describing the purpose and motivation behind the website
2. Maintain and regularly update blogs
3. Invite others involved in the same domain to write blogs or suggest improvements
4. Add a link to a website that records all/recent disasters, particularly in India
5. Add more pictures to the website to make it more readable