

THE HEINZ SCHOOL

# Telecentre Software

---

## Cutting the Cost of Telecentre's in the Developing World

**Dae Won Ku and Brian Wang**

**December 9, 2010**



## **Project Overview**

### **Team Members:**

Dae Won Ku and Brian Wang

### **Problem Statement:**

Throughout the world there is a major information gap as a result to the digital divide. One of the attributing factors is because many people around the world do not have the ability to access information through such means as computers and the Internet. In order to solve this issue, developing countries around the world have been looking to telecentres as a potential option to mitigate the divide. Telecentres act as an affordable option to gain access to information and have grown in popularity in the past decade. On the other hand, the high cost of telecentre development has been stunting the effectiveness, sustainability and the spread of telecentres in the third world.

### **Solution:**

We have been working with our client to help develop a bundle of software that is free and updatable, which will alleviate much of the maintenance costs of telecentre. Thus, by lowering variable costs, developing countries will be able to sustain their telecentres more easily and to gain productivity through capacity building software. This software bundle will have the ability to be downloaded or accessed online, depending on the region's infrastructure situation.

## Introduction

In 2010 within the United States, there are approximately 1.4 computers per households and the number continues to grow daily.<sup>1</sup> Overall in the U.S, computers and the Internet is very accessible as the nearest library or café usually have public computers with Internet access. However, this is not the case around the world. In developing countries, very few people have personal computers or access to ones. Instead, many people in developing nations have to result to using telecentres, and PC Cafés. However, telecentres are still not readily available around the world because of the high cost in developing and maintaining these centers. A major cost component is the software. No matter how cheap the hardware can be bought, licensed commercial software is often times a large barrier due to its high costs. Often times, commercial software like Microsoft Office can cost up to three hundred dollars, even the operating system can be costly.<sup>1</sup> In addition, licensing fees for distribution are extremely expensive, which prevents the likeability that all computers within a telecentre will have commercial software. Thus, the core issue our project will address is how to overcome high expense of software in many of the telecentres in the third world to ensure a more sustainable and functional facility in the Asian Pacific region.

In the Asia Pacific area there are many rural telecentres implemented, but the success rate and sustainability of them is very limited. Our team has been in communication with Wisit Atipayakoon who is a "Specialist in Telecommunication Infrastructure Development" International Telecommunication Union Regional Office for Asia and the Pacific to help improve telecentres in that area. Specifically, Wisit has brought to our attention the problem of expensive software in the area and our team has specifically been working on creating a software bundle and developing a framework to help analyze freeware online. Previously, Wisit has done field work in Sri Lanka with Text-to-Speech development, which inspired our team to focus more specifically on this region. Thus, specifically the telecentres in Jaffna, Sri Lanka could utilize in order to minimize costs and ensure sustainability. Freeware is a term that is traditionally used for software that is available for no cost or for an optional fee. It also includes both proprietary and closed sources software. Often times, free or trial versions of freeware exist

---

<sup>1</sup> <http://office.microsoft.com/en-us/buy/>

and in order to get the entire full features of the application, a user must pay full costs.

Although there are many countries in the Asia Pacific region, our project is focusing on creating software bundle that would be ideal for the city of Jaffna in Sri Lanka based on the needs expressed by our client and the city's potential for growth. The location for this project is Jaffna because we believe that telecentres can play a key role in the development of their education as education is considered culturally to be very important in Jaffna. There are two kinds of software that we believe are best suited for the telecentres in Jaffna: freeware software or cloud software. We recommend a bundle of downloaded software because the infrastructure and Internet network in Jaffna is still considered weak and unstable to have cloud software, which means all the software is in a network online. Our thesis is that bundled free downloaded software, taking into consideration the specific needs of the region, is an absolute necessity to the increase of telecentres all over the world. In conclusion leading to a more connected world that has a smaller “informational gap.”



## Background

Jaffna known as Yazhpanam, which means Harp Town, is the capital of the Northern Province in Sri Lanka. The population is made up of Sri Lankan Tamils, Muslims, and Portuguese. The city has faced many religious disputes amongst the Tamils and Muslims. Historically speaking, the town was known for its strategic location in the Indian Ocean. The city has been controlled by rulers of Thai, Dutch, Portuguese, British, and Tamil descent. The city has had a rich history and

many civil wars, due to religion. The population is currently 85% Hindi.<sup>2</sup>

Today the economy is made up of mostly sea port and harbor related industries. Agriculture like tobacco is the major export. The fishing industry is also a big part of the economy. However, currently the economy is under uncertainty due to the unstable prices in Sri Lanka as a whole. The reason for this is because of the ongoing disputes between the government and Liberation Tigers of Tamil Eelam.<sup>3</sup> There has been a great deal of attack and violence. Even in the past civil war was a major problem. These military acts have led to detrimental effects on Sri Lanka's economy, especially Jaffna's economy. If one goes to the harbor city today one will see many empty stores and houses along the coast.

The city's people consider education a very important part of daily life. Due to Jaffna's rich history and former glory the people of Jaffna are much more cultured than other areas in Sri Lanka. It has the highest level of education in all of Sri Lanka. The literacy rate in 2001 was at 90.7%.<sup>4</sup> Since the literacy and education mentality is there, Jaffna is an ideal location for our proposal.

Telecentres are a public place where the people in the community can access the Internet with computers and other digital technologies. Telecentres have many different names: public Internet access center (PIAP), village knowledge center, infocenter, community technology center (CTC), community multimedia center (CMC), multipurpose community telecentre (MCT), Common/Citizen Service Centre (CSC), and PC Café.

A telecentre is made to help support the community's economic, educational, and social development through digital technology. Telecentres aim to reduce the informational gaps in developing countries around the world.

There are many different kinds of telecentres today. Some are sponsored by nongovernmental organizations that are involved with the development of local government; local government, which also have the communities development in mind; commercial telecentres are created

---

<sup>2</sup> <http://en.wikipedia.org/wiki/Jaffna>

<sup>3</sup> <http://www.un.org/apps/news/story.asp?NewsID=19968&Cr=Sri&Cr1=Lanka>

<sup>4</sup> [CIA.gov](http://CIA.gov) "CIA - The World Factbook. Sri Lanka."

because of capitalistic motives by entrepreneurs for profit, school telecentres are created to spread education and information throughout the community; finally, public libraries serve as telecentres in the community. However, today telecentres are faced with many problems. The major issue is sustainability. Many telecentres cost a lot of money to start as well as run. Hence, there are problems with maintaining a telecentre when the region the telecentre is in is very poor.

Telecentres are becoming a very big part of Jaffna culture. However, they are faced with frequent cut off of the Internet in the city.<sup>5</sup> Hence, we recommend downloaded software over cloud software. The economy is taking a huge stunt in growth due to the governmental struggles. Hence, even though the citizens want more telecentres the government and people do not have the money to pay for them. Cost is a major issue with the telecentres, but the software will provide a solution to this problem.

## **Software**

This paper will examine some of the top freeware in several categories in order to create bundled software that can ultimately be used for deployment in any telecentres, but specifically Jaffna for this case study. Although our team does not have firsthand experience in Jaffna we have determined its need for more effective telecentres through our literature review. In order to evaluate all the recommended software we will utilize several criteria such as functionality, usability, support and learning curve in order to compare and contrast. Primarily there are several categories of software that will stressed that we feel are essential to their telecentres such as Operating System, Word and Data Processing, Content Management System, general e-services and applications. Overall the goal is to provide a platform that is customized for Jaffna, but still has the ability for modification.

## **Operating Systems**

### **Background**

In every telecentre, an operating system (OS) is the fundamental software that the computers must run off from as it controls the execution of computer programs. It is also essential that a

---

<sup>5</sup> <http://lirneasia.net/2007/01/Internet-out-in-jaffna-according-to-free-media-movement/>

specific telecentre utilizes an OS that is appropriate for the region and its specifications. The, two very common operating systems that are most well known in the U.S. are Windows and Mac OS, as they have great functionality and stability, but it comes at a great cost. Thus, for the needs of Jaffna, we believe that two alternative free open source operating systems can serve the area much better for its need in terms of cost, functionality and flexibility.

## **Ubuntu**

First, our team is recommending the use of Ubuntu for the region as it is a free open source software that runs on GNU/Linux distribution with about 12 million existing users. It has a low requirement of 1GHz Processor required for a desktop and only 5GB Hard Drive space needed. When installing, it comes install with such basic software as OpenOffice, Firefox browser, Empathy instant messaging client, Transmission BitTorrent client, and GNU Image Manipulation Program (GIMP).

Overall, Ubuntu contains a lot of flexibility with a lot of extensions as well as apps for various needs, especially small businesses. Thus, Ubuntu offers a very well rounded package for Cloud support, management, training and consulting. The cloud services offer such support such as its Ubuntu Enterprise Cloud. Thus, telecentres have the ability to create their own private cloud and also burst to public clouds as well. Overall, Ubuntu would fit well with the environment of Jaffna as it would allow small businesses a lot of modularity to support a variety of functionality. Because it also has low software specifications, it also lends itself well for being compatible with perhaps older machines, which would help with distribution. The default software that comes with it such as Open Office and GIMP also helps provides some basic functionality that will greatly help productivity and minimize searching for software alternatives.<sup>6</sup>

## **Setup**

To download Ubuntu online please visit:

<http://www.ubuntu.com/desktop/get-ubuntu/download>

---

<sup>6</sup> (<http://www.ubuntu.com/project/about-ubuntu>)

Ubuntu's website has a very comprehensive library of information from software requirements to an open Wiki page for an easy install from various types of media. Visit the site below for any questions or problems for installation.

<https://help.ubuntu.com/community/Installation>

## **Google Chrome OS**

The second recommendation that we feel would suit Jaffna well is the upcoming Google Chrome OS as it will be released in early 2011. This is a unique open source project that emphasizes speed, simplicity, and security that runs also on Linux. Unlike other traditional operating system, after the system starts up, the OS boots straight to the browser. The OS is meant for users who spend most of their time on the Internet as the browser is the main functionality. Thus, users can focus more on utilizing the Internet rather than worrying about programs, managing files and applying updates. On the other hand, the OS will only be available to ship on specific hardware branded from Google's partners, which may present some limitations on adoption. Overall, we feel that this option may be a good alternative for Jaffna to invest in especially for telecentres where computer specifications will not limit the functionality of the computers.<sup>7</sup>

## **Setup**

Although the full version of the OS has not been released, the site below provides a step by step easy installation guide that contains clear instructions with associated screen shots to help with the process. <http://google-chrome-browser.com/installing-google-chrome-os>

## **Comparison**

Overall we feel that these two open source operating systems provide a lot of functionality and each fulfill a specific niche in the market. Overall, we believe that Ubuntu is the best option for Jaffna as it will provide much more flexibility for customization in the area so that users have the ability to download various other applications and store files. Relying purely on the Internet to store and manage applications would not be optimal as the bandwidth speed for Jaffna is also poor.

---

<sup>7</sup> <http://google-chrome-browser.com/installing-google-chrome-os>



## Word and Data Processing

### Background

One of the most commonly used software that users around the world is word and data processing capabilities. On the current market, there are a lot of companies that offer a wide range of word processing software that is open source. Many existing options on the market range from downloadable single function software to bundled software that contains many components. After evaluating numerous amounts of options, our team feels that OpenOffice application in particular that will be best suited for Jaffna best on several criteria.



### OpenOffice

First, OpenOffice is a great multiplatform office suite and open-source project that is free to download and use. It is easily integrated with other existing word processes and has similar functionality to the traditional Microsoft Office Suite, without costing anything. OpenOffice is also compatible with most major operating systems and runs on various platforms. Its features range from word processing, to spreadsheets, presentations, graphics and databases. Because the software is bundled together, Jaffna will have all the basic word processing functionalities with the download of one software. In addition, there are many alternatives to download, but most of the software comes as separate components and are not cross compatible. The overall learning curve is also small for this intuitive software and would be easily to implement into a local telecentre. Because the software is readily available for download online, this provides a lot of flexibility and mobility for each telecentre in the area. In addition, there is also no restriction on

licensing so that such things as making copies are free to help improve distribution. Overall, our team feels that OpenOffice offers the optimal bundle of software.<sup>8</sup>

## **Setup**

OpenOffice is fairly easy to install as it is a self-extracting EXE file after downloading it off the website. You can download the client from the link below:

<http://download.openoffice.org/>

For instructions on how to install and for a FAQ, Wiki community and open forum on OpenOffice you can visit.

<http://wiki.services.openoffice.org/wiki/Documentation/FAQ>

## **Content Management System**

### **Background**

Another need that was expressed in the Asia Pacific region is the need for a Content Management System (CMS). A CMS will help serve as a central repository for telecentres in the Jaffna region to help manage and store large datasets as well as the ability to contribute and share data. This can be extremely useful for the small businesses in the region as it can greatly aid in managing customers, product and sales information and revenue. Thus, such information would no longer have to be stored on a flat file system and would have the ability to be more sustainable through backing up data.

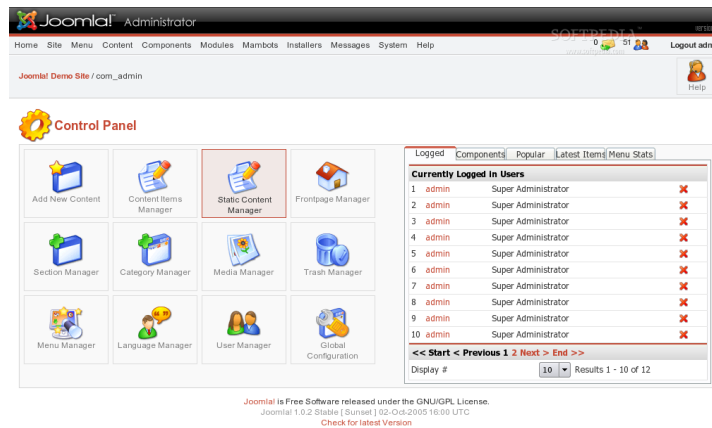
### **Comparison**

Our team recommends two open source CMS in particular for Jaffna, specifically Joomla and Drupal. Both of these CMSs are free open source content management platforms that have the ability to power websites and various applications worldwide. Because we believe that these two platforms are very similar, but each may tailor better for we have done a comparative analysis. In the short run, after doing an analysis we believe that Joomla would be better suited for the Jaffna region because of its smaller learning curve and easier setup. Overall, the two lists highlight

---

<sup>8</sup> <http://why.openoffice.org/>

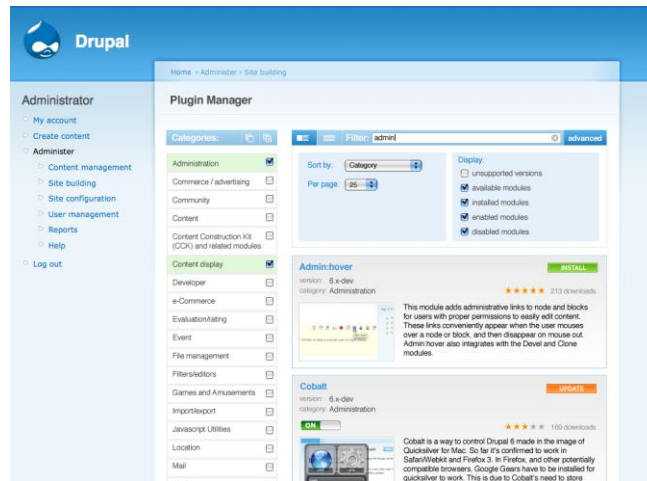
some pros and cons of both systems. For a more in depth technical analysis and the ability to compare other CMSs, you can visit <http://www.cmsmatrix.org/>.



<http://linux.softpedia.com/progScreenshots/Joomla-Screenshot-5739.html>

## Joomla 1.5

- Pros
  - Easy to install and maintain
  - High quality platform
  - Easy learning curve
  - Intuitive admin user interface
- Cons
  - One site per installation
  - Cannot use a single log-in to several sites
  - Modules cost additional money



<http://groups.drupal.org/node/17765>

## Drupal 7

- Pros
  - Quality add-ons with over 4000+ plug-in modules for enhanced functionality
  - Ability to set user and group permissions
  - Compatible with other community sites
  - Strong templating system
  - Precise API and high quality code
- Cons
  - Higher learning curve for a first time user
  - Difficult backend admin functionality

## Setup

### Joomla

To download the Joomla client visit the following link:

<http://www.joomla.org/download.html>

To access Joomla's installation manual and forum please visit the following:

<http://help.joomla.org/content/category/48/268/302/>

## Drupal

To download the Drupal client visit the following link:

<http://drupal.org/download>

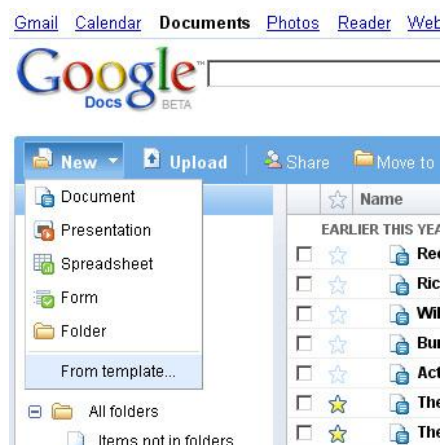
For a step by step tutorial and a general installation guide please visit the following:

<http://drupal.org/documentation/install/basic>

## Cloud Computing

### Background

Although there are many strong applications that exist online to download, an alternative for the telecentres in Jaffna is to utilize cloud computing. Cloud computing is based on the Internet where resources, software, and information can be shared to other computers and devices. For Jaffna, if several telecentres have limited disk space or processing speed, then relying on web based application may be more optimal. There are two applications in particular that serve as resourceful online tools, which are the Google Docs and Zoho.



### Google Docs

Google Docs contains a lot of great functionality that helps anything from word processing, to sharing data to creating and collecting surveys. Google Docs' five main functionalities are Google Docs Document, Spreadsheet, Presentation, Form and Drawings. Any type of document that is created within Google Docs is saved to a central repository that is linked to a specific

account. These documents also have the ability to be shared with multiple users online so that they also have the ability to view or edit anything. Overall, this will be great for tying local communities together at Jaffna and the ability to communicate, share ideas and increase productivity for local businesses.

Google Document works very similar to Microsoft Office and contains a majority of the same functionality. Thus, you are able to edit various font styles, format with rulers, insert images, equations and various other functionality. For Google Spreadsheet, it contains primarily most of Microsoft Excel, but lacks in deep graphical analytics. Google Presentation is similar to Microsoft PowerPoint, but lacks in customizability for templates and overall formatting can be a bit difficult. Google Form is a great tool that is easy to setup, which users can create and distribute surveys to people. Finally, Google Drawings is a quick free form drawing tool that integrates well into Google Document and Presentation. Overall, all these tools will provide a lot of functionality to organize and store information to increase efficiency with existing processes.<sup>9</sup>

## Setup

Google Doc does not require anything client to download, but you must create an account to access the applications hosted on its page.

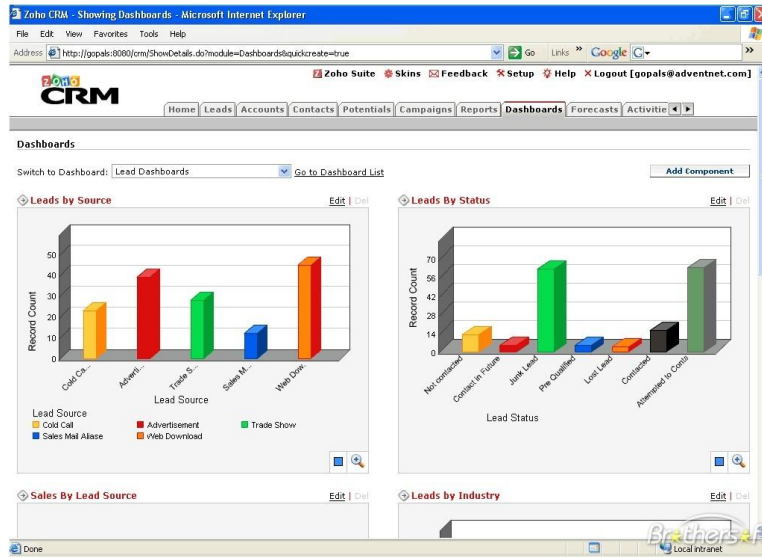
<http://docs.google.com/>

To access its FAQ and for any questions you want to ask you can look for it through its extensive search bar for help.

<http://docs.google.com/support/?hl=en>

---

<sup>9</sup> <http://www.google.com/support/forum/p/Google+Docs?hl=en>



## Zoho

The second software that is run off Cloud Computing is Zoho. This application contains all the same functionality as OpenOffice, but also provides many more “gadgets” for flexibility. Zoho is much more customizable and contains many more applications for collaboration, productivity and targeted for businesses. The application contains such functionality as creating wikis, a CRM, invoice calendar, projects, and a chat feature. Thus, Zoho, acts as a comprehensive all in one software that can fit the needs for a variety of different telecentres. Zoho is also scalable to help support bigger businesses to help maintain business e-mail and migration. In addition, Zoho helps to facilitate collaboration online through its various live communication features and many of the applications integrate well with each other. One function in particular that would be a great feature for the Jaffna region is Invoice 2.0. This application will help small business record, track, run reports and maintain purchases made. It is also integrated with PayPal and Google Checkout to help provide online payments and transactions. Overall, this is just one of the few amazing applications that Zoho has for users, but overall it has a lot of flexibility and should have an application to meet most needs.<sup>10</sup>

## Setup

<sup>10</sup> <http://www.zoho.com/company.html>

Zoho does not require anything client to download, but you must create an account to access the applications hosted on its page.

<https://accounts.zoho.com/register?serviceurl=http://www.zoho.com/>

For any general questions on its applications or to access its forums please visit:

<http://www.zoho.com/support.html>

## **Action Plan**

- Create software bundle
- Work with Wisit for distribution
- Identify telecentres for user testing
- Incorporate feedback and update
- Make software bundle more wide spread in Jaffna
- Ensure sustainability through building knowledge capacity

## **Additional Recommended Software**

### **Antivirus Utilities**

- AVG Anti-Virus Free Edition 8.5: Excellent detection and disinfection
- Ad-Aware Free: Stops spyware and adware

### **Collaboration Services**

- Zoho Discussions: Add a feature-rich discussion forum to any online destination

### **CRM**

- CiviCRM: Open source (customer) relationship management (CRM) software
- Sales force: CRM software solutions and enterprise cloud computing
- Zoho: Offers a suite of online web applications

### **File Sharing**

- Dropbox: Online file syncing

### **Photo Utilities**

- Picaso: Photo manipulation program



## Outcomes and Conclusion

After researching our project for the past month we feel like we have developed a sustainable solution to help aid the digital divide and help the Jaffna region. After researching and evaluating a lot of existing software on the market our team has developed a bundle of software that we believe encompasses the major needs of the area. Our hope is to eventually develop a bundle of software that can be widely used not only in the Jaffna region, but the greater Sri Lanka area and eventually the great Asia Pacific.

## Literature Review

*Agenda*. No. 38, Techno-Innovation (1998), pp. 78-80. Published by: [Agenda Feminist Media](#).  
<http://www.jstor.org/stable/4066065>

This article talked about the value of telecentres. Telecentres have helped a great deal with the spread of information. The article talks about how the telecentres have helped with giving females power of knowledge in areas of poverty. It discusses how telecentres have helped with the digital divide and has helped with the spread of information in many of the developing cities. It shows that telecentres have been growing; however, there can be more growth and a wider spread of telecentres in poverty stricken regions.

Fosfuri, Andrea; Giarratana, Marco S.; and Luzzi, Alessandra. *Organization Science*: "The Penguin Has Entered the Building: The Commercialization of Open." Vol. 19, No. 2 (Mar. - Apr., 2008), pp. 292-305.

<http://www.jstor.org/stable/25146180>

This article has spoken about the values of open source software. It discusses how many people even in the developed world use the software, and how it is a great alternative for much different paid software. It also addressed how many people around the world are taking advantage of this idea of open source software and there are countries that the majority software would be open source software. Also, it discusses the organizational process of open source software and how it allows for outside innovation to occur much more frequently, which will be ideal for telecentres

as then people in the area, if they have the programming knowledge, will be able to work on the software themselves and create software that fits the regions' needs.

Premila Gamage, Edward F. Halpin, (2007) "E-Sri Lanka: bridging the digital divide", Electronic Library, The, Vol. 25 Iss: 6, pp.693 – 710

This article talks specifically about the issues in Sri Lanka and how there is a major digital divide in the country. Sri Lanka has been investing a great deal, publically and privately, into telecentres. The telecentres have played a major role in spreading information in Sri Lanka.

However, there are still major issues that Sri Lanka faces. Such as, rural and remote areas in Sri Lanka, that do not receive the funding needed to develop telecentres.

## Works Cited

- "About Drupal | drupal.org." *Drupal - Open Source CMS | drupal.org*. N.p., n.d. Web. 8 Dec. 2010.  
<<http://drupal.org/about>>.
- "Chromium OS - The Chromium Projects." *The Chromium Projects*. N.p., n.d. Web. 4 Dec. 2010.  
<<http://www.chromium.org/chromium-os>>.
- "Download | Ubuntu." *Ubuntu homepage | Ubuntu*. N.p., n.d. Web. 5 Dec. 2010.  
<<http://www.ubuntu.com/desktop/get-ubuntu/download>>.
- "Drupal Vs Joomla and other CMS | My Drupal." *My Drupal | Drupal Themes, Drupal Developers and services, Drupal Tools , Tips and Showcase*. N.p., n.d. Web. 6 Dec. 2010.  
<[http://mydrupal.com/drupal\\_vs\\_joomla\\_and\\_other\\_cms](http://mydrupal.com/drupal_vs_joomla_and_other_cms)>.
- "Frequently Asked Questions (FAQ) - OpenOffice.org Wiki." *OpenOffice.org Wiki: Home*. N.p., n.d. Web. 4 Dec. 2010. <<http://wiki.services.openoffice.org/wiki/Documentation/FAQ>>.
- "Google Docs Help." *Google*. N.p., n.d. Web. 6 Dec. 2010.  
<<http://www.google.com/support/forum/p/Google+Docs?hl=en>>.
- "The CMS Matrix - cmsmatrix.org - The Content Management Comparison Tool." *The CMS Matrix - cmsmatrix.org - The Content Management Comparison Tool*. N.p., n.d. Web. 5 Dec. 2010.  
<[http://www.cmsmatrix.org/.](http://www.cmsmatrix.org/)>.
- "OpenOffice.org - The Free and Open Productivity Suite." *OpenOffice.org - The Free and Open Productivity Suite*. N.p., n.d. Web. 5 Dec. 2010. <<http://www.openoffice.org/>>.
- "What is Joomla?." *Joomla!*. N.p., n.d. Web. 8 Dec. 2010. <<http://www.joomla.org/about-joomla.html>>.
- "Zoho - FAQ (Frequently Asked Questions)." *Email Hosting, CRM, Project Management, Database Software, Office Suite, Document Management, Remote Support, Online Forums Software, Intranet*. N.p., n.d. Web. 6 Dec. 2010. <[http://www.zoho.com/zoho\\_faq.html](http://www.zoho.com/zoho_faq.html)>.

---