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**Press Information Bureau  
Government of India  
Ministry of Health and Family Welfare**

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**MoHFW Launches National Health Portal (NHP)**

Ministry of Health and Family Welfare (MoHFW) has launched a “National Health Portal”(http://nhp.gov.in) on 14.11.2014 to provide healthcare information to the citizens of the country. This portal will serve as a single point of access for consolidated and authentic information and resources on the health sector to a wide spectrum of users such as academicians, citizens, students, healthcare professionals and researchers. Presently, the NHP is disseminating information in Hindi, Gujarati, Bangla, Tamil and English.

The Health Minister, Shri J P Nadda stated this in a written reply in the RajyaSabha here today.

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MV/BK

16 August 2010

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# Detailed Project Report

for

Developing, Setting up and  
Management of the India Health Portal  
to promote Health Literacy

## Constitution of the Working Group for the India Health Portal

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# Context and Background

Recognising that the Internet constitutes a powerful and democratic source of information and knowledge, the National Knowledge Commission (NKC) deliberated on ways to create a series of web portals. These web portals are aimed at becoming a decisive tool in the popular movements that are in support of the right to information, decentralisation, transparency, accountability and people's participation. In order to increase openness and enhance accessibility, the NKC recommended the creation of web portals to aggregate, organise and present relevant and useful content in English and local languages, in a highly uniform, customisable, user-friendly and personalised way for several key areas related to basic human needs.

The country has undertaken major reforms in the health sector in the recent years. The rapid increase in quantum of public funding for the sector and operationalisation of decentralised innovations in rural areas has substantially altered the treatment seeking behaviour of communities in favour of public health facilities. Major reforms have simultaneously been undertaken to improve the health infrastructure, health human resources, drugs and diagnostics and referral transport options. In India, there is an opportunity for deploying IT to disseminate health information and present greater health choices before the citizens and help improve health status of the people. The proposal under consideration seeks to utilise IT-enabled protocols for improving access to health-related information and services so as to improve the quality of life of citizens specially the poor people living in remote rural areas of the country.

India is the second most populous country of the world and has changing socio-political, demographic and morbidity patterns that have been drawing global attention in recent years. Communicable diseases, which are preventable, dominate as one of the leading causes of morbidity in the rural areas. Lifestyle-related disorders dominate the urban scenario. Health problems are reflected in the life expectancy (63 years), infant mortality rate (80/1000 live births) and maternal mortality rate (438/100 000 live births). Therefore, the current situation

calls for addressing areas such as the burden of disease and health indicators such as maternal and infant mortality ratios and lifestyle-related diseases.

The developments in information and communication technology (ICT) have created new opportunities for enhancing the efficiency of health care delivery. Knowledge can be productively applied to promote change, enhance quality of life and facilitate reliable and regular flow of information. It has also come to light that the availability of information pertaining to traditional systems of medicine is lacking in the public domain. In a multilingual country, translation plays a critical role in making this knowledge available to different linguistic groups. Various champion organizations have been identified in promoting this cause such as the Centre for Science and Environment (CSE); on Teachers, championed by the Azim Premji Foundation; and on Biodiversity, championed by the Ashoka Trust for Research in Ecology and the Environment (ATREE). It has therefore become increasingly necessary to champion the cause of health literacy.

In the wake of this, the NKC had proposed to launch the National Health Information Portal which would serve as a comprehensive source on health information in India. This portal will provide information on healthcare for the citizens of India and the healthcare workers alike. This portal will serve as a single point of access for consolidated health information, application and resources on the sector and aim to cater to a wide spectrum of users from citizens, to students, healthcare professionals and researchers.

The proposal aims to create space for other portals, publishers, IT and non IT based interventions. As the portal evolves, cloud computing technologies could be incorporated with the central agency becoming the mentor for multiple interventions (thematic, geographical etc).

The India Health Portal is being proposed to be built in collaboration with a wide range of stakeholders from all sectors including Government, academic institutes, private sector and technology experts.

# I. Problems to be addressed

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## **Need for a National Health Information Portal**

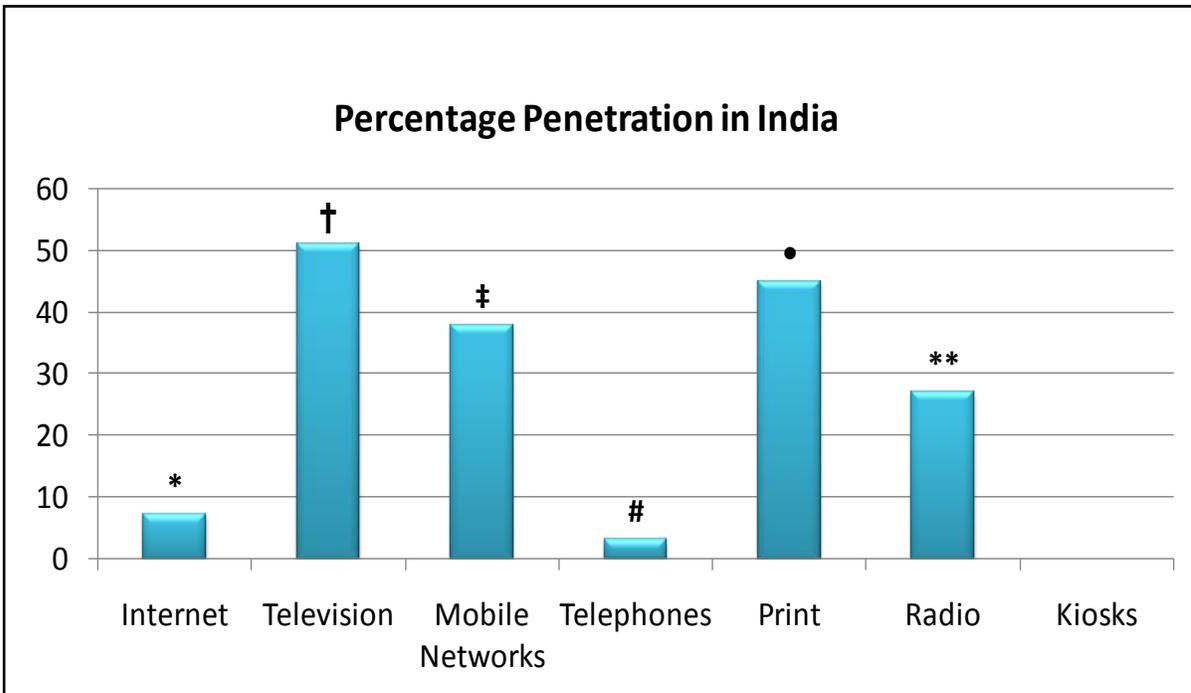
Health literacy is generally agreed upon as a means to find, understand, analyze and use information to make better decisions about health and to ultimately reduce inequities in health. Health literacy is about communicating health information in ways patients and families can understand. The diffusion and use of knowledge in society is arguably one of the most important factors in improving health outcomes.

However, although knowledge is often considered a prerequisite for change in attitudes and behaviours that lead to better health, that relationship is not always direct, positive, linear or even necessarily present (Andrew Pleasant, 2008). Health behaviour could be affected by multiple factors that operate at various levels including the individual, family, social, organisational and the community level (Deborah R. Sepinwall, 2002). Some of these factors include access to information, policies and regulations in place to address the health problem, the individual's perception of the problem and an understanding of the recommending behaviour for managing the problem.

Access to health information is one of the foremost rights of humankind. Inadequate or poor health information can increase the risk of hospitalization or even disease burden. Medical information that is not tailored for consumers can be confusing and deciphering this can be difficult. Therefore, availability of reliable, high quality health information is important for the promotion of health among the population.

In a study (by Tessa Tan-Torres Edejer 2000 - BMJ), it was found that in India, information technology (IT) has not been utilised systematically to improve the population's health. However, there is still an opportunity for IT to help improve the health status of the people, as the same can be used to publish health information and people could be presented with greater health choices. Studies have demonstrated throughout the world that the digital divide is creating huge

inequalities in health as information is not being used appropriately. Besides, the health information being published on the Internet currently is rather inconsistent and lacks validity. Today's technology needs to be utilised to provide greater interactivity and ensure that information is continuously being used to further the knowledge of the people. With the explosion of the Internet in India, it has become increasingly important for quality health information to be made readily available on the public domain via this medium. However, the challenges that need to be considered in India include the prevalence of illiteracy, multiple languages and cultures and poor access to the Internet especially in rural areas. These problems can be resolved by disseminating quality health information tailored for the population of our nation by using a wide range of Information and Communication Technologies (ICT) including fixed and mobile telephony, touch-screen kiosks, television and radio, besides the Internet.



**Figure II.1: Penetration rates (%) of various communication modalities in India**

\* **Internet** – World Bank, [http://www.google.com/publicdata?ds=wb-wdi&met=it\\_net\\_user\\_p2&idim=country:IND:PAK:USA:GBR:KOR:CHN&tstart=631152000000&tunit=Y&tlen=18#met=it\\_net\\_user\\_p2&idim=country:IND&tstart=631152000000&tunit=Y&tlen=18](http://www.google.com/publicdata?ds=wb-wdi&met=it_net_user_p2&idim=country:IND:PAK:USA:GBR:KOR:CHN&tstart=631152000000&tunit=Y&tlen=18#met=it_net_user_p2&idim=country:IND&tstart=631152000000&tunit=Y&tlen=18)

† **Television** – International Television Expert Group, [http://www.international-television.org/tv\\_market\\_data/indian-pay-tv.html](http://www.international-television.org/tv_market_data/indian-pay-tv.html)

‡ **Mobile** –

<http://www.trai.gov.in/WriteReadData/trai/upload/PressReleases/697/pr20aug09no64.pdf>

# **Telephone** –

<http://www.trai.gov.in/WriteReadData/trai/upload/PressReleases/697/pr20aug09no64.pdf>

• **Print** – National Readership Survey, 2006, <http://www.auditbureau.org/nrspress06.pdf>

\*\* **Radio** – National Readership Survey, 2006, <http://www.auditbureau.org/nrspress06.pdf>

There is also a need to provide health information to healthcare workers who in turn can share this information with the populations they serve. There is a need for healthcare professionals in India to access relevant updated medical information through a single window as part of continuing medical education, which would soon become a mandatory component for health professionals or an e-learning initiative.

A recent review (Magdalena Z Raban, 2009) found that there was a lacunae in the availability of essential health information on Indian websites with regard to mainly non-communicable diseases and injuries. This is a significant gap as India is undergoing an epidemiological transition and non-communicable diseases now account for a major proportion of disease burden. This is besides the point that information on any health condition is less than required across the spectrum.

With the passage of time there has been a shift in the role of the patient from being a passive recipient to becoming an active consumer of health information (McMullan M, 2006). Patients today are expected to and also feel like playing an active role in their own medical care and treatment.

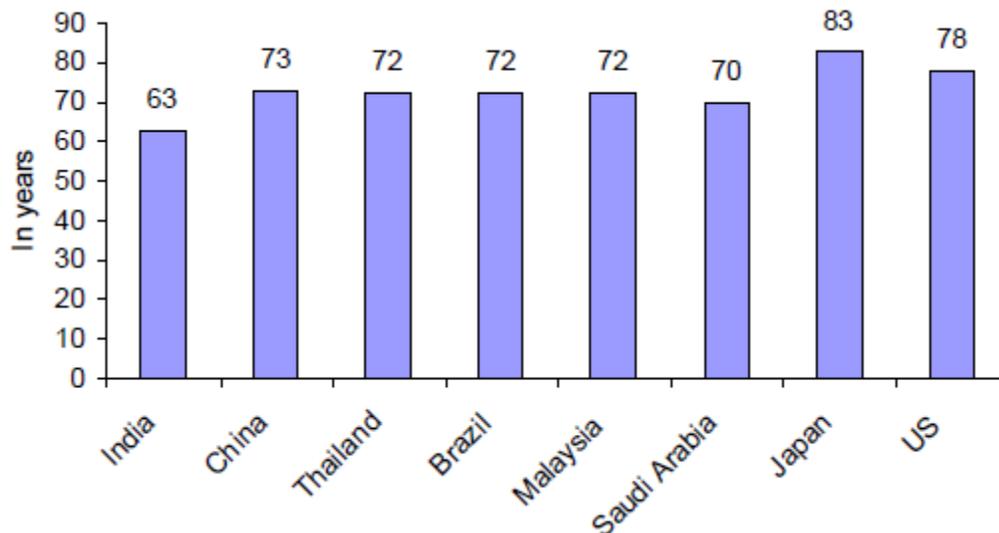
The development of reliable, relevant, usable information in an agreed-upon fashion requires cooperation among a wide range of stakeholders including health-care providers, policy makers, researchers, publishers, information professionals, indexers, and systematic reviewers (Godlee F, 2004). However,

concerns have emerged regarding the quality of health information documents contained on the World Wide Web and this requires introspection.

Health information published on the Internet lacks review, and there is no means by which the user can check the validity of the information. Often the information present on the Internet is inaccurate and misleading. It was felt that for those seeking easy ways to identify high-quality and reliable information, rating systems to evaluate the quality of health information on the Internet should be provided and developed (Aeree S, 2001).

### **Burden of Disease**

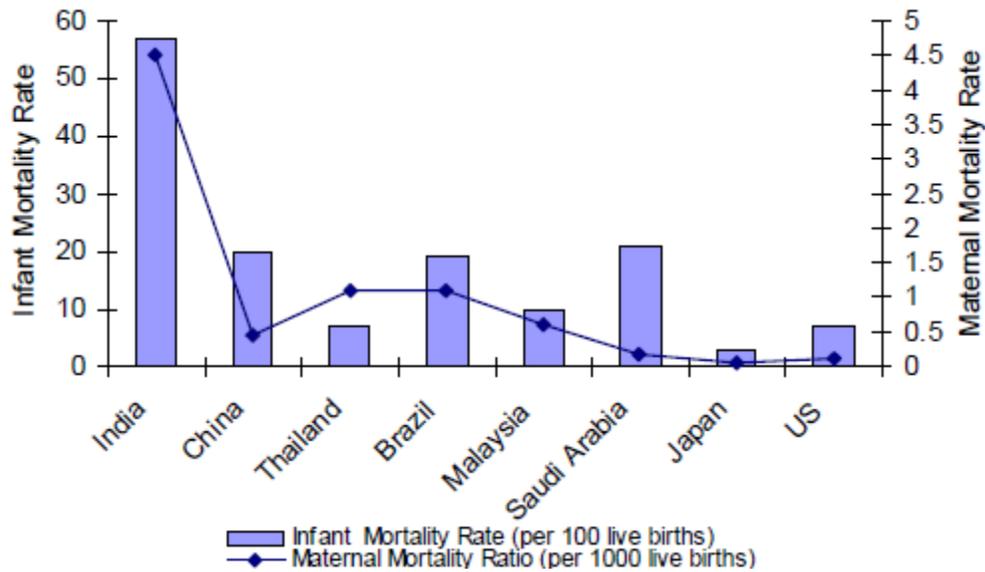
When compared to the South Asian Region averages on life expectancy and mortality (Life Expectancy: 64 years, Infant Mortality: 52 per 1000, Maternal Mortality 4.5 per 1000)<sup>1</sup> India is just about at the average level on these parameters. Therefore, a focus on these areas needs to be continued.



**Figure II.2: India life expectancy comparison<sup>2</sup>**

<sup>1</sup> World Health Organisation report on World Health Statistics, 2008

<sup>2</sup> World Health Organisation report on World Health Statistics, 2008



**Figure II.3: India mortality rate comparison<sup>3</sup>**

Changes to the age demographics mix of the Indian population indicate an increase in the working age group population. This has also brought with it a change in the disease profile and an increase in the incidence of diseases to which the population in the working age group is more prone towards.

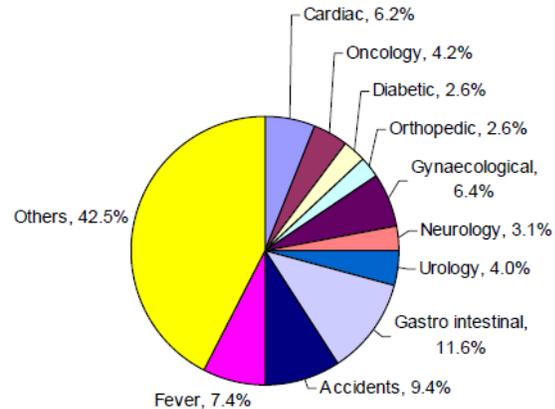
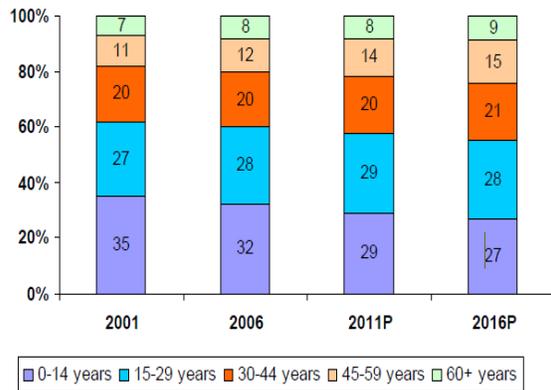
India is facing an epidemiological transition accompanied by health transition, which has resulted in an epidemic of NCD's (Non Communicable Diseases). In India, deaths from NCDs are projected to almost double from about 4.5 million in 1998 to 8 million by the year 2020. In the year 2005, 53% of all deaths were due to NCDs and this is projected to increase by 18% over the next 10 years<sup>4</sup>.

While NCDs are usually expected to occur in old age, their peak occurrence in India is a **decade earlier than western countries**. Hence, the issue is not only the burden, but also its prematurity and the resulting socioeconomic consequences. With changing socio-economic mix in India, the share of lifestyle diseases is likely to surge. The figure below indicates that lifestyle diseases like Cardiac ailments, Oncology and Diabetes accounted for about 13 percent of the total hospitalization in 2006. Projections for these diseases in the future indicate that

<sup>3</sup> World Health Organisation report on World Health Statistics, 2008

<sup>4</sup> <http://www.ncd.in/need.html>

the share of these might rise to more than 15 percent by 2011 on account of a change in dietary habits and a more sedentary lifestyle led by people. These lifestyle diseases are more expensive to manage and control.



**Fig II.4: Age and Demographic Shift<sup>5</sup>**

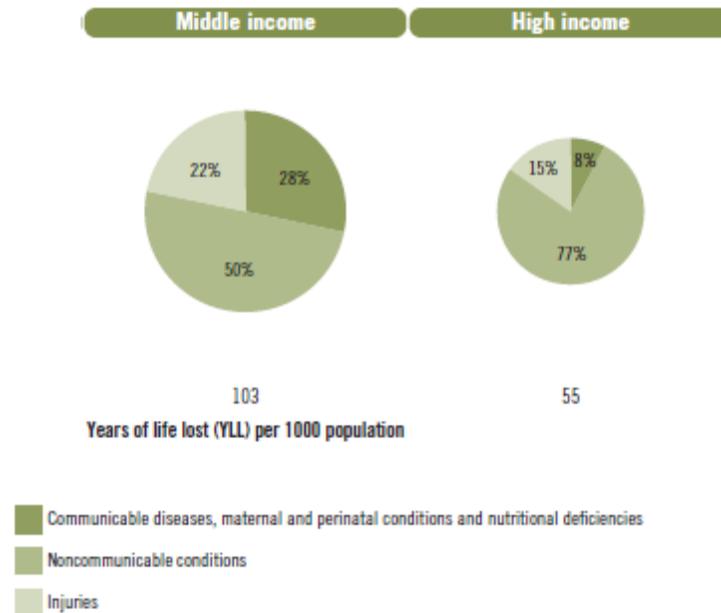
**Fig II.5: Hospitalized Cases in India<sup>6</sup>**

In middle-income countries<sup>7</sup>, around one quarter of YLL per 1000 population are due to communicable diseases, maternal and perinatal conditions, and nutritional deficiencies. The major cause of YLL here would be NCDs. The figure below depicts the Years of life lost (YLL) due to deaths occurring at younger ages. It is evident that lower-middle income economy such as ours, the YLL per 1000 population is almost twice when compared with high income economies.

<sup>5</sup> World Health Organisation report on World Health Statistics, 2008

<sup>6</sup> Policy Paper – The emerging role of PPP in healthcare sector

<sup>7</sup> World Bank Report <http://data.worldbank.org/about/country-classifications/country-and-lending-groups#Europe and Central Asia>



**Figure II.6: Years of life lost (YLL) due to premature mortality by broad cause and country-income group – 2004<sup>8</sup>**

Inadequate health literacy was an independent risk factor for hospital admission among elderly.<sup>9</sup> Inadequate health literacy also contributes to disproportionate burden of disease among disadvantaged populations as evidenced by studies conducted in other countries<sup>10</sup>. It has further been proven in studies that respondents with inadequate health literacy knew significantly less about their disease than those with adequate literacy. Statistical analysis indicated that health literacy was independently related to disease knowledge<sup>11</sup>.

Health literacy has a significant impact on lowering the maternal and infant mortality. In the Swasthya Sakhi program (under the Rajiv Gandhi Mahila Vikas Pariyojana), conducted in 22 Blocks in Amethi, Uttar Pradesh, one Swasthya Sakhi (or Community Health Activist) was assigned to a village to spread health literacy and create awareness. Every pregnant woman in these villages was identified and connected to the public health facilities. 1550 pregnancies and

<sup>8</sup> WORLD HEALTH STATISTICS 2010

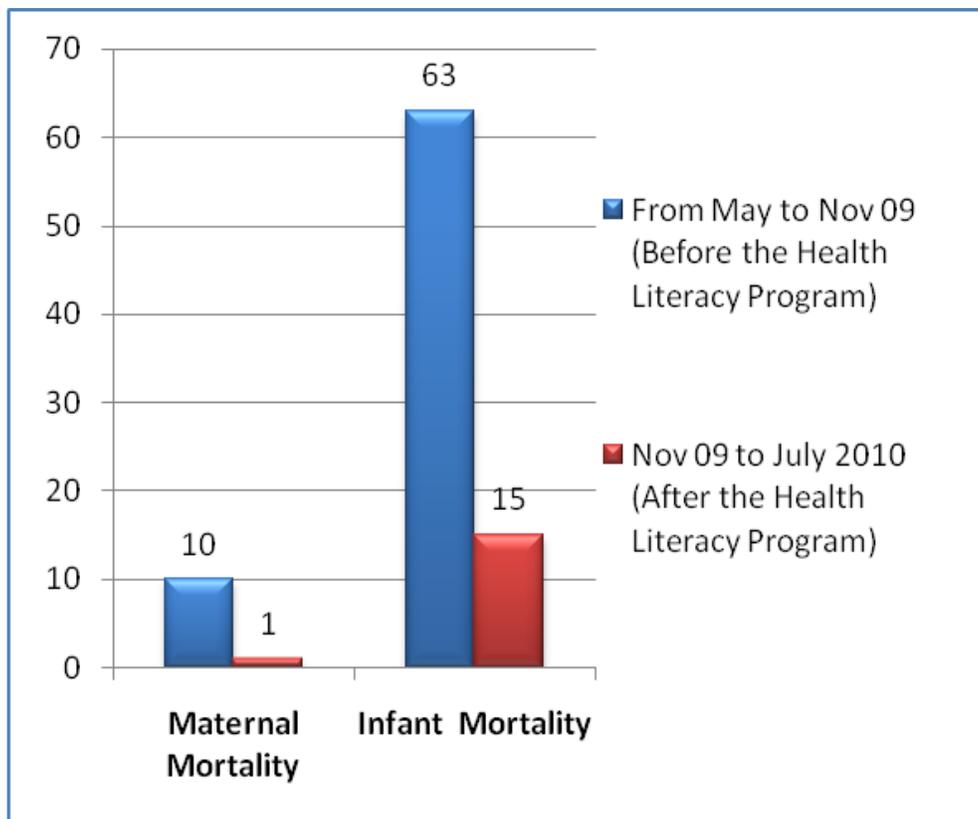
<sup>9</sup> Am J Public Health. 2002;92:1278–1283 <http://ajph.aphapublications.org/cgi/content/full/92/8/1278>

<sup>10</sup> JAMA 2002;288:475-482

[http://hss.ucsf.edu/PDF/article\\_AsoHealthLiteracy%20Schillinger%20JAMA%202002.pdf](http://hss.ucsf.edu/PDF/article_AsoHealthLiteracy%20Schillinger%20JAMA%202002.pdf)

<sup>11</sup> [http://www.pec-journal.com/article/S0738-3991\(02\)00239-2/abstract](http://www.pec-journal.com/article/S0738-3991(02)00239-2/abstract)

deliveries before the program (May 2009 to November 2009) were compared with subsequent 1532 pregnancies after the implementation of the Swasthya Sakhi program (November 2009 to July 2009), in the same 256 villages in 22 blocks. The study also demonstrated a significant reduction in the maternal and infant deaths. MMR has decreased from 645 to 65 and IMR from 40 to 9.7 (there is a margin of error in MMR due to small sample size)<sup>12</sup>. The maternal deaths after the study was just 1, compared to 10 before the study. The infant deaths after the study was 15, compared to 63 before the study. Through this Health literacy there was also improvement in the personal hygiene. The number of families who adopted personal hygiene habits was 48,349 and before the study 14,575 had followed personal hygiene habits. This study goes on to demonstrate the impact of health literacy on maternal and child health.



**Figure II.7: Maternal & Infant Mortality Rate before & after the Literacy Program**

<sup>12</sup> Unpublished data - Courtesy: Rajiv Gandhi Mahila Vikas Pariyojana, <http://rgmvp.org/core-programmes-cbhc-overview.asp>

<b>Events</b>	<b>May 09 to Nov 09 (Before the Health Literacy Program)</b>	<b>Nov 09 to July 10 (After the Health Literacy Program)</b>
<b>Number of pregnant women followed</b>	1,550	1,532
<b>Maternal deaths</b>	10	1
<b>Infant deaths</b>	63	15
<b>Number of families who adopted personal hygiene habits</b>	14,575	48,349

**Table II.1: Statistics before & after the Literacy Program**

There is no lack of information in the system about healthy lifestyles, but the manner of communication of risk and the level of support for lifestyle change need improvement. Action also has to be taken to address inequalities in health and to focus on securing better access to healthier choices for people in disadvantaged groups or areas. Accordingly, one randomized controlled trial examined whether access to a purpose-built health portal for heart disease could enable patients to manage better their heart conditions. The results of this study indicate that there were significant changes in the way they managed their diets, thereby improving their lifestyle<sup>13</sup>.

Efforts should focus on developing and evaluating interventions to improve diabetes outcomes among patients with inadequate health literacy. There are many opportunities to improve patients' knowledge of their disease(s), and efforts need to consider their health literacy skills.

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<sup>13</sup> <http://www.ncbi.nlm.nih.gov/pubmed/15923772>

With all these problems being encountered in finding reliable and relevant health information, it has become increasingly necessary to create a window of information that will help the common man in his need for basic health knowledge.

## II. Project Objectives

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### I Development Objectives:

1. The Project aims to improve the health literacy of the masses in India.
2. It aims to improve access to health services across the nation.
3. It aims to decrease the burden of disease by educating the people on the preventive aspects of disease.

### II Outputs to be achieved:

The Project has following key Outputs:

1. Improve access to services through IT enabled cataloguing of service providers.
2. Create a comprehensive web based National Health Portal to make available comprehensive health related information to the community using IT and analogue or Non-IT methods.
3. Create protocols to enable the masses to access reliable, easy to understand, multilingual health information from the interactive National Health Portal.
4. Create protocols for wide dissemination of health information in public domain using the Internet and other pertinent communication modalities.
5. Create databases to enable citizens to seek, locate and access health care providers across the country.
6. Create platforms to provide health information and health resources for the healthcare workers, NGOs, student communities, and health professionals.
7. Create a transparent resource on regulatory and statutory guidelines pertaining to healthcare in India.

### III Key Outcomes of the Project:

1. Wider awareness of validated information on health, common diseases and health services.
2. Improved health status of citizens through better access to services.
3. Improved financial status of citizens through optimized allocation of resources.
4. To enable the masses to access reliable, easy to understand, multilingual health information from an interactive National Health Portal.
5. To make health information readily available on the public domain using the Internet and other pertinent communication modalities.
6. To enable an average citizen to seek, locate and access health care providers across the country.
7. To provide health information and health resources for the healthcare workers.
8. To provide information to organizations who wish to contribute to public health and welfare (NGOs).
9. To provide health information to cater to the needs of student communities including educational/career opportunities.
10. To cater to the body of health professionals and meet their information needs, networking, and learning.
11. To provide a transparent resource on regulatory and statutory guidelines pertaining to healthcare in India to the public.
12. To provide information on National/State Health Programmes and schemes to the public

## IV Deliverables for the Objectives:

The scope of this project would mainly include but not limited to the following:

- Building the health portal with all its features and functionalities
- Dissemination of information on the portal through various modalities

The portal will be updated with content in a phased manner. Although there may be certain overlaps between the phases, it is planned that the portal would be developed over 4 years.

These Years would be as follows:

1. Year 1
2. Year 2
3. Year 3
4. Year 4
5. Maintenance

The portal will be updated with content in a phased manner. Although there may be certain overlaps between the Years, it is planned that the portal would be developed over a period of 4 years and thereafter regular updates would be performed under maintenance phases.

### IV.1 Year 1

This year will mainly focus on collecting and collating information and static content (non-vetted) from existing sources, both from the government and private/ third party agencies. Information thus collected would presumably be in various styles and formats. It therefore becomes necessary that all such information be converted into a single standardized format. The institutional mechanism that will be responsible for standardizing the content has been described later. The various types of content that would be collected and uploaded on the portal would include the following:

### **IV.1.1 Health Content**

During the first year, Information Education & Communication (IEC) and health information material that is already available with various government (including state governments) and non-governmental agencies will be collected and compiled by the CHI and handed over to the CDCs. The CDCs would be responsible for converting the information thus gathered into a standard format to unify the look and feel of information available on the portal. The information available will cater to both the rural and urban populations alike. This section will consist of health information that will be presented in a format that is succinct and addresses key points of interest or concern. The design will be fairly minimalist and aesthetic which will convey the most relevant information in the least amount of space. The purpose of such a design is to reason in the concept that facts proliferate in an ever-increasing number while the time available to review and comprehend them diminishes. These fact sheets will attempt to solve this problem by condensing information into an easy-to-read, straightforward, portable and modular form of knowledge. This will aid in the process of promoting health and hygiene amongst the masses.

As part of improving outreach of IEC material to health workers in the field, the team will compile the existing health promotion material and make it available through the portal.

### **IV.1.2 AYUSH Content**

It's also being proposed AYUSH content will also be made available on the portal. The Department of AYUSH would be responsible to collect and compile health information that's already available for the masses and transfer this data to the portal development team which will be responsible to present the information in a standard format.

Along with health content, the AYUSH section would also consist of information regarding the AYUSH department (structure & function, offices, etc), courses that are being offered and the institutes where these courses are being offered. This would help prospective students to reach out and make informed choices

regarding carer options in AYUSH. Also part of this year, the portal will link-out to the Traditional Knowledge Digital Library ([TKDL](#)) database which will serve to foster modern research based on traditional knowledge.

### **IV.1.3 Regulatory Information**

It is also proposed that the India Health Portal will provide information regarding regulations, standards and policies as described above in section V.5. This aspect seems important as the healthcare industry would need to comply with several such regulations, standards and policies. The insurance schemes of state governments in the areas of health will be listed here and links to appropriate sites will be provided.

### **IV.1.4 Disaster Management**

In year 1, it is also being proposed that the India Health Portal will provide links to the various resources specific to disaster management and preparedness that are available on specific Government websites such as the National Disaster Management, Government of India <http://www.ndmindia.nic.in>, National Disaster Management Authority <http://ndma.gov.in/ndma/index.htm> and the National Institute of Disaster Management <http://nidm.gov.in/>. This will help masses in better understanding the anatomy of both natural and manmade disasters and help them to be better equipped to manage these unfortunate incidents.

It is proposed that during this year the India Health Portal should contain comprehensive information and listing regarding national health programs that have been initiated by the government and that are aimed at improving the reach and delivery of healthcare across the country.

### **IV.1.5 Directory Services**

This service will provide a database of all healthcare providers in the country. This list will contain vital information such as address and contact details of health care providers such as registered hospitals, nursing homes, private clinics,

government hospitals, primary care health centres, etc. Data would be taken from MoHFW, Infrastructure development division which is updated annually. Accordingly the states will be required to update the portal annually.

## IV.1.6 Deliverables in Detail for each Year

### Year 1

Task Name	Resource Group	Clearing House
<b>☐ Year I</b>		
IEC Material Collection & Integration	NIHFW	CHI
Health Information - Already Available (Collect & Collate)	NACO+IDSP+DGHS	CHI
AYUSH Content	Dept. of AYUSH	CHI
Directory Services	WHO	CHI
Regulatory Issues	MoHFW, Legal Experts	CHI
National Health Programmes	NIHFW	CHI
Disaster Management	NDMA/ NIDM	CHI
Standardizing Content	CDC	CHI
<b>☐ Dissemination</b>	<b>Information and Publicity</b>	
Enabling CSCs with content for dissemination		
Identifying Vendors for Kiosk, booklets & DVDs		

**Table III.1: Deliverables for Year 1**

## IV.2 Year 2

This year will see the creation of pristine content. The CHI will enable the CDCs to create new content that would be vetted by health care professionals. Along with new content creation which will include AYUSH topics. The CCDC would create interactive modules & online health widgets. This phase would also consist of translating content that was uploaded in year 1 into 11 major Indian languages. Deliverables of this phase have been described in the following paragraphs.

During this phase, the following content would be uploaded onto the portal:

- ✓ Patient Information Fact Sheets/ Interactive modules

- ✓ Directory Services
- ✓ AYUSH/ Complementary and Alternative Systems of Medicine
- ✓ Online Health Tools and widgets

#### **IV.2.1 Patient information sheets/ Interactive modules**

This section will contain information in the form of static text pages, interactive modules, illustrations, animations and downloadable patient information sheets that can either be viewed on the portal or could also be downloaded on to a computer, burnt on a CD/ DVD or can be printed in the form of patient information hand-outs.

This section will consist of health information that will be presented in a format that is succinct and addresses key points of interest or concern. The design will be fairly minimalist and aesthetic which will convey the most relevant information in the least amount of space. The purpose of such a design is to reason in the concept that facts proliferate in an ever-increasing number while the time available to review and comprehend them diminishes. These fact sheets will attempt to solve this problem by condensing information into an easy-to-read, straightforward, portable and modular form of knowledge.

The areas that will be covered in this module include the following broad categories:

- ✓ Blood
- ✓ Bones & Joints
- ✓ Child Health
- ✓ Heart Health
- ✓ Mental Health
- ✓ Pregnancy
- ✓ Respiratory
- ✓ Sexual & Reproductive Health
- ✓ Travel Health

At the end of each module, there will be an optional quiz which the user can take that will evaluate the extent to which he/ she has understood the module. Short films will be embedded within select modules which will make the information dissemination more efficacious.

These modules will be built using contemporary software, and the modules will require minimal plug-ins so that the content can be accessed with ease.

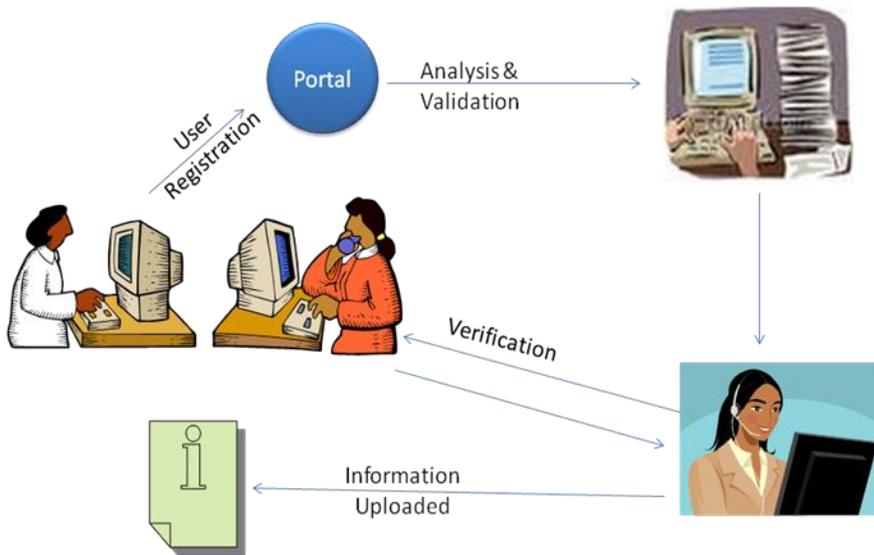
#### **IV.2.2 Directory Services**

Health care provider information will be updated during this phase. This phase will aim to include the smaller health facilities and individual providers who have been missed out by the mechanism applied in Year 1. During this Year, online registration forms will be made available. With the help of this, providers will be able to upload their information such as specialty name, range of services, contact details etc. This process will however require validation to prevent misuse. For this purpose, external validators will be hired who will be responsible for the accuracy of the information provided. The directory services could also include 24-hour pharmacy and blood bank locations.

The mechanism for online registration and validation would be as follows:

Individuals who seek to upload their details will need to register online with the portal. This may either be a free registration or a nominal fee can be charged from the individuals who wish to do so.

- Data that will be collected from individual care providers would contain their address and telephone number and GIS coordinates if possible.
- The validators will be responsible to call back these individuals and confirm location and identity.
- Once the validation has been performed, the webmaster can then give authorization for the information to become public.



**Figure III.1: Individual Health care provider Registration Mechanism**

This information will be made available when the user selects key information such as name of state, city, village etc in the form of dropdown options or search as you type feature. Based on his selection, the portal will be able to display the closest matches to his selection as indicated in the figure below.

State/ UT	12. Karnataka
District	Bangalore Urban
City/ Village	Bangalore
Area/ Panchayat	Airport Road

Akkipet  
 Akshaya Nagar  
 Albert Victor Road  
 Alur Venkatarao Road  
 Amruth Nagar  
 Amruth Halli  
 Ananda Nagar

**Eye Care Center** , Ophthalmology  
 Airport Road, Bangalore

**HAL Hospital** , Multispecialty  
 Airport Road, Bangalore

**Manipal Hospital** , Multispecialty  
 Airport Road, Bangalore

**Figure III.2: Proposed Directory Services User Interface**

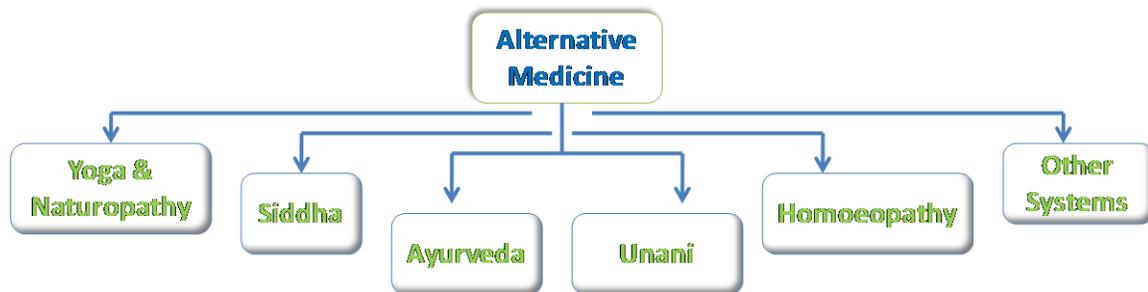
The directory services module in Year 2 will incorporate advanced features that have been discussed in the sections below.

### IV.2.3 AYUSH

AYUSH comes under the purview of what is commonly known as 'Complementary and Alternative Medicine' (**CAM**) in the West. This section will include facts that a common man should know regarding the alternative systems of medicine and the various treatment modalities available in these systems.

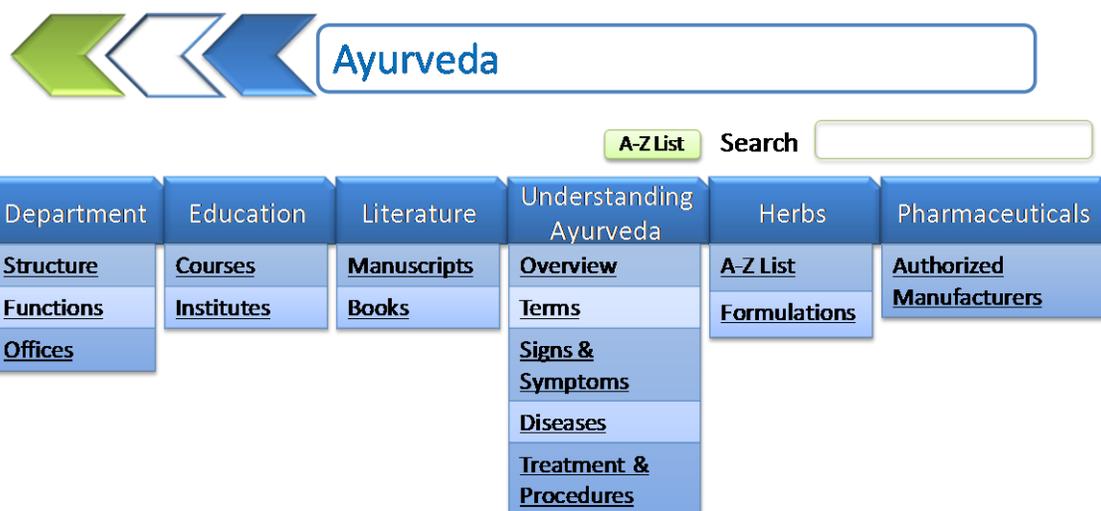
This section will provide information regarding the most commonly practiced CAM systems in India such as Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homeopathy (AYUSH).

Structure of the AYUSH section is being proposed per the chart below.



**Figure III.3: Structure of the AYUSH section of the portal**

The diagram below represents the structure being proposed for one of the Ayurveda system of medicine. Every system of medicine will have similar headings and pages. Most sections will be dynamic pages that would be updated on a regular basis.



**Figure III.4: Typical structure of the AYUSH section with Ayurveda as the example**

Some of the sections that would be covered under the AYUSH section include the following:

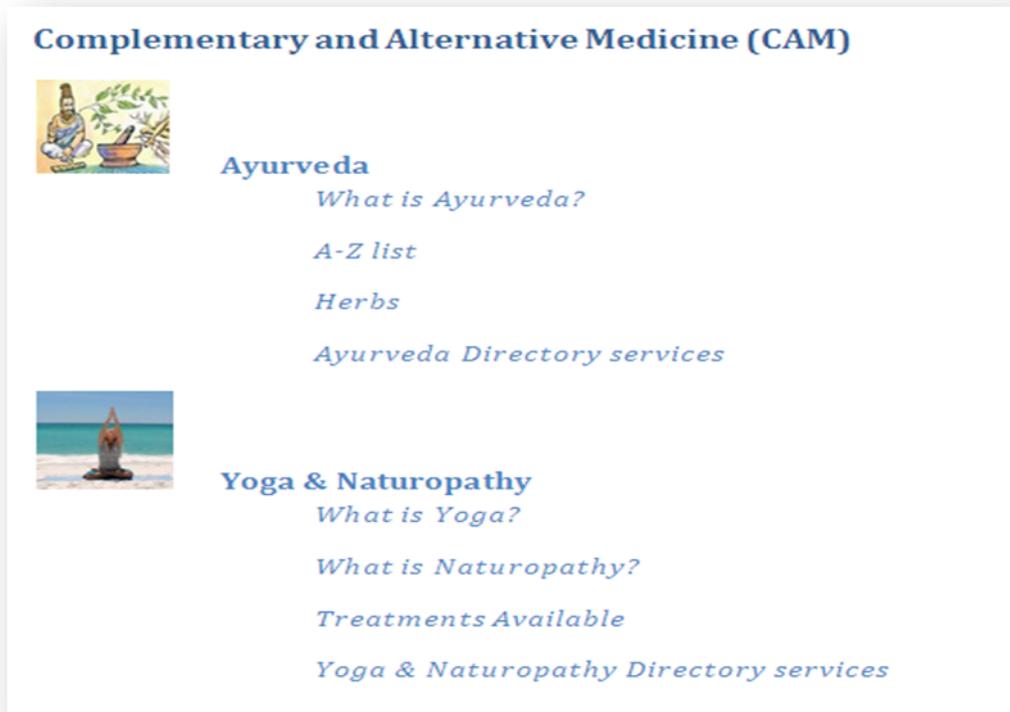
**'What is....?' Section:**

This section will contain the AYUSH basics, i.e., introduction, overview of principles and concepts, technical terms and description, diseases and brief description, signs and symptoms and description and treatment options.

**A-Z List:**

This section will contain a list of health topics that one commonly comes across in these systems). This will include disease conditions, common herbs, names of treatment options/ procedures (Panchakarma, Shirodhara, Basti, etc), and AYUSH jargon (nadhi-shodhan, Vata, Pitta, Kapha, etc), medications names, etc.

E.g. Diseases that can be treated with the help of CAM, Commonly used substances in preparations, their actions, indications, dose, etc.



**Figure III.5: Proposed User Interface for the Alternative Medicine Section**

#### **IV.2.4 Online Health Tools and Widgets**

Health tools and widgets would be available in this section for calculating health related values. Medical calculators can be used for patient care, researching solutions and keeping one-self updated. The users will be required to provide appropriate information within the required fields and the tool will then have the ability to give results instantaneously. In the long run, this could include widgets that can be installed on the desktops or even on mobile phones.

This section will house a number of online health calculators that will help the user make informed choices.

The **Figure** below is an example of one such tool that can be used by parents to predict the target height of their child.

**Height Predictor (Mid-Parental Target Height Prediction-Tanner)** 1

Gender	male	▼
Father's Height	170	cm
Mother's Height	145	cm

**Predicted Height = 155.98 cm (61"). 67% will be within +/- 5 cm (2"). 95% will be within +/- 10 cm (4")**

**Figure III.6:** Online Health Tool-Height Predictor

Table below is a listing of examples of online calculators/ health tools that could be implemented in year 2.

#	Name of the Widget/Calculator	Functions of the Widget/Calculator
1	Expected date of delivery (EDD) calculator	Calculates the Expected Date of Delivery based on the Last Menstrual Period
2	BMI Index Tool	Measures the BMI
3	Risk for Cardiac Disease	Measures the Risk for CVD
4	Life Stressors Calculator	Helps to measure the level of stress in the life activities
5	Adult Height Potential of the Child	Predicts the height of the child, based on height of the mother and father
6	Life time risk for specific cancers	Determine the risk of cancer through various history and clinical details
7	Immunization scheduler	Helps to set up the immunization calendar for the baby

8	Depression Screening test	Online depression screening test
9	Tooth eruption chart	Mentions the eruption/fall of various teeth
10	Family Heart Risks	Determines the family risk for heart disease

**Table III.2: Online Health Tools**

A more comprehensive and final list will be decided upon based on inputs from various knowledge partners and experts in due course.

#### **IV.2.5 Translations**

It is envisaged that during this phase, the content uploaded in year 1 will be translated to various other Indian Languages by the Regional Knowledge Centres.

#### **Timeline**

The timeline required to finish this build would be 12 months.

## Year 2

Task Name	Resource Group	Clearing House
<input type="checkbox"/> IHP Year-wise Project Plan		
<input type="checkbox"/> Year I		
<input type="checkbox"/> Year II		
1200 Fact Sheets Including AYUSH Topics (English 600+Hindi 600)	CHI+1 RKC	CHI
<input type="checkbox"/> Translations	DoL+12 RKC's	CHI
Translation of un-vetted Content from Year 1 in 12 Languages		
Translation of New Content in 11 Languages		
50 interactive modules (English 25+Hindi 25)	CHI+12 RKC	CHI
10 Health Widgets	CHI+12 RKC	CHI
Updating Directory Services	CHI+12 RKC	CHI
Updating Regulatory Issues	MoHFW, Legal Experts	CHI
Updating National Health Programmes	NIHFW	CHI
Updating Disaster Management	NDMA/ NIDM	CHI
<input type="checkbox"/> Dissemination	IEC Director - Centre & State Directorate of Information and Publicity	CHI
Print		
TV/ Radio		
DVDs		

**Table III.3: Deliverables for Year 2**

## IV.3 Year 3

### IV.3.1 Health Fact sheets

During Year 3, a total of 1200 factsheets in Allopathy and AYUSH would be generated by the CCDC and the AMKC. This would include Static web pages, 600 in Hindi and 600 in English. During the same period, the Department of official language (DOL), Central Institute of Indian Languages (CIIL), and the Technology Development for Indian Languages (TDIL) would translate the 600 Factsheets produced into 11 National languages, which would be validated by the 12 RKC's.

### **IV.3.2 Interactive Modules**

During Year 3, a total of 25 interactive flash-based modules in English and 25 interactive modules in Hindi would be generated by the CCDC and the Hindi RKC. These interactive modules along with some generated during Year 2 would be translated into 11 national languages by the DOL and further validated by the 11 RKC's.

### **IV.3.3 Health Widgets**

10 Health widgets would be developed and then translated into 12 different Indian Languages including Hindi. The Directory Services section on the portal would be updated with information about various health providers and entities. The CCDC and the 12 RKC's would play a vital role in compiling the information on directory services from various parts of India.

### **IV.3.4 Regulatory Issues**

The section on Regulatory issues would be updated during this year by the MOHFW in collaboration with legal experts. Regulatory information pertaining to various laws, regulations, policies, and insurance schemes, would be compiled and collated during this year.

### **IV.3.5 National Health Programmes**

Further the NIHFW would also update the information on various national health programmes on the portal. The Schema of this section would include a brief description of the programme along with link outs to the relevant external source for the user to obtain more details.

### **IV.3.6 Disaster Management**

The National Disaster Management Authority (NDMA) and the National Institute of Disaster Management (NIDM) would create and update content on various disaster management issues in brief, along with link outs to relevant factsheets on the NIDM/NDMA portal.

### IV.3.7 Dissemination

Besides, the internet portal, dissemination of information and other IEC material would also be enabled through other modes including print, TV, Radio, DVD's and health kiosks. With the help of the HLRL (Health Literacy Research Laboratory) and its team, the IEC Director, NIHFW, would head the dissemination of information through various offline modes. Health content would be delivered to the Directorate of Information and Publicity of various states, to enable them to disseminate information at the grassroots levels. During Year 3, existing content would be standardized and disseminated via the print mode. Existing content would also be disseminated by TV and Radio during the course of Year 3. During Year 3, static web content, videos and other IEC materials would be burnt on to CD/DVD's and disseminated. Interactive modules and content developed thus far to be incorporated into this health kiosks installed at strategic locations throughout the country.

### Year 3

Task Name	Resource Group	Clearing House
<input type="checkbox"/> <b>Year 3</b>		
1200 Fact Sheets Including AYUSH Topics (English 600+Hindi 600)	CHI+1 RKC	CHI
<input type="checkbox"/> <b>Translations</b>	<b>DoL+12 RKC's</b>	
Translation of New Content in 11 Languages		
Translation of Interactive Modules from Years 2 & 3		
50 interactive modules (English 25+Hindi 25)	CHI+12 RKC	CHI
10 Health Widgets	CHI+12 RKC	CHI
Updating Directory Services	CHI+12 RKC	CHI
Updating Regulatory Issues	MoHFW, Legal Experts	CHI
Updating National Health Programmes	NIHFW	CHI
Updating Disaster Management	NDMA/ NIDM	CHI
<input type="checkbox"/> <b>Dissemination</b>	<b>IEC Director - Centre &amp; State Directorate of Information and Publicity</b>	
Print		
TV/ Radio		
DVDs		
Kiosk		

**Table III.4: Deliverables for Year 3**

## IV.4 Year 4

### **IV.4.1 Health Factsheets**

During Year 4, a total of 1200 factsheets in Allopathy and AYUSH would be generated by the CCDC and the AMKC. This would include Static web pages, 600 in Hindi and 600 in English. During the same period, the Department of Official language (DOL), Central Institute of Indian Languages (CIIL) and the Technology Development for Indian Languages (TDIL) would translate the 600 Factsheets produced into 11 National languages, which would be further be validated by the 12 RKC's.

### **IV.4.2 Interactive Modules**

During year 4, a total of 25 interactive flash-based modules in English and 25 interactive modules in Hindi would be generated by the CCDC and the Hindi RKC. These interactive modules along with some generated during Year 2 & year 3 would be translated into 11 national languages by the DOL and further validated by the 11 RKC's.

### **IV.4.3 Health Widgets**

10 Health widgets would be developed and then translated into 12 different Indian Languages including Hindi. The Directory Services section on the portal would be updated with information about various health providers and entities. The CCDC and the 12 RKC's would play a vital role in compiling the information on directory services from various parts of India.

### **IV.4.4 Regulatory Issues**

The section on Regulatory issues would be updated during this year by the MOHFW in collaboration with legal experts. Regulatory information pertaining to various laws, regulations, policies, and insurance schemes, would be compiled and collated during this year.

#### **IV.4.5 Health Programmes**

Further the NIHFW would also update the information on various national health programmes on the portal. The Schema of this section would include a brief description of the programme along with link out to the relevant external source for the user to obtain more details.

#### **IV.4.6 Disaster Management**

The National Disaster Management Authority (NDMA) and the National Institute of Disaster Management (NIDM) would create and update content on various disaster management issues in brief, along with link out to relevant factsheets on the NIDM/NDMA portal.

#### **IV.4.7 E-learning**

As a sub-section under professional enhancements, it is also proposed that in the later Years of development, a structured E-learning platform could be developed to be used to share health knowledge across a wide range of healthcare professionals. This would be initiated by the CHI in coordination with various RKC's (medical colleges across the country). The regional centres would provide the learning materials required for various e-learning modules.

Medical colleges across the country could be involved in developing the content for this section. This section would specially cater to the needs of doctors, nurses, paramedical professionals, other healthcare workers and field-based health workers in rural areas among others. In time, short online courses can be developed in various focused specialty areas and those attending these courses can gain credits. This is in tune with the proposed continuing medical education requirement that the Medical Council of India is mooting. It will help in improving and ensuring better quality of healthcare delivery across the country.

## IV.4.8 Dissemination

Besides, the internet portal, dissemination of information and other IEC material would also be enabled through other sources including print, TV, Radio, DVD's and health kiosks. The IEC Director, NIHFW, would head the dissemination of information through various modes. Health content would also be delivered to the Directorate of Information and Publicity of various states, to enable them to disseminate information at the grassroots levels. During Year 4, existing content would be standardized and disseminated via the print mode. Existing content would also be disseminated by TV and Radio during the course of Year 4. During Year 4, static web content, videos and other IEC materials would be burnt on to CD/DVD's and disseminated. Interactive modules and content developed thus far to be incorporated into this health kiosks installed at strategic locations throughout the country.

### Year 4

Task Name	Resource Group	Clearing House
<b>Year 4</b>		
1200 Fact Sheets Including AYUSH Topics (English 600+Hindi 600)	CHI+1 RKC	CHI
<b>Translations</b>	<b>DoL+12 RKC's</b>	
Translation of New Content in 11 Languages		
Translation of Interactive Modules from Years 2 & 3		
50 interactive modules (English 25+Hindi 25)	CHI+12 RKC	CHI
10 Health Widgets	CHI+12 RKC	CHI
Updating Directory Services	CHI+12 RKC	CHI
Updating Regulatory Issues	MoHFW, Legal Experts	CHI
Updating National Health Programmes	NIHFW	CHI
Updating Disaster Management	NDMA/ NIDM	CHI
e-Learning	RKC's	CHI
<b>Dissemination</b>	<b>Information and Publicity</b>	
Print		
TV/ Radio		
DVDs		
Kiosk		

**Table III.5: Deliverables for Year 4**

## IV.5 Maintenance

Beyond Year 4, the IHP project would continue on Maintenance mode, with progress on adding more health topics, updating older topics, disseminating more content through print TV, radio, DVD's and Kiosks, and also providing e-learning material to health professionals.

### **IV.5.1 Health Content**

In the maintenance phases, 100 health topics would be added each year, and further translated into Hindi and 11 different Indian languages. The old topics inserted into the portal from Year 1 to Year 4, would be updated during the Maintenance phase.

### **IV.5.2 Dissemination**

Dissemination of information and other IEC material would also be enabled through other sources including print, TV, Radio, DVD's and health kiosks. During the Maintenance Phases, existing content would be standardized and disseminated via the print mode. Existing content would also be disseminated by TV and Radio during the course. Static web content, videos and other IEC materials would be burnt on to CD/DVD's and disseminated. Interactive modules and content developed thus far to be incorporated into this health kiosks installed at strategic locations throughout the country.

### **IV.5.3 E-learning**

During the maintenance phase, the e-learning section of the portal would be further developed by the CHI in coordination with various RKC's. The regional centres would provide the learning materials required for various e-learning modules.

## Maintenance per Year

Task Name	Resource Group	Clearing House
<input type="checkbox"/> Maintenance		
100 health topics		CHI
Old topics will be updated		CHI
<input type="checkbox"/> Dissemination	IEC Director - Centre & State Directorate of Information and Publicity	
Print		
TV/ Radio		
DVDs		
Kiosk		
e-Learning	RKCs	CHI

**Table III.6: Deliverables for Maintenance phases, every year**

# V General Description of the Portal:

In order to appeal to the masses, it is proposed that the portal will be designed to cater to the entire spectrum of audiences in multiple Indian languages. From the literate to the illiterate, from the technology-savvy to the technologically-challenged, from the well-to-do to the not-so-well-off, from the urban to the rural populations and from the young to the aged, all will be served with this Portal. It will present information in various means to the public and will aim to satisfy most of their health information needs.

Pertinent health information will be made available in a manner that can be understood by the lay person. The information would initially be provided in English and Hindi and will be translated to support major Indian languages. Information will be presented in the following forms:

## V.1 Information

- Text/ Static Web Pages
- Voiceovers/ Podcasts
- Directory Services
- Multilingual translated information
- Intelligent searches

## V.2 Interaction

- Interactive Multilingual Health Modules
- Online Health Tools/ Widgets
- Online Health Forums/Blogs

## V.3 Communication

- Alerts/ Updates/ NEWS
- RSS feeds
- SMS alerts (for registered users)

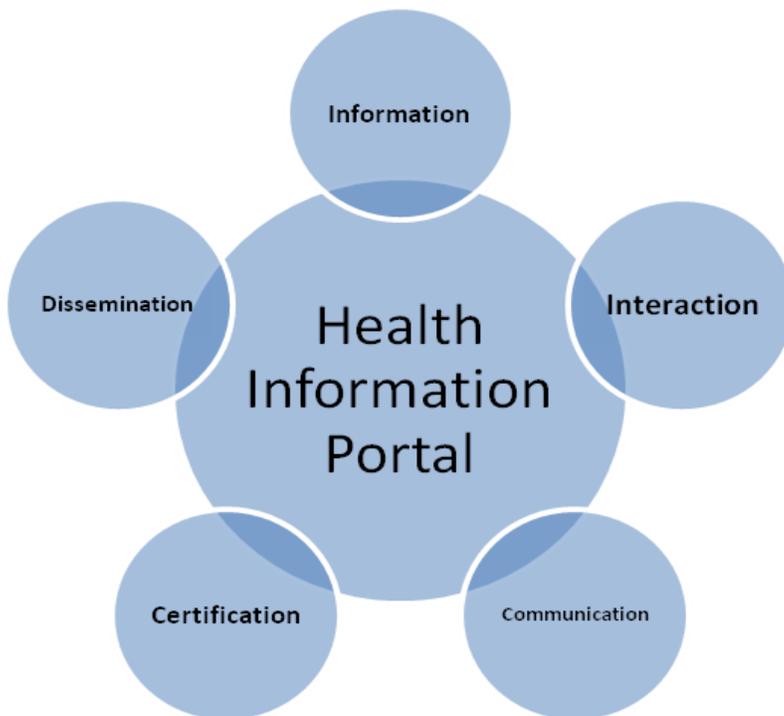
- Mailing Lists

## V.4 Dissemination

- Interactive DVDs
- Short Films/ Videos
- Touch Screen Kiosk-based health information
- Mobile Telephony or Fixed phone-based health information
- Print Media

## V.5 Certification

- HONcode or Indian equivalents such as QCI may be decided upon



**Figure III.7: Features of the India Health Portal**

# VI Features of the India Health Portal

## VI.1 Information

### **VI.1.1 Text and Static web pages**

Information that covers areas such as disease conditions, procedures, treatment modalities, outcomes (prognosis) healthy living & wellbeing, complementary and alternative systems of medicine will be presented on the portal in a systematic and organized manner.

### **VI.1.2 Voiceovers / Podcasts**

To enable individuals who are illiterate to use, understand and benefit from information on the portal, it is proposed to provide voiceovers and podcasts for selective high-impact health information

### **VI.1.3 Directory Services**

Directory Services that will offer guidance and assistance to the general public in locating healthcare facilities including AYUSH centres, diagnostic laboratories, pharmacies, and blood banks, and practitioners in due course will also be an integral part of the portal.

### **VI.1.4 Multilingual Translations**

It is proposed that all health information and other information such as directory services on the portal will be translated into the most commonly used in India. This will be done in a phased manner and will include the following languages:

	Rank	Language	2001 census[1] (total population 1,004.59 million)	
			Speakers	Percentage
1. Hindi	1	Hindi	422,048,642	41.03%
2. Bengali	2	Bengali	83,369,769	8.11%
3. Telugu	3	Telugu	74,002,856	7.37%
4. Marathi	4	Marathi	71,936,894	6.99%
5. Tamil	5	Tamil	60,793,814	5.91%
6. Urdu	6	Urdu	51,536,111	5.01%
7. Gujarati	7	Gujarati	46,091,617	4.48%
8. Kannada	8	Kannada	37,924,011	3.69%
9. Malayalam	9	Malayalam	33,066,392	3.21%
10. Oriya	10	Oriya	33,017,446	3.21%
11. Punjabi	11	Punjabi	29,102,477	2.83%
12. Assamese	12	Assamese	13,168,484	1.28%

These languages were chosen based on the 2001 census data for the order of spoken languages in India based on the percentage of speakers.

### **VI.1.5 Intelligent Searches**

It is proposed that during the later Years of the development of this portal, specific features such as intelligent searches would be added to help users find information easily.

These intelligent searches would include semantic web features and Natural Language Processing (NLP) (currently available only for English) to retrieve information from within the portal database using simple search strategies.

Another concept of intelligent searches proposed in the 'Health Cloud' concept, where users can explore this feature when they do not know exactly what they're looking for. The 'Health Cloud' will facilitate that process of finding the information by fetching the links from the site map and allowing the user to find exactly what he or she wants. Perhaps it will allow the user to explore more health care concepts or information in the process (Courtesy: P.Trivedi, 2010).

## Health Cloud

This is a demo. Links will do not work

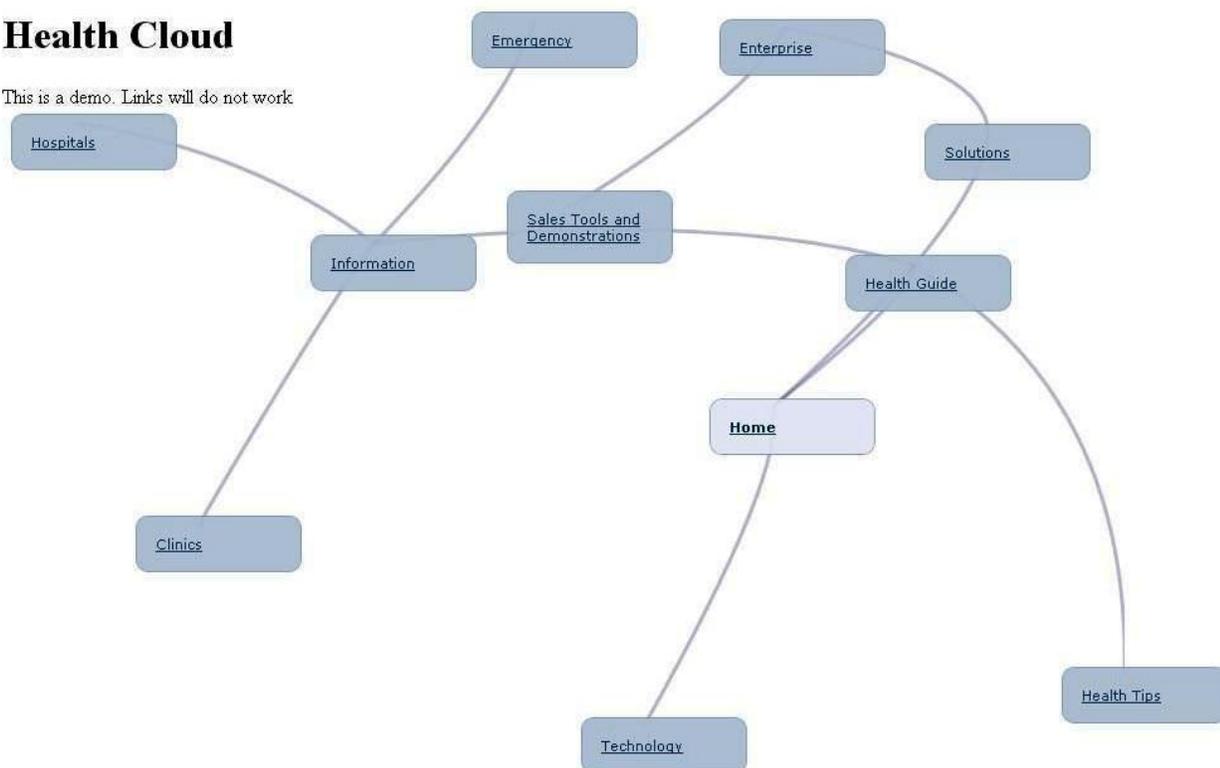


Figure III.8: Health Cloud Concept (Courtesy: Parthasarathi Trivedi. 2010)

## VI.2 Interaction

### VI.2.1 Interactive Multilingual Health Modules

Interactive multilingual health modules will be developed on the portal which will present health content in the form of interactive patient tutorials and self-playing modules with voiceovers. These self-playing modules will be primarily targeted at the illiterate/ untaught audiences.

### VI.2.2 Online Health Tools/ Widgets

Online health tools and widgets will be built that will offer a simple form of calculating health related values and offer some decision support to the user. These tools will include calculators such as Body Mass Index calculator, expected date of delivery calculator, Ideal weight calculator and various others that will be specifically designed for the public and patient population.

### **VI.2.3 Online Health Forum/ Blogs**

Online Health Forums or blogs mediated by health experts will be developed to provide interactivity to the public who feel the need to discuss health problems or issues with a health professional. This will help people supplement traditional health information with an attribute of reliable interactivity.

## **VI.3 Communication**

### **VI.3.1 Health Videos**

It is proposed that health information will also be communicated in the form of short videos on the portal. Short video clips, with or without celebrities, giving out special health messages ranging from preventive health, basic hygiene, specific disease conditions, and other important topics will be produced.

These video clips can be integrated within the interactive modules that encompass health condition information, voiceovers and self-playing tutorials. These clips besides being viewed through the portal can also be broadcast through other media such as television, could be viewed on the health information kiosks or distributed to schools and rural health workers to be viewed on a TV screen using DVD players for health promotion.

### **VI.3.2 RSS feeds**

It is envisioned that 'Really Simple Syndication' (RSS) feeds will be provided from this portal to consumers who may be interested in specific updates of information.

RSS is a technology that allows individuals to stay informed easily by retrieving the latest content from the sites they are interested in. Time is saved by not needing to visit each webpage individually all over again.

RSS feeds will provide customized information to individual users from the India Health Portal.

### **VI.3.3 SMS alerts**

It is proposed that Short Messaging Services (SMS) will be used to provide health information and alerts to subscribers in the form of health alerts, reminders for taking medications, reminders for diagnostic tests, doctor's appointments, healthy lifestyle tips and others. This is proposed to be a paid subscription-based service.

Individuals could subscribe to a specific health topic or should be able to setup alerts for various health needs. These alerts will be sent by bulk SMS to specific users in the language of their choice.

### **VI.3.4 Mailing Lists**

E-mail is widely popular today and therefore it is proposed that user specific mailing lists based on user requests will be created and this modality of communication will also be used to disseminate health and wellness information.

Users can choose to receive information of their choice from the India Health Portal.

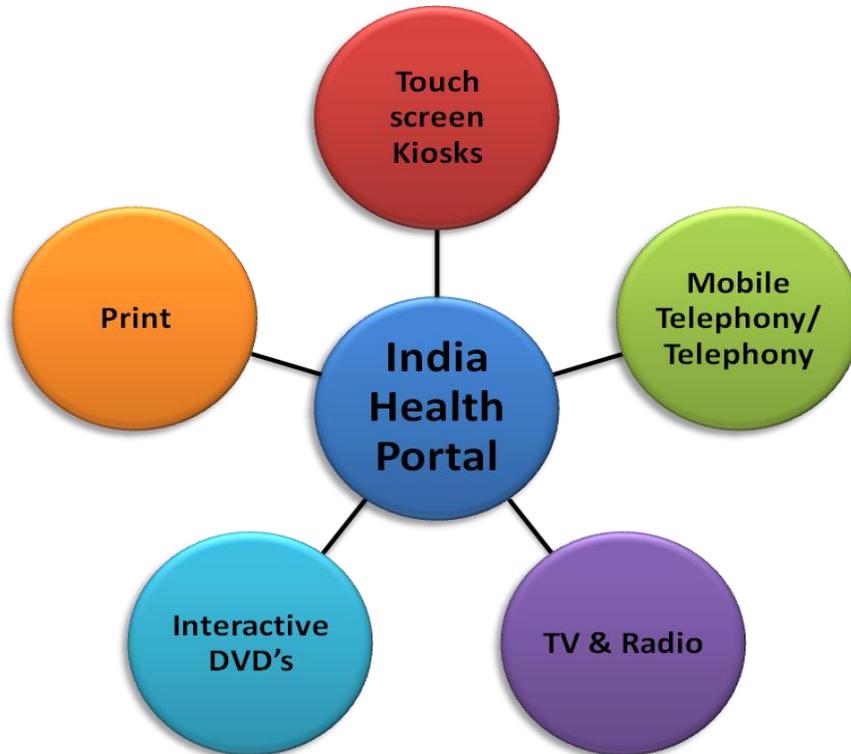
## **VI.4 Dissemination**

It is proposed that this portal would be the central repository of health knowledge developed and aims to become a trusted source of health information for the common man, irrespective of the existing alternative sites.

Health literacy for the masses being one of the main objectives of this portal, it is proposed that this knowledge will be readily available in various packaged formats to be disseminated through various available communication modalities such as interactive DVDs, touch screen kiosks, mobile and fixed telephony, television, radio and print media for wider spread of information, especially in areas that lack the reach of the Internet. Dissemination would involve a whole lot of participants from various sectors who would ultimately use the existing health system structure down to the sub centre and all IEC divisions at all State Health

and Family Welfare Departments would be involved. It is also proposed to use the primary/elementary school setup for dissemination through the active involvement of teachers.

**Figure III.9: Modalities of Health Information Dissemination**



## VI.5 Certification

It is understood that the health content being made available on the portal should be robust, valid and trustworthy. It is proposed that the portal is accredited by a certifying authority. One such existing organization that certifies healthcare websites across the world is HONcode (Health on the Net Foundation) which is a not-for-profit organization. **The HONcode certification is provided free of charge.** The certification conducted by HON implies a thorough evaluation of website and the processes to develop and publish content on it according to the HONcode guidelines listed below.

Alternatively, an Indian body such as the to be formed National Health Informatics Authority (NHIA) as recommended by the National Knowledge Commission or the Quality Council of India or any other body could also be involved in setting up standards that are specific for Health Information pertinent to India. This could include standards for traditional medicine and AYUSH related health information that is India Centric as well.

The aim of certification is to guide the growing community of healthcare consumers and providers on the World Wide Web to valid and reliable medical information and expertise.

### **Certification Guidelines**

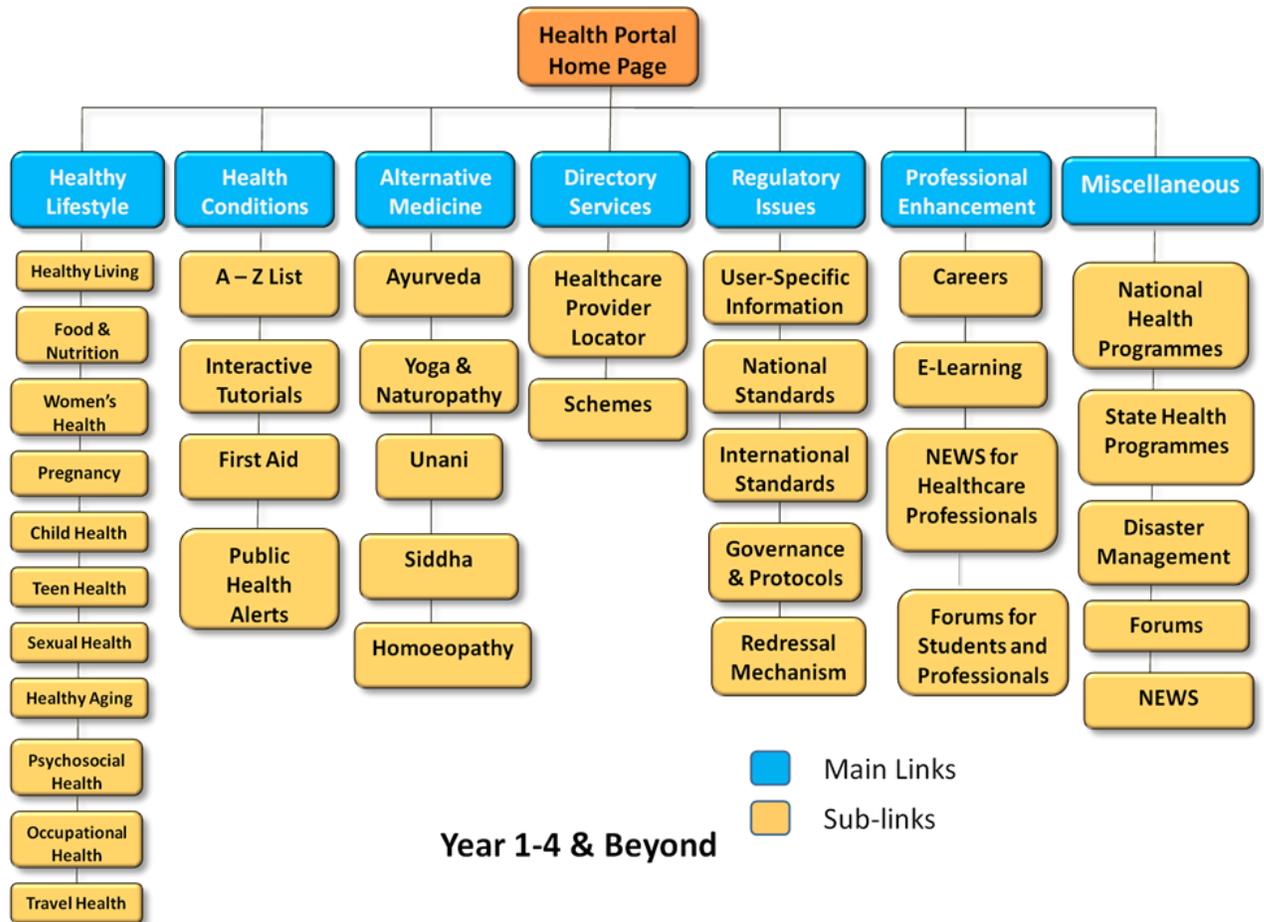
1. **Authoritative Details** – Information should be provided attributing the author and details about his or her training or qualification.
2. **Purpose of the Website** – A clear statement should exist about the purpose of the website.
3. **Privacy Policy** – A statement regarding the confidentiality of information provided by the users to the web site should exist in the Privacy Policy. The web site should respect the confidentiality of the users and protect misuse of their personal information (such as email id, names or contact details provided by the user).

4. **Documentation** – All medical information provided should be supported by appropriate evidence-based findings and sources (in the form of references). The specific date of creation and editing of the content has to be mentioned along with the intended audiences (such as the medical professional or the patient).
5. **Transparency** – The contact details of the web publishers has to be made available to the users and in case of any query, he/she should be easily able to contact the publisher. The web portal should have a system to provide prompt response to the user-queries.
6. **Justification of claims** – All claims made about a particular intervention or a product has to be supported by scientific evidence such as a journal or report. It would be in the best interest of the web site to avoid brand names and give generic data instead.
7. **Disclosure of funding sources** – A statement should exist on the portal that informs the users of the funding source (for example government agency, private organizations, etc).
8. **Advertising Policy** – To avoid any kind of conflict of interest and to ensure that the users can differentiate between the editorial content and advertisement, the portal needs to have an advertisement policy. The portal has to demarcate/outline all the promotional and commercial content and the friendly links (from non-paying bodies), such that they are clearly identifiable by the user.



**Figure III.10: HONcode Logo Sample - Courtesy: The HON Foundation**

## VII Structure and Functions of the India Health Portal – Site Map



**Figure III.11: Proposed Sitemap for the India Health Portal**

The site map above provides the list of pages accessible to the users. The site map will grow over time with new content being added and may be a dynamic site map in the future.

The Home Page of the health portal would contain the following main links:

- Healthy Lifestyle
- Health Conditions
- Alternative Medicine
- Directory Services

- Regulatory Issues
- Professional enhancement
- National Health Programs
- Forums

## **VII.1.1 Healthy Lifestyle**

This section will primarily focus on the preventive aspects of health. This section will support multilingual text formats, illustrations and interactive modules. The following sub-categories would be available under this header:

### **VII.1.1.1 Healthy Living**

This section will contain information and tools that people can use to lead a healthy life. Social awareness videos/ short films such as the benefits and techniques of proper hand washing and personal hygiene would be the main contents of this section. This section will also contain information regarding weight loss, physical activity and fitness, stress management and smoking cessation amongst many others.

### **VII.1.1.2 Food & Nutrition:**

This section will contain information regarding foods, concept of healthy eating, nutrition in health and disease. Nutritional advice for special conditions and populations such as pregnancy, obesity, and hypertension will be discussed here. Also, a special section on nutritive food recipes would be discussed in this section of the portal.

### **VII.1.1.3 Women's Health:**

The most common concerns and information regarding women's health conditions will be discussed here. Of special mention would be topics such as osteoporosis, anaemia, irregularities of menstruation, anorexia, breast and cervical cancer among others would be discussed here.

#### **VII.1.1.4 Pregnancy:**

This section will contain information related to the essence of “What should women watch out for during their pregnancy?” The do's and don'ts, visits to the doctor, laboratory tests, food and nutrition, changes that women undergo during pregnancy, possible complications, encourage institutional deliveries and information regarding pre-delivery mother care and post delivery mother and child care will be discussed here.

#### **VII.1.1.5 Child Health:**

This section will contain information regarding immunization schedules, common childhood illnesses and what can mothers do to manage them, home remedies for common problems, nutrition and growth milestones are some of the topics that would be discussed in this section.

#### **VII.1.1.6 Teen Health:**

This section will contain information on health conditions of the teenage, including information on changes such as puberty and common concerns of the age group such as substance abuse, teenage pregnancy, violence and injuries.

#### **VII.1.1.7 Sexual Health:**

This section will contain health information regarding various sexual health related concerns such as sexually transmitted infections, sexual health, impotence, safe sexual practices, unintended pregnancy, and contraception among others.

#### **VII.1.1.8 Healthy Aging:**

This section will address the health issues faced by the elderly such as self care, vision and hearing impairment, memory concerns, musculoskeletal disorders such as arthritis, dental health and other topics related to the health problems faced by the elderly.

### **VII.1.1.9 Psychosocial Health:**

This section will address topics related to stressors at work and life, tackling stigma and discrimination, domestic violence, harassment, human rights and links to various support groups in this regard.

### **VII.1.1.10 Occupational Health:**

This section will cover the occupational hazards of some of the most common occupations, types of health concerns at work, what precautions need to be taken and suggested modifications such as ergonomics in the workspace. This section will also contain information on common occupation-related diseases, treatment and rehabilitation options and prevention measures.

### **VII.1.1.11 Travel Health:**

The travel health section will cover travel advisories and precautions for travellers while travelling to specific endemic areas within India and outside the country. This section will also detail information about vectors or organisms that are known to harbour specific diseases and will also include information regarding immunization, recommendations, treatment guidelines and suggested preventive measures before visiting an endemic area. Travel hygiene will also be a focus in this section.

## **VII.1.2 Health Conditions**

This section will contain information regarding disease conditions (A-Z), medical/surgical procedures, treatment options, outcomes, first aid and public health alerts. Information would be made available in the form of text, illustrations, animations, short films, interactive modules and voiceovers.

### **VII.1.2.1 A-Z List:**

This section will house the A-Z listing of diseases and health conditions. This would provide a comprehensive guide on hundreds of conditions, Diagnostic

tests (what is the test? What is the meaning of the result?), and procedures (what is it? How is it done? How do I prepare? What are the risks, etc) would also be listed in this part of the health portal.

#### **VII.1.2.2 Interactive Tutorials:**

Some of the health conditions and procedures that are common and hence mandate information to be presented in vivid detail will be housed in this section. Simple Flash based modules will be created which can be accessed from computers, touch screen kiosks and possibly mobile phones. These modules will contain interactive text, audio and video content.

#### **VII.1.2.3 First Aid:**

A brief explanation of basic first aid information that can be used by the common man in case of emergencies such as domestic injuries, sports injuries, road traffic accidents and burns will be discussed in this section. Also, the do's and don'ts in specific cases such as electric shocks, building collapse, spinal injuries and explosions among others can be discussed here.

#### **VII.1.2.4 Public Health Alerts:**

This section would contain updated news feeds regarding happenings in the health domain. This section will bring about information regarding prevailing health conditions, trends and forewarn or describe current epidemics among others. Also, information on drugs that are phased out/ recalled/ banned will be made available to make people aware so that they can take informed choices and spread the word around.

### **VII.1.3 Alternative Medicine**

The most commonly practiced systems of alternative medicine in India would be discussed here. Alternative systems of Medicine (AYUSH) are becoming a focus for Indians with growing impetus by the Ministry of Family Health and Welfare in this area. An increasing number of research findings have shown many benefits

of these forms of Medicine. Therefore, this section would contain authentic information from the practitioners of these systems of medicine. This section will educate the masses about the different streams of medicine prevailing in India and their therapeutic benefits. This section will also contain the different perspectives of disease in tune with the different systems of medicine. Salient features include information regarding medicinal preparations, constituents of the preparations and their properties, treatment modalities, expected outcomes amongst others.

### **VII.1.3.1 Ayurveda:**

This section would include health information from the Ayurveda stream of medicine - about Ayurveda, the theory behind, the emphasis on the use of body, mind and spirit in disease prevention and treatment, the herbs and remedies being used, various preparations, therapeutic procedures, and expected therapeutic benefits would be provided here.

### **VII.1.3.2 Yoga & Naturopathy:**

This section will have health information based on the yoga and naturopathy stream of medicine. It would provide information on yoga and naturopathy and cover the various exercises, meditation techniques, diet and postures that are commonly used in yoga and naturopathy. Also, information about common conditions that can be treated with yoga would be discussed here. The science behind naturopathy and the therapeutic benefits of naturopathy would be also provided.

### **VII.1.3.3 Unani:**

This section will contain health information from the Unani stream of medicine. It would enlist the principles of Unani, modalities used, treatment available and treatment perspectives of common conditions where Unani is being used.

#### **VII.1.3.4 Siddha:**

This section will contain information regarding the Siddha branch of Indian medicine. Information about this stream, the basic treatment concepts, used of Siddha and the conditions where it is most useful, will be presented

#### **VII.1.3.5 Homoeopathy:**

This section will contain information on homoeopathy, the direction of the science to disease diagnosis and treatment. The different condition-specific treatments available in homeopathy will also be presented

### **VII.1.4 Directory Services**

#### **VII.1.4.1 Health Care Provider Locator**

The directory services that is proposed in the India Health Portal will list out all healthcare facilities across the length and breadth of the country – including hospitals – private and government, nursing homes, clinics and public health centres located across the country along with important details such as addresses, phone numbers, email id, Web sites, and if possible GIS coordinates linked to a map. ISRO could be one such organization to help provide GIS coordinates for this venture.

The consumer can search on this directory to obtain information of the type of medical services provided, type of health care providers available, addresses, timings of functioning and so forth. In the advanced Years, efforts would be made to provide names and contact details of individual doctors and other healthcare professionals to the patients.

#### **VII.1.4.2 Health Insurance Schemes**

Medical care is expensive and is unaffordable to a huge proportion of the population. People are often unable to afford even basic healthcare services,

leave alone situations in which treatment of critical illnesses through hospitalization would be required.

It is proposed that this section will list out the various schemes of medical insurance, accident insurance and travel health insurance that are available for the Indian people from the Government and private sectors as listed below:-

- Government run insurance schemes such as the ESI and the CGHS
- Employer-based insurance schemes
- Private insurance schemes
- Insurance schemes offered by NGO's and community bodies

The India health portal will provide basic information and links to other specific websites if the user wants to know more about each in greater detail.

### **VII.1.5 Regulatory Issues**

One of the vital issues in the healthcare industry is the need to comply with certain set standards and regulations. Many regulatory norms are also aimed at bringing out potential reforms in the healthcare industry. The India Health Portal would try to educate the people about the various aspects of the health regulatory issues and include various standards. The Regulatory issues section would be broadly classified into-

- User-specific Information
- National Standards
- International Standards
- Governance and protocols
- Redressal mechanisms

### **VII.1.5.1 User-specific Information**

The India health portal would provide information to three user-specific groups namely - patients/consumers, healthcare professionals and special populations about appropriate healthcare regulatory information. The main aim of including this section would be to create greater awareness among the public so that they can take better control over their health and are aware of the regulations surrounding healthcare. Healthcare providers who are aware of the norms and laws in place would be encouraged to follow, change practice modalities and deliver higher standards of care to the public. Specific populations will have unique healthcare needs and the India Health Portal would concentrate on their rights and provide specific knowledge to manage their interactions with healthcare providers and exercise greater control over their health. Broadly, based on the stakeholders in the healthcare industry, regulatory issues would be classified into 3 user-specific groups:-

**1. For The General Public and Patients** – The general public and patients should be aware of the various health entitlement schemes in place for different health problems to enable them have better control over their health. Certain legal instruments and health policies are available for people to address their health problems and any grievances with the healthcare system. Today, with growing consumerism in India, the patients should also be informed about their rights as consumers. Some of the suggested topics that can come under this section include:-

- Medical Termination of Pregnancy Act
- Pre-natal diagnostic Techniques Act
- Medical Malpractice laws
- Consumer Protection Act
- Drug and cosmetics Act 1940
- Mental Health Act, 1987
- Tobacco Control Act in India
- Transplantation of Human Organ Act and Rules
- Air, water, Noise, hazardous wastes, pollution and environment protection

- ESI Act
- CGHS Act
- Industrial Legislative Measures (which aim to protect the health of the workers)
- Maternal Benefits Act
- Birth and Death registration regulations

**2. For Healthcare Providers** – A healthcare provider who is aware of the norms and laws that govern healthcare practice would not only be able to follow them, perform better and offer a higher standard of care, but also avoid circumstances wherein there could be expense of time and money over malpractice lawsuits thus benefiting the patient in the bargain. The portal would give information on the various legal and procedural requirements including accreditation, ethical practice, etc. Some of the suggested topics in this list include:-

- Code of ethical practice
- MCI Act, Rules and Regulations
- DCI Act, rules and regulations
- Nursing Act, rules, and regulations
- Indian Medicine Central Council Act 1970 (CCIM is the governing body for AYUSH)
- Registration under MCI/DCI/State Medical Councils/State Dental Councils/AYUSH Registration
- Bio-medical Waste (management & handling) Act compliance
- Accreditation with the NABH
- Medical Establishment / Nursing Home Act of various states that may be applicable

**3. For Special populations** – Specific populations of the country have unique needs and the Indian Health Portal would concentrate on their rights and

specific health needs. For example, a disabled individual would be having specific rights to protect his/her health as envisaged by the government. These populations would have better control over their health and quality of life when they are aware and informed. Some of the specific populations that can be suggested in this list include:-

- Disabled individuals
- Lower socio-economic groups
- Women & child
- Adolescents
- Individuals with Special Mental Health Needs
- Travellers (especially from out of country)

### **VII.1.5.2 National standards**

The India health portal would communicate the various standards developed by the policymakers and organizations in India that aim at improving quality, maintaining consistency and building a framework for development.

These standards may concern various aspects of healthcare including:-

1. Administration
2. Patient Outcomes
3. Clinical effectiveness
4. Cost effectiveness
5. Patient and employee safety
6. Public health
7. Accessibility
8. Care Environment

### **VII.1.5.3 International Standards**

The India Health portal would also attempt to create awareness amongst the people regarding international standards being developed across the world.

Links will be provided to various other websites that host International Standards that may be relevant to healthcare systems and delivery.

The main purpose of publishing the international standards would be to ensure that the healthcare organizations in India can employ the latest technology and evidences and guarantee quality healthcare delivery.

Some of the international standards that may be vital include:-

- Joint Commission (JCAHO)
- Health Level 7 (HL7)
- Food and Drug Administration (FDA)
- National Clearinghouse Guidelines (NGC)

#### **VII.1.5.4 Governance and Protocols**

This section would contain information addressing the schemes, laws and processes that assure the quality, accountability and proper management of health and social care organizations.

#### **VII.1.5.5 Redressal mechanisms**

This section would provide the various grievance mechanisms that can be used by patients to claim relief for any issue or grievance against healthcare providers that may arise during hospitalization, diagnosis and treatment. The India health portal would provide information and link-outs to various other resources on the web that would address these issues.

#### **VII.1.6 Professional Enhancement & E-Learning**

Professional enhancement is the means by which medical professionals can maintain, improve, update and broaden their clinical knowledge and skills and develop the required acumen in their professional work.

In the India Health Portal, it is proposed to have a section that will be accessible to all medical professionals. This section listed in the 'Professional Enhancement' category will require a user name and password to access the content.

The following sub-categories would be available under this header.

### **VII.1.6.1 Careers**

This section would host information that assists jobseekers to search and find job opportunities/vacancies listed on Indian government/private healthcare institutions, help students find information links on career development resources, graduate programmes and courses offered by various Indian Medical Institutions amongst others. Further, it would also provide customized job alerts, career opportunities / job vacancies notifications in the form of emails or SMS (short message service).

### **VII.1.6.2 E-learning**

As a sub-section under professional enhancements, it is also proposed that in the later Years of development, a structured E-learning platform could be developed to be used to share health knowledge across a wide range of healthcare professionals.

Medical colleges across the country could be involved in developing the content for this section. This section would specially cater to the needs of doctors, nurses, paramedical professionals, other healthcare workers and field-based health workers in rural areas among others.

In time, short online courses can be developed in various focused specialty areas and those attending these courses can gain credits. This is in tune with the proposed continuing medical education requirement that the Medical Council of India is mooting. This will help in improving and ensuring better quality of healthcare delivery across the country.

In order to assist those in the medical field to maintain competence and learn about new and developing topics/areas in their medical specialty, the portal

would be a one stop information source to channel information about healthcare meetings, conferences, seminars, live events, and at the same time host written publications, e-learning programmes, audio, video, or other electronic media broadcasts related to updates in Healthcare. Content for these programs would be developed, reviewed, and delivered by faculty who are experts in their individual clinical areas.

### Health Forums for Students & professionals

This proposed section will be a moderated discussion forum for students (regarding medical/health courses) and health professionals alike. The forum would facilitate discussion groups for health professionals and student doctors (who are training to become qualified doctors) to come and share their professional experiences and discuss about the latest and interesting topics with peers across the nation.

## **VII.1.7 Miscellaneous**

### **VII.1.7.1 National Health Programmes**

It is proposed that this section of the India Health Portal will contain comprehensive information and listing regarding national health programs that have been initiated by the government and are aimed at improving the reach and delivery of healthcare across the country. This section would have information on programmes such as the NRHM (National Rural Health Mission) which is the flagship health programme of the country. The India Health Portal will also provide links to other Governmental websites where the user can obtain more detailed information about national health programmes.

### **VII.1.7.2 State Health Programmes**

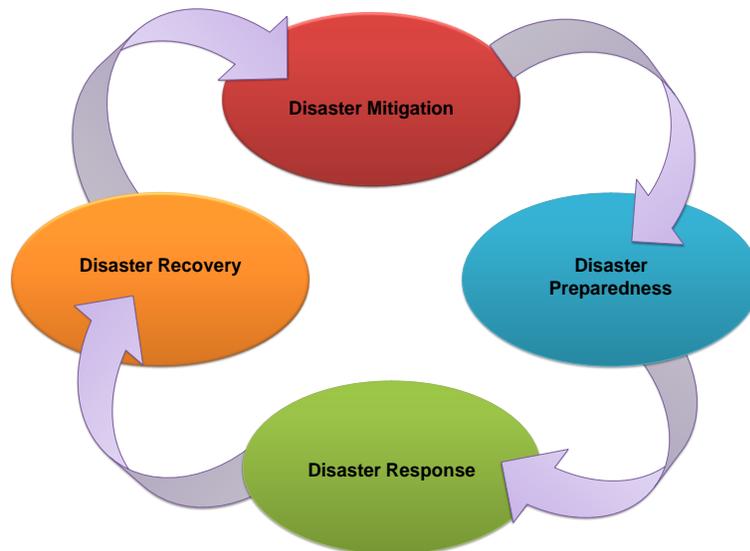
It is proposed that this section of the India Health Portal will contain comprehensive information and listing regarding respective State health programs that have been initiated by the governments at the State level.

### VII.1.7.3 Disaster Management

It is proposed that the India Health Portal will provide brief information of various disaster management issues along with links to the various other resources specific to disaster management and preparedness that are available on specific Government websites such as the:

- National Disaster Management, Government of India  
<http://www.ndmindia.nic.in/>
- National Disaster Management Authority  
<http://ndma.gov.in/ndma/index.htm>
- National Institute of Disaster Management  
<http://nidm.gov.in/>

The entire cycle of disaster management would include the following cyclic processes and appropriate health, safety and related links from the various above mentioned websites will be chosen and categorized under the different headers indicated below.



**Figure II.12: Schematic Illustration of the Disaster Management Cycle**

### VII.1.7.4 Health Forums

This proposed section will be a moderated discussion forum for the general public. These forums would facilitate discussion groups between citizens and

healthcare professionals on various health related and interesting topics. This would be a citizen driven initiative and will be inclusive rather than exclusive. In the future, these forums could be an avenue where citizens could reach out directly

#### **VII.1.7.5 News**

This section would provide links to the most recent health news across the world and would include press announcements and medical headlines from the world of medicine, healthcare and research. News would especially be related to disease outbreak, drug discovery, research findings with related health videos and animations.

## IV. Target Beneficiaries

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In order to appeal to the masses, it is proposed that the portal will be designed to cater to the entire spectrum of audiences in multiple Indian languages. The list of Target Beneficiaries would include:-

- General population of India
- Infant, children & adolescents
- Elderly, Middle-aged and the young adults
- School Children
- Individuals with special health needs (including those with disabilities, mental health problems, chronic diseases, etc)
- Rural, remote, semi-urban, & urban populations
- Illiterate and the literate populations
- Technologically-challenged and the technology-savvy
- Lower, middle and the upper socioeconomic groups
- Healthcare professionals
- Health care workers, ASHA, etc
- Healthcare students
- AYUSH-healthcare practitioners
- Special population groups

All these populations will be served with this Portal. It will present information in various means to the public and will aim to satisfy most of their health information needs. The portal would have special features that would in turn help meet the special needs of the special populations. For example, the interactive modules

would contain voiceovers, with user-friendly graphics & textual messages, which would aid the illiterate populations & people with disabilities. Further, various dissemination modes beyond the portal including Non-IT modes such as the print media, Mobile Telephony, TV, Radio and Kiosks would be utilized.

**Stakeholder Details:**

The India Health Portal is being proposed to be built in collaboration with a wide range of stakeholders from all sectors including Government, academic institutes, private sector and technology experts.

1. Ministry of Health and Family Welfare (MoHFW)
2. National Institute of Health and Family Welfare (NIHFW)
3. National Rural Health Mission (NRHM)
4. National Informatics Centre (NIC)
5. Indian Council of Medical Research (ICMR)
6. Department of AYUSH
7. National Centre for Disease Control (NCDC)
8. National Disaster Management Authority (NDMA)/National Institute of Disaster Management (NIDM)
9. Dept of Official Language, Ministry of Home Affairs.
10. State Directorate of Information and Education and Publicity
11. UNICEF
12. WHO
13. Various (12) Medical Colleges across the country
14. St. John's Research Institute (SJRI), Bangalore
15. Apollo Group

## 16. NGO's and other knowledge partners

<b>Stakeholder</b>	<b>Stakeholders Roles</b>
Ministry of Health and Family Welfare (MOHFW)	Own the Portal; Develop a Policy for the Portal; and Coordination & evaluation of the executory functions related to the portal
National Institute of Health and Family Welfare (NIHFW)	Proposed to be the Nodal centre to provide an administrative framework that would enable the development, implementation, and maintenance of the IHP
National Rural Health Mission (NRHM)	Aiding in improving the quality of health of those who reside in rural areas through dissemination using the portal and other Non IT modes of communication.
National Informatics Centre (NIC)	The NIC will provide the necessary security framework within their Data centre to host the IT infrastructure based on set standards as required by the Govt. of India.
Indian Council of Medical Research (ICMR)	Being a national knowledge body and a contributor towards research, will provide assistance in Research Studies and content related to the portal.
Department of AYUSH	Will provide guidance and content for enriching people's knowledge on AYUSH systems for the Portal.
National Centre for Disease Control (NCDC)	Will provide educational content & literacy materials on various topics related to communicable diseases meant for the Portal.
National Disaster Management Authority (NDMA) & National Institute of Disaster Management (NIDM)	Would provide additional content on various disaster management topics. Aid to develop a disaster management strategy, thereby help in building a safer and resilient India.
Centre for Development of	Aiding in the translation of health and non-health related content generated by various content development

Advanced Computing (C-DAC); Central Institute of Indian Languages (CIIL) ; Technology Development of Indian Languages (TDIL); Dept of Official Language (DOL)	centres into Hindi & various other Indian languages.
State Directorate of Information and Publicity	Help in the implementation of various health literacy initiatives at the state level so as to improve the health status; Aiding in the dissemination through various modes.
UNICEF	Providing IEC content to educate families and providing them with the knowledge required to take better care of their children.
WHO	Providing IEC content to help people attain the highest possible level of health.
St John's Research Institute (SJRI)	Will contribute their vast experience in developing and validating Health Content as well as medical illustrations and animation for the masses.
Apollo Group	Will assist with providing technology inputs for the Portal platform development as well as contribute content.
NGO's and other Knowledge partners	NGO's will contribute health content that is beyond the scope of the Content Development Centre and Regional Knowledge Centres and will actively engage in the dissemination process.

**Table IV.1: Stakeholders**

**Impact of the Project:**

The project would have a positive impact on the health and lives of the people as it has been proved time and again that the more informed the people are the better choices they can make. For example, providing people with the right health knowledge is akin to empowering them to lead better lives and take better care of their health.

Health awareness is the problem area here and a multipronged mechanism to provide health information to the masses is expected to reduce disease burden and provide a solution to the problem of ill health.

## V. Project Strategy

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Various alternative strategies to achieve the same development objective have been tried in the past. Modes such as media, print, primary health centre-driven, governmental vertical programme initiatives, NGO interaction at the grassroots level, door-to-door campaigns, community radio, telemedicine, doctor-on-call services and many more. Each has its own merit and has been successful in its own right, but there have never been a united, comprehensive, standardised health literacy campaign which this portal aims to drive and achieve.

According to a report released by the United Nations Educational, Scientific and Cultural Institution (UNESCO) in 2007, the countries of South and South-West Asia have the highest number of illiterate adults in the world: an estimated 388 million. While literacy rates in Central Asia are not as high, the gender gap is of concern, as 72.5 per cent of the illiterate population are women. The lack of education and literacy among women and children is manifold causing a direct and indirect impact on their sense of empowerment, low socio-economic status, health care and ultimately poor health.

To improve literacy rates, 2003-2012 has been designated as the United Nations Literacy Decade. In this context, UNESCO has been partnering with UN agencies and other organizations to promote literacy and teach basic health literacy, through formal and informal educational programmes in many countries.

Health literacy and the pivotal role it plays have been defined by the World Health Organization as follows:<sup>14</sup>

Health literacy implies the achievement of a level of knowledge, personal skills and confidence to take action to improve personal and community health by changing personal lifestyles and living conditions. Thus, health literacy means

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<sup>14</sup> 1. Literacy Portal ([http://portal.unesco.org/education/en/ev.php-URL\\_ID=54369&URL\\_DO=DO\\_TOPIC&URL\\_SECTION=201.html](http://portal.unesco.org/education/en/ev.php-URL_ID=54369&URL_DO=DO_TOPIC&URL_SECTION=201.html))

more than being able to read pamphlets and make appointments. By improving people's access to health information, and their capacity to use it effectively, health literacy is critical to empowerment. Health literacy is itself dependent upon more general levels of literacy. Poor literacy can affect people's health directly by limiting their personal, social and cultural development, as well as hindering the development of health literacy.<sup>15</sup>

Health care providers often face challenges when catering to the needs of the communities they serve. One of the important barriers which need to be addressed is the lack of compliance due to the low levels of health care literacy worldwide. Certain groups of populations, such as women, those living in rural areas and immigrants are vulnerable to serious health disparities. Unfortunately, they experience significantly worse health outcomes such as higher rates of morbidity and mortality due to a lack of health literacy levels. Some of the health risks faced by these groups include a higher incidence of cancer, diabetes, high blood pressure and HIV/AIDS. These health risks demand effective communication between the providers and the target population—to help them recognize, minimize and respond effectively and in a timely fashion to potential health problems. It is ironic that while there is such a compelling need for effective communication, the process is extremely complicated and often poorly developed. Language, socio-political, economic and cultural barriers and time constraints pose challenges to health care providers.<sup>16</sup>

Incorporating health literacy into educational programmes for youth, women, children and adult learners is vital and the India Health Portal would support and enhance this initiative.

Upon searching the internet for major health websites in India for health information/content, it was found that most of the sites have little or no health information and were not comprehensive.

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<sup>15</sup> Fourth UNESCO Regional Literacy Conference to open in New Delhi ([http://portal.unesco.org/education/en/ev.php-URL\\_ID=54831&URL\\_DO=DO\\_TOPIC&URL\\_SECTION=201.html](http://portal.unesco.org/education/en/ev.php-URL_ID=54831&URL_DO=DO_TOPIC&URL_SECTION=201.html))

<sup>16</sup> Health Promotion Glossary ([http://whqlibdoc.who.int/hq/1998/WHO\\_HPR\\_HEP\\_98.1.pdf](http://whqlibdoc.who.int/hq/1998/WHO_HPR_HEP_98.1.pdf))

Most of the Government health websites were found to have information on Central/State health schemes, New Health policies and Health status of their citizens.

Though there are several other private websites that provide health information, the information available is not comprehensive. Information was neither credible nor in the same format.

Some of the Indian governmental websites which had some health content are as follows:

No.	Name of the Organisation	Web Address (URL)	Updated Date
<b>1.00</b>	<b>Indian/State Government Websites</b>		
<b>1.01</b>	Kerala Govt	<a href="http://www.healthkerala.gov.in/hrp/diseaseinfo.jsp">http://www.healthkerala.gov.in/hrp/diseaseinfo.jsp</a>	Link not working
<b>1.02</b>	Tamil Nadu Govt	<a href="http://www.tnhealth.org/">http://www.tnhealth.org/</a>	Copyright date -2009
<b>1.03</b>	Govt	<a href="http://maha-arogya.gov.in/diseasesinfo/default.htm">http://maha-arogya.gov.in/diseasesinfo/default.htm</a>	No update/copyright date
<b>1.04</b>	Rajasthan Govt	<a href="http://rajswasthya.nic.in/">http://rajswasthya.nic.in/</a>	No update/copyright date
<b>1.05</b>	Andhra Pradesh Govt	<a href="http://health.ap.nic.in/">http://health.ap.nic.in/</a>	No update/copyright date
<b>1.06</b>	Karnataka Govt	<a href="http://stg2.kar.nic.in/healthnew/IDSP/Home.aspx">http://stg2.kar.nic.in/healthnew/IDSP/Home.aspx</a>	No update/copyright date
<b>1.07</b>	Haryana Govt	<a href="http://haryanahealth.nic.in/">http://haryanahealth.nic.in/</a>	No update/copyright date
<b>1.08</b>	Uttaranchal Govt	<a href="http://gov.ua.nic.in/health/">http://gov.ua.nic.in/health/</a>	No update/copyright date

1.09	Govt	<a href="http://health.delhigovt.nic.in/">http://health.delhigovt.nic.in/</a>	12th march 2010
1.10	Govt	<a href="http://gujhealth.gov.in/">http://gujhealth.gov.in/</a>	No update/copyright date
1.11	Govt	<a href="http://lakdirhealth.nic.in/">http://lakdirhealth.nic.in/</a>	2003
1.12	Orissa Govt	<a href="http://www.orissa.gov.in/health_portal/Swine/swine.htm">http://www.orissa.gov.in/health_portal/Swine/swine.htm</a>	No update/copyright date
1.13	National Leprosy eradication Programme	<a href="http://mohfw.nic.in/National Leprosy Eradication Programme/LEP_AB7.htm">http://mohfw.nic.in/National Leprosy Eradication Programme/LEP_AB7.htm</a>	No update/copyright date
1.14	Tuberculosis control	<a href="http://www.tbcindia.org/">http://www.tbcindia.org/</a>	No update/copyright date
1.15	National Institute of malaria Research	<a href="http://www.mrcindia.org/">http://www.mrcindia.org/</a>	4th August 2010
1.16	India Development Gateway (DIT)	<a href="http://www.indg.in/health/">http://www.indg.in/health/</a>	July 27, 2010

Some of the hospital websites in India which have health content are as follows:

2.00	Hospitals	Web Address (URL)	Updated Date
2.01		<a href="http://www.apollolife.com/">http://www.apollolife.com/</a>	Copyright 2010 by Apollo life
2.02	AIIMS	<a href="http://www.aiims.edu/aiims/health_inf.htm">http://www.aiims.edu/aiims/health_inf.htm</a>	Web site was last revised on July 21, 2010 National oral health programme updated in 2003 Information on Dengue fever updated in May 2007

<b>2.03</b>	Rajiv Gandhi Cancer and Research Institute	<a href="http://www.rgci.org/index.php?option=com_bnmn&amp;id=69&amp;Itemid=10622">http://www.rgci.org/index.php?option=com_bnmn&amp;id=69&amp;Itemid=10622</a>	Copyright © 2009-10
<b>2.04</b>	Tata Memorial centre	<a href="http://www.tatamemorialcentre.com/cancerinfo/cancer/cancer.htm#cause">http://www.tatamemorialcentre.com/cancerinfo/cancer/cancer.htm#cause</a>	Copyright 2003-04
	Tata Memorial centre	<a href="http://www.tatamemorialcentre.com/cancerinfo/types.htm">http://www.tatamemorialcentre.com/cancerinfo/types.htm</a>	Copyright 2003-04
<b>2.05</b>	Apollo health street	Nil	No update or copyright date available
<b>2.06</b>	Manipal Hospital	Nil	Copyright 2009 Manipal Hospitals
<b>2.07</b>	Sanjay Gandhi Hospital	Nil	No update or copyright date available

<b>3.00</b>	<b>Health Information concerned with Ayurveda</b>	<b>Web Address (URL)</b>	<b>Updated Date</b>
<b>3.01</b>	National Institute of Ayurveda	<a href="http://www.nia.nic.in/">http://www.nia.nic.in/</a>	Updated on 30-07-2010
<b>3.02</b>	National Institute of Naturopathy	<a href="http://punenin.org/index.htm">http://punenin.org/index.htm</a>	Copyrighted 2004
<b>3.03</b>	National Institute of Unani Medicine	<a href="http://www.nium.in/">http://www.nium.in/</a>	Website temporarily unavailable
<b>3.04</b>	National Institute of Siddha	<a href="http://www.nischennai.org/">http://www.nischennai.org/</a>	Copyright (2009-10)
<b>3.05</b>	National Institute of Homoeopathy	<a href="http://nih.nic.in/">http://nih.nic.in/</a>	Updated on July 23, 2010

3.06	Department of Ayurveda, Yoga & Naturopathy, Unani, Siddha and Homoeopathy (AYUSH)	<a href="http://indianmedicine.nic.in/">http://indianmedicine.nic.in/</a>	Copyright and Update date not available
3.07	Rashtriya Ayurveda Vidyapeeth	<a href="http://ravdelhi.nic.in/">http://ravdelhi.nic.in/</a>	Copyright and Update date not available
3.08	Gujarat Ayurveda University	<a href="http://www.ayurveduniversity.edu.in/index1.php">http://www.ayurveduniversity.edu.in/index1.php</a> ,	Updated 28 July 2010
		<a href="http://www.ayurvedamanuscripts.com/">http://www.ayurvedamanuscripts.com/</a>	Copyright and Update date not available
		<a href="http://www.ayujournal.org/">http://www.ayujournal.org/</a>	Copyright and Update date not available
3.09	Institute of Post Graduate Teaching & Research in Ayurveda	<a href="http://www.ayurvedacatalogue.com/viewjournal.php">http://www.ayurvedacatalogue.com/viewjournal.php</a>	Copyright and Update date not available

Some of the governmental health content available on the internet with respect to AYUSH is as follows:

There is however no scheme with overlapping objectives and coverage in other Ministries and States currently.

### **Involvement of NGO's**

Various NGO's are working closely with the population at the grass-root level to improve health outcomes. It is proposed that content on the portal can be used by these groups to further disseminate this content using Non-IT means and other direct communication methods. The features of the India Health Portal will help empower the NGO's to further their work in helping change the health literacy amongst the masses.

NGO's will also help contribute their learning's in the form of content that can be shared with other users.

### **Some examples of health information sources for the common man in India:**

The main reason patients have not been treated as partners in India is that traditionally it has always been the doctor who has had all the information about medical problems: the patient simply followed the doctor's orders. However, today we know that if we empower patients with information about their medical problems, they can become educated partners in their own medical care.

A good example is the Health Education Library for People (HELP) in Bombay which was launched in May 1996. This is India's first consumer health library, and it has grown to become one of the worlds largest. HELP is a free public library which aims to empower people by providing them with the information they need to protect their health and to prevent and treat medical problems while working in partnership with their doctor. The library is run by a registered charitable trust.<sup>17</sup>

It is recognised that the Internet constitutes a powerful and democratic source of information and knowledge. This health literacy portal aims to be a decisive tool in the popular movements in support of the right to health information, decentralisation of information, transparency, accountability and people's participation in their health. This proposal recommends the creation of a Health Literacy Portal to aggregate, organise and present relevant and useful health content in local languages, in a highly uniform, customisable, user friendly and personalised way.

Pertinent health information will be made available in a manner that can be understood by the lay person. The information would initially be provided in English and Hindi and will be translated to support major Indian languages.

### **Location:**

The National Health Portal shall be hosted on the servers of the NIC and shall be available throughout the country. Contributors of content, technical teams and other knowledge partners will be located in various centres, medical institutes

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<sup>17</sup> Health Library in India works to empower patients, *BMJ* 1999;319:785 ( 18 September ).

and organizations across the Country. This team will work in a virtual environment from their respective offices to build, maintain and enable this portal.

## Content Creation for the Portal

The most important aspect of the India Health Portal will be the health content. For the collation, standardization, creation, translations and dissemination of original content, it is proposed that the following model be created.

### **1. CONTENT DEVELOPMENT FUNCTION:**

- Under the Content Development arm, the Content Development Centre's (CDC's) would be primarily responsible for generating, collating and putting forth the health content in the appropriate formats
- Regional Knowledge Centres (RKC's) for translating and validating of health content in the respective languages
- Alternative Medicine (AYUSH) Knowledge Centre (AMKC) for generating and validating AYUSH health content
- Department of official language (DOL), Central Institute of Indian Languages (CIIL), and the Technology Development For Indian Languages (TDIL) for translations, and
- Other Knowledge Partners.

### **2. CONTENT DISSEMINATION FUNCTION:**

- The Health Literacy Research Laboratory (HLRL, NIHFV) will carry out the function of carrying out dissemination of health content to the masses through the IEC channels
- The existing health system structure of the nation would be utilized in this endeavour
- Development Partners and NGO's at the grassroots level would form other valuable partners in this task.

# VI. Legal Framework:

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## **Legal Framework of the IHP**

The vision of the IHP is to ensure that the stakeholders (including the people, healthcare providers & professionals) have easy and affordable access to health information, for their specific needs. This endeavour would generate huge amounts of medical knowledge which could significantly improve the health status of the people. This initiative would facilitate creation, management and frequent updating of a detailed knowledge database. The Ministry of Health and Family Welfare should work in collaboration with the Ministry of Law and Justice in developing an effective long-term legal framework for the Portal. Based on the NKC guidelines, the following recommendations are suggested:

### **General Recommendations of the India Health Portal**

1. A legal promotional framework should be setup that should enable and not stifle the growth of health ICT sector.
2. It is recommended that protective mechanisms be setup keeping the current legal regulations & technological specifications in mind.
3. Regulations should also be developed to enable proper flow of personal information, ownership and access of data.
4. The framework should also encourage the development of common National Health IT Standards, common Health Terminology (Clinical nomenclature) and permit interoperability between Health IT systems.
5. The framework needs to be substantially similar and aligned to state health acts, in order to avoid conflicts between central and state legislations creating jurisdictional dilemmas.

6. It is recommended to create a Portal Steering Committee which could be a part of the National Health Information Authority (NHAI) proposed by the NKC, which would develop ways of ensuring proper flow of information between various healthcare organisations and create guidelines & standards to enable the same. This Steering Committee would include Governmental and Private Representatives & would ensure that the information on the portal is appropriately collected, used, secured and transmitted.

7. The Project Steering Committee team under the NIHF ( & MOHF) will have representation from the following areas:

- Domain knowledge experts from the field of medicine
- Healthcare IT (Medical Informatics) experts
- Legal experts
- IT experts
- Public health experts from the states/ districts

8. It is recommended that the Government creates a Health IT Act both at the central and state levels that will govern to prevent the following issues:

- Denial of the services of the system of portal
- Accidental or deliberate destruction of data of the portal
- Unauthorized access to, or disclosure of, data from the portal.
- Accidental or deliberate alteration of data from the portal
- Unauthorized creation of data on the portal.

**Specific Recommendations of the India Health Portal - These would apply only if the India Health Portal is aligned with the IHIND initiatives.**

1. The health information presented on the portal would not be meant to replace the advice of a doctor or health professional, but rather supplement the same. It is recommended that appropriate disclaimers are displayed on the portal for any health information, widgets, health calculators provided.

2. The Portal Steering committee of the NHIA should regulate the secondary use of health information based on the following fundamental principles:

- The revenue generated from the commercial use of any data or health information from the application should be used for strengthening the India Health Portal and dissemination efforts.
- If any third party organization wishes to use the database of the portal for a new purpose that is not otherwise permitted by law, that organization must approach Portal Steering Committee to seek permission for that new use.

The IHP team would need to work on this. The NKC recommended several back office activities associated with such an initiative. This really is one of those activities.

## VII. Environmental Impact Assessment

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## VIII. On-Going Initiatives

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There are several alternative websites as mentioned under Section V (Project Strategy). However, none of these initiatives are comprehensive to be called a portal. They also lack the objectives and coverage as proposed here. The India Health Portal Initiative would have several advantages over the current initiatives and would add value.

No single project or website mentioned in section V would mirror all aspects of the IHP and the IHP would be different in the following features:

1. Multilingual Health Content
2. It would have a repository of AYUSH content along with content from modern medicine.
3. Interactive modules
4. SMS or Text alerts
5. Health E-Learning platform
6. Regulatory Information on Health
7. Directory services to locate health care providers and facilities
8. Moderated Health Forums
9. Downloadable Health Widgets
10. Content on Disaster Management
11. Information on National and State Health Programs & Schemes
12. Health Cloud for easy access of information.

# IX. Technology Issues

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## Development, Hosting, Maintenance and Technical Description of the portal

It is proposed that the development of the India Health Portal will be given to a competent Software or web development group.

Considering that the content will be added from the Content development centre, Regional Knowledge Centres and other authorized groups, it is proposed that a Content Management System is designed with appropriate features to enable the addition, translation and validation of content.

### I Content Management System

The requirements of the content management system are

- **Extensibility:** The portal should be easily extensible. The requirements for the various Years are such that content would be aggregated from by diverse teams operating across the country and would be vetted and published in the portal. The portal development roadmap also envisages a series of features, which would be required to be developed as the portal increases in size and scope. All this requires an enterprise portal framework, which is extensible and where new modules and components can be easily added. The subsequent development should also not impact the existing live site.
- **Stability:** The CMS framework should be stable and mature. All the components and code should have been tested and proven. This would be especially important in the context of a healthcare portal where information have the potential to provide immediate help to

thousands of people. The portal as it grows should be stable and not crash at any point of time. It should be able to manage thousands of users accessing the site at the same time.

- **Security:** The nature of the portal makes security a very important component of the portal. Healthcare information both public and private is of a very sensitive nature and has to be guarded very well so that it is neither modifiable nor accessible by a third party. The portal should be well protected against both security threats, which target the server as well as the portal itself. These threats are of various types including, server hacking, SQL injection, cross-site scripting, automation script execution, spamming, DoS etc.

**The security** architecture of the portal should be designed to take care of any attempts to hack into the database and the application. The server should be hosted at a secure location so that server side hacking can be minimized. Apart from this during portal customization and deployment, security testing should be done so that all known security loopholes can be detected and fixed.

- **Robustness:** The portal framework should be able to support hundreds of users accessing several services at the same time. Apart from being extensible and stable it should also be robust and should not deny services to any user at any time. The framework should support clustering and allow scaling up of the database and application servers as the users to the portal increase over time. No basic changes to the portal architecture should be required to enable the portal to manage increased traffic.
- **Open Source:** Open source software is one where the source code is provided under a license. A mature Open Source framework which has been successfully deployed for commercial usage would meet these requirements as it allows integration with other services and also

allows a greater degree of customization so that the portal offerings can be much more user friendly and unique.

- **The vision for the portal** is that it acts as a content aggregator and disseminates this content over multiple channels like DVD, Kiosk, Other sites, Mobile, Print and media. The portal would also, over time, build in a great many unique features including integrating with best-in-field service vendors like Google, Microsoft and other third party vendors to offer its users a wide range of services. A proprietary portal framework while proven, robust and secure would also limit the extent of cross linkage, which can happen with other service providers.

As more public and private organizations embrace open source and advocate open source, a framework, which meets the above requirements, should be considered for the implementation of the India Health Portal.

- **Other Features:** Some of the other features essential to the portal are
  - o **Workflow Management system for Content management:** A workflow system, which allows content staging and authoring of the content so that multiple users can manage content across the portal, is essential. The workflow CMS should allow for authoring, proofing and publishing of content by different user groups.
  - o **Versioning of the content:** Content publishers should be able to roll back content to a previous version at any time. The system should track content changes and maintain content versions.
  - o **Multilingual Support:** The portal framework should allow multiple languages on the site. The support should extend to the workflow and versioning of the content for multiple languages.

## II Proposed Content Management System

Keeping the above requirements in mind, the following portal frameworks were analyzed to arrive at the best of breed solution for the India Health portal.

- Typo3
- Movable Type 4.25
- Moodle 1.9
- DotnetNuke (Dotnet)
- Joomla (PHP)
- eZ Publish 4.2
- Drupal 6.10
- Xoops 2.0.18

### E-Learning Platforms

- Skool ([www.skool.com](http://www.skool.com))
- Moodle ([www.moodle.org](http://www.moodle.org))
- Tusk ([http://tusk.tufts.edu/about/our\\_vision](http://tusk.tufts.edu/about/our_vision))

### **Features suggested:**

- Content Management System (CMS) including content staging and authoring
- Blogs management
- Wiki
- Chat
- Classifieds
- Discussion Forum

- Event Calendar
- Job postings
- Videos
- Newsletter
- Photo Gallery
- Polls
- Search Engine
- Quiz
- News / Health updates

## III Hosting

The portal will be hosted on dedicated servers with a provision for clustering at the national Informatics Centre's data centre. NIC will be the primary hosting provider. A disaster recovery site is also proposed.

### III.1 Hardware requirements for Hosting

The technical architecture proposed for the infrastructure to be hosted at the data centre at NIC is detailed below:

#### **Multi-Tier Architecture**

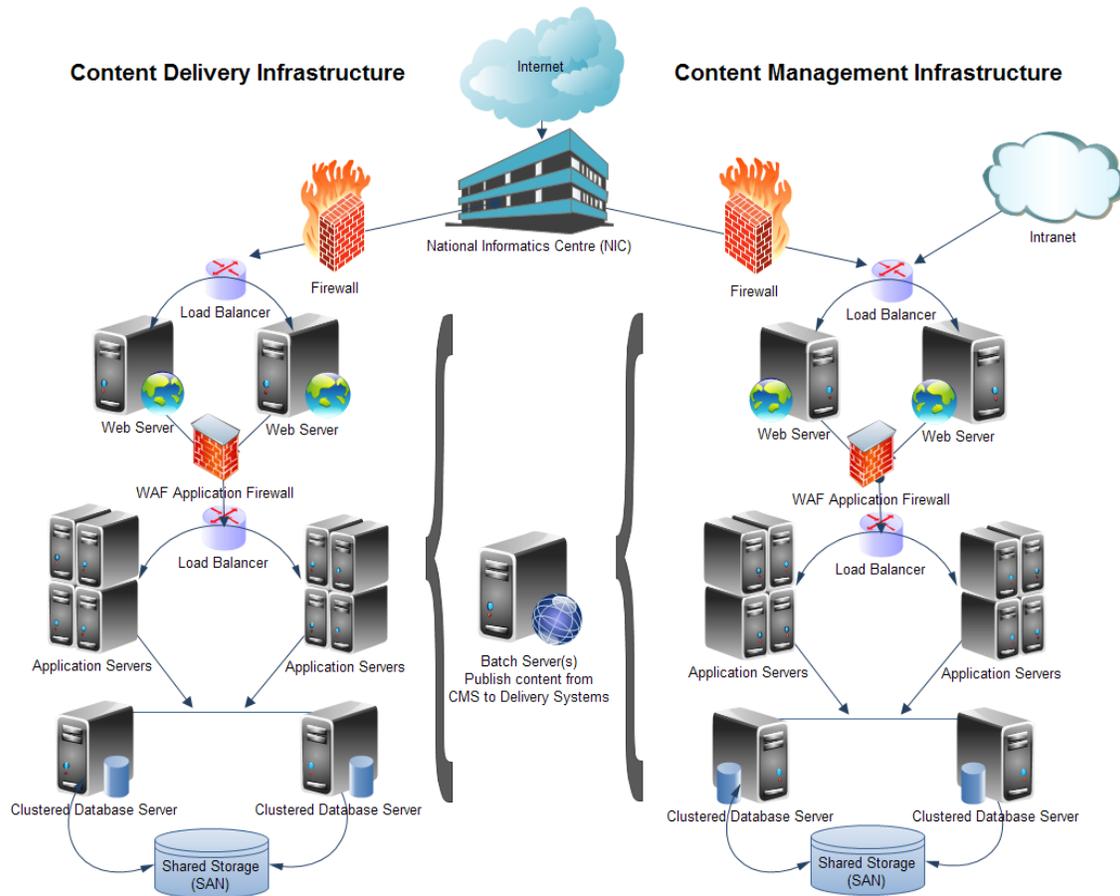
The above diagram depicts typical 3-Tier architecture for a web based applications segregated into Content Delivery and Content Management Systems (CMS). CMS can be exposed externally depending on the requirement if there are any external authors expected to create content.

#### **High Availability (HA) – for application uptime**

**Load balancing** – sharing load across multiple servers (e.g. web server farm configured using an load balancer as depicted above)

**Fault tolerance** – Failing over to redundant server(s) in the pool if the primary server(s) fails. (E.g. a database cluster)

**Identifying SPOF** (Single Point of Failure) is critical to achieve HA. Every such point needs to be addressed and design should be changed to ensure HA (e.g. a single load balancer appliance can be a SPOF at network layer)



**Figure IX.1: Required Hardware Architecture**

**Reducing/eliminating Scheduled Outages** – Every application goes through several upgrades forced due to security patches, technology upgrades, new feature additions, etc. The application architecture including minutest details like database schema changes, etc. should be taken into consideration and possible workarounds/ processes should be put in place to reduce the outages (e.g. taking a web server out of the load balanced pool before rebooting it).

**Disaster Recovery (DR)** – A good disaster recovery plan and infrastructure should be in place to bring back the applications online quickly in case of any disaster at the primary site. Distributed application architecture can help utilize the DR infrastructure where applications can be active in both, production and DR environment and users automatically get redirected to the available or nearest environment. Data synchronization strategy and product support are key to implementing distributed architecture.

**Reliability – for reducing or avoiding failures or outages**

Separation of critical components from non-critical components helps reduce failures of critical external facing applications due to issues with non-critical internal facing components or non-real-time components (e.g. – separating batch processing components from content delivery components, separating CMS and content delivery systems)

**Designing for the end state** – Content grows over the period and if the application design should take it into consideration. Significant performance degradation or failures may occur if the application is not designed to work with end state data. (E.g. splitting content in to multiple repositories vs. maintaining a huge repository, separation of digital assets from content assets, separation of structure vs. user generated unstructured content, etc.)

**Performance**

The following details should be considered when the infrastructure is designed: 32-bit vs. 64-bit systems and 32-bit applications vs. 64-bit applications running on 64-bit Operating System. Before buying high-end systems, need to ensure the software product can make use of the resources.

The application should also leverage inbuilt caching and cache invalidation techniques to improve the performance at the same time keeping the cache up-to-date.

## **Security – Authentication and Authorization**

Granularity of security implementation may have an adverse impact on performance of the application. Sometimes it's not prominent when there isn't much data in the system, but becomes a performance bottleneck as the data grows.

Hosting partner should provide necessary network security infrastructure (eg. DMZ setup), however the firewalls have been costed here for this proposal.

## **Scalability**

Vertical scaling – This is having multiple application instances on the same server to share the load. Depending on the product support, this can help gain maximum out of the system resources.

Horizontal scaling – having additional servers to have more application instances to share the load; typically used when vertical scaling is not supported.

## **Virtualization**

Although virtualization has not been proposed in this design, there are couple of points to note.

Software product must support virtualization technology being used. Some of the products either do not support or have performance limitations when hosted on virtual servers.

Virtualization can significantly reduce the hardware requirements and also help reduce time to market.

**Other Technical details and best practices can be accessed from the following resources:**

Solid State Drives (SSDs) can be considered for heavy disk IO requirements; video streaming applications.

<http://download.intel.com/design/storage/papers/321783.pdf>

Best practices on virtual infrastructure implementation can be found at:

<http://software.intel.com/en-us/articles/intel-virtualization-technology-best-practices-for-software-vendors/>

<http://www.vmware.com/files/pdf/partners/intel/vmware-intel-best-practices-wpl.pdf>

<http://www.intel.com/itcenter/topics/virtualization/index.htm>

### **Disaster Recovery (DR) Site**

For high availability and disaster preparedness, it is recommended that a Disaster Recovery site is also maintained by the Hosting Provider with duplication of the entire specifications indicated above.

## **IV Technical specifications**

### **Environment**

Server : Windows Server 2003/2008

Dotnet framework : 2.0/3.5

Web Server : IIS6.0/ IIS 7.0

Database : MS SQL Server 2005/2008

IDE : Visual Studio 2008

### **Application Framework**

Application Development Framework:

The Content Management System (CMS) and Learning Content Management Systems (LCMS) will need to be evaluated and selected based on final technical consultations by technical consultants appointed by the Portal steering Committee.

APIs available to integrate third party applications and modules.

# X. Management Arrangements

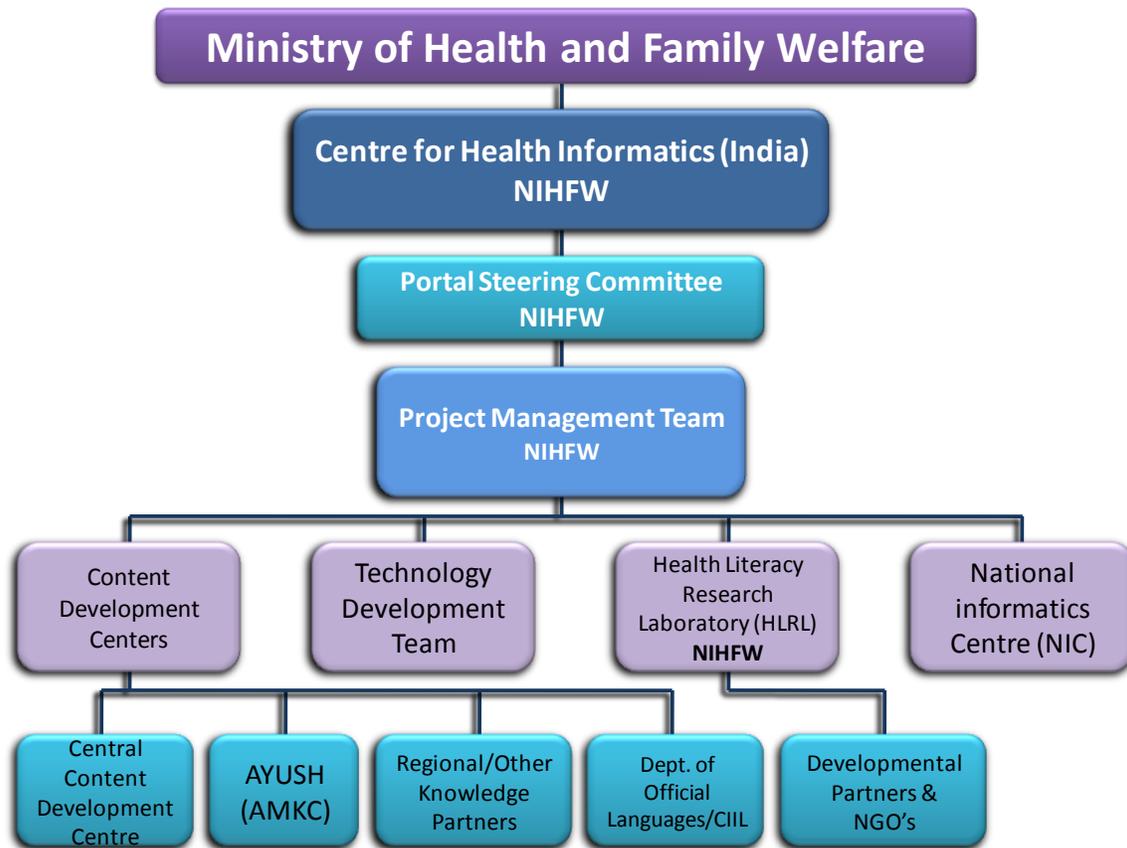
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For operationalizing the portal, it is suggested that a structure may be established in an institution such as the NIHFW, where the expertise of public health specialists and other experts could be pooled for contributing to the IHP project. It is also suggested that a **Centre for Health Informatics (India)** be established under the NIHFW which could take the lead in maintaining and managing the IHP Project under an IHP Project Steering Committee of the MoHFW comprising official and non official members. The Centre could function on a consultancy or contractual mode or as a registered society under the NIHFW on the lines of the Software Technology Parks of India (STPI) under the Department of IT to begin with and Development Partners could be invited to fund chairs and positions.

## **The stakeholders of the portal would include:**

1. MOHFW
2. Project Steering Committee
3. Centre for Health Informatics, NIHFW
4. Portal Management Team
  - a) Content Providers (ICMR, SJRI, Apollo, UNICEF, NIHFW)
  - b) AYUSH (AMKC)
  - c) Dept of Official languages
  - d) TDT
  - e) NIC
  - f) Development Partners & NGOs

The illustration below describes the overall organization structure of the India Health Portal.



**Figure X.1: Organization structure of the India Health Portal**

## I Ministry of Health & Family Welfare (MOHFW)

The MOHFW would be the owner of the India Health Portal and would hold the IP for all the data displayed on the portal (including other related Intellectual Property Rights (IPR's)). The MOHFW would have certain roles and responsibilities with regards to the India Health Portal:-

- It would be a facilitator for the functioning of the India Health Portal
- It would be responsible for providing the funds for initiating, development and maintenance of the portal until it becomes self-sustaining.

- It would coordinate and supervise all the executive functions related to the portal
- To depute officials to the Portal Steering Committee (PSC) under the Centre for Health Informatics (CHI).

## II Centre of Health Informatics (CHI)

The Centre of Health Informatics and the affiliate bodies could be registered under the Indian Societies Registration Act of 1860, meant for the purpose of promotion of education & literacy in health. The CHI would be setup by the Ministry of Health and Family Welfare, Government of India, and would be under the Administration of the NIHFV under the Department of Health & Family Welfare, New Delhi. The Director of the NIHFV, New Delhi, would also function as the Chief Executive of the Centre of Health Informatics. The roles and responsibilities of the Centre of Health Informatics include:-

- An administration that would enable the development, implementation, and maintenance of the India Health Portal to provide access to reliable, easy to understand, and multilingual health information to the public
- To make health information readily available on the public domain using the Internet and other pertinent communication modalities
- To enable an average citizen to seek, locate and access health care providers across the country
- To provide health information and health resources for the healthcare workers
- To provide information to organizations who wish to contribute to public health and welfare (NGOs)
- To provide health information to cater to the needs of student communities including educational/career opportunities

- To cater to the body of health professionals and meet their information needs, networking, and continuing medical education through e-learning.
- To provide a transparent resource on regulatory and statutory guidelines pertaining to healthcare in India to the public
- To provide information on National Health Programmes and schemes to the public

### III Portal Steering Committee (PSC)

In order to direct, advice and manage the India Health Portal, it is necessary to have a Portal Steering Committee which will include 8 static members and various consultants. It would be appropriate to have representation from the following members on the board of the PSC to govern and supervise the functioning of the India Health Portal Management Team and the various processes/functions there under:

- MOHFW
- Research and Academic Institutes
- Technology experts
- Development Partners
- NGO's

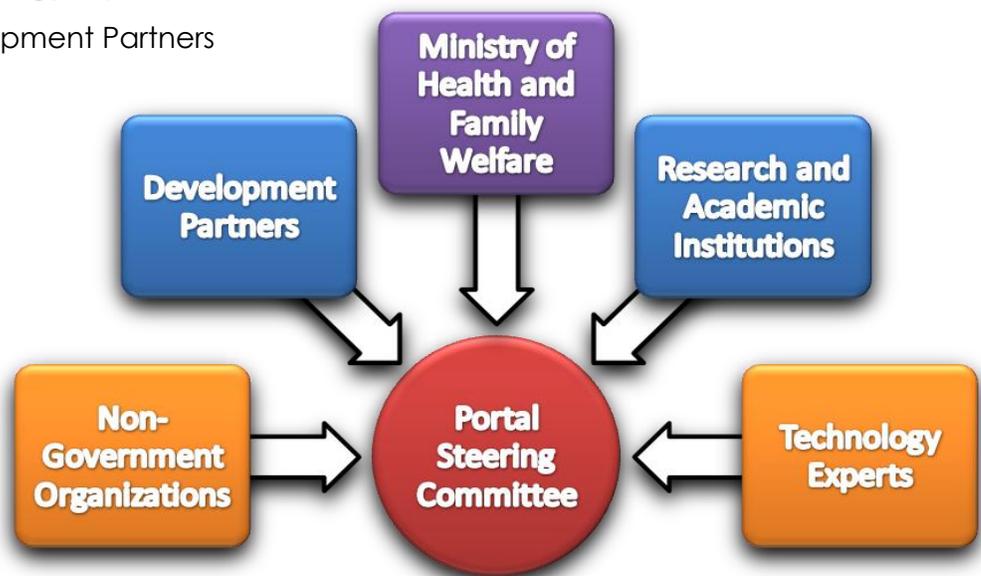


Figure X.2: Organization Structure of the Portal Steering Committee

The operations of the portal can be managed by the Management Team for the portal who will be appointed by the Portal Steering Committee.

The Portal Steering Committee will be responsible to strategize and steer the entire operation for the development and maintenance of the India Health Portal. It is proposed that this board should consist of members from concerned Governmental Ministries or Departments, Academicians, Technology Experts, Doctors and Management Experts and consultants who will be appointed by the Portal Steering Committee for specific tasks and time periods.

**Members of the Board:** It is proposed that at least 8 members from various specialities and organizations could be part of this board. They will help strategise the operations, plan and implement revenue generation mechanisms to ultimately self-sustain this effort. It is proposed that the members of the board will meet every quarter to review the development and progress of the project.

**Consultants:** The Members of the Portal Steering Committee could appoint specific consultants based on specific requirements, Technical, Management, Financial, legal or others to advise and provide specific inputs for the India Health Portal and literacy initiative. Each consultant will be paid a retainer for a specific task and a specific statement of work based on existing norms.

## IV Project Management Team (PMT)

In order to manage the India Health Portal's operations, there is a need for a management team that is to be formed which would run all through the project mode of the initiative and beyond into maintenance phase to ensure continuity and continuous upgradation/enhancement of the portal and associated features.

It is envisioned to that the Project Management Team will consist of an administrative unit that will coordinate the overall development and

management of the India Health Portal. It is envisioned that the Project Management team will comprise of a Lead Manager, a Financial Manager and at least 3 Project Managers. This Project Management team will be created by the Portal Steering Committee and will report to the same body. The management team will supervise, manage, interact and liaise between the Central Content Development Centre, Health Literacy Research Laboratory, Regional Knowledge Centres, National Informatics Centre, Technology Development Team, Development Partners and other Knowledge groups to ensure that work, targets and functions are achieved as per plan.

## V Content Development Centres (CDC's)

These centres would be responsible for generating health content in all the proposed languages. Such centres would typically consist of medical teaching institutions (medical colleges) and NGOs. Topics that required to be authored would be sent to these centres where they will be authored and validated by experts. If expert review is not available at these centres, the authored content would be sent to the Central Content Development Centre (CCDC) where it would be vetted by experts. This vetted content will then be put into a standard template and published by the CCDC. In the first year, however, no new content would be authored by these centres. Instead content that already exists with various central and state governments and NGOs would be shared with the CCDC which will in turn be responsible for publishing the content by putting them into structured formats and in a language easily understood by the common man.

The CDC's will be chosen by the PSC. They will be enabled with the necessary hardware and software infrastructure for a seamless flow of data across the collaborating centres.

## VI Technology Development Team (TDT)

The technology development team would be responsible for the following:

- Software development for the portal
- Customizing the design to the requirements specified by the PSC
- Developing the components as per the requirements of the different Years of the portal development
- Managing the front end, application and database
- Maintaining the portal
- Creating the functional and technical documentation
- Training the content development teams and other users on the various features of the portal

Consultants will be hired by the PSC who would then be responsible for choosing the right organization for portal development and maintenance. This centre will be enabled with the necessary hardware and software infrastructure for a seamless flow of data across all collaborating centres.

## VII Health Literacy Research Lab (HLRL)

This would be the dissemination material creation wing of the CHI. This team will be responsible to collect all the health content made available through the various teams and disseminate them to the grass-root levels with the help of the IEC machinery of the state. They would be responsible for the following:

- Identifying media teams for creating health videos and snippets.
- Identifying partners for translating the health videos and snippets into regional languages.

- Identifying DVD and publishing houses for interactive modules and printed material respectively.
- Planning appropriate dissemination strategies in association with the MoHFW (keeping in mind the existing health structure in India) and the IEC directorate at state government levels
- Distribute the dissemination material through the right channels including IEC machinery of State Directorate of Information and Publicity so that it reaches the target audience.
- Collect and collate lists and databases of all hospitals, pharmacies, blood banks and AYUSH centres across the country.
- Collecting and collating existing regulatory information from the central and various state governments in the first year.
- Creating new content for regulatory information from the second year onwards.
- Plan, design and conduct evaluation studies to assess the impact of the health literacy dissemination strategies.
- To monitor the progress of the dissemination strategies and suggest interim corrections if need be.
- The HLRL is also going to spearhead the monitoring and evaluation of the portal by partnering with an external partner agency which specialises in conducting M&E studies for health and ICT related projects.
- Setting up necessary provisions for running the SMS based services for disseminating health tips.

This team would work under the direct auspices of the NIHFW. The HLRL will also work closely with NGOs in promotion of health literacy amongst the grass-roots and also make available IEC material to the healthcare workers in the field.

The HLRL team will be set-up by the PSC. This centre will be enabled with the necessary hardware and software infrastructure for a seamless flow of data across all collaborating centres.

## VIII National Informatics Centre (NIC)

The portal will be housed and hosted at the National Informatics Centre (NIC). NIC will receive recommendations from the PSC regarding the hardware, software and firewall requirements for the servers that would house and run the portal. NIC will also be responsible for setting up appropriate Disaster Recovery (DR) plans for the portal based on the recommendations of the PSC.

## IX Central Content Development Centre

The Central Content Development Centre (CCDC) would be primarily responsible for continuously generating, collating and populating health content in a standardized format for the India Health Portal. This group will also be responsible for developing templates that would contain the health literacy content. This template would ensure that all the information is displayed in a standard format. This will also help easily navigate through the various pages.

This Centre will be primarily responsible for creating health content in modern medicine primarily targeted for the masses and lay people. This team will coordinate efforts with other CDCs, RHCs and the AYUSH centres to collect translated content and further validation of health content and putting them together in a standardized format. The team will also be responsible to develop all health related illustrations and animations for the India health portal. These will be used in the static content pages and the interactive flash based modules designed by this team.

The Central Content Development Centre could be setup in a medical institution which has an existing working model of developing health content for the masses and has the expertise in generating, collating, validating and presenting health content in the desirable and appropriate formats.

The CCDC will be chosen by the PSC. This centre will be enabled with the necessary hardware and software infrastructure for a seamless flow of data across all collaborating centres.

## X AYUSH Content Development Centres

These are the centres that would be responsible for generating AYUSH content for the masses.

For health content creation related to alternative medicine, it is proposed that such knowledge centres be setup specifically to create content for this focus area. This centre will work closely and will coordinate with CCDC to develop and publish English content. They will also work closely with the RKC's for translation of content into various Indian languages. The specific areas of content creation in alternative medicine will include Ayurveda, Yoga, Unani, Siddha and Homeopathy. Content created by this centre will be validated by specialists from the respective fields of alternative medicine.

The prerogative of choosing the AYUSH centres would lie with the PSC. The AYUSH centres would in-turn be responsible to choose their partners for translating the content in the proposed 12 languages. These centres will be enabled with the necessary hardware and software infrastructure for a seamless flow of data across the collaborating centres.

## XI Regional Knowledge Centres

These centres would be responsible for collating and validating content in the 12 Indian languages. These centres would be identified by the PSC. English content that has been developed by the CDCs would be handed over to the RKC's for validating/translating the content into regional languages. These would be primarily medical colleges. In year 1 there would be one RKC responsible for

assembling the Hindi health content. Subsequently from year two onwards there would be 11 additional centres for translating the content in other languages. Eventually one hopes that there would be at least one RKC for every state and union territory so that specific information pertaining to their regions can be generated and provided on the portal. This would also ensure that a regional informatics centre would be established in every state and union territory.

## XII NGO's and Other Knowledge

### Partners

The Centre for Health Informatics will also invite NGO's and other knowledge partners to contribute health content and will coordinate collection of additional health information that is beyond the scope of the Content Development Centre and Regional Knowledge Centres and to actively engage in dissemination.

## XIII Translation Services

The Department of Official Language, the Central Institute of Indian Languages (CIIL) and the Technology Development for Indian Languages (TDIL) would be responsible for translation of health and non-health related content generated by various content development centres.

## XIV Monitoring and Evaluation

Monitoring and Evaluation would form an essential component of the project. M&E efforts would be entrusted to an established monitoring and evaluation agency with considerable expertise in handling health and ICT related projects.

Appropriate, realistic and measurable indicators would be chosen based on the aims and objectives of the portal. Monitoring and evaluation would involve all stakeholders who would be involved in making the decisions. It is proposed to set aside approximately 50 lakhs per year with annual increments of 5% for monitoring and evaluation costs.

The India Health Portal Project has the following key Outcomes which can be assessed with measurable indicators:

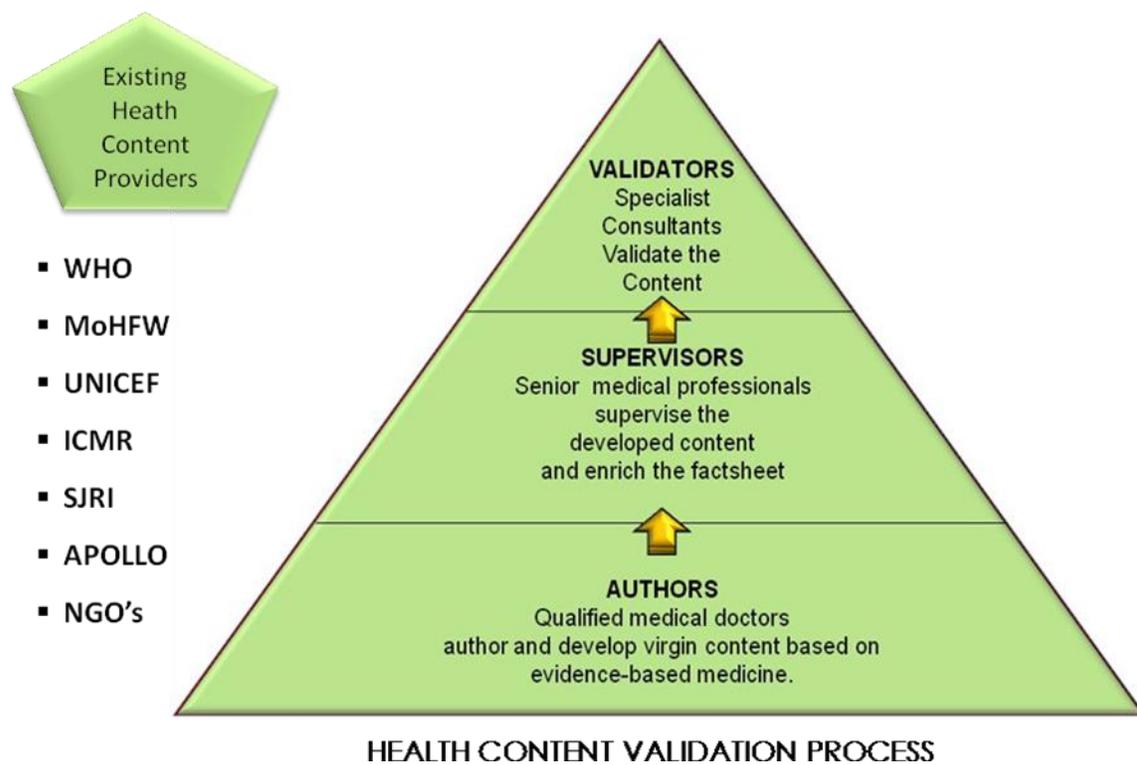
13. Wider awareness of validated information on health, common diseases and health services.
14. Decrease the burden of disease through education of the people on the preventive aspects of disease
15. Improved health status of citizens through better access to services and
16. Improved financial status of citizens through optimized allocation of resources.

## XV Methods to Validate Content for the Portal

### Health Content

The India Health Portal will need high quality, evidence based health information that has been supervised and validated before being published on the portal.

The current method proposed at the Content Development Centre and the Regional Knowledge Centres is described in the figure below. Existing content from reliable knowledge partners such as the Indian Council for Medical Research (ICMR), World Health Organisation (WHO), UNICEF, MoHFW, State Health and Family Welfare Departments, and Non-governmental Organisations (NGO's).



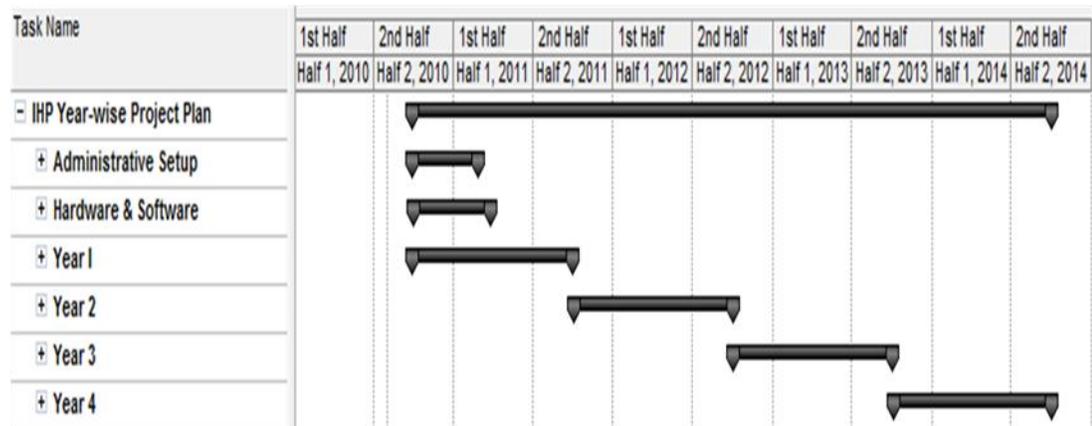
**Figure X.3: Health Content Validation Process for the India Health Portal**

## XII. Time Frame

This project would be executed over a period of 4 years. October 1<sup>st</sup> 2010 has been chosen as the zero date for the start-up. Majority of content development and value adding features of the portal would be developed during these 4 years, after which the maintenance phase would begin sometime around the second half of the year 2014.

### I Gantt Charts

#### I. Gantt Chart – Timeline



#### II. Gantt Chart – Administrative Set-up



### III. Gantt Chart – Analysis-Hardware & Software Set-up

Task Name	Resource Group	Duration	2nd Half	1st Half
			Half 2, 2010	Half 1, 2011
<input checked="" type="checkbox"/> <b>Hardware &amp; Software</b>		<b>127.33 days</b>		
Server Acquisition for NIC, CHI, CDCs, RKC	NIC	44.33 days		
Server Set-up	NIC	24.67 days		
Identifying Software Development Team for the Portal	PSC	62.33 days		
Development of CMS	PDT	62.33 days		
Networking with all centres	NIC	41.67 days		
Testing & Troubleshooting	NIC, PDT, CDC, RKC	62.33 days		

### IV. Gantt Chart – Year 1

Task Name	Resource Group	Clearing House	Duration	2nd Half	1st Half	2nd Half	1st Half
				Half 2, 2010	Half 1, 2011	Half 2, 2011	Half 1, 2012
<input checked="" type="checkbox"/> <b>Year I</b>			<b>263 days?</b>				
IEC Material Collection & Integration	NHFW	CHI	109 days?				
Health Information - Already Available (Collect & Collate)	NACO+DSP+DGHS	CHI	109 days?				
AYUSH Content	Dept. of AYUSH	CHI	109 days?				
Directory Services	WHO	CHI	109 days?				
Regulatory Issues	MoHFW, Legal Experts	CHI	109 days?				
National Health Programmes	NHFW	CHI	109 days?				
Disaster Management	NDMA/ NDM	CHI	109 days?				
Standardizing Content	CDC	CHI	260.33 days?				
<input checked="" type="checkbox"/> <b>Dissemination</b>	<b>IEC Director - Centre &amp; State Directorate of Information and Publicity</b>		<b>130.33 days?</b>				
Enabling CSCs with content for dissemination			130.33 days?				
Identifying Vendors for Kiosk, booklets & DVDs			130.33 days?				

### V. Gantt Chart – Year 2

Task Name	Resource Group	Clearing House	Duration	2nd Half	1st Half	2nd Half
				Half 2, 2011	Half 1, 2012	Half 2, 2012
<input checked="" type="checkbox"/> <b>Year 2</b>			<b>262 days?</b>			
1200 Fact Sheets Including AYUSH Topics (English 600+	CHI+1 RKC	CHI	260 days?			
<input checked="" type="checkbox"/> <b>Translations</b>	<b>DoL+12 RKC</b>	<b>CHI</b>	<b>262 days?</b>			
Translation of un-vetted Content from Year 1 in 12 La			260 days?			
Translation of New Content in 11 Languages			260 days?			
50 interactive modules (English 25+Hindi 25)	CHI+12 RKC	CHI	260 days?			
10 Health Widgets	CHI+12 RKC	CHI	150 days?			
Updating Directory Services	CHI+12 RKC	CHI	260 days?			
Updating Regulatory Issues	MoHFW, Legal Experts	CHI	260 days?			
Updating National Health Programmes	NHFW	CHI	260 days?			
Updating Disaster Management	NDMA/ NDM	CHI	260 days?			
<input checked="" type="checkbox"/> <b>Dissemination</b>	<b>IEC Director - Centre &amp; State Directorate of Information and Publicity</b>	<b>CHI</b>	<b>260 days?</b>			
Print			260 days?			
TV/ Radio			260 days?			

## VI. Gantt Chart – Year 3

Task Name	Resource Group	Clearing House	Duration	2nd Half	1st Half	2nd Half
				Half 2, 2012	Half 1, 2013	Half 2, 2013
<b>Year 3</b>			<b>261 days?</b>			
1200 Fact Sheets Including AYUSH Topics (English 600+)	CHI+1 RKC	CHI	260 days?			
<b>Translations</b>	<b>DoL+12 RKC</b>		<b>260 days?</b>			
Translation of New Content in 11 Languages			260 days?			
Translation of Interactive Modules from Years 2 & 3			260 days?			
50 interactive modules (English 25+Hindi 25)	CHI+12 RKC	CHI	260 days?			
10 Health Widgets	CHI+12 RKC	CHI	150 days?			
Updating Directory Services	CHI+12 RKC	CHI	260 days?			
Updating Regulatory Issues	MoHFW, Legal Experts	CHI	260 days?			
Updating National Health Programmes	NIHFW	CHI	260 days?			
Updating Disaster Management	NDMA/ NDM	CHI	260 days?			
<b>Dissemination</b>	<b>IEC Director - Centre &amp; State Directorate of Information and Publicity</b>		<b>260 days?</b>			
Print			260 days?			
TV/ Radio			260 days?			
DVDs			260 days?			
Kiosk			260 days?			

## VII. Gantt Chart – Year 4

Task Name	Resource Group	Clearing House	Duration	2nd Half	1st Half	2nd Half
				Half 2, 2013	Half 1, 2014	Half 2, 2014
<b>Year 4</b>			<b>260 days?</b>			
1200 Fact Sheets Including AYUSH Topics (English 600+)	CHI+1 RKC	CHI	260 days?			
<b>Translations</b>	<b>DoL+12 RKC</b>		<b>260 days?</b>			
Translation of New Content in 11 Languages			260 days?			
Translation of Interactive Modules from Years 2 & 3			260 days?			
50 interactive modules (English 25+Hindi 25)	CHI+12 RKC	CHI	260 days?			
10 Health Widgets	CHI+12 RKC	CHI	150 days?			
Updating Directory Services	CHI+12 RKC	CHI	260 days?			
Updating Regulatory Issues	MoHFW, Legal Experts	CHI	260 days?			
Updating National Health Programmes	NIHFW	CHI	260 days?			
Updating Disaster Management	NDMA/ NDM	CHI	260 days?			
e-Learning	RKCs	CHI	260 days?			
<b>Dissemination</b>	<b>IEC Director - Centre &amp; State Directorate of Information and Publicity</b>		<b>260 days?</b>			
Print			260 days?			
TV/ Radio			260 days?			
DVDs			260 days?			
Kiosk			260 days?			

## II PERT Analysis

### I. Pert Analysis- Year wise

	Task Name	Duration	Optimistic Dur.	Expected Dur.	Pessimistic Dur.
1	- IHP Year-wise Project Plan	1048.67 days?	1046 days	1050 days	1067 days
2	+ Administrative Setup	108 days?	89 days	110 days	119 days
7	+ Hardware & Software	127.33 days?	118 days	128 days	134 days
14	+ Year I	263 days?	261 days	264 days	334 days
26	+ Year 2	262 days?	229 days	262 days	312 days
41	+ Year 3	261 days?	210 days	261 days	310 days
57	+ Year 4	260 days?	228 days	260 days	310 days

### II. Pert Analysis- Administrative Set-up

	Task Name	Duration	Optimistic Dur.	Expected Dur.	Pessimistic Dur.
	- Administrative Setup	108 days?	89 days	110 days	119 days
	Setting-up PSC	23.67 days?	14 days	25 days	28 days
	Setting up CHI	23.67 days?	14 days	25 days	28 days
	Identifying CDCs & RKC	84.33 days?	75 days	85 days	91 days
	Setting up capacity for CDCs and RKC	84.33 days?	75 days	85 days	91 days

### III. Pert Analysis-Hardware & Software Set-up

Task Name	Duration	Optimistic Dur.	Expected Dur.	Pessimistic Dur.
<input type="checkbox"/> <b>Hardware &amp; Software</b>	<b>127.33 days?</b>	<b>118 days</b>	<b>128 days</b>	<b>134 days</b>
Server Acquisition for NIC, CHI, CDCs, RHCs	44.33 days?	35 days	45 days	51 days
Server Set-up	24.67 days?	19 days	25 days	29 days
Identifying Software Development Team for the Portal	62.33 days?	54 days	63 days	68 days
Development of CMS	62.33 days?	54 days	63 days	68 days
Networking with all centres	41.67 days?	33 days	42 days	49 days
Testing & Troubleshooting	62.33 days?	54 days	63 days	68 days

### IV. Pert Analysis-Year 1

Task Name	Duration	Optimistic Dur.	Expected Dur.	Pessimistic Dur.
<input type="checkbox"/> <b>Year I</b>	<b>263 days?</b>	<b>261 days</b>	<b>264 days</b>	<b>334 days</b>
IEC Material Collection & Integration	109 days?	86 days	110 days	128 days
Health Information - Already Available (Collect & Collate)	109 days?	86 days	110 days	128 days
AYUSH Content	109 days?	86 days	110 days	128 days
Directory Services	109 days?	86 days	110 days	128 days
Regulatory Issues	109 days?	86 days	110 days	128 days
National Health Programmes	109 days?	86 days	110 days	128 days
Disaster Management	109 days?	86 days	110 days	128 days
Standardizing Content	260.33 days?	209 days	260 days	313 days
<input type="checkbox"/> <b>Dissemination</b>	<b>130.33 days?</b>	<b>105 days</b>	<b>130 days</b>	<b>157 days</b>
Enabling CSCs with content for dissemination	130.33 days?	105 days	130 days	157 days
Identifying Vendors for Kiosk, booklets & DVDs	130.33 days?	105 days	130 days	157 days

## V. Pert Analysis-Year 2

Task Name	Duration	Optimistic Dur.	Expected Dur.	Pessimistic Dur.
<b>Year 2</b>	<b>262 days?</b>	<b>229 days</b>	<b>262 days</b>	<b>312 days</b>
1200 Fact Sheets Including AYUSH Topics (English 600+Hindi 600)	260 days?	210 days	260 days	310 days
<b>Translations</b>	<b>262 days?</b>	<b>212 days</b>	<b>262 days</b>	<b>312 days</b>
Translation of un-vetted Content from Year 1 in 12 Languages	260 days?	210 days	260 days	310 days
Translation of New Content in 11 Languages	260 days?	210 days	260 days	310 days
50 interactive modules (English 25+Hindi 25)	260 days?	210 days	260 days	310 days
10 Health Widgets	150 days?	120 days	150 days	180 days
Updating Directory Services	260 days?	210 days	260 days	310 days
Updating Regulatory Issues	260 days?	210 days	260 days	310 days
Updating National Health Programmes	260 days?	210 days	260 days	310 days
Updating Disaster Management	260 days?	210 days	260 days	310 days
<b>Dissemination</b>	<b>260 days?</b>	<b>210 days</b>	<b>260 days</b>	<b>310 days</b>
Print	260 days?	210 days	260 days	310 days
TV/ Radio	260 days?	210 days	260 days	310 days
DVDs	260 days?	210 days	260 days	310 days

## VI. Pert Analysis-Year 3

Task Name	Duration	Optimistic Dur.	Expected Dur.	Pessimistic Dur.
<b>Year 3</b>	<b>261 days?</b>	<b>210 days</b>	<b>261 days</b>	<b>310 days</b>
1200 Fact Sheets Including AYUSH Topics (English 600+Hindi 600)	260 days?	210 days	260 days	310 days
<b>Translations</b>	<b>260 days?</b>	<b>210 days</b>	<b>260 days</b>	<b>310 days</b>
Translation of New Content in 11 Languages	260 days?	210 days	260 days	310 days
Translation of Interactive Modules from Years 2 & 3	260 days?	210 days	260 days	310 days
50 interactive modules (English 25+Hindi 25)	260 days?	210 days	260 days	310 days
10 Health Widgets	150 days?	120 days	150 days	180 days
Updating Directory Services	260 days?	210 days	260 days	310 days
Updating Regulatory Issues	260 days?	210 days	260 days	310 days
Updating National Health Programmes	260 days?	210 days	260 days	310 days
Updating Disaster Management	260 days?	210 days	260 days	310 days
<b>Dissemination</b>	<b>260 days?</b>	<b>210 days</b>	<b>260 days</b>	<b>310 days</b>
Print	260 days?	210 days	260 days	310 days
TV/ Radio	260 days?	210 days	260 days	310 days
DVDs	260 days?	210 days	260 days	310 days
Kiosk	260 days?	210 days	260 days	310 days

## VII. Pert Analysis-Year 4

Task Name	Duration	Optimistic Dur.	Expected Dur.	Pessimistic Dur.
<b>Year 4</b>	<b>260 days?</b>	<b>228 days</b>	<b>260 days</b>	<b>310 days</b>
1200 Fact Sheets Including AYUSH Topics (English 600+Hindi 600)	260 days?	210 days	260 days	310 days
<b>Translations</b>	<b>260 days?</b>	<b>210 days</b>	<b>260 days</b>	<b>310 days</b>
Translation of New Content in 11 Languages	260 days?	210 days	260 days	310 days
Translation of Interactive Modules from Years 2 & 3	260 days?	210 days	260 days	310 days
50 interactive modules (English 25+Hindi 25)	260 days?	210 days	260 days	310 days
10 Health Widgets	150 days?	120 days	150 days	180 days
Updating Directory Services	260 days?	210 days	260 days	310 days
Updating Regulatory Issues	260 days?	210 days	260 days	310 days
Updating National Health Programmes	260 days?	210 days	260 days	310 days
Updating Disaster Management	260 days?	210 days	260 days	310 days
e-Learning	260 days?	210 days	260 days	310 days
<b>Dissemination</b>	<b>260 days?</b>	<b>210 days</b>	<b>260 days</b>	<b>310 days</b>
Print	260 days?	210 days	260 days	310 days
TV/ Radio	260 days?	210 days	260 days	310 days
DVDs	260 days?	210 days	260 days	310 days
Kiosk	260 days?	210 days	260 days	310 days

## XIII. Risk Analysis

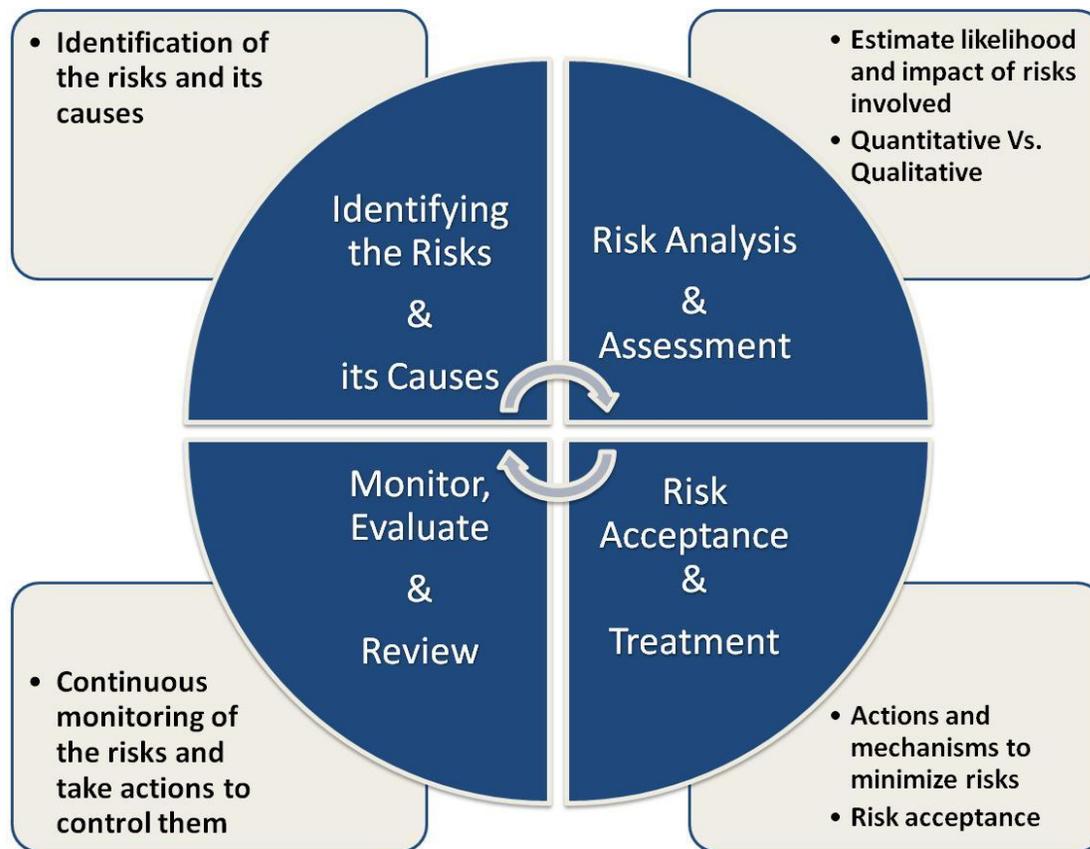
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### I Risk Management for the India Health Portal:

The risks perceived for the India Health Portal are legal/contractual risks, revenue risks, project management risks and regulatory risks.

The legal/contractual risks can arise from differences between stakeholders that might arise pertaining to the legal or contractual clauses on the agreement. This can be prevented or mitigated by obtaining expert legal counsel to vet and approve the entire legal and contractual obligations of the stakeholders' right at the start of the project.

The revenue risks can be funding related, management of finances, accounting, revenue generation, and sharing and sustenance issues. This can also be prevented by putting into place adequate regulations governing the fund management, methods of financing, management of resources, management of revenue generated, sharing of resources or revenue and contractual obligations of the stakeholders in maintaining the expenditure of the project.



**FigureXIII.1: Risk assessment, Evaluation and Management**

## II Management of Project Risk:

Project risk can be managed by adhering to the following guidelines:

- A recommended list of documentation that summarizes the best practices for the project.
- A project start-up workshop; including its preparation and execution. The goal is to align people to the goals and educate them on the challenges.
- Determining the appropriate metrics for the project, ensuring they are not burdensome and effect behaviour in a positive manner.
- Setting the amounts and conditions for use of the project resources and contingencies.
- Negotiating the final objectives of the project with stakeholders to improve the chances of project success.

- Validate that all team members and stakeholders accept the plan of action
- Describe to all team members and stakeholders the change management process and how it will be enforced<sup>18</sup>.

Risk management is simply a practice of systematically selecting cost effective approaches for minimising the effect of a risk or threat to the project. All risks can never be fully avoided or mitigated simply because of financial and practical limitations. Therefore all projects have to accept some level of residual risks<sup>19</sup>.

In case the risk is known and perceived, the project needs to incorporate planning to deal with the consequences of the realised risks. Risk management also proposes applicable controls for the perceived risks. Risk management for an ICT related project should delineate:

- Process by which risk management can be carried out
- Organization structure for risk management

The area of potential errors in an ICT project is usually related to neglecting risk cost estimation. Project cost overruns are usually countered by making cuts. The usual areas that are targeted to be cut are those with least perceived obvious benefits– managerial and design overhead, process control software, quality assurance programs and test procedures. These are the very areas whose costs are often underestimated in the first place. Therefore it is proposed that the Project Management Team should study the various risks carefully and take necessary steps to prevent or mitigate these known or unknown risks.

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<sup>18</sup> Lam, J., Enterprise Risk Management: From Incentives to Controls (2003). Wiley; 1 edition, ISBN 0-471430005

Virine, L. and Trumper M., Project Decisions: The Art and Science (2007). Management Concepts. Vienna, VA, ISBN 978-1-56726-217-0

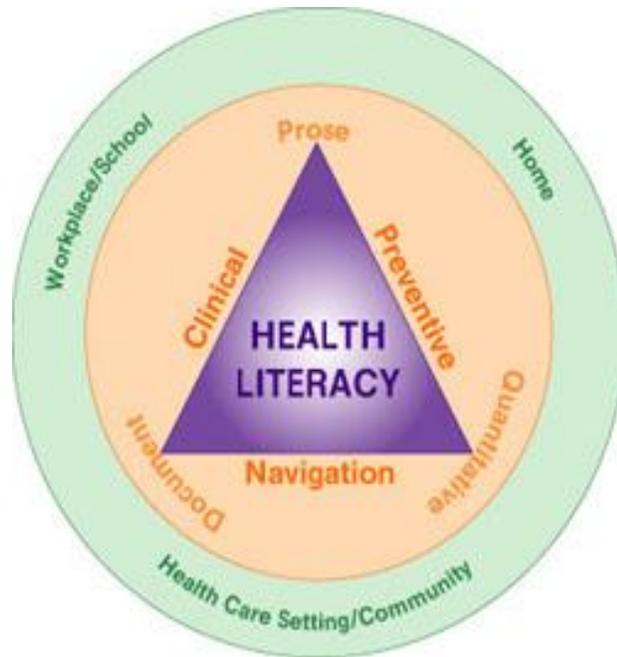
<sup>19</sup> Wideman, R.M. Project and Program Risk Management (1992). Newtown Square, PA: Project Management Institute. ISBN 978-1-880410066

# XIV. Evaluation

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Since this is a new project, no evaluation has yet been done.

However, evaluation will be done year wise at the end of each year. Monitoring would also be performed to undertake mid-term corrections and steer the project well.



**Figure XIV: Components of Health Literacy**

## **Methods of evaluating Health Literacy:**

There are many tools for measuring health literacy at the population level. One such mechanism is proposed by Kickbusch was to look at the type of understanding for different types of information<sup>20</sup>:

- \* Prose literacy (understanding texts);
- \* Document literacy (being able to understand and fill out forms, formats, maps, tables); and
- \* Quantitative literacy (the ability to apply arithmetic operations).

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<sup>20</sup> Ilona S.Kickbusch, Health literacy: addressing the health and education divide , Health Promotion International, Vol. 16, No. 3, 289-297, September 2001

Along these lines, a first step towards measurement could be agreement on the key domains for health literacy by using, for example, the three areas that have been proposed by Nutbeam (2001)<sup>21</sup>:

- \* Functional health literacy;
- \* Interactive health literacy; and
- \* Critical health literacy.

The evaluations that are proposed to be done will be conducted in-depth by independent organizations that will be chosen by the Portal Steering Committee. Appropriate budgets for the same have been factored for these activities in the budget section.

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<sup>21</sup> Nutbeam, D. (2001) Health literacy as a public health goal. *Health Promotion International*, in press.

## XV. Success criteria

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As this is a new and novel project, no specific base line data has been collected yet. It is hypothesized that providing health knowledge to the people would help them to take care of their health better.

**The Development Objectives, Outputs and Outcomes are as follows:**

### I Development Objectives:

1. The Project aims to improve the health literacy of the masses in India
2. It aims to improve access to health services across the nation
3. It aims to decrease the burden of disease by educating the people on the preventive aspects of disease.

### II Deliverable Outputs to be achieved:

1. Improve access to services through IT enabled cataloguing of service providers.
2. Create a comprehensive web based National Health Portal to make available comprehensive health related information to the community using IT and analogue or Non IT methods.
3. Create protocols to enable the masses to access reliable, easy to understand, multilingual health information from the interactive National Health Portal

4. Create protocols for wide dissemination of health information in public domain using the Internet and other pertinent communication modalities
5. Create databases to enable citizens to seek, locate and access health care providers across the country
6. Create platforms to provide health information and health resources for the healthcare workers, NGOs, student communities, health professionals etc
7. Create a transparent resource on regulatory and statutory guidelines pertaining to healthcare in India

### III The Project has following key

#### Outcomes:

1. Wider awareness of validated information on health, common diseases and health services.
2. Improved health status of citizens through better access to services
3. Improved financial status of citizens through optimized allocation of resources.
4. To enable the masses to access reliable, easy to understand, multilingual health information from an interactive National Health Portal
5. To make health information readily available on the public domain using the Internet and other pertinent communication modalities
6. To enable an average citizen to seek, locate and access health care providers across the country

7. To provide health information and health resources for the healthcare workers
8. To provide information to organizations who wish to contribute to public health and welfare (NGOs)
9. To provide health information to cater to the needs of student communities including educational/career opportunities
10. To cater to the body of health professionals and meet their information needs, networking, and learning.
11. To provide a transparent resource on regulatory and statutory guidelines pertaining to healthcare in India to the public
12. To provide information on National Health Programmes and schemes to the public.

The Success criteria will be achieved by Monitoring and evaluation (M&E) to assess the extent to which the project has achieved its objectives. M&E studies would be implemented during each year of the portal and continued into the maintenance period. In order to evaluate the success, three types of estimation is required

1. One is to estimate the number of people who visited the portal or had access to content from the portal through any of the media available
2. The other is to look at the uptake on the field and interview people across the nation to realise if health literacy has made any significant impact on the way they live and practice health.
3. Monitoring and evaluation of the impact of Health literacy dissemination on various measurable indicators such as mortality rates, morbidity rates, burden of disease, and health economics.

A good example of success is the Swasthya Sakhi program (under the Rajiv Gandhi Mahila Vikas Pariyojana), conducted in 22 Blocks in Amethi, Uttar Pradesh, one Swasthya Sakhi (or Community Health Activist) was assigned to a village to spread health literacy and create awareness. Every pregnant woman in these villages was identified and connected to the public health facilities. 1550 pregnancies and deliveries before the program (May 2009 to November 2009) were compared with subsequent 1532 pregnancies after the implementation of the Swasthya Sakhi program (November 2009 to July 2009), in the same 256 villages in 22 blocks. The study demonstrated a significant reduction in the maternal and infant deaths. MMR has decreased from 645 to 65 and IMR from 40 to 9.7 (there could be a margin of error in the MMR due to the small sample size)<sup>22</sup>. However, the maternal deaths reported after the study was just 1, compared to 10 before the study. The infant deaths after the study was 15, compared to 63 before the study. This is just one of those small interventions of health literacy which helps us realise larger public health goals. It was also noted that there was a general improvement in hygiene. The number of families who adopted personal hygiene habits was 48,349 and before the study the number stood at 14,575. This study goes on to demonstrate the impact of health literacy on maternal and child health.

In the same vein, imparting health literacy to the masses in India is bound to improve the health situation and uptake of better health and hygiene practices across the nation.

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<sup>22</sup> Unpublished data - Courtesy: Rajiv Gandhi Mahila Vikas Pariyojana, <http://rgmvp.org/core-programmes-cbhc-overview.asp>

## XVI. Financial and Economic Analysis

The project is a social sector scheme seeking to create IT based protocols for improving dissemination of health related information and access to health services to the citizens. As such the project does not aim to generate revenue. However, the benefits accruable from the project are expected to include improved health of citizens and reduced costs of health care for the system in general.

# XVII. Sustainability

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## I Maintenance of the Portal

The maintenance of the India Health Portal involves two components:

- Maintenance of the software and hardware
- Maintenance of the Content and Knowledge Centres including dissemination costs.

### 1.1 Maintenance of the software and hardware

Maintenance of the Software and content management system will be required as a continual process. Any new developments or modifications to the portal will be covered by a designated software company with the necessary skills.

### 1.2 Maintenance of the Content and Knowledge Centres

The content will be required to be maintained and kept up-to date. It is proposed that beyond Year 4, the Knowledge centres would reduce their personnel by 25% and continue to function.

The Knowledge centres will continue to contribute content and will also help with updates regularly. They will continue to help with dissemination of health information. The Knowledge network of Knowledge centres will play a crucial role in filling the gaps in the Health Information space for both the masses and Health Professionals.

## II Revenue Streams and Sustainability

The following sources can be considered for revenue generation:

### II.1 Sponsorship:

Pharmaceutical companies, Hospitals, Insurance companies, Medical Equipment Industries and other corporate entities can be approached to support the portal development costs. Names of sponsoring organizations can be listed on the portal. However, it may not be possible to run advertisements from the companies as the portal would be following a stringent no-ads policy to comply with the HON Code standards.

The aim of this revenue generation activity is to raise at least Rs. 2.5 Crores per annum through sponsorships. This is assuming at least Rs. 5,00,000/- (Rs 5 Lakhs) per sponsor from 50 corporate entities.

### II.2 Subscriptions:

SMS alerts, health messages, Email alerts or listings can be created for subscribers of the value added services such as regular health tips and alerts. These subscriptions can either be directly purchased by interested individuals on the portal or can be purchased by corporate organizations insurance companies and hospitals for their employees or clients and customers as part of wellness programmes. The revenue earned by this service is presented in the table below.

Service Name	Actual cost per SMS	Cost to the customer	Actual Turnover/ year	Revenue
SMS Health Tips and Alerts	Rs 0.05/-	Rs 20/- Per month for 12 SMS's every month	Rs 62,40,00,000/- (assuming a minimum of 30,000 individuals per state register across 26 states)	Rs 60,37,20,000/-

### II.3 Dissemination material sponsorship:

The industry can be called to support dissemination activities such as the health kiosks, interactive DVDs, booklets, etc. Non Governmental Organizations and Not-for Profit Organizations such as the WHO, UNICEF and UNESCO can be contacted to sponsor and help in the regularization of the dissemination activities. The services can carry the names of the sponsoring organizations. E.g. a health kiosk could carry on it the name of the sponsoring company or organization and also display their ads as a screensaver.

<b>Service Name</b>	<b>Actuals</b>	<b>Cost to the Sponsor</b>	<b>Actual Turnover/ Year</b>	<b>Revenue/ Year</b>
<b>CMEs</b> -20 CMEs in a year	NA	<b>Rs. 10,00,000/</b> per CME	<b>Rs. 2,00,00,000/-</b>	<b>Rs. 2,00,00,000/-</b>
<b>e-Learning Modules</b> -20 modules in a year	NA			
<b>Kiosks</b> -50 Kiosks to be introduced in pilot phase	<b>Rs. 2,00,000/per</b> kiosk and <b>Rs. 8000/month</b> towards AMC per kiosk including electricity costs	<b>Rs. 2,50,000/per</b> kiosk and <b>Rs. 25,000/- /</b> month AMC per kiosk with advertisements	<b>Rs. 1,48,00,000/-</b> for 50 kiosks	<b>Rs. 1,27,00,000/-</b> for 50 Kiosks
<b>DVDs</b> -1 lakh DVDs to be released in pilot phase	<b>Rs. 50/per</b> DVD	<b>Rs. 100/per</b> DVD	<b>Rs. 1,00,00,000/-</b> per 1 lakh DVDs	<b>Rs. 50,00,000/-</b> per 1 lakh DVDs

<b>Booklets</b>  -2 lakh booklets to be launched in pilot phase	<b>Rs. 75/per</b> Booklet	<b>Rs. 150/per</b> Booklet	<b>Rs. 3,00,00,000/-</b> for 2 lakh Booklets	<b>Rs. 1,50,00,000/-</b> for 2 lakh booklets
<b>Total Revenue earned per year</b>			<b>Rs 5,27,00,000.00</b>	

**Table XVII: Sponsorship Models for the India Health Portal**

#### II.4 Content royalty/licenses:

Once content has been created and showcased on the portal, the intellectual property of this content would then belong to the Ministry of Health and Family Welfare, GOI. Also, royalty can be claimed from countries that wish to purchase or license the content. Customization of the content can be done at additional costs.

# Glossary of Terms

AMKC	Alternative Medicine Knowledge Centre
Anaemia	a deficiency of red blood cells resulting in a decrease in oxygen supply to the body's cells/ tissues
Anorexia	a prolonged disorder of eating due to loss of appetite
AP	Andhra Pradesh
AYUSH	Ayurveda Yoga and Naturopathy Unani Siddha Homoeopathy
BMI	Body Mass Index
CAM	Complementary and Alternative Medicine
CCIM	Central Council of Indian Medicine
CGHS	Central Government Health Scheme
CCDC	Central Content Development Centre
CME	Continuing Medical Education
CMS	Content Management System
CVD	Cardiovascular Disease/ Coronary Vessel Disease
DCI	Dental Council of India
DVD	Digital Video Decoder
EDD	Expected Date of Delivery
e-learning	term covering a wide set of applications and processes, such as web-based learning, computer-based learning, virtual classrooms, and digital collaboration
Epidemiology	the branch of medical science dealing with the transmission and control of disease
ESI	Employee State Insurance
FDA	Food and Drug Administration
Flash Player	a file format used to deliver video and interactive applications over the Internet

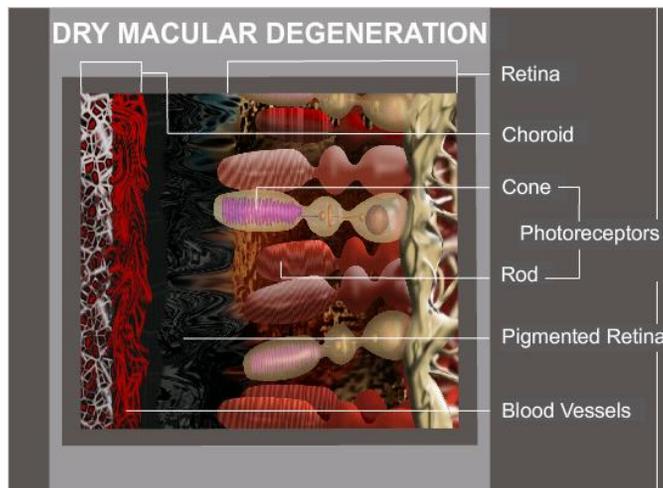
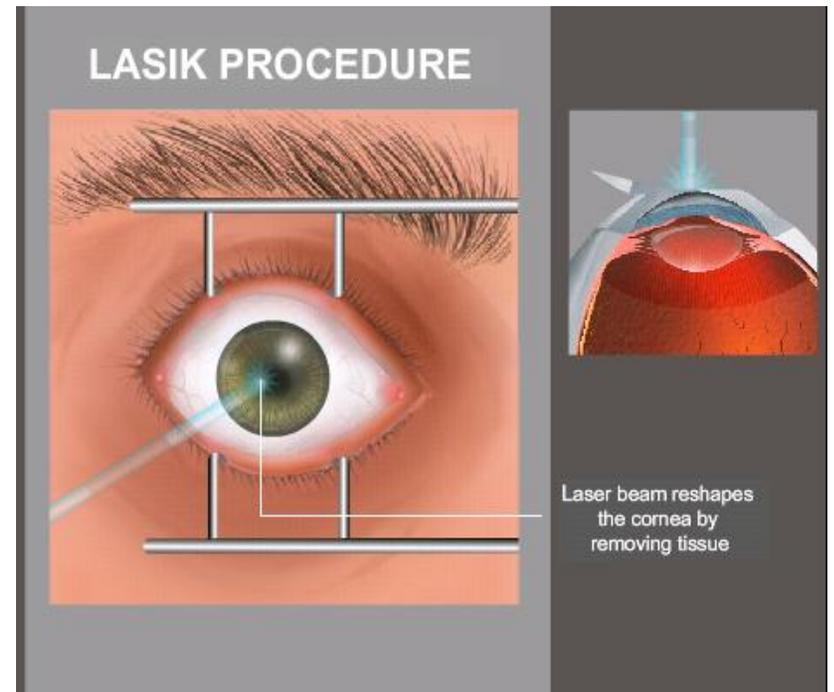
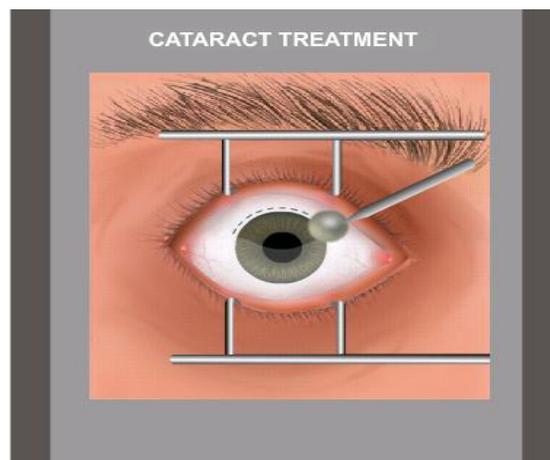
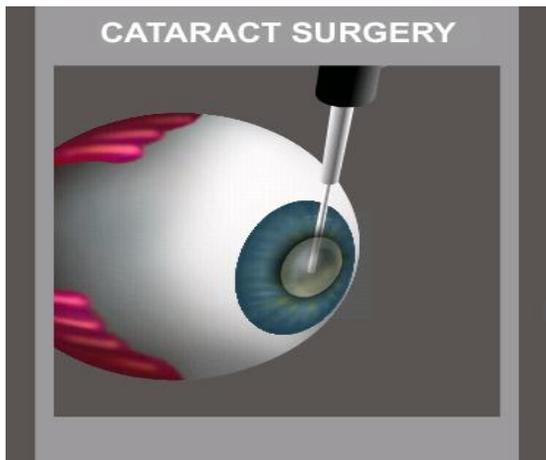
GB	Giga byte
Govt	Government
HbA1c	Glycosylated Hemoglobin
HL7	Health Level 7
HLRL	Health Literacy Research Laboratory
HONcode	Health on the Net Foundation
ICT	Information Communication Technologies
IHP	India Health Portal
IMA	Indian Medical Association
INR	Indian National Rupee
IT	Information Technology
JCAHO	Joint Commission for the Accreditation of Healthcare Organizations
Kiosk	any small structure that stands alone, usually for the purpose of supplying a product or service
MCI	Medical Council of India
MoHFW	Ministry of Health and Family Welfare
Musculoskeletal	relating to muscles and skeleton
MS	Microsoft
NABH	National Accreditation Board for Hospital and Healthcare Providers
NDMA	National Disaster Management Authority
NGO	Non Governmental Organization
NIC	National Informatics Centre
NKC	National Knowledge Commission
NLP	Natural Language
NRHM	National Rural Health Mission

Osteoporosis	abnormal loss of bony tissue resulting in fragile porous bones attributable to a lack of calcium
PSC	Portal Steering Committee
PHC	Primary Health Centre
PMxT	Project Management Team
Podcast	distribute (multimedia files) over the internet for playback on a mobile device or a personal computer
Pre-natal	the period preceding birth, during which the foetus develops in the uterus
Prognosis	a prediction of the course of a disease
QA	Quality Analyst/ Quality Assurance
RAM	Random Access Memory
RKC	Regional Knowledge Centre
RSS	Really Simple Syndication
SJRI	St. John's Research Institute
SMS	Short Messaging Service
SQL	Structured Query Language
Transplantation	the act of removing something from one location and introducing it in another location
TV	Television
URL	Universal Resource Locator
Voiceover	corded dialogue, usually narration, that comes from an unseen, off-screen voice
Web 2.0	web applications that facilitate interactive information sharing, interoperability, user-centered design and collaboration on the World Wide Web
Widgets	a small, portable application or piece of dynamic content that can easily be placed into a Web page or an embedded browser within a rich client
WWW	World Wide Web

# Annexures

## Annexure I – Sample Medical Illustrations

(Courtesy: Health Informatics Group, St. John's Research Institute, Bangalore).



## Annexure II – Comparison Table for Content Management Systems (CMS)

<b>CMS</b>	<b>TYPO3 4.2.9</b>	<b>Movable Type 4.25</b>	<b>Moodle 1.9</b>	<b>Joomla! 1.5.10</b>	<b>eZ Publish 4.2</b>	<b>Drupal 6.10</b>	<b>DotNetNuke Professional Edition 5.2</b>	<b>Xoops 2.0.18</b>
Last Updated	10/14/2009	6/10/2009	8/12/2007	1/11/2009	9/30/2009	2/26/2009	12/7/2009	8/5/2008
<b>System Requirements</b>	<b>TYPO3 4.2.9</b>	<b>Movable Type 4.25</b>	<b>Moodle 1.9</b>	<b>Joomla! 1.5.10</b>	<b>eZ Publish 4.2</b>	<b>Drupal 6.10</b>	<b>DotNetNuke Professional Edition 5.2</b>	<b>Xoops 2.0.18</b>
Application Server	Apache	CGI	Apache	CGI	Other	Apache	IIS/.Net	Apache
Approximate Cost	Free	Free version available	0	Free	30EUR + VAT per domain	Free	US\$1,999 per year	Free
Database	MySQL	MySQL	MySQL	MySQL	MySQL	MySQL	MSSQL	MySQL

<b>CMS</b>	<b>TYPO3 4.2.9</b>	<b>Movable Type 4.25</b>	<b>Moodle 1.9</b>	<b>Joomla! 1.5.10</b>	<b>eZ Publish 4.2</b>	<b>Drupal 6.10</b>	<b>DotNetNuke Professional Edition 5.2</b>	<b>Xoops 2.0.18</b>
License	Open Source	Closed Source	Open Source	Open Source	Open Source	Open Source	Open Source	Open Source
Operating System	Platform Independent	Platform Independent	Platform Independent	Platform Independent	Platform Independent	Platform Independent	Windows Only	Platform Independent
Programming Language	PHP	Perl	PHP	PHP	PHP	PHP	Other	PHP
Root Access	No	Yes	No	No	No	No	Yes	No
Shell Access	No	Yes	No	No	No	No	Yes	No
Web Server	Apache	Apache	Any	Apache	Apache	Apache	IIS	Apache
<b>Security</b>								
Audit Trail	Yes	Yes	Yes	No	Yes	Yes	Yes	Limited
Captcha	Free Add On	Yes	No	Free Add On	Free Add On	Free Add On	Yes	Free Add On

<b>CMS</b>	<b>TYPO3 4.2.9</b>	<b>Movable Type 4.25</b>	<b>Moodle 1.9</b>	<b>Joomla! 1.5.10</b>	<b>eZ Publish 4.2</b>	<b>Drupal 6.10</b>	<b>DotNetNuke Professional Edition 5.2</b>	<b>Xoops 2.0.18</b>
Content Approval	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Email Verification	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Granular Privileges	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Kerberos Authentication	Free Add On	Costs Extra	Yes	No	No	No	Free Add On	No
LDAP Authentication	Free Add On	Costs Extra	Yes	Yes	Yes	Free Add On	Free Add On	Yes
Login History	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Free Add On
NIS Authentication	Free Add On	Costs Extra	No	No	No	No	Free Add On	No
NTLM Authentication	Free Add On	Costs Extra	Yes	No	Free Add On	Free Add On	Yes	No

<b>CMS</b>	<b>TYPO3 4.2.9</b>	<b>Movable Type 4.25</b>	<b>Moodle 1.9</b>	<b>Joomla! 1.5.10</b>	<b>eZ Publish 4.2</b>	<b>Drupal 6.10</b>	<b>DotNetNuke Professional Edition 5.2</b>	<b>Xoops 2.0.18</b>
Pluggable Authentication	Free Add On	Yes	Yes	Yes	Yes	Yes	Yes	No
Problem Notification	Yes	Costs Extra	Yes	No	Costs Extra	No	Yes	Limited
Sandbox	Yes	Yes	Yes	No	Yes	No	Yes	Yes
Session Management	Yes	Costs Extra	Yes	Yes	Yes	Yes	Yes	Limited
SMB Authentication	Free Add On	Costs Extra	No	No	Free Add On	No	Free Add On	No
SSL Compatible	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SSL Logins	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
SSL Pages	Free Add On	Yes	Yes	Yes	Yes	No	Yes	Yes
Versioning	Yes	Costs Extra	Yes	Free Add On	Yes	Yes	Yes	Yes
<b>Support</b>								
Certification	Yes	No	Yes	No	Yes	No	Costs Extra	Yes





<b>CMS</b>	<b>TYPO3 4.2.9</b>	<b>Movable Type 4.25</b>	<b>Moodle 1.9</b>	<b>Joomla! 1.5.10</b>	<b>eZ Publish 4.2</b>	<b>Drupal 6.10</b>	<b>DotNetNuke Professional Edition 5.2</b>	<b>Xoops 2.0.18</b>
Image Resizing	Yes	Yes	Yes	Yes	Yes	Free Add On	Yes	Free Add On
Macro Language	Yes	Yes	No	Yes	Yes	Free Add On	No	Limited
Mass Upload	Free Add On	Costs Extra	Yes	Yes	Yes	Free Add On	Yes	Free Add On
Prototyping	Free Add On	No	No	Yes	Yes	Limited	Yes	No
Server Page Language	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Site Setup Wizard	Free Add On	Yes	No	No	Yes	Limited	Yes	***
Spell Checker	Yes	Free Add On	Free Add On	No	No	Free Add On	Yes	No
Style Wizard	Yes	Yes	Yes	No	No	Limited	Yes	No
Subscriptions	Free Add On	Yes	Yes	Costs Extra	Yes	Free Add On	Yes	Yes
Template Language	Yes	Yes	No	Yes	Yes	Limited	Yes	Yes
UI Levels	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes









<b>CMS</b>	<b>TYPO3 4.2.9</b>	<b>Movable Type 4.25</b>	<b>Moodle 1.9</b>	<b>Joomla! 1.5.10</b>	<b>eZ Publish 4.2</b>	<b>Drupal 6.10</b>	<b>DotNetNuke Professional Edition 5.2</b>	<b>Xoops 2.0.18</b>
Interface Localization	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Metadata	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Free Add On
Multi-lingual Content	Yes	Yes	Yes	Free Add On	Yes	Yes	Yes	Free Add On
Multi-lingual Content Integration	Yes	Free Add On	Yes	Free Add On	Yes	Free Add On	Free Add On	Free Add On
Multi-Site Deployment	Yes	Yes	Yes	Free Add On	Yes	Yes	Yes	No
URL Rewriting	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
<b>Built-in Applications</b>								
Blog	Free Add On	Yes	Yes	Yes	Yes	Yes	Yes	Free Add On
Chat	Free Add On	Costs Extra	Yes	Free Add On	Free Add On	Free Add On	Costs Extra	Free Add On
Classifieds	Free Add On	No	Yes	Free Add On	Free Add On	Free Add On	Yes	Free Add On

<b>CMS</b>	<b>TYPO3 4.2.9</b>	<b>Movable Type 4.25</b>	<b>Moodle 1.9</b>	<b>Joomla! 1.5.10</b>	<b>eZ Publish 4.2</b>	<b>Drupal 6.10</b>	<b>DotNetNuke Professional Edition 5.2</b>	<b>Xoops 2.0.18</b>
Contact Management	Free Add On	Yes	Yes	Yes	Yes	Free Add On	Yes	Yes
Data Entry	Free Add On	Yes	Yes	Free Add On	Yes	Free Add On	Yes	Free Add On
Database Reports	Free Add On	Costs Extra	Yes	Free Add On	Limited	No	Yes	Free Add On
Discussion / Forum	Free Add On	Yes	Yes	Free Add On	Yes	Yes	Yes	Yes
Document Management	Free Add On	No	Yes	Free Add On	Yes	Limited	Yes	Free Add On
Events Calendar	Free Add On	Costs Extra	Yes	Free Add On	Yes	Free Add On	Yes	Free Add On
Events Management	Free Add On	Costs Extra	Yes	Free Add On	Free Add On	Free Add On	Yes	Free Add On
Expense Reports	Free Add On	No	Yes	Free Add On	No	No	Costs Extra	No
FAQ Management	Free Add On	Yes	Yes	Yes	Free Add On	Yes	Yes	Yes

<b>CMS</b>	<b>TYPO3 4.2.9</b>	<b>Movable Type 4.25</b>	<b>Moodle 1.9</b>	<b>Joomla! 1.5.10</b>	<b>eZ Publish 4.2</b>	<b>Drupal 6.10</b>	<b>DotNetNuke Professional Edition 5.2</b>	<b>Xoops 2.0.18</b>
File Distribution	Free Add On	Costs Extra	Yes	Free Add On	Yes	Free Add On	Yes	Free Add On
Graphs and Charts	Free Add On	Costs Extra	Yes	Free Add On	Free Add On	No	Yes	No
Groupware	Free Add On	Yes	Yes	Free Add On	No	Free Add On	Costs Extra	No
Guest Book	Free Add On	Yes	Yes	Free Add On	Free Add On	Free Add On	Yes	Free Add On
Help Desk / Bug Reporting	Free Add On	No	Yes	Free Add On	Yes	Free Add On	Costs Extra	Free Add On
HTTP Proxy	Free Add On	Costs Extra	No	No	Free Add On	No	Costs Extra	Yes
In/Out Board	No	No	Yes	No	No	No	Free Add On	No
Job Postings	Free Add On	No	Yes	Free Add On	Yes	Free Add On	Yes	Free Add On
Link Management	Free Add On	Yes	Yes	Yes	Yes	Free Add On	Yes	Yes
Mail Form	Yes	Free Add On	Yes	Yes	Yes	Free Add On	Yes	Yes
Matrix	Free Add On	No	No	No	No	No	Free Add On	No



<b>CMS</b>	<b>TYPO3 4.2.9</b>	<b>Movable Type 4.25</b>	<b>Moodle 1.9</b>	<b>Joomla! 1.5.10</b>	<b>eZ Publish 4.2</b>	<b>Drupal 6.10</b>	<b>DotNetNuke Professional Edition 5.2</b>	<b>Xoops 2.0.18</b>
Tests / Quizzes	Free Add On	Costs Extra	Yes	Free Add On	Free Add On	Free Add On	Yes	Free Add On
Time Tracking	Free Add On	No	Yes	No	No	Free Add On	Costs Extra	Free Add On
User Contributions	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Weather	Free Add On	Costs Extra	No	Free Add On	Free Add On	Free Add On	Free Add On	Free Add On
Web Services Front End	Free Add On	No	No	Yes	No	Limited	Yes	Free Add On
Wiki	Free Add On	No	Yes	Free Add On	Yes	Free Add On	Yes	Free Add On
<b>Commerce</b>								
Affiliate Tracking	Free Add On	Costs Extra	No	Free Add On	No	Free Add On	Yes	Yes
Inventory Management	Free Add On	No	Yes	Free Add On	No	Free Add On	Costs Extra	Free Add On
Pluggable Payments	Free Add On	No	Yes	Free Add On	Yes	Free Add On	Costs Extra	Free Add On

<b>CMS</b>	<b>TYPO3 4.2.9</b>	<b>Movable Type 4.25</b>	<b>Moodle 1.9</b>	<b>Joomla! 1.5.10</b>	<b>eZ Publish 4.2</b>	<b>Drupal 6.10</b>	<b>DotNetNuke Professional Edition 5.2</b>	<b>Xoops 2.0.18</b>
Pluggable Shipping	Free Add On	Costs Extra	No	Free Add On	Yes	Free Add On	Costs Extra	Free Add On
Pluggable Tax	Free Add On	No	No	Free Add On	Yes	Free Add On	Costs Extra	Free Add On
Point of Sale	No	No	No	Free Add On	No	No	Costs Extra	No
Shopping Cart	Free Add On	Costs Extra	No	Free Add On	Yes	Free Add On	Yes	Free Add On
Subscriptions	No	Costs Extra	No	Free Add On	Free Add On	Free Add On	Yes	Free Add On
Wish Lists	Free Add On	No	Yes	Free Add On	Yes	Free Add On	Free Add On	Free Add On

## Annexure III – Touch Screen Kiosk

### “Evaluation of a Touch-Screen Health Information Kiosk”

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#### Abstract:

Computer-based health information kiosks are being introduced for providing health information to patients. The objective of this study was to evaluate user satisfaction on a touch-screen computer-based health information kiosk that we had developed, for its ease of use, appropriateness and usefulness.

A pilot study of 50 patients who accessed the **iHealth Desk** was randomly performed and an exit interview was conducted. Responses obtained were graded on a scale of 1-9 (9 being the highest) based on user satisfaction.

94% of patients rated the kiosk between 7 and 9 for 'ease of use', 90% of them rated the kiosk between 7 and 9 for feedback on screen features; 58% of them rated between 7 and 9 for 'availability of health information' on the kiosk; 82% rated the kiosk between 7 and 9 for 'adequacy and satisfaction with the health information'; and 92% rated the kiosk between 7 and 9 for 'overall satisfaction' with the kiosk.

Ease of use, easy navigation, availability of required information and the adequacy of health information available were important for user satisfaction with a health information kiosk.

# Annexure IV – Mobile Telephony in Health Care

AIDS Behav  
DOI 10.1007/s10461-009-9658-3

BRIEF REPORT

## Designing a Mobile Phone-Based Intervention to Promote Adherence to Antiretroviral Therapy in South India

Anita Shet · Karthika Arumugam · Rashmi Rodrigues ·  
Nirmala Rajagopalan · K. Shubha · Tony Raj ·  
George D'souza · Ayesha De Costa

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**Abstract** Integration of mobile phone technology into HIV care holds potential, particularly in resource-constrained settings. Clinic attendees in urban and rural South India were surveyed to ascertain usage of mobile phones and perceptions of their use as an adherence aid. Mobile phone ownership was high at 73%; 26% reported shared ownership. A high proportion (66%) reported using phones to call their healthcare provider. There was interest in weekly telephonic automated voice reminders to facilitate adherence. Loss of privacy was not considered a deterrent. The study presents important considerations in the design of a mobile phone-based adherence intervention in India.

**Keywords** Mobile phones · Adherence · HIV · Antiretroviral therapy

**Electronic supplementary material** The online version of this article (doi:10.1007/s10461-009-9658-3) contains supplementary material, which is available to authorized users.

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### Introduction

There has been recent interest in the potential use of mobile phone technology for different aspects of healthcare particularly in low-income settings [1–3]. Presently, 64% of all mobile phone users are in the developing world [4]. The growing ubiquity of mobile phones is a central element in the promise of mobile technologies for health [5]. While there have been a number of studies integrating mobile phones in the care of chronic conditions such as diabetes and asthma, interest has been evoked specifically in the area of HIV [2].

Access to HIV care and treatment in India has improved dramatically as a result of efforts by the National AIDS Control Organization (NACO) and the number of people accessing antiretroviral therapy (ART) has crossed 200,000 in 2008 [6]. Adherence is a key issue in treatment success as poor adherence contributes to the development of resistance and need for expensive second-line ART regimens. The role of mobile telephones in promoting adherence to ART has not been extensively explored in the literature. India is particularly suited for a mobile telephone-based intervention given the widespread connectivity, low costs and growing popularity of the mobile phone. The survey reported here was planned as a preliminary study prior to the initiation of a randomized trial on the influence of mobile phones on adherence to ART in South India. Specifically, the survey was intended to explore the pattern of use of mobile phones among patients, and understand patients' perceptions of a potential mobile phone-based intervention to promote adherence in this setting. The appropriateness of the intervention in this setting and implications of the preliminary study findings are discussed in this report.

# Annexure V – E-Learning Portal for Health Care Professionals in HIV

URL: <http://www.khpt.org.in/samasthahelp/>

**HeLP** HIV AIDS e-Learning Portal  
St. John's National Academy of Health Sciences, Bangalore.

The Online Portal for Continuing HIV AIDS  
Medical and Nursing Education



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The St. John's National Academy of Health Sciences, Bangalore, through its partnership with the Karnataka Health Promotion Trust (KHPT), is the implementing partner for the capacity building component of the USAID | INDIA funded Samastha Project. This project aims to build capacity primarily in the rural sector with a focus on providing comprehensive care and support to PLHIV. One of our objectives is to build capacity of care & support centers in 11 districts in Karnataka.

This HIV e-Learning Portal (HeLP), a key aspect of the capacity building component of the USAID | INDIA funded "Samastha" project, aims to enhance the knowledge and skills of medical, health and community professionals in prevention of HIV and comprehensive care & support of PLHIV through a dynamic internet based Portal.



#### ■ Online CME

The CME will be in the form of "case based discussions" and the topics to be covered will be based on the identified core competencies. Each course – HIV AIDS basic and HIV AIDS advanced - will consist of many modules. Each of the modules will consist of one or more sessions which will cover one or more of the core competencies. At the beginning and end of each session there will be a pre and post test in the form of MCQs.

#### ■ Interactive portal

This will be a portal where participants will be able to post questions regarding patient management & other issues. The program will allow for uploading of photographs (X-ray, clinical photographs, ECG, CT scans, ultrasound scans...etc.) and other materials. A panel of experts, from various specialties, will provide solutions and guide the participant in patient management.

#### ■ NEWS

This will be the central hub for news about HIV AIDS research, initiatives and events.

#### ■ FAQs

This section will provide an archive of the most frequently asked questions about HIV and evidence based answers for the same. This list will be periodically updated.

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This "HIV AIDS e Learning Portal" (HeLP), developed by St. John's National Academy of Health Sciences, Bangalore is specifically designed for the purpose of providing continuing information for educating physicians and other health care workers on HIV treatment and disease management topics. The materials available through the HeLP are the property of St. John's National Academy of Health Sciences and the Karnataka Health Promotion Trust. (KHPT) You are welcome to display and print for your personal, non-commercial use information you receive through HeLP. This material available through HeLP may be reproduced in whole or in part without permission of St. John's National Academy of Health Sciences, Bangalore or KHPT provided full source citation is given and the reproduction is not for commercial purposes.

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Note: Requirements of the EFC/PIB format may also be kept in view while preparing the DPR.

O.M.No.1 (2)-PF II/03, dt.7th May, 2003.

## **GENERIC DPR**

### **XII (a) Disaster Risk Reduction/Mitigation**

This section focuses on natural disasters viz. floods, earthquakes, cyclones and landslides that may impact on the project and the physical and regulatory measures to be taken based on design and engineering/ technology so as to prevent or mitigate the effect of such disasters including the possible impact the project may have on the population or the environs.

A risk assessment is to be conducted which includes: identification of different types of risks to which the project area is vulnerable, probable vulnerability of the project components, description of the risk; risk analysis based on likelihood and consequences; and evaluation of risk for prioritization.

Identification will also be done of local land-use management directives, legislations, building codes and building-use regulations compliance to which will prevent/mitigate the identified risks. Risk treatments (engineering and non-engineering options) based on objective criteria will be identified and prioritised and included within the budget.

Some specific items on which information will be furnished in all cases, are given below:

1. Siting of Project
2. Nature/ Type of Project
3. Hazard risk to the project
4. Mitigation/Reduction of Risk
5. Impact of the Project on the Environs and the People

A detailed checklist as enclosed will be attached with the Detailed Project Report.

**Note:** Measure against blasts/terrorism related activities do not form part of this suggested activity.

## **Check List for Natural Disaster Impact Assessment**

Name of the Project:

State:

District:

Project Estimate Rs. \_\_\_\_\_ (Lakhs)

### **1. Siting of the Project**

1.1 Location of Project site

- Latitude
- Longitude
- Height above mean sea level

1.2 Earthquake Zone (Any known geological fault near by may be listed)

1.3 Flood Proneness & Vulnerability:

- Past history of floods in the area
- Observed Highest flood level
- Frequency of flooding
- Depth of flooding
- Duration of flooding
- Damage/loss (maximum, average, potential)

1.4 Cyclone Proneness (If close to sea coast) & Vulnerability:

- Frequency and Intensity
- Wind speed zone - information on highest wind speed
- Distance of site from sea coast
- Record of past storm surge

1.5 Landslide Proneness & Vulnerability:

- Location of Hill slope vis-a-vis the project's location
- Past history of landslides,
- Possibility of mud flows/rock falls/snow avalanches etc.

1.6 Tsunami proneness (If close to sea coast) & Vulnerability:

- Past history

1.7 Existence of Dams or Barrages upstream

- Distance from the project. Was dam breach effect considered on the project?
- If so, have the dam break analyses been carried out? Has their impact on safety of the project been evaluated?

## **2 Nature/Type of Project**

2.1 All the projects of the nature/type mentioned below are liable to damage by natural disasters and inadequacies of design or any of their components is likely to accentuate the vulnerability of the area to the disasters and/ or lead to rise in damage/loss to lives, property, livelihood systems environment,

- Communications: towers, lines, building
- Transportation: Roads, Railways, Bridges, Tunnels
- Power: Power houses, sub stations, power lines
- Water Resources: Dams, barrages, appurtenant structures, river training structures, Canals
- Habitations: townships- planning from the point of view of safety against hazards
- Water supply and sanitation projects including water supply and sewer lines
- Ports & Harbors
- Building projects
- Any other

## **3. Hazards Risk to the Project**

Have the following been evaluated:

- Probable maximum seismicity at site and site dependant seismic design parameters
- Probable Maximum storm surge,
- Probable Maximum wind speed
- Probable Maximum precipitation
- Probable maximum flood discharge and level
- Probability of occurrence of floods, earthquakes, land slides, mud flows, avalanches, cyclones, tsunamis
- Soil liquefaction proneness under probable earthquake intensities

## **4. Mitigation/ Reduction of Risk:**

4.1 There are specific codes, manuals, guidelines etc. developed by Bureau of Indian Standards, NDMA, and concerned organizations for sitting, design, construction and maintenance of various type of infrastructures. Indicative and not exhaustive list of some of them is at Annex-1.

4.2. Have the relevant BIS codes and guidelines been complied with?

4.3. Have adequate safeguards to meet the risks of natural hazards as evaluated at para 3 above, been adopted?

## **5. Impact of the Project on the Environs and the People**

Has the impact of the project on the environment and the people been studied with the respect to the following and what mitigation measures have been adopted? An illustrative but not exhaustive list of scenarios is given below:

5.1 The earthquakes and landslides may damage the pipelines to transport and storages to store harmful and inflammable materials and gases in the project area. Has any study been made to asses the danger to the environment and the people posed by those occurrences? And if so what measures have been proposed?

5.2 The railway lines and roads run across the drainage lines and if adequate waterways at appropriate locations are not provided, it may result in rise in water level and drainage congestion in upstream areas. Has this aspect been studied and if so, what mitigation measures have been proposed?

5.3 Land- slides triggered by earthquakes as well as due to inherent instability of slopes accentuated by rains may lead to blockage of drainage channels and accumulation of water up-stream. These blockages may collapse due to their inherent instability or aided by rains. Men, machines and explosives can also be used to remove blockages and reduce flooding upstream. These lead to sudden release of water and flooding and erosion in down-stream areas. It may be stated whether any study has been carried out in this regard and what mitigation measures have been proposed?

5.4 As all the projects involve acquisition of land and influx of large number of people in the area to take up construction activities, it may result in deforestation and soil erosion. Measures for prevention of deforestation and arresting soil erosion are required to be taken. It may be stated whether any study has been carried out in this regard and what mitigation measures have been proposed?

5.5 If the project involves storage of water, failure of any component may cause flooding and large scale damage to lives, property and infrastructure etc. Please state whether any study has been made and if there is a possibility thereof, what measures have been proposed to meet the eventuality?

**LIST OF CODES/GUIDELINES FOR SAFETY OF BUILDINGS/STRUCTURES FROM  
NATURAL HAZARDS**

*As these codes and guidelines are being updated from time to time by different Institutions/organizations therefore the latest updated version shall be refereed at the time of conceiving a project. List has been attempted which may not be complete.*

**I For General Structural Safety**

1. BIS National Buildings Code 2005
  2. IS: 456:2000 "Code of Practice for Plain and Reinforced Concrete.
  3. IS: 800-1984 "Code of Practice for General Construction in Steel
  4. IS: 801-1975 "Code of Practice for Use of Cold Formed Light Gauge Steel Structural Members in General Building Construction
  5. IS 875 ( Part 2):1987Design loads ( other than earthquake ) for buildings and structures Part2 Imposed Loads
  6. IS 875 ( Part 4):1987Design loads ( other than earthquake ) for buildings and structures Part 4 Snow Loads
  7. IS 875 ( Part 5):1987Design loads ( other than earthquake ) for buildings and structures Part 5 special loads and load combination
  8. IS: 883:1966 "Code of Practice for Design of Structural Timber in Buildings
  9. IS: 1904:1987 "Code of Practice for Structural Safety of Buildings: Foundation's
  10. IS1905:1987 "Code of Practice for Structural Safety of Buildings: Masonry Walls
  11. IS 2911 (Part 1): Section 1: 1979 "Code of Practice for Design and Construction of Pile Foundation Section 1
- Part 1: Section 2 Based Cast-in-situ Piles
- Part 1: Section 3 Driven Precast Concrete Piles
- Part 1: Section 4 Based precast Concrete Piles
- Part 2: Timber Piles
- Part 3 Under Reamed Piles
- Part 4 Load Test on Piles

## **II Protection from Cyclones/Wind Storms**

12. IS 875 (3)-1987 "Code of Practice for Design Loads (other than Earthquake) for Buildings and Structures, Part 3, Wind Loads"

13. IS:2911 – 1973 "Guideline for construction of cyclone shelters".

14. IS: 15498 – 2004 "Guidelines for improving the cyclonic resistance of low rise houses & other building/structures.

15. Guidelines (*Based on IS 875 (3)-1987*) for improving the Cyclonic Resistance of Low rise houses and other building.

## **III For Earthquake Protection**

16. IS: 1893-2002 "Criteria for Earthquake Resistant Design of Structures (Fifth Revision)"

17. IS:13920-1993 "Ductile Detailing of Reinforced Concrete Structures subjected to Seismic Forces -

Code of Practice"

18. IS:4326-1993 "Earthquake Resistant Design and Construction of Buildings - Code of Practice (Second Revision)"

19. IS:13828-1993 "Improving Earthquake Resistance of Low Strength Masonry Buildings - Guidelines"

20. IS:13827-1993 "Improving Earthquake Resistance of Earthen Buildings - Guidelines",

21. IS:13935-1993 "Repair and Seismic Strengthening of Buildings - Guidelines"

## **IV Flood Management/ River Valley Projects**

22. IS: 4189 -1985 "Guide for preparation of project report for river valley projects".

23. IS: 4410 (Part 3): 1988 "Glossary of terms relating to river valley projects: Part 3 River and river training".

24. IS:4410 (Part 11): Sec 5 -1977 "Glossary of terms relation to river valley projects: Part 11 Hydrology Section 5 Floods".

25. IS:4410 (Part 21): 1987 "Glossary of terms relating to river valley projects :Part 21 Flood control".

26. IS:11532 - 1995 "Construction and maintenance of river embankments (levees)- Guidelines"

27. IS: 12094 – 2000 "Guidelines for Planning and Design of River Embankments (Levees)".

28. IS: 14262 - 1995 "Planning and design of revetments- Guidelines".
29. IS: 5477 (Part 4): 1971 "Methods for Fixing the capacities or reservoirs: Part 4 Flood storage".
30. IS: 7323 – 1994 "Operation of Reservoirs – Guidelines".
31. IS: 8408 -1994 "Planning and design of groynes in alluvial river – Guidelines".
32. IS: 14815 – 2000 "Design Flood for River Diversion Works- Guidelines".

### **V Landslide Hazard**

33. IS:14458 (Part 1): 1998 Guidelines for retaining wall for hill area: Part 1 Selection of type of wall.
34. IS:14458 (Part 2): 1997 Guidelines for retaining wall for hill area: Part 2 Design of retaining/ breast walls
35. IS:14458 (Part 3): 1998 Guidelines for retaining wall for hill area: Part 3 Construction of dry stone walls
36. IS:14496 (Part 2): 1998 Guidelines for preparation of landslide – Hazard Zonation maps in mountainous terrains: Part 2 Macro-Zonation.
37. IS: 14680: 1999 Guidelines for land slide control
38. IS: 14948: Code of practice for Reinforcement of Rock Slopes with plain edge of failure
39. BIS 12023: Code of Practice for Field Monitoring and Movement of Structures using Tape Extensometer
40. BIS: 14804: Guidelines for Siting, Design and selection of materials for Residential Building in Hilly

Areas

### **VI For Protection of Saline Embankments and Coastal Canals**

41. IS:8835 – 1978 "Feasibility study and preparation of preliminary project report".
42. IS: 10635 – 1993 (reaffirmed 2003) "Freeboard requirements in embankments and dams".
43. IS:12169 – 1987 – "Criteria for design of small embankment dams".
44. IS: 8835-1978: Feasibility study, preparation of
45. IS:12094-1978: Preliminary Project Report

46. IS: 10635-1993 (reaffirmed 2003): Freeboard requirements in embankments and dams
47. IS: 11532-1995 (reaffirmed 2005): Construction and maintenance of river embankments
48. IS: 12094-2000 (reaffirmed 2005): Planning and design of river embankment
49. IS: 12169-1987: Criteria for design of small embankments dams

*Annexure -2*

**LIST OF INDIAN ROAD CONGRESS (IRC) CODES/MANUALS**

1. IRC: 5-1998 (Seventh Revision) - "Standard specifications and Code of practice for Road Bridges, Section 1- General features of Design".
2. IRC: 10-1961 - "Recommended Practice for Borrow pits for Road Embankments Constructed by Manual Operation".
3. IRC: 34-1970 - "Recommendations for Road Construction in Waterlogged Area".
4. IRC: 36-1970 - "Recommended Practice for the Construction of Earth Embankments for Road Works".
5. IRC: 45-1972 - "Recommendations for Estimating the Resistance of Soil Below the Maximum Scour Level in the Design of Well Foundations of Bridges".
6. IRC: 52-2001 (Second revision) – "Recommendations about the Alignment Survey and Geometric Design of Hill Roads".
7. IRC: 56-1974 - "Recommended Practice for Treatment of Embankment Slopes for Erosion Control".
8. IRC: 75-1979 - "Guidelines for the Design of High Embankments".
9. IRC: 78-2000 (Second Revision) – "Standard specifications and Code of practice for road, bridges, Section VII – Foundations and substructure.
10. IRC: 89-1997 (First Revision) - "Guidelines for Design and Construction of River Training and Control Works for Road Bridges".
11. IRC: 104-1988 – "Guidelines for Environmental Impact Assessment of Highway Projects".
12. IRC: SP: 13-2004 (First Revision) - "Guidelines for the Design of Small Bridges and Culverts".
13. IRC: SP: 35-1990 - "Guidelines for Inspection and Maintenance of Bridges".

14. IRC: SP: 42-1994 - "Guidelines on Road Drainage".
15. IRC: SP: 50-1999 - "Guidelines of Urban Drainage".
16. IRC: SP: 54-2000 – "Project preparation Manual for Bridges".
17. IRC: 6 – 2000 – "Standard specifications and code of practice for road bridges – section: II Loads & stresses".
18. IRC: SP: 57-2001 – "Guidelines for quality systems for road construction".
19. IRC: 28-1967 – "Recommendation of road construction in water logged areas".
20. IRC: SP: 26-1984 – "Project preparation manual for bridges".
21. IRC: 87-1984 – 'Guidelines for design and erection'.
22. IRC: 21-2000 – "Standard specification and codes for roads and bridges".
23. IRC: SP: 20-2002 – "Rural roads".
24. MORT & H Pocket Book for Highway Engineers,2002 (Second Revision)
25. IRC: SP33:1989 Guidelines on Supplemental Measures for Design, Detailing & Durability of Important Bridge Structures.

*Annexure -3*

#### **RAILWAY CODES & MANUALS – RDSO PUBLICATIONS**

1. RBF-20: "Estimation of design discharge based on regional flood frequency approach for sub-zones 3(a), 3 (b), 3 (c) & 3 (e)".
2. RBF-22: "50 year 24 hour set of isopluvial maps of India maps of short duration ratios".
3. RBF- 23: "Validation of flood estimation report No. UNT-7-1983 for sub-zone- 3 (f)".
4. RBF-24: "Validation of flood estimation report No. 3/1980 for sub-zone-3 (f)".
5. RBF-25: "Estimation of design discharge based on regional flood frequency approach for sub- zone - 3 (f)".
6. RBF-26: "Validation of flood estimation report No. UGP -9-1984 for sub-zone-1 (e)".
7. RBF-27: "Validation of design discharge based on regional flood frequency approach for sub-zone- 3 (e)".
8. RBF -28: "Estimation of design discharge based on regional flood frequency approach for sub-zone-3 (i)".

9. RBF-29: "Estimation of design discharge based on regional flood frequency approach of sub-zone-3 (b)".
10. RBF-32: "Validation of flood estimation report no.c/16/1988 Subzone -1 (b) (chambal basin)".
11. RBF-33: "Estimation of design discharge based on regional flood frequency approach for sub- zone-1 (d) (sone basin)".
12. RBF-34: "Validation of flood estimation report no.S/15/1987 sub-zone-1 (d) (sone basin)".
13. GE-1: "Guidelines- Erosion control on slopes of banks and cuttings".
14. GE-6: "Guidelines for earthwork in conversion projects".