# News Media initiative to developing digital repository from public contribution: A case of SDPL Nepal

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## Abstract:

*Digital repositories have been mushrooming all around the world, but it is still rare in the developing countries like Nepal due to technological, economical and infrastructural constraints. A consortium was formed with different professionals and organizations to develop a public repository in Nepal. This initiative was fueled by the growing interest of people on new technology after they showed high degree of immunity to natural disaster during 2015 mega earthquake. This paper discusses about the challenges and the solutions employed to build digital repository in hard economic and technological constraints.*

*The news media - Voice of Library advocated and motivated stakeholders and public for the support and contribution. The repository is built with volunteer efforts, without the help from major donors. The project used old donated computers, open source software, and volunteers. The core team digitizes books, maintain the infrastructure and manage the submitted items. Harvesting web might seem easiest and obvious way for developing contents to the eyes of hi-tech community, it was however, not viable with the limited resources. Most of the collections are contributed by public and some books donated by the publishers and authors. Repository contains digital manuscripts, datasets, articles, books, news and other materials. The volunteers filter, classify, and tag the contents. The automatic keyword harvester is also used and similar items are recommended using these words. It is hosted in intranet and not fully online till now.*

*It was found that the collection growth was very slow. It took 4 full time volunteers, 23 part time volunteers and over 750 contributors a full year to collect around 6100 items. This article shares the legal, managerial, technological, economical, and ideological challenges and mistakes. It also shares lessons learnt and measures taken to cope with limitations and mistakes, which could be useful for people trying to establish similar repositories.*

**Keywords:** Digital Repository, sustainability, News Media, Economic constraint, volunteering

## Introduction

Information Technology has revolutionized the way we do our work on daily basis. It has become an integral part in the teaching learning activities around the world. With the advent of new technology, most information is born-digital. Storage, management and dissemination of information in digital form is much easier, cheaper and effective. It also has also posed severe challenge for the information seekers in the form of information overload. Most of the information that we need today is already present in the web, but the uncategorized information of the web leads to more confusion. Digital repositories have well-managed information, which is the best way for the users to find it. Digital repositories with good collection that provide free access to the information for public is the lifeline for the education services of any country.

According to Digital Library Federation (2001), Digital Libraries are organization that provide the resources, including the specialized staff to select, structure, offer intellectual access to interpret, distribute, preserve the integrity of and ensure the persistence over time of collections of digital works so that they are readily and economically available for use by a defined community or set of communities. Digital libraries bring significant benefits to the users by providing improved access, wider access, improved information sharing and improved preservation. (Alhaji, 2005) Many terms like digital library, e-library, e-resources etc. are also used to describe digital repository, but we try to stick on the term digital repository.

Although digital repositories have been mushrooming around the developed world, it is still rare in the developing countries like Nepal due to technological, economical and infrastructural constraints. There were some donor-driven initiatives to developing digital repositories by digitizing contents in Nepal. One or two have managed to develop a decent amount of collection, but they become unsustainable after donor pulls its hand. Few institutional repositories for born-digital contents are maintained by few INGOs. Biggest among them is UN publication for Nepal with about six thousand collection. There is a big buzz in government institutions and universities about digital resources, but the development has not been materialized till now. There has been no effort to make publicly accessible digital repository with diverse type of collection.

Nepal needed a long-term local initiative that not only focussed on digitization of rare books, but also the preservation of born-digital contents. The news media – Pustakalaya Aawaj and LDF advocated and motivated stakeholders and public for the support and contribution. A consortium was formed with different professionals and organizations to develop a public digital repository in Nepal. This initiative was fuelled by the growing interest of people on new technology after they showed high degree of immunity to natural disaster during 2015 mega earthquake. It took most of them at least two to three months to start the regular service, however the digital repositories could be reinstated hours after the mega earthquake.

This consortium decided to develop the current Sagarmatha Public Library into Sagarmatha Digital Public Library (SDPL). The repository was built with volunteer efforts, without the help from major donors. The project used old donated computers, open source software, and volunteers to develop digital repository from public contribution. The core team digitizes books, maintain the infrastructure and manage the submitted items.

Harvesting web might seem easiest and obvious way for developing contents to the eyes of hi-tech community, it was however, not viable with the limited resources. The harvested web content might not be in context of what the users wanted. Every day, too much information is

generated, more than we could even handle. We must select the appropriate information, which matches our context, interest and capacity. In the low budgeted repository, public contribution has very high value. Most of the collection in SDPL is contributed by the public and some books are donated by the publishers and academic organizations. The volunteers filter, classify, and tag the contents. The automatic keyword harvester is also used and similar items are recommended using these keywords. Only part of the repository has been published online. Plan to publish it in Internet has not been successful due to tough budget constraints.

It was found that the collection growth was very slow. It took 4 full time volunteers, 23 part time volunteers and over 750 contributors in addition to 2 full time paid employees a full year to collect around 6100 items. This article shares the legal, managerial, technological, economical, and ideological challenges and mistakes. It also shares lessons learnt and measures taken to cope with limitations and mistakes, which could be useful for people trying to establish similar repositories.

## Initiatives of digital repositories in Nepal

The establishment and maintenance of digital library requires a lot of technical, human, and economical resources. In the case of Nepal, only the libraries, which got external support from foreign donors, have developed digital repositories. Most of the initiatives are limited to preservation of old and rare palm-leaf scrolls and some manuscripts.

### Digital Repository initiatives in Nepal

Some institutions are involved in the collection, preservation and dissemination of digitized and born digital contents in recent times with the support from foreign donors.

Table 1: List of Digital Repositories and their status

| Institution | Supported by | Digitized content | Born-digital content | Accessibility | Status |
|---|---|---|---|---|---|
| TU Institutional repository | Internal | - | 162 | Accessible online, many empty links, downloadable | No growth after inauguration |
| MoHP | MLI, USA | 3.3k | 600 | Broken link, inaccessible IP address | Very low growth after donor support ended |
| Open learning exchange (OLE) | NLF, Canada | 1k | 7.8k | Accessible online, downloadable PDFs | Low growth after donor support ended |
| NepJOL | INASP, UK, NORAD | - | 112 journals, 798 issues, 10k articles | Accessible online, downloadable PDFs | All articles submitted by journal publishers |
| Nepal National Library | UNESCO | - | 43 | Accessible online, many empty links | No growth after inauguration |
| SJPG, CDPA | Internal | - | 350 articles | Available online, downloadable PDF | Very low growth |
| UN Digital Repository in Nepal | UN information centre | - | 6.6K | Available online after registration | Institutional repository |

Source: Respective websites as of June 2016

**Foremost among them is OLE and NepJOL**

OLE was involved in digitizing and collecting children literature with the support from NLF, Maitri foundation, Read Nepal etc. After the support stopped, reduced or changed focus, it has been only involved in adding public domain books of English literatures since 2015. It contains 8878 titles as of June 2016. There is no provision for community collaboration. It has its own in-house custom software, in Nepali interface, and the service is focussed towards schools. The primary interest of OLE has shifted from digital repository to school education.

NepJOL on the other hand is involved in cataloguing, indexing and collecting academic journals published in Nepal with OJS software. It has the rich collection of 798 issues of 112 journals published in Nepal with 10,248 articles. It is supported by INASP project. Most of the articles can be found fulltext and it is open to use. Any journal publishers meeting the criteria can register with NepJOL and send email when new issue is published.

**Other repositories not included**

Central Department of Public Administration TU, Open and Distance Education Centre TU, and Kathmandu University School of Management (KUSOM) have also started digital repository from downloaded contents recently. They mostly have downloaded and copyrighted content for internal use.

## Target audience

According to the report of Nepal Telecommunications Authority on March 2016, around half (48.3%) of the Nepalese have Internet connectivity, but they cannot access digital contents of Nepalese context. Audience is ready, but repository isn't.

## Donor Support

Nepal is one of the poorest countries with per capita annual income of about $735. From the surface above, it seems that foreign donors are very benevolent in the development of Nepal. But according to Prof. Adhikari (2013), most of the donor support is based in aid conditionality, which is very hard to attain. He also mentions that many donor agencies of the west are run in the interest of Christian missionaries, the hidden motive of which is to change the educational and governance system so as to support Christian conversion. (Adhikari, 2013) Moreover, Prof Adhikari states that most donor driven policy transfer has not worked here and projects have failed. Some authors recommend us to "See foreign assistance more as a partnership, and less as charity" (Bhattarai, 2000). He also recommends to accept aid only without conditionalities attached to it.

The libraries in Nepal have very low budget and most libraries are so enthusiastic about new development that they readily decide to start new project if they get some fund. They start project without having detailed plans, without considering their own capacities and limitations. That's why there is low level of sustainability in most digital library. Most donor driven projects fail due to the lack of the continuous interest from the initiating entity. Most libraries exclusively depend on one donor entity. If donor is gone, project is orphaned. OLE has good success rate compared to other because it depended upon more than one partners.

## Why New Digital Repository?

Some digital repositories in Nepal have decent collection, but the problem is that, most have slowed down to almost halt. In OLE, The focus of donor is changed towards other activities, and the digital repository is not growing well. NepJOL is only focussed towards listing journal articles and other online repositories concerned with their institutional goals.

The collection in most of the above listed repositories is focussed towards specific area. The news media Pustakalaya Aawaj advocated the need for general-purpose digital public repository, which could run sustainably without foreign donor support. It published articles with these issues continuously for about a year. Sagarmatha Digital Public Library is the result of the news media initiative to establish a sustainable digital library.

## How the project started

The project was started with a talk program jointly organized by Pustakalaya Aawaj and Library Development Forum (LDF) in the beginning of 2014. The talk was about the status of digital resources and library automation in Nepal. Most of the participants expressed that library automation in Nepal is satisfactory, but digital repository is not. Most of them said that the digital repositories have sustainability issues. The talk program concluded with the need of developing open and sustainable digital repository. A consortium was formed with some leaders, professionals, institutions of library movement and other library enthusiasts. The professionals included some of the prominent figures of library field in Nepal, representatives from news media Pustakalaya Aawaj, Library Development Forum, Library enthusiasts, IT and library institutions and professionals.

Development at government library would be very difficult as administrative paperwork would be very complicated and long process. The consortium decided to develop digital repository at Sagarmatha Public library which was the most trusted and easily accessible library public library for most of the participants. The members of the consortium expressed their interest to help the library by the possible means to develop a good digital public library. The consortium decided

- Develop digital Repository to at Sagarmatha Public library
- Born-digital contents collected from public contribution, managed by volunteers, and overlooked by the consortium
- Digitization of old collection to be done if budget and technical constrain allow
- Financial, technological and professional support provided by members of consortium
- News media be used extensively to create whelm about digital library
- Different forums and news media used for policy advocacy to support digital library activities
- Interns and volunteers employed to do the job without financial burdens

## Some of the key institutional partners in the consortium

### Library Development Forum Nepal

Library Development Forum (LDF) is a not-for-profit non-government organization. It is the forum of library enthusiasts, volunteers and professionals, which works for the development of libraries in Nepal. It has started and supported many libraries in Nepal. It has been involved in advocating the library development and library movement in Nepal since a very

long time. It regularly conducts trainings, talk programs, motivational programs, exposure visits, seminars and workshops for the library and the librarians in Nepal. It is the main coordinating institution for the development of Sagarmatha Digital Public Library.

### Sagarmatha Digital Public Library

It was established in 1998 by LDF It has around 32000 physical collections. The physical collection of library is automated with Libra Library Automation System. There are two full time employees, one part time employee, and some non-paid volunteers. It was renamed Sagarmatha Public Digital Library in the late 2014 to mark the start of digital library service.

### News Media Pustakalaya Aawaj (Voice of Library)

The news media *Pustakalaya Aawaj* translates to Voice of Library in English. It is the monthly magazine since February 2008. The total of 2800 copies are published per month and circulated to almost 40 percent of the libraries and almost all of the most influential libraries and policy makers for libraries in Nepal. As the name suggests, it is involved in describing, journaling and creating the general awareness about the issues of libraries in Nepal. It has been involved in policy advocacy for the development of libraries in Nepal, motivating libraries and librarians by publishing articles about current trends, developments, technology etc.

### Squad of Technical Minds

Squad of Technical Minds (STM) is the private company that develops library automation system in Nepal. Its Libra Library Automation System is the most used library automation system in Nepal with almost 75% of the market share. It supports community schools by installing Libra for free as corporate social responsibility. It has developed Libra digital library system that is used to manage, and disseminate digital resources to the public. This software was put as one of the possible candidates for the future digital library software.

## Social Awareness and Advocacy

Pustakalaya Aawaj started to create awareness and advocate for the development of digital libraries in Nepal. It started publishing the articles for motivating stakeholders to join hands in this movement. One issue of the magazine totally featured the theme of digital library. All other subsequent issues contained at least one article that featured the benefits, issues and descriptions of digital libraries around the world.

Pustakalaya Aawaj started a "Donate a digital content" campaign. It advocated and motivated many individuals and institutions to donate the digital content they created. LDF conducted 3 workshop programs in 2014 about creating, managing and building collection. Most of the digital contents are from the participants of these trainings and other stakeholders in the consortium. Following actions were taken to collect the documents

- Sending request letters to the Publisher, writers, academic institutions, government and non government organizations
- Manual request by all the members of committee
- Using news media for Advocating and motivating creators of to submit their work
- Interaction programs and meetings with the groups having large source of document

## First steps towards digital repository

Sagarmatha Digital Public Library decided to form a project plan in early 2014 and analyzed need, financial capacity, existing IT infrastructure and supporting manpower. The first step was to form the consortium central committee and sub committee.

### Forming committees

Central committee consisted of 11 members. One each from TU central department of library and information science (CDLIS), Library Development Forum, Pustakalaya Aawaj, Sagarmatha Public Library, Squad of Technical Mind, 3 Library Professionals, 2 IT professionals, and a retired government official. Following committees were formed after the formation of central committee. Each committee has 5 members.

- *News advocacy committee:* Creating news for motivation, advocacy, call for document donation, and informing public about current development through voice of library and other magazines.
- *Materials selection committee:* Selecting the contents to be included in the digital library. The selection committee featured one each senior librarian, teacher of library science, and one each subject expert of social sciences, technology, and economics.
- *Technical committee:* Primary duty to install, setup and run the Digital library system.
- *Volunteer selection and mobilization committee:* Primary duties of this sub-committee were finding and selecting interns and volunteers, motivating and mobilizing volunteers.
- *Curating committee:* Primary duties of this committee was assigning proper taxonomies to the documents, generating meta data, converting file format etc.

### Selecting the software

There were three candidate software for building digital repository. They were Dspace, GSDL and Libra digital library system. Requirements for the software:

- Support easy data migration from Calibre
- Customization possible locally
- Local technical support available in case of server crash or emergency
- Free to use and preferably open source
- Consume little resource and able to run in any platform
- Web based and secure
- Automatic keyword harvester
- User friendly with book recommender

Although Dspace is good, local manpower for customizing is not available. The local software Libra digital library system was good fit only if it could be obtained free of cost. Official request to Squad of technical mind was sent. The company not only offered it free, it also made the code open source. It also offered to make some customizations according to the requirements. It uses TF/IDF based keyword harvester and recommends other books based on keyword rank.

Although the Libra digital library supported all types of document, the photo repository has been developed separately using the open source Wordpress CMS. This is not public till now, but expected to go live soon. Yet another portal to list free Internet resource is planned, but the work has not been started yet. All these will be integrated through a common portal.

The OCR software of Google was used to convert digital image to the text. This is free software, cheap and easy to use.

**Physical infrastructures**

The digital library has different set of hardware, software and physical infrastructure requirements. There is high amount of economic burden on infrastructure development. When approached, most infrastructure could be used free of cost. Following list shows how each type of resources were obtained

- Office space provided free of cost by Kuleshwor Awas Community Center
- Old furniture of Sagarmatha Public Library used
- Internet connection bought by Library Development Forum with government support
- IBM System x3100M4 with 16 GB memory donated by Squad of technical mind
- Libra Digital library system, customized for SDPL by Squad of Technical Mind
- Workstations: some donated by users, some bought by Library Development forum
- High speed scanner allowed to be used free of cost by CDPA
- Advertising and advocacy, for creating general awareness about library movement by Pustakalaya Aawaj

**Cost**

There were very less economic burden on physical infrastructure since almost all were obtained free of cost. This had relieved SDPL from most of the financial burden. The overhead cost, tea and coffee for volunteers etc. is borne by the Library Development Forum. LDF gets yearly government grant of around $5000, from which it manages most of its activities. It also raises funds for library movement on different projects. For this project it has raised around $2200 over the 2 years. This is a volunteer based project with public contribution so it could be completed in low cost. The digital repository is populated with public contribution and there is no burden on buying the collection.

**Making preliminary collection**

The first step was to collect digital contents from the members of consortium. Only text documents were accepted in this stage. Most of the stakeholders of the consortium were professionals and already had some collection in the Calibre software which was popularized by previously conducted workshop. Training was given to more people and all of the collection came from the members and volunteers maintaining the personal resource. Initially 4145 digital contents could be collected from the collection of about 18 members.

All the collected documents were not in very good shape and quality. The selection committee filtered the contents in order to maintain good and clean collection. The selection committee included 2193 titles in total. Almost half of the total items did not comply with the selection criteria and most discarded due to copyright issues.

## The selection criteria used to screen the collection

- **Content**: The contents should be appropriate and of educational or literary quality or it has some cultural or historical values. The contents should match the context of use. Original contents are favoured though collected or compiled contents are included, if they give proper attribution to the creators.

- **Language**: The collection must be in Nepali, English, Sanskrit, Hindi or other local languages used in Nepal.
- **Place of preparation/publication**: The place where it was prepared, intended to be used, or place of publication should most preferably be Nepal or at least South East Asia. Other contents could be included if it could confirm other criteria.
- **Format of the content:** The content should be in standard format that is accessible by most of the devices and free software. Although important document can be in any other format. The content should not be password protected or encrypted.
- **Copyright:** The collection must be free, and no restriction for full access is made.

## Source of documents

### Born digital documents

Now a days most of the documents are born in digital form. There are too many documents, too many platforms, and too many formats of data that we could not store all born-digital contents. According to Neal (2015), the individual libraries cannot preserve all born-digital contents on their own. We have to select few among them, which interests us the most, which matches our context and up to our capacity to store. Scrutinizing and selection process is very important but it is very challenging and time consuming. Discarding the unintended document at source saves a lot of resources on later stage.

Long-term preservation of born digital materials was necessary. The preservation was secured by securing network and RAID storage technology. Preservation from alteration is another important issue for born digital materials. Timestamp and sha1 stored for each collection were stored.

The author or the publisher are the ones who know the most about their document, so SDPL adopted a policy which requires the people submitting information to describe the document and assign it to pre-defined taxonomic categories. Following issues were considered while collecting born-digital contents

- Virus free materials, scanned for virus during acceptance
- Encoding of ASCII and UNICODE format accepted
- Password protection, encryption and other security mechanism nullified before including to repository
- Size of document not more than the maximum allowed by web server (subject to change)

*Books donated by authors and publishers*

One of the most important and major sources of born digital documents is the books donated by authors and publishers. Several publishers were contacted and authors approached through their respective publishers for donating out-of-print books. Most authors were happy to donate old books. The most helpful publisher was Buddha Academic Publishers. They allowed all their content including old and new publication, provided that authors are convinced to give their manuscripts.

Table 3: Source of born-digital contents in SDPL with public contribution

| Source | No |
| --- | --- |
| Professional Publishers | 323 |
| Individual Publishers | 67 |
| Government and Non-government organizations | 1576 |
| Universities and colleges | 3292 |
| Individuals | 906 |
| Total | 6164 |

Source: SDPL Digital Library Statistics as of June, 2016

**Digitization**

Digitization is the process of conversion of any analogue media like manuscripts, photographs, sounds, arts, microfilms etc. into electronic form either by scanning, recording or typing in the contents. There were different types of challenges in digitization compared to born-digital materials. Before the digitization process, few questions were asked like – is it worth digitizing? Do people read the digitized content? Does digitization adds to the educational or cultural value? etc. Digitization of around 180 books has been completed till now. The major challenges faced during digitization are listed below

*Identification of materials to be digitized*

The digitization was started with the handful of old manuscripts. Identification and acquisition of material seemed to be one of the easiest tasks at the beginning. This became the most time consuming. All other phases of digitization depended upon this initial phase. According to the Nepalese copyright act, the book becomes public domain property 50 years after the death of all authors. Art or photographic work becomes public domain 25 years after publication. There are not much books of that length in Nepal. Most books had to be obtained with permission from the author. Following initiatives were taken for identification

- Out of publication older books chosen for digitization.
- Awareness to digitize and preserve the old publication was created through news media partners. This motivated some old authors.
- The community outreach program of the SDPL with the senior citizens and literator helped a lot to identify the potential donors and literatures.
- Catalogues printed in old newspapers were used to identify some books
- If book is still copyrighted author address searched and contacted to request permission. The degrees of separation between individuals in socially interlinked societies like Nepal is low according to the small world experiment.
- Getting permission to digitize old book was very easy for most authors. However, getting permission for new book was not so easy.

*Degree to which existing materials are digitized*

There are several steps involved in digitization of materials. SDPL used 4 steps for digitization and they are described below:

- *Scanning/photographing*: If the binding can be removed and pages are not fragile, books were fed to high-speed scanner. Most books were old and only single copy was available. These books were photographed. For taking photograph, low-tech method as described below in digitization technology was used. There were few problems

during photographing though. Most bugging one was curved edges of the book. OCR software could not recognize the text around curved edges of the book. For this, Volunteers used their hands to align the book to make it as straight as possible or stretched with clip as much as possible.

- *Primary investigation and correction of the scanned materials*: This step was not taken in the beginning, but without this step, there were many errors in recognizing the text by the software. The images with low clarity were discarded and new image taken. Images with unnecessary borders were cropped and images were ordered according to their page numbers. Some pages were rotated appropriately to make it align straight as required by the OCR software.
- *Optical Character Recognition (OCR):* Google OCR software was used to recognize the text. This was the most challenging part of digitization. English text could be OCRed very easily, but Devnagari Script used for Nepali, Sanskrit, Hindi and other local languages could not be recognized effectively. For these languages some clear typed contents were OCRed and for others only scanning was done. Few very important texts were manually typed.
- *Editing the text:* The OCR software does not recognize the text with full accuracy. This step was necessary after the above processes. Part time volunteers helped a lot with this process.
- Creating metadata: Most of the documents were in Devnagari script and could not be OCRed effectively, so special care were given to include as much information about the original text as possible. The brief introduction and table of contents of most of the contents were typed in.

*Ownership issues of digitized content*

Many digitized books are public domain. Author's permission was taken before digitizing other books so there are no serious ownership issues till now. Due to probable legal issues in future, written permission is taken from the authors.

*Technology used for digitization*



*Figure 1*

The project had very limited economic and technical resources. A low-tech cheap method as described below was used for digitization. The picture below (Figure 1) shows how digital images of books were obtained. With this technique the volunteers could photograph 1 small book a day.

- The photograph was taken with 5-mega pixel camera phone.

- Cubic wooden frame box was made with flat bottom and top with glass having a slot where camera could look below at the document.
- Proper lighting adjustments were made.
- Camera phone was kept still by the glass on the top and distance between camera and book maintained, so that every image was of same size and orientation.
- Pages of the book was kept straight by using clips and proper orientation by hands
- Paper was turned by hand and photograph taken.
- For the books whose binding could be separated, it was fed to high-speed scanner. The scanner at CDPA, near the SDPL was allowed to be used free of cost.

*OCR software*

Among many OCR software, Google Optical character recognition was free and easiest to use. After uploading the text into Google drive, the content was safe in cloud, and converted easily to text through its convert function.

- Scanned images edited in bulk, then uploaded to Google drive
- Images converted to text by opening it as Google document
- Converted text edited and compiled as the new book

## Types of collection

The project is mostly focussed on the digital text document. It has also collected some images, but audio and video has not been collected. Following are some of the types of collection in repository.

**Text and data**

The project mainly focuses on collecting the text documents. The text documents are accepted in different formats of PDF, DOCX, TXT. Other formats are accepted, but the documents are changed to the standard formats before publication in the digital repository. In case of data sets, CSV, XLS or SAV format is favoured. Some acceptance policies for text and data sets are made.

- The text document and datasets must be in standard format.
- The document must be original. If the document is compiled or copied, proper attribution to the original author must be given.
- Contents should be in Nepali, English, Sanskrit, Hindi, or other local language.
- For the datasets, description about the data, data dictionary, sample selection criteria, methodology and other general information about data must be given.
- The document should have contents that reflect the Nepalese context.
- Document should be freely usable and written permission be submitted in case of copyrighted content
- Author can submit his own work without written permission.
- Very large sized documents should be properly compressed to fit the space requirements

The problem while collecting text document was that too many unusable documents were collected. None of the documents are published without scrutinized by one of the volunteers.

**Photographs**

At the beginning, only text documents were accepted. After the preliminary development of digital repository, the service was extended to include photograph. However, the photograph portal is not on Internet till now. The photograph is maintained separately in a separate database and software. There are two policies for photograph

- To publish photograph in main digital repository, one has to publish it as book with images with description and story that each photograph tells.
- Problems with photograph: Photographs are very easy to capture with smartphone, camera and computers. There are too many photographs, to handle and store. So a policy is developed for the acceptance. If the photograph does not follow the guidelines, it is readily discarded. Following information is required for photograph
  o Each photograph should be named appropriately
  o Story about each photograph, time, description and conditions when it was taken must be included
  o Only one copy of similar photograph is accepted
  o Photograph must resemble the original photo. None or very less amount of Photoshopping is acceptable.
  o Personal photograph is not accepted unless it is of some social, educational, or academic value.
  o Inappropriate, unrelated and photograph not maintaining personal privacy of the people is not accepted.
  o If the photograph contains the art, or copyrighted content of someone, written permission from copyright owner must be submitted with the photograph.
  o The photograph must be open to be used by all.
  o Low resolution and very small images are not accepted. Images larger than 10 megabytes are not accepted due to space constraints

**Audio and Video**

There was a plan to include audio/video in the digital repository, but due to the technological and economical constraints, it has not been done till now. Videos could be saved on YouTube and only the links can be listed in library in the future.

**Total collection**

The total amount of collection in SDPL by June 2016 was around 8500 titles, with the growth rate of around 260 new titles per month.

Table 4: Total amount of collection in SDPL by June 2016

| Source | Number |
|---|---|
| Initial collection through collaborators | 2193 |
| Public contributed collection | 6164 |
| Digitized collection | 180 |
| All collection | 8537 |

## Limitations and some of the solutions employed

There were many difficulties faced during the project. The major is economic constraint, this constraint brings about almost all other limitations in the project.

- Economic constraints: Foremost of limitation is the economic constraint. The total expenditure made by the project till now is around $3000 in over 2 years. Almost all the expenses are incurred by LDF.
- Network bandwidth: Presence in Internet is very limited because of the low bandwidth network.
- Power backup: High electric load shedding upto 18 hours a day in dry season has always hindered digital development in Nepal. There is small power backup system in SDPL only for the server. Sustainable power sources like solar electricity could not be installed due to high initial cost. Project has managed 3 places with different load-shedding schedule around Kathmandu where volunteers can go to work according to load-shedding schedule.
- Full time IT manpower: Full time IT manpower needed for constant monitoring of server but it has not been managed due to economic constraint. To overcome this situation, the skilled IT volunteer monitors the server through remote desktop.
- Skills of staff and volunteer: Most of the volunteers come with low levels of skills even in their own field. These volunteers are trained at first for them to prepare them to work.
- Quality contents: Getting new edition book is almost impossible. Old edition books and books without copyright has been collected till now, but this does not confirm good quality content.
- Hardware and software: Low-end hardware has been used. Once the user base grows, this hardware will not be sufficient. Although the software is good, the Keyword generator and recommender system seems to take very long time for indexing. Alternate ways to indexing for keyword harvesting and recommender is researched.
- Disintegrating members of consortium: The organizational members of the consortium suffer from disinterest in project after the leadership changes. The professional members and volunteers stop working if they get new opportunities. To combat this situation, new volunteers and professional members is added regularly, and advocacy created by media regenerates the interest. At this point it is not possible but compensating interns might help retaining trained workforce for longer.

## Conclusion

Underdeveloped countries face acute economic constraints in every project they try to accomplish. Developing digital repository requires good budget, high-tech infrastructure, skilled manpower, good team and constant interest and input. It is a joint endeavour from different fields of expertise. Most digital repositories in Nepal are donor initiated and have sustainability issues after donors draw their hand back. For sustainability, the library where repository is built should be the initiating entity. If the repository is built with public collaboration, it will be easier to collect the resources sustainably in low cost. The role of news media in creating awareness about the digital library and advocating and motivating stakeholders to help was one of the most prominent success factors in case of SDPL. It was not much successful to get enough funds, but it could collect the decent amount of documents through public contribution and volunteer mobilization. The growth rate of around 8.5 books a day seems exciting at the moment. It will become one of the prominent digital libraries in Nepal if the trend continues to grow. The joint efforts of news media and other stakeholders should be used to advocate government to allocate long-term grant on endeavours of social and educational development which government should have conducted.

Other libraries with similar economic and technical constraints can adopt some of the ideas used by SDPL to run its digitization activity in low cost. Libraries should try to partner with as many entities as possible so that they do not need to depend upon any single donor. LDF was able to join hands with many stakeholders to form a consortium to develop the digital repository at SDPL. Even though some of the partners leave the consortium, the work does not seem to stop because new ones are constantly included. Partnership with news media in creating awareness and advocating has helped a lot in the sustainability of this project.

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