Methodology of Content Development
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What is content
The term content is used in the context of wide use of ICTs and Internet. Content is piece of information or knowledge to meet any specific need. Content may be text, picture, sketch, design, audio & video clip/file, animation or their combination. Using content one can fulfill his/her requirement; find solution of his/her problem. It is prepared by experts of different sections.

Importance of content
Content is the heart of any information system. Education, business, security, health care, and any other human activities are performed through exchange of information. Information and knowledge is considered as one of the basic economic resources along with land, labour and capital. Access to information is considered as basic human rights and pre-requisite of a democratic society.

Content is information and knowledge presented in specific form suitable for specific target group. User-friendly and need-based content can solve many livelihood problems. In developing countries, where literacy rate is a problem, content in local language is a basic requirement for the local people.

Classification of content
Content is classified by it's channel of delivery (ICT based and non-ICT based) and focus. ICT-based content may be presented in visual & voice form. (Visual – text, picture, animation, video etc.). Non-IT based includes books, journals, posters, banners, booklets, leaflets etc. Classification of content focus means content on specific area of needs. For example, content on agriculture, health, medicine, education, banking, engineering, etc.

Content and target audience
For development of content, a content developer needs to know the target users and their demand. For this purpose, the developer needs to conduct need assessment exercise among the potential user groups using various methodologies. The group of people could be the underprivileged poor people, students, professionals, policy makers, researchers etc.

Identification of demand for content
In this section, we need to answer the question why we should develop content. The objective for content development must be defined. The objectives could be poverty alleviation, improvement of livelihood, better education system, better management system etc. The information needs must be identified through individual interview with representatives of all sections like, schoolteachers, members of local government authorities, NGO workers, youth groups, farmers, small traders and women. Delivering demand-based information through trial method can help identifying the specific livelihood queries of the people. This also helps to develop a priority list of content to be prepared.

Content specification
To prepare content specification information need assessment is important among the end-users. For identification of requirement, end-user's opinion must get priority. Once the priority is defined it is important to decide about the type of content: text, audio or video. Based on the type of content technology for content should be defined. The language should

also be defined, as many languages are still not fully compatible for content development. So, based on available technology one should choose the type of content.

Content development life-cycle
The life cycle presented below is applicable for text based content.

The life-cycle consists of some steps :

Step I: Identify target audience and type of content (text, voice, image, video, animation)

Step II: In this phase, we need to develop a team with choosing young scholars in different livelihood areas on which content development was focused. For example, an agriculture graduate can be invited for agriculture content development, medical graduate for health content development, etc. The team must be trained on how to develop an easy-to-communicate format for the end-user, must be provided with a set-up of computer with necessary facilities of internet, telephone and software for typing, converting into web-enabled format and image editing and other activities.

Step III : Content resources partners must be involved in this phase for ensuring steady flow of content development process; and for ensuring authentication of developed content.

Step IV : On developing content initial work is to understand the urgency of need of the recipients. The information needs subsequently must be ranked according to content availability in secondary sources as well as strength of the content development team. At this step a separate content structure for each thematic area can be prepared. For example, the structure suitable for agriculture content development might not be as of health or appropriate technology.

Step V : At this stage content raw materials are to be collected from various sources, i.e. research reports, report on technical innovations, books, periodicals on relevant topics; collected information from different service providers about service type, procedure, cost etc. within the mobilization point of the end-users.

Step VI : The content development activities are as follows:

- Compilation of information from raw contents and put into a prescribed format
- Digitization of content with all references as well as used own domain knowledge of the subject matter specialists, who are involved in the content development process
- Attachment of relevant pictures where applicable and possible
- Development of a database system and data entry for a directory database
- Validation of content by infomediary and end-users to get first hand feedback on content structure, information type and user-friendliness
- Posting of content in a common resource pool (CD based offline system).

Step VII : As the task of content development is a continuous venture, user feedback and questions must be continuously analyzed and new demands are identified to be incorporated in the existing content base. The steps for content upgrade are as follows:
- Compile regular feedback from the service recipients on different issues
- Collect raw information and materials from different sources based on the demand and feedback
- Conduct survey on service provider to upgrade directory database
- Add newly developed/edited content into the common browser

Consider copyright issue
For information of secondary source, copyright issue is very important. We must have written or verbal consent of the source and recognize the source as per the Intellectual Property Rights law within the country. The content developer also has to have a copyright of the developed content.

Among the copyright options, Creative Commons Licenses is a popular one. It depends on the version and comprises a selection of four conditions :

- Attribution (by) : Licensee may copy, distribute, display and perform the work and make derivative works based upon it only if they give the author or licensor the credits in specified manner.
- Noncommercial (nc) : Licensee may copy, distribute, display and perform the work and make derivative works based upon it only for noncommercial purposes.
- No Derivative Works (nd) : Licensee may copy, distribute, display and perform only verbatim copies of the work, not derivative works based upon it.
- Share a like (sa) : Licensee may distribute derivative works only under a license identical to the license that governs the original work.

The following are the possible combinations of Creative Commons License :

1. Attribution alone
2. Attribution + Noncommercial
3. Attribution + NonDerives
4. Attriution + ShareAlike
5. Attribution + Noncommercial + NoDerives
6. Attribution + Noncommercial + ShareAlike

The GNU General Public License (GNU GPL) is a widely used free software license, which is said to grant the recipients of a computer program the rights of the free software definition and uses copyleft to ensure the freedoms are preserved, even when the work is changed or added to.

Method of dissemination of content
For identification of the method of dissemination of the developed content, it is very important to assess the existing information delivery channels, their effectiveness and lacking. The methods can be through internet, mobile phone, informediary and other promotional means i.e. posters, banners etc.

Content access skill need
To access to the developed content, we have to measure the skill of the user for this. If needed, training should be provided.

Analyze effectiveness of content
To analyze the effectiveness, we can survey the users with the raw content, collected from secondary sources. After getting the result of the survey, we can finalize the content. We can also conduct impact assessment of the developed content and identify the effectiveness or gap.

Sustainability of content development activities
Content development is a continuous process. The developed content must be updated in suitable intervals. Skill training can be repeated, when needed.

Case Study
This is a case study of the research work of D.Net, Bangladesh, the objective of which was to ensure ICT (including Internet) based of access to information for the improvement of rural livelihood and poverty alleviation. The project envisaged to experiment a village information centre (Pallitathya Kendra), owned by the rural poor people, with a set of services for the rural people. A number of village experts are planned to run the centre as "infomediary", trained by the project team. The project planed to experiment a business model of the centre, which tried to combine various types of necessary services demanded by the rural people and earn money to cover both fixed cost and variable cost over a certain period. The centre is planned to be backed by a content development and update centre, which develops the content necessary for the rural livelihood activities.

Conceptual Framework

One of the fundamentals of the conceptual framework for access to information for rural livelihood understood information needs for the poor by the poor. In devising approaches and tools for improvement of rural livelihood and poverty alleviation generally top-down method provides wrong signals and leads towards wastage of resources. Thus the identification of information needs is to be conducted with a bottom-up approach.

Broad Objective of the full cycle of the research was to ensure ICT (including Internet) based access to information for the improvement of rural livelihood and poverty alleviation. The objective of the phase I was to understand and identify information needs and effective delivery channels foe the rural livelihood. A special emphasis was given to the information needs of the rural poverty groups.

The research components of phase I was as follows:

a. Understanding information needs of the rural community in Bangladesh
b. Assessment of Effectiveness of Existing Institutions Supplying Information in the Rural Areas and Identification of gap
c. Understanding Supply Perspective Of Rural Livelihood Information
d. Development of taxonomy of Contents
e. Development of test contents for testing the effectiveness of the channels
f. Content Experimentation For Local Conditionality

Methodology of the research

Initially ten areas through out the country were selected using some predefined criteria. The criterion are diversity of economic activities, distance from the town centers, access to electricity, access to telephony, transport infrastructure, level of education of the population, availability of social infrastructure, availability of NGO etc. After visiting those villages five villages were finally selected for through investigation.

In the first round, each of the villages selected was studied separately. The field research used the well known PRA tools and techniques, of course, customized according to the requirements of this particular research. Based on the findings of the first round field research village report was prepared for each village. In the second round, the same teams conducted a second round fieldwork in the same villages mainly to share the findings from the villages, to collect additional information and to test web based contents. Based on the findings of the filed research web based contents for selected issues have been developed and tested in the

filed for suitability. For developing the contents several institutions have been visited by the content team and content development materials have been collected. In addition to identification of information needs, this round addressed the issues related to villagers' willingness to pay for the information required by them. The findings of the second round field work were analyzed and content test report has been prepared. In the third round, content validation was performed in each village for finalizing the shape of the web portal name www.pallitathya.org.

Existing Methodologies (in Bangladesh)

I. Content Development Methodology followed by Bangladesh Center for communication Programs (BCCP)

Steps to follow

1. Distribute
2. Finalize Material
3. Revise
4. Pretest Material
5. Revise
6. Technical review
7. Develop Material
8. Design a massage based on the concept
9. Develop a message concept

II. Content Development Methodology Followed by Dhaka Ahsania Mission (DAM)

Step 1	Need Assessment		
Step 2	Curricular Unit Preparation		
Step 3	Material Preparation		
		3.1 Selection	
		3.2 Adaptation	
		3.3 Development	
			3.3.1 Folk Media
			3.3.2 Audio-Visual
			3.3.3 Written Material
Step 4	Pre-test		
Step 5	Revision and Finalisation		
Step 6	Duplication		
Step 7	Application		
Step 8	Evaluation		

Survey Results & Country Compounds

Introduction: The survey conducted aimed to understand the state of content development by the partners of PANL10 project. It was observed that the partners responded to the queries with different understanding of the questions. After reviewing the report, the partners may want to revise their answers, which are welcome to provide more complete picture of the status.

Partners' Involvement in Content Development: Six partners are involved in content development of various kinds [Figure 1]. Out of ten partners, 3 [Bhutan, Laos and Vietnam] did not respond to the questionnaire. Only one partner [Mongolia] informed that it is not involved with content development activities.
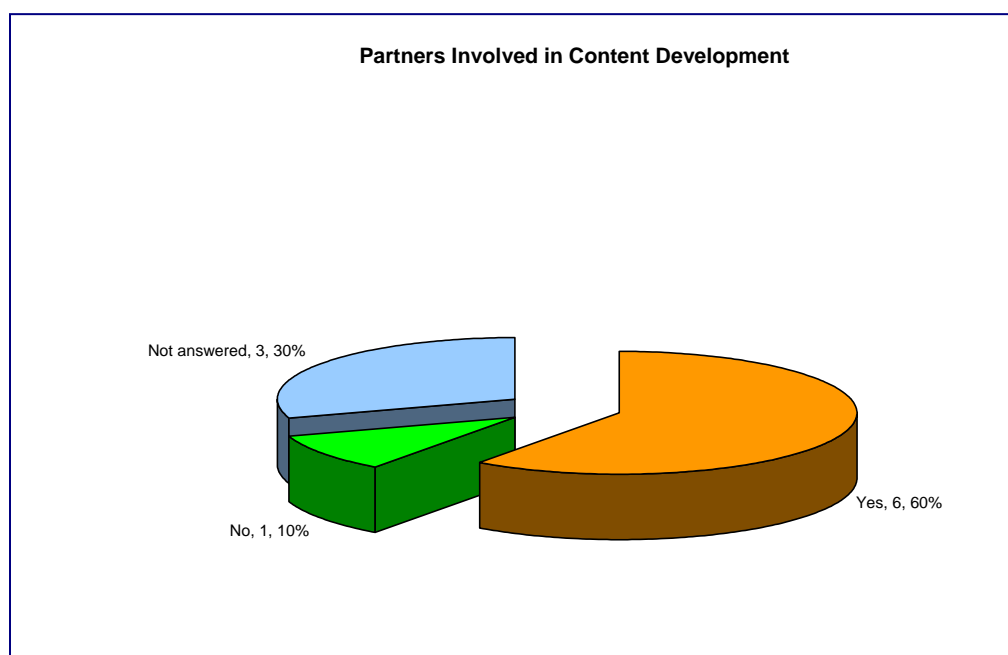
Partners Involved in Content Development

Not answered, 3, 30%

No, 1, 10%

Yes, 6, 60%

Figure 1: Partners Involved in Content Development

Target Audience of Developed Content: Two major trends in content development have been identified: one, the partners develop content for localization communities, i.e, orgasniations who are involved in local language computing and develop various kinds of training manuals in one of the national languages and in English. The second trend is content development is still confined within the materials development which is related to organisations' own purpose and for the purpose of project related reporting. Only two partners are involved in content development in local language for community users related to livelihood issues (Bangladesh and Sri Lnaka). Students and teachers are also among target users in Pakistan and Sri Lanka. Afghan partner develop content for local IT magazine. Local language open source software (operating system and applications) are well developed by the partners in Nepal, Pakistan and Sri Lanka. The partners in these countries develop guidebook and manual to be used by the open source communities. The training manuals for using localized operating system and applications are very useful for spreading local language computing in the project countries. The project at this phase may target packaging and spreading of local language platform.

Content Type: In terms of variety, the partners develop content for different channels of delivery, through PC, Internet, TV, multi-media projector and radio. Four partners develop text and picture-based content, while two of them publish e-book and e-learning materials (text and image, audio and video conference). These e-book and learning materials are related

to teaching of ICT and open source local language computing. Besides, video and animation are available both for off-line and on-line use. Radio content (Programme on ICT), TV content, on-line interactive tools are also developed by partners. If a reference list of all materials developed by the partners can be prepared, it would be useful for replication, translation.
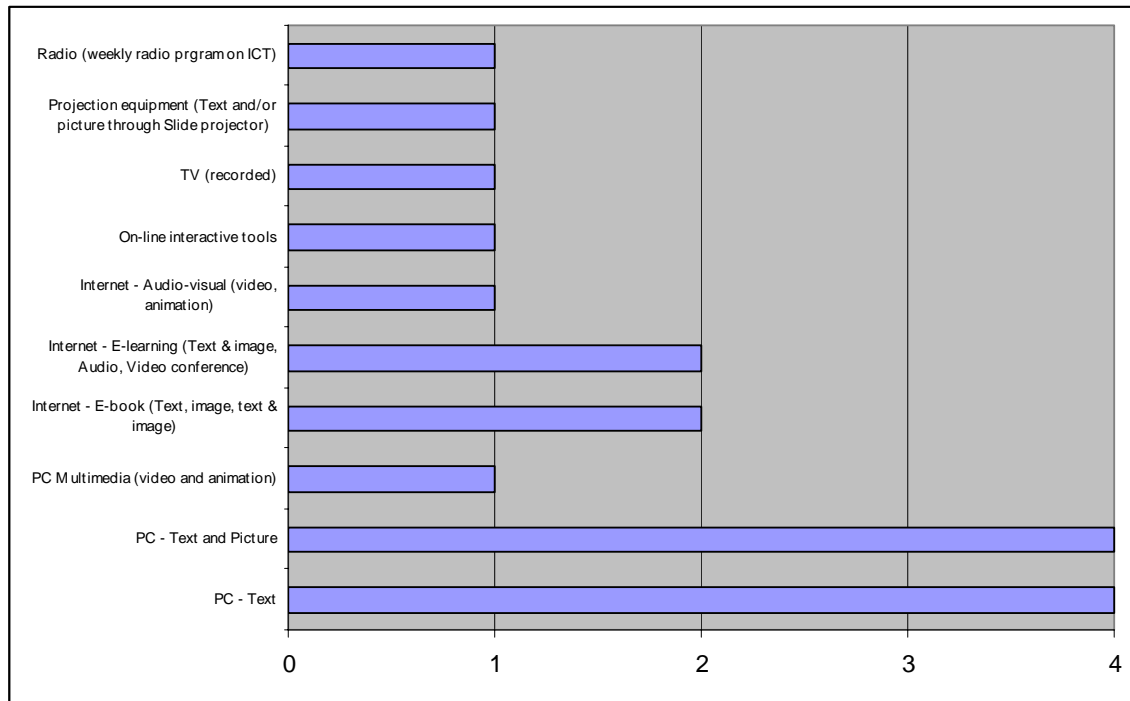

Figure 2: Content Type Developed by Partners

Source of Content and IPR: Majority of the partners use printed materials as a source of content. These materials are published by different domain institutions, including the government. Furthermore, three partners also use web content for production of local language contents. One organisation generates original content developed by in-house experts and two organizations use in-house documentation as a source of content.
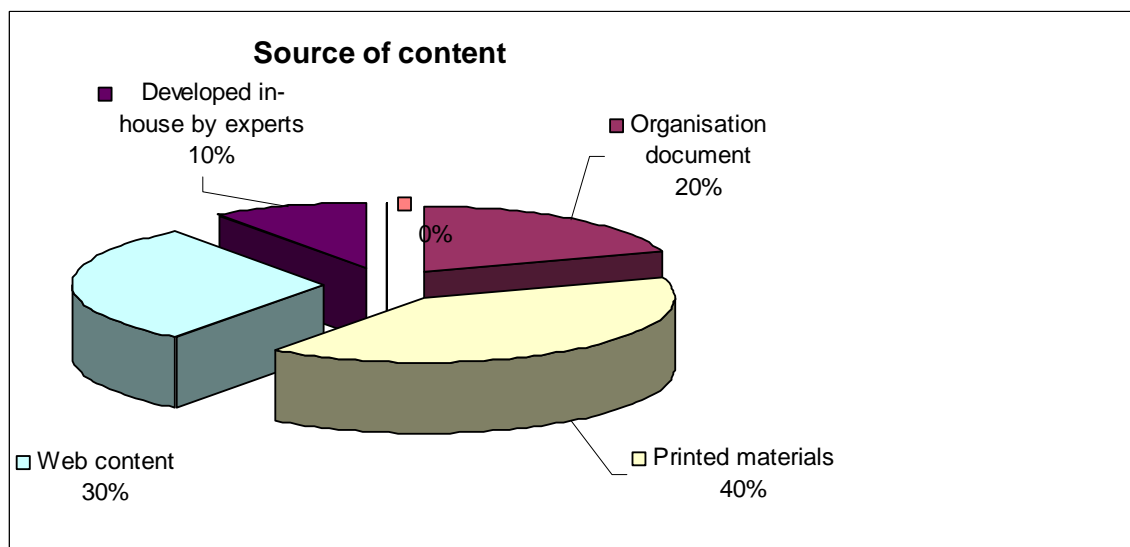

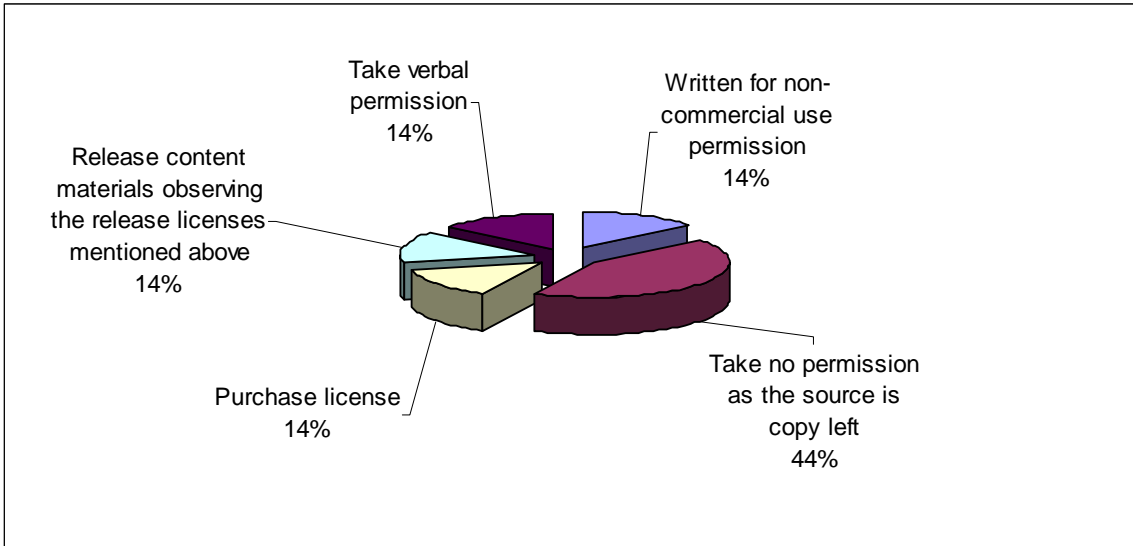**Figure 3: Source of Content used by Partners**

Figure 4: Management of IPR Obligation by the Partners

The question was understood by the responding partners differently. Only one organization takes written permission for the source materials, which are used in content development. On the other hand, three organizations use only copy left materials for content development, which helps avoiding any complications. One organization mentioned that they purchase license of source materials for content development. It would be appropriate to understand in more details, how they purchase and how much it costs. Another response is not clear (release content materials observing the release licenses mentioned above).

IPR in Case of Content Release: The content developing institutions did not mention clearly (except one partner) about licensing policy. Only one organization mentions about GNU free documentation license. For all others it is not clear whether they follow specific type of licensing. It would be good if they can identify any specific license type they use. If they are not sure, the project secretariat can help them in this regard. Three orgnisations mentioned that the content which they develop is not protected. It is not clear what does it mean: does it mean that if any organizations even use the content for commercial purpose, they do not have any complain? The answer partially protected is also not clear: does it mean that some of the content for free and other are protected, or, some rights for all content developed are left and some rights are preserved? It would good to know which rights are left and which rights are protected.
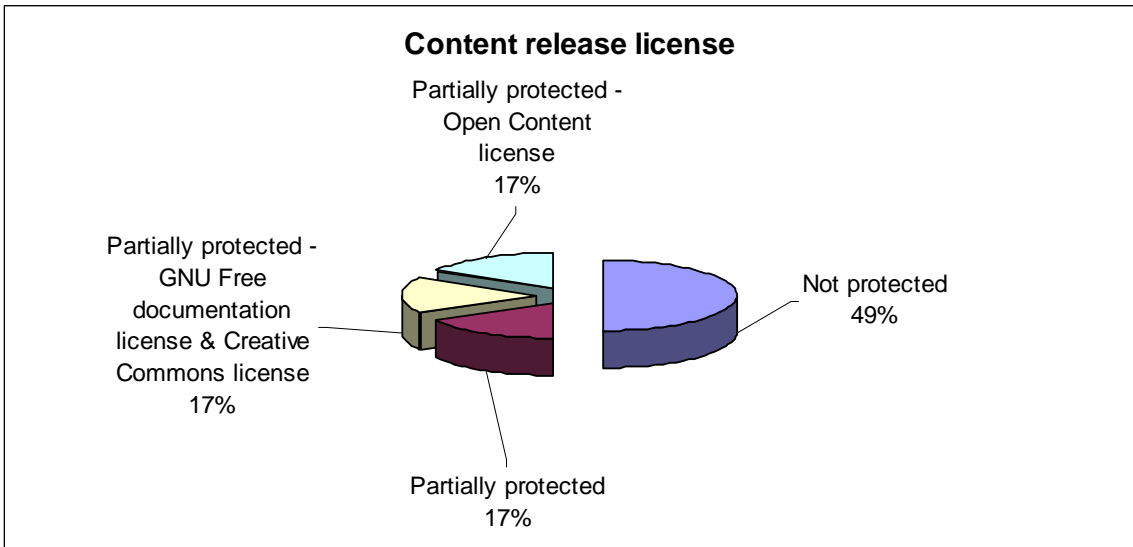

Figure 5: Status of IPR for Content Release by the partners

Content Development Tools: Three orgnisations use a number of tools for content development, ranging from word processor, open tools and ending to proprietary tools and CSS [Figure 6].
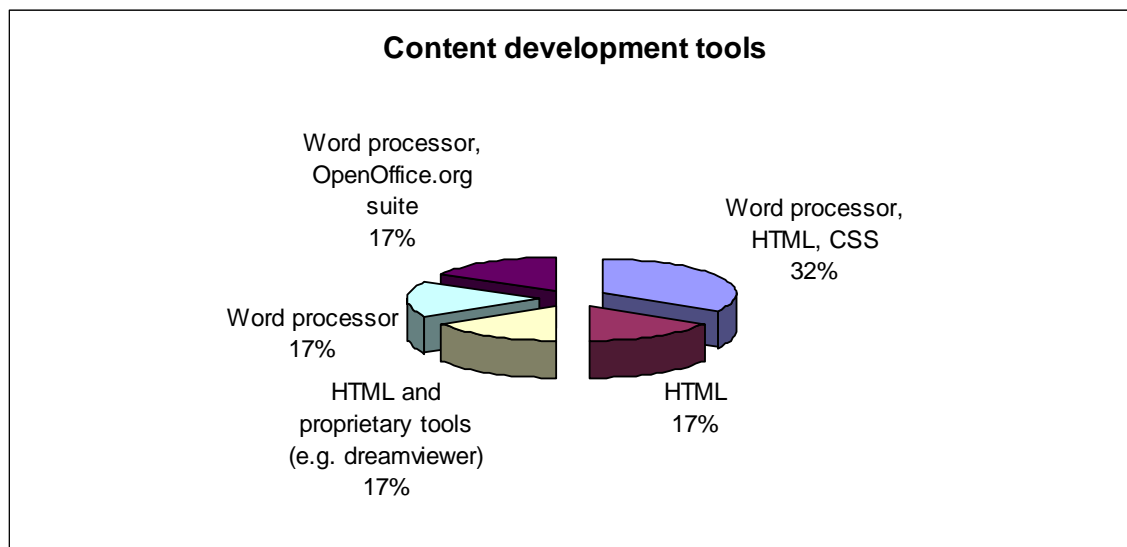
Content development tools

Word processor, OpenOffice.org suite 17%

Word processor 17%

HTML and proprietary tools (e.g. dreamviewer) 17%

Word processor, HTML, CSS 32%

HTML 17%

Figure 6: Content Development Tools

Four partners use different types of content management systems [Figure 7]. One organsiation use mambo, drupal, joomla, LCMS. Other three uses PAN wiki, grangonfly and joomla. Two orgnisations do not use any CMS. The experience of using different types of CMS and experience in localizing them can be shared among the partners.
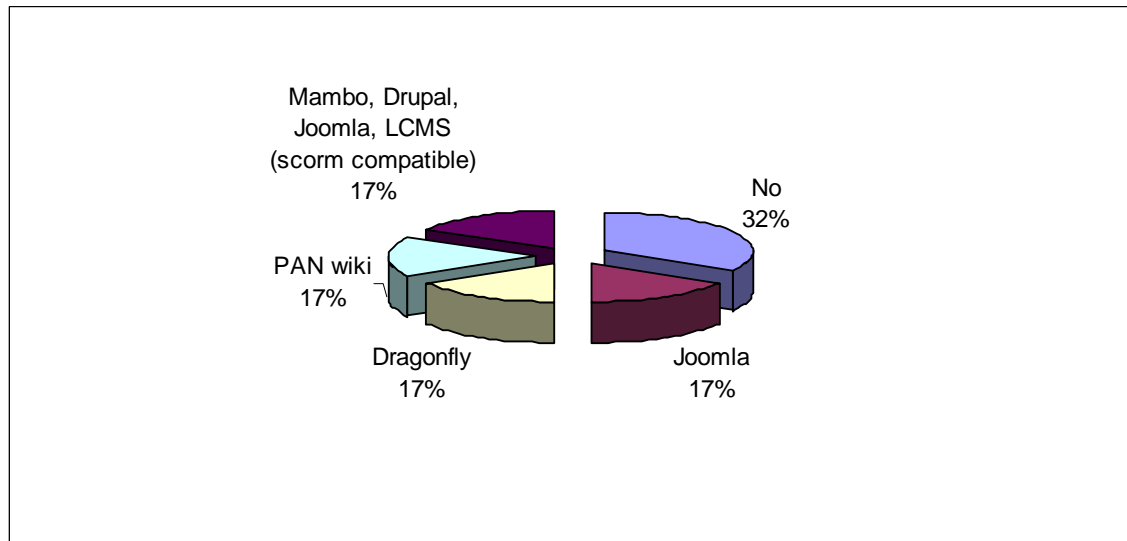
Mambo, Drupal, Joomla, LCMS (scorm compatible) 17%

PAN wiki 17%

Dragonfly 17%

No 32%

Joomla 17%

Figure 7: Use of Content Management Systems by the Partners

Methodology of Content Selection and Audience Selection: Only two orgnisations select content based on orgnisations' own decision. Others follow some kind of methodology and they do need assessment for content selection. It would be nice if we, partners can share their content selection methodology and audience identification methodology. The content in Afghanistan is related to ICT training, both for the beginners and professionals. Bangladesh mainly develops livelihood content for community people which can be delivered from telecenters and based on need assessment survey and expert opinion. Target users of NepalLinux are people from rural & remote areas of Nepal, where the English-proficient masses is very low or absent. Hence, the target groups also are general Desktop users, who

may be students, teachers, farmers, youths etc. Target group of the localizaion guide is all free and open source researchers, developers and enthusiasts. The target groups in Nepal are selected with the intention of empowering the local people with ICT training. In Pakistan, content development is based on assumption that the target group has minimal exposure to ICTs. Based on exposure & access to ICTs, i.e. those groups with the least exposure and access are selected. The target group in Sri Lanka is Registered students and general public, which are identified through need assessment and expert opinion.

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6. Survey questionnaire for content development.