Bachelor's Thesis

JOOMLA WEBSITE PROJECT FOR NORSAD AGENCY

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ABSTRACT OF THESIS

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This thesis is based on NORSAD Website development using Joomla Content management System to design a dynamic website. The task was to build a content management system website using Joomla application and then train the two members of the staff on how to update the site. The aim of this thesis was to study Joomla application and how to build a dynamic website with this application. The study includes evaluation of the Joomla application with other content management systems.

The final result was an interactive, dynamic and user friendly website which provide information to NORSAD's partners in four Nordic countries Denmark, Finland, Norway and Sweden as well as its eleven clients in (SADC) Southern Africa Development Community member states Angola, Botswana, Lesotho, Malawi, Mauritius, Mozambique, Namibia, Swaziland, Tanzania, Zambia and Zimbabwe. Using open source software Joomla package, PHP, MYSQL and Apache the content management system website was developed. The knowledge and skills of PHP, MYSQL, Apache, HTML and CSS were required.

This thesis discusses three segments, Joomla Content Management System, NORSAD Agency and the Joomla development project for NORSAD Agency. The work related to this thesis is based on four-month NORSAD Agency adopting Joomla content management system for web development.

Keywords: Joomla Content Management System (CMS)

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1 INTRODUCTION

While discussing with the (CEO) chief executive officer of NORSAD one day, she highlighted the need for her organization to have a content management system website to be built. After the discussion on that day, I checked NORSAD's website, then I wrote an e-mail to the chief executive officer of NORSAD. I told her that I could design a content management system website for her organization. After further exchange of e-mails I was awarded a four month contract to help with information technology related issues and above all this to build a new website for the organization.

This thesis project focuses on Joomla content management system application, including PHP script language, MYSQL database, and Apache server, to build website and then train two non-technical staff (Persons without knowledge of HTML, PHP, MYSQL and Apache) to create web content, edit, delete, upload and update the system. The thesis project is based on my four-month working with NORSAD Agency and adopting Joomla content management system for web development. The theory aspect of this thesis is chapter two that discusses Joomla application, the technology behind it, and other content management systems common today. Chapter three highlights NORSAD Agency, the organization behind the name, its core business, its geographical location and its staff.

The fourth chapter is the empirical part of this thesis project that documents the Joomla website project, the Joomla system configuration, the designing of the website, testing of the system and the outcome of the project. The challenges faced in the development of the project are discussed. The impact of Joomla website on NORSAD staff both local and abroad and its customers in the (SADC) Southern Africa Development Community region are discussed.

2 JOOMLA CONTENT MANAGEMENT SYSTEM

2.1 About Content Management Systems

A content management system (CMS) is a tool used to manage the content of a website. Basically the Content Management System consists of two elements, content management application and (CMA) and Content Delivery Application (CDA). Content Management Application allows the web manager or author, who may be a non-technical staff, who may not know (HTML) Hypertext Markup Language, PHP script programming language, and (QSL) Query Structured Language for database, to manage update, upload and delete content from the website without needing the expertise of a web developer (Robertson 2003 [referenced 15.10.2009]). The four basic features of Content Management System includes web based publishing, format management, indexing and search and retrieval. A web based publishing feature allows a wizard tool to create or edit web content. The format management allows scanned papers and electronic documents to be formatted into (HTML) Hypertext Markup Language or (PDF) Portable Documents Format for the website. Content Management System (CMS) system indexes all data on the company site so that individuals can then search all data using keywords, which the Content Management System retrieves. (Robertson 2003 [referenced 15.10.2009])

There are ten commonly used open source Content Management System (CMS) software worldwide. The ten commonly used worldwide includes Dropal, Wordpress, Joomla, Plone, eGrail, Typo3, Moodle, Dolphin, Pligg, and Movable Type. Many are the organizations that use Drupal, Joomla, Plone, eGrail, and Typo3 software to build their web portal because these software have huge libraries, professional standards, internationalization and customization (Scott 2008 [referenced 18.10.2009]). Most popular blogging platforms are Wordpress and Movable Type software because of their appeal, themes, tags and supports multiple uses, these features are vital for blog designers. Dolphin and Pligg platforms are popular for social networking sites, because of plug and play user community, they provide social bookmarking functionality for sites, allowing users to post links, vote them up or down, and leave

comments. On the other hand the unique platform is Moodle, its dedicated design specifically for courses management and education and it is popular for online learning environment with no competitors. (Scott 2008 [referenced 18.10.2009])

On the other hand there are many enterprise content management system software available on the market today the list includes SharePoint, Lotus Domino, Open Text ECM suite, Sitecore, Vignette web content management solution, and RedDot enterprise content management system. Some organization prefers enterprise content management systems because of many website templates that come with the enterprise package.

2.2 Joomla Overview

Joomla is open source content management system software for web development. In order to install and use Joomla Content Management System for your website the minimum requirements are Apache server Version 1.x or higher, PHP Version 4.3 or higher, and MYSQL version 3.23 or higher. Joomla is designed to work basically with other Open Source Software such as Apache, MYSQL, and PHP. Joomla delivers a robust professional level website empowered by many extensions suitable for both personal and business website. Joomla is a content management system of choice for large corporate and small business who wants a professional appeal of their website with easy deployment and use. Since Joomla Content Management System is licensed under an Open Source Software license, the General Public License (GNU) its free of charge. With this in mind, you can build a Content Management System website for an organization using open source software to reduce cost on software license.

2.3 The Technology Behind Joomla

The technology backing Joomla platform is a web server such as Apache, a database such as MYSQL and a server side script language like PHP. You can install Joomla package, plus Apache, MYSQL and PHP as Localhost or remote host. Localhost is

when a web server and associated database that is set up directly on your computer or that on a local network either within your home or business facility. You have direct access to the computer upon which the Joomla, plus Apache, MYSQL and PHP are situated. On the other hand remote host is one that you access via the Internet, be it yours or rented from the dedicated web-hosting firm. With regard to localhosting options there are a number of ready-made packages that put all the necessary software together in one easily installable package that allows persons without knowing much about how they work. Here are the popular ready made packages and their operating systems, WAMP is for Windows, MAMP is for Apple Mac, LAMP is for Linux, and XAMPP is a multi-platform which means its compatible with Apple Mac, Windows and Linux.

2.4 Script Language PHP

PHP is a server-side scripting language designed specifically for the web. Within an HTML page, you can embed PHP (Hypertext Preprocessor) code that will be executed each time the page is visited. PHP code is interpreted at the web server and generates HTML or other output that the visitor will see. PHP script language is easy to learn and use because its syntax is based on other programming languages like C Plus Plus and Java and it also supports interfaces to many different databases systems. PHP can generate PDF (Portable Document Format) document, connect to web services and other network services and send e-mails with just a few line of a code. PHP is available for many different OS (Operating System) including Windows, Mac Apple, and Linux. PHP is very efficient and uses inexpensive servers and databases system such as open source servers and MYSQL. Open Database Connectivity Standard (ODBC) enables PHP to connect to any database that provide an ODBC drive (Welling and Thomson 2005).

2.5 MYSQL Database System

MYSQL database server is used to add, access and process data stored in the computer database. MYSQL is a relational database management system, which

means that it stores data in separate table rather than putting all data in one huge storage, the data stored in separate tables in turn adds speed and flexibility. You do not need to understand relational theory to use relational database, but you need to understand some basic database concepts. SQL (Structured Query Language) is the most common standardized language used to access databases (Welling and Thomson 2005).

2.6 Apache Web Server

Apache is used to for both static and dynamic web content on the World Wide Web. Many web applications are designed expecting the environment and features that Apache provides. Apache is a web server application. Apache is used for many other tasks where content needs to be made available in a secure and reliable way. One example is sharing files from a personal computer over the Internet (Welling and Thomson 2005). A user who has Apache installed on their desktop can put arbitrary files in Apache's document root, which can be shared. Programmers developing web applications often use a locally installed version of Apache in order to preview and test codes as it is being developed (Welling and Thomson 2005).

2.7 Joomla's Benefits to Companies

The benefits of Joomla to an organization are many, since Joomla is an Open Source Software meaning its free of charge, the organization can use Joomla to build a dynamic website without the cost of software license. The components associated with Joomla, PHP, MYSQL and Apache are available at no cost to an organization and these components add much value to Joomla application. For example MYSQL component enables Joomla application to have a database were all web content could be stored and easy accessed too. Joomla has many appearing features that attract web developers to use this application, user-friendly interface, easy installation, professional standards, internationalization and customization is easy to do in Joomla. Many web hosting companies can host Joomla website without any reservation.

3 NORSAD AGENCY

3.1 The Organization

NORSAD (www.norsad.org) was established in 1990 and its partners are the Nordic development financial institutions, including Finnfund of Finland (www.finnfund.fi), the Industrialization Fund for Developing Countries (IFU) of Denmark (www.ifu.dk.en), Norfund of Norway (www.norfund.no), Swedfund of Sweden (www.swedfund.se). NORSAD is a joint cooperation between eleven countries within the Southern African Development Community (SADC) namely Angola, Botswana, Lesotho, Malawi, Mauritius, Mozambique, Namibia, Swaziland, Tanzania, Zambia and Zimbabwe, and four Nordic countries Denmark, Finland, Norway and Sweden. NORSAD consists of two legal entities, the NORSAD Fund and NORSAD Agency. The NORSAD Fund's Board of Governors main responsibilities are overall policy and decision making of NORSAD. Each member state has one seat on the Fund's board. The NORSAD Agency's Board of Directors oversees NORSAD management of the operations of the NORSAD Fund and management of the Fund's assets. The Chief Executive Officer oversees the daily operations and management of the NORSAD Agency, and acts as the Secretary to the Board of Governors. (NORSAD old home page March 2009)

3.2 NORSAD's Services

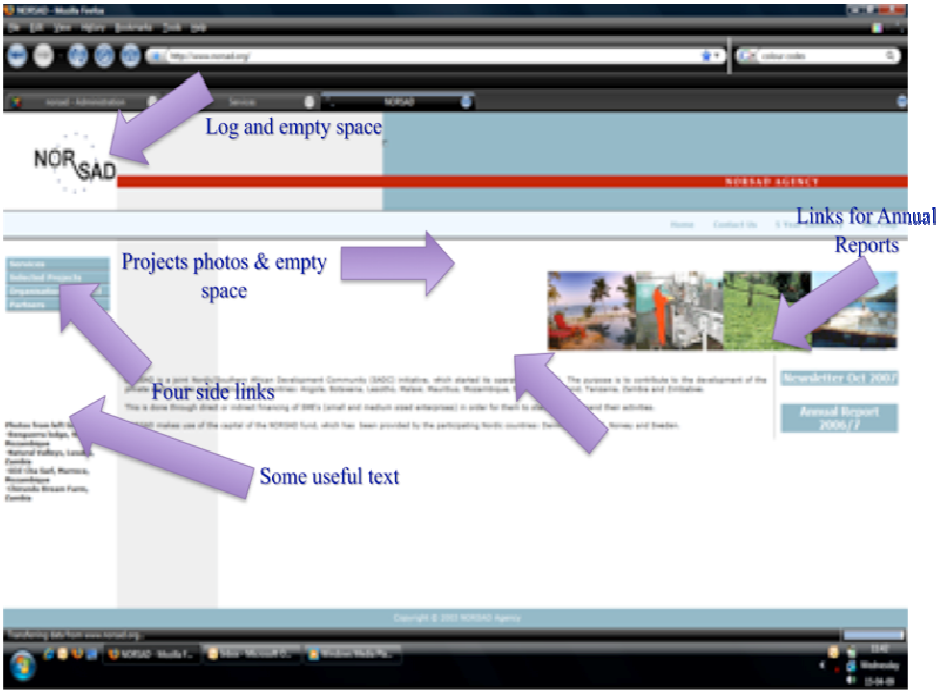
NORSAD's core business is to give financial assistance to small medium sized companies in SADC participating states and contribute in the development of the private sector. A number of projects have been co-financed with the Nordic partners (IFU) of Denmark, Finnfund of Finland, Norfund of Norway and Swedfund of Sweden either directly or through local and regional equity funds funded by these institutions. NORSAD's international partner is the International Finance Corporation (IFC). IFC is the world's largest source of private sector funding in the developing world with an extensive experience in Africa. NORSAD signed a Memorandum of

understanding with SADC's Development Financial Resource Centre (DFRC) that will enable collaboration between the two institutions in enhancing regional Development Financial Institutions' delivery to small medium sized companies (NORSAD old home page). The relationship is vital to NORSAD since its main delivery mechanism is through financial intermediaries of which regional and national Developing Financial Institutions. Many small medium sized companies do not have the capacity to develop projects ideas into bankable business plans, the NORSAD Agency collaborates with various local, regional and international private sector development programmes, including programmes established or supported by the Nordic countries. NORSAD Agency has established formal cooperation with Centre for Development of Enterprises, a European Union initiative based in Brussels, which provides entrepreneurs with assistance on conducting market studies and other specialized investigations to establish the feasibility of proposed projects ideas. (NORSAD old home page)

NORSAD's main financing method is through intermediaries that are financial institutions located in SADC member states. NORSAD also provides loans and other financial services directly to eligible enterprises in all major international currencies. NORSAD financing for projects is between USD 500,000 and 3,000,000, for line of credit to financial institutions the upper limit is USD 5,000,000. When the project is large NORSAD prefers not to be the only lender, and the financing should not exceed 50 Percent of the total project cost. NORSAD encourages co-financing with SADC, Nordic and International development finance institutions. Interest rate on a loan depend on many factors such as currency, country risk and project risk. The maximum loan repayment period is seven years with a grace period of two years. NORSAD loan requires suitable securities such as fixed and floating charges on assets of the project company, mortgage, bank or promoter guarantee. (NORSAD old home page)

3.3 NORSAD's old Website

NORSAD's old website was static one and the information on the website was very old such that it no longer represented the current NORSAD. The project that NORSAD had done with some companies was showing on the site that the project is on going whilst in reality the project was concluded years back. NORSAD wanted two members of staff to be trained in how to update the website. NORSAD opted for a content management system website in order to update its web content on a monthly basis. NORSAD has directors in Nordic and governors in SADC countries who are using the website to check what progress NORSAD is making. Local and international Partners use the website to monitor the development NORSAD is making in the region. NORSAD's clients scattered in SADC region are keenly interested in the information on the website too. NORSAD use its website to announce its meetings, market its projects and communicate with the rest of the world. (NORSAD old home page)

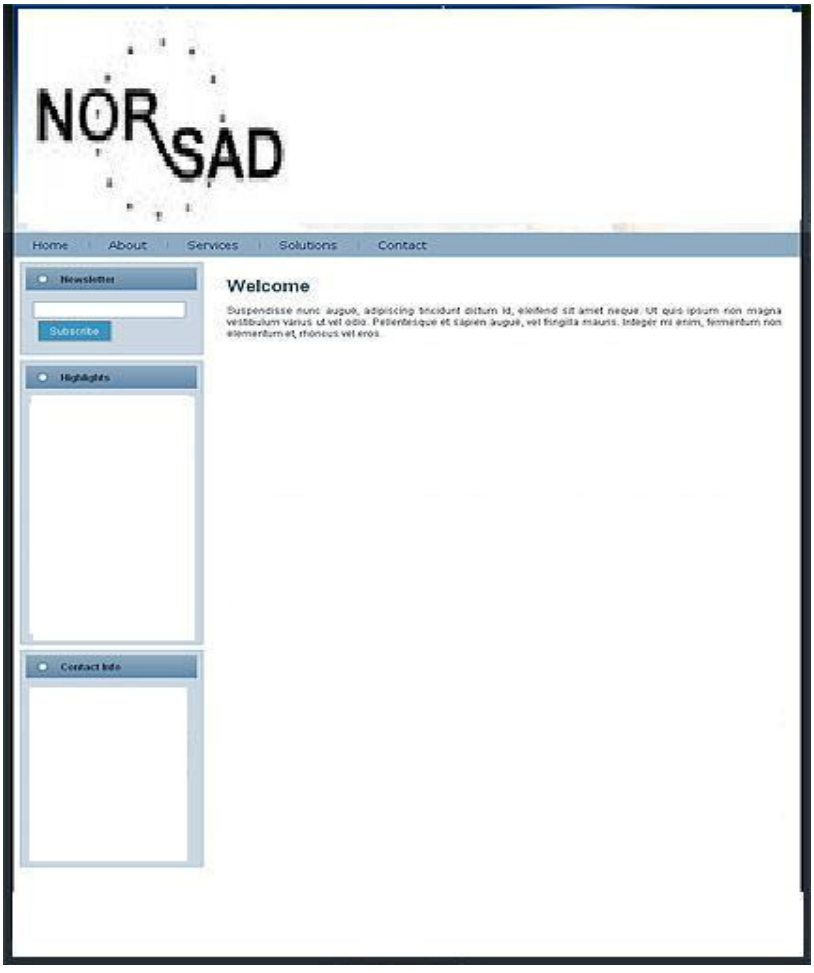


Screenshot 1: NORSAD old website

This screenshot 1 is NORSAD's old website, the site lost it's appear over the years hence came the need for the new one. The site was not updated for some time, and a lot of empty spaces on the front page made it look unattractive to visitors.

4 THE JOOMLA DEVELOPMENT PROJECT FOR NORSAD

The chief executive officer was not happy with the static website the organization had. Its understandable because the design of the old NORSAD website was like an online catalogue and was not updated for some years. The NORSAD management had plans to build a new and content management system website for the organization. The project plan was four months to build a Joomla content management system and train two members of staff on how to maintain the site at the same time help with all Information Technology related problems the organization faced. The first two weeks I designed four front pages with four different colours, menus, links and style. One was chosen and the designing part of the project began to take shape.



Screenshot 2: Sample front-page 1

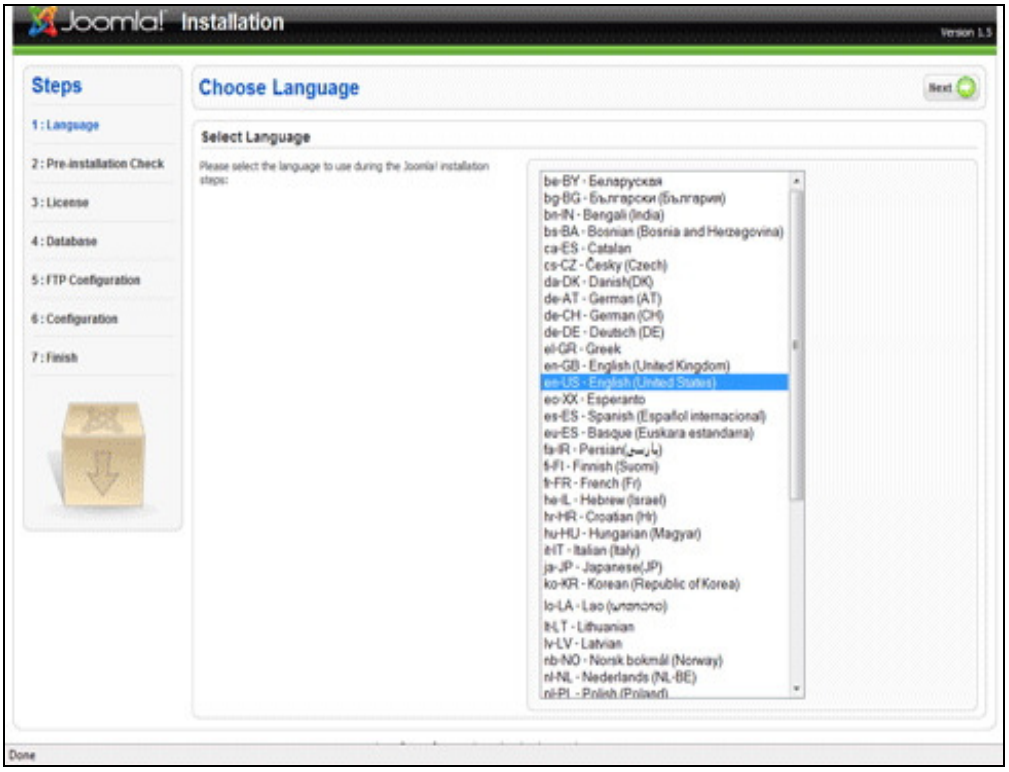
Screenshot 3: Sample front-page 2

The screenshots 2 and 3 were the initial front page designs that the NORSAD management rejected in favour of screenshot number 20 which is the current new website. Screenshot 2 was rejected partly because the drop-down menus did not look good on it. While screenshot 3 was rejected, among the reasons for its rejection was it looks just too simple for a NORSAD Agency front page.

Screenshot 4: The old NORSAD site

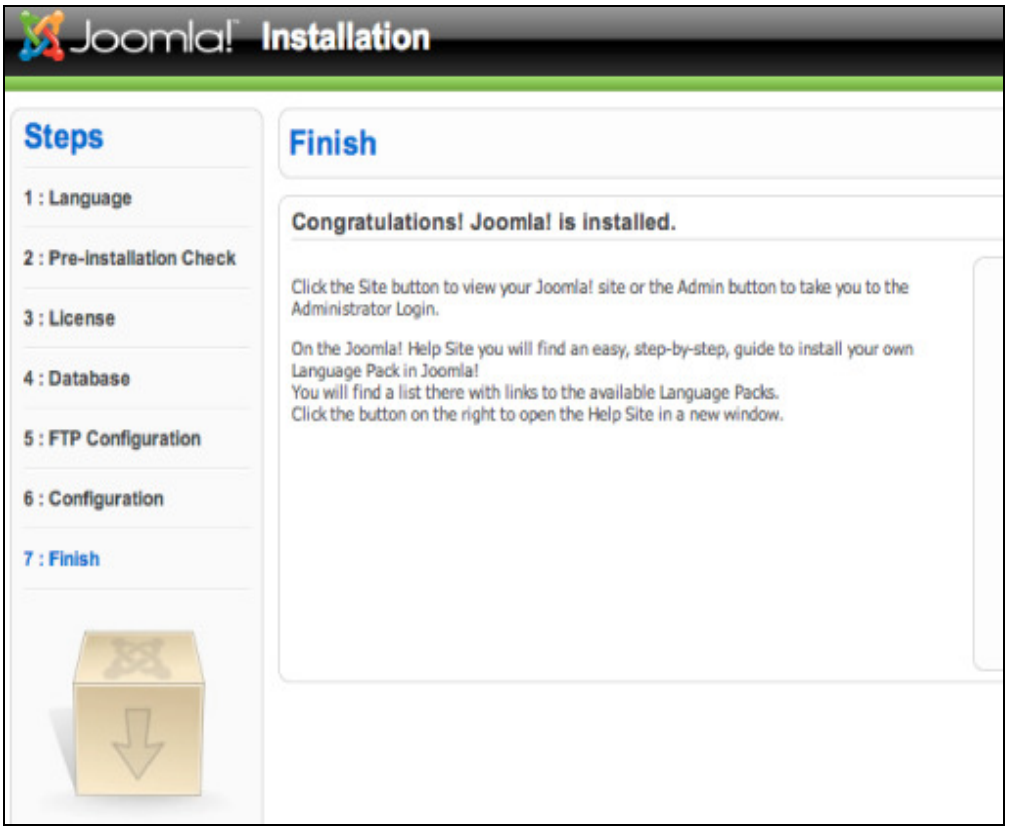
2.8 Joomla System Configuration

The successful installation and use of Joomla must have a fully operational web server such as Apache, a database such as MYSQL and the server side scripting language such as PHP. There are two options on installation, Localhost and Remote. Remote host is one that access is via the Internet to the web hosting company. Simply put the terms Remote host means the computer housing the software is far away on the Internet. Localhost is when a web server and the associated database that are set up are installed directly on your machine or local network either within the home or business facility. In the NORSAD project localhost installation was preferred. For this NORSAD project WAMP was installed, the WAMP installation is easy to install, all you have to do is download the package and follow the installation guide. When the latest version of Joomla installation is complete, the installation directory should be deleted, if not deleted it will leave a security risk to the site. After the complete installation of Joomla and WAMP, the Joomla application is ready to use.



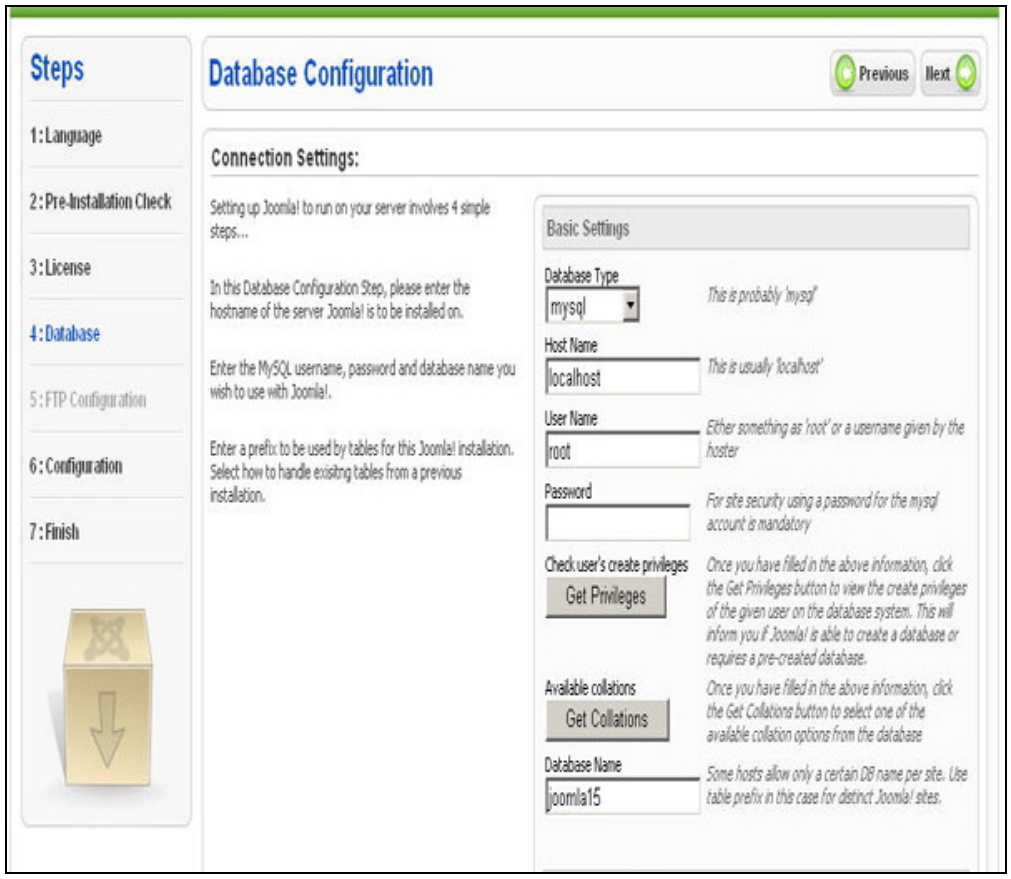
Screenshot 5: Joomla web installer

The screenshot 5 is the web installer for Joomla. After installing the WAMP package which includes Apache, MySQL and PHP, inside the WAMP package is a folder called HCDOC, in this hcdoc folder you put the Joomla package. Now to use the web installer you type the address in the address bar, for example **C:wamp/hcdoc/Joomla** and then the web installer appears just like in the screenshot 5 show. Then you follow the on screen detailed installation guide by clicking next, next until you complete the web installer.



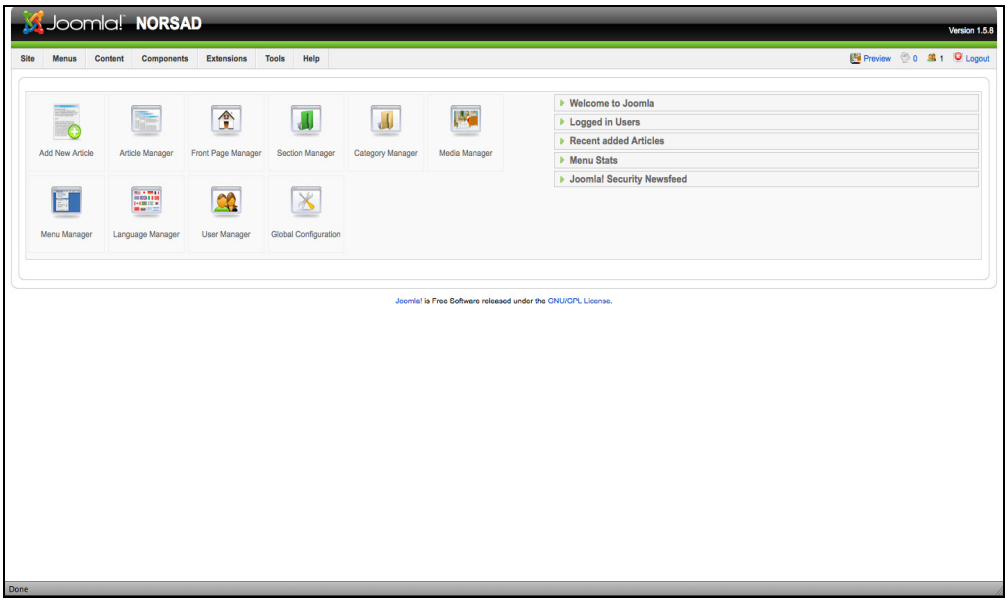
Screenshot 6: Joomla Successfully installed

For Joomla application to work properly a functional database must be installed and configured. The Joomla application helps in configuring the database, all you need to do is provide the name of the database that is MYSQL, host is localhost, since I was installing on my local server my laptop. The MYSQL username by default is administrator username is set as “root”. The database password is left blank since Joomla administrator password is used to access the database.



Screenshot 7: Database configuration

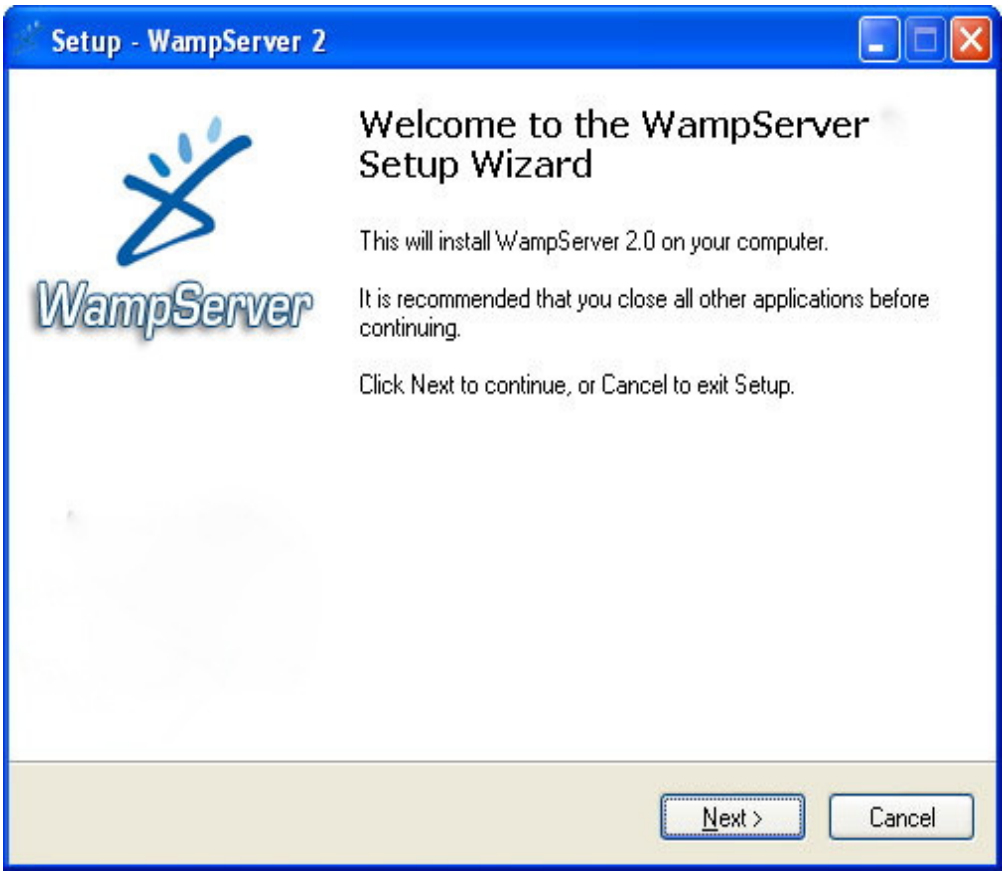
The database configuration is simple in Joomla all you have to do is chose the database type (by default the database type is MyQSL), when installing on the local machine the hostname is localhost, the username is root and the password you can leave it blank since the database will be using the Joomla password by default, then lastly the database name, you just name it Joomla5, then the database configuration is complete.



Screenshot 8: Joomla control panel

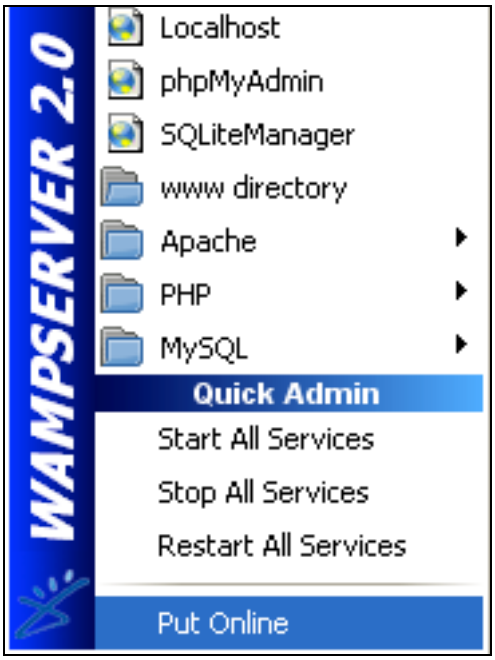
As a Joomla administrator screenshot number 8 is what you see when you login. This control panel will help you design the Joomla site, with a link icon to the Front-page, Article manager, Section manager, Menu manager as the caption show. Only the supper administrator will have all access to this control panel. Depending on the rights you have you will see a deferent interface in Joomla.

The Joomla control panel has 10 icons namely Add new article, Article manager, Front-page manager, Section manager, Category manager, Media manager, Language manager, User manager, and Global configuration, which aids a web developer to build a Joomla site. Add new article Icon is used to create new articles or pages, you do not have to know html to create an article in Joomla, since Joomla has all the ready-made features for this function. You just type your text, or even add an image to the article, write article title, chose the category were the article belongs, save the article and then publish on the site as the screenshot below illustrate.



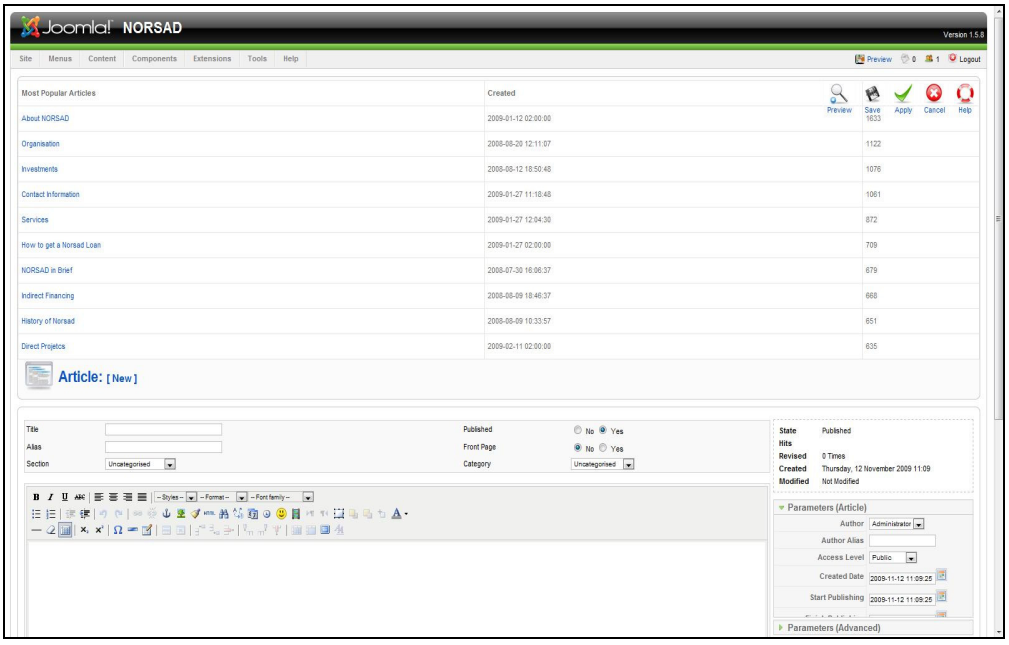
Screenshot 9: WAMP installation

This is a WAMP installing wizard; all you have to do is click next, next until the installation is done. This is the package that has Apache, MySQL and PHP. This WAMP package is installed first then the Joomla follows. WAMP is open source software; you can freely download it and use it for personal and business alike. Or if you don't want to use WAMP, you can download separately Apache, MySQL, and PHP and again install them separately it can still work with Joomla.



Screenshot 10: WAMP

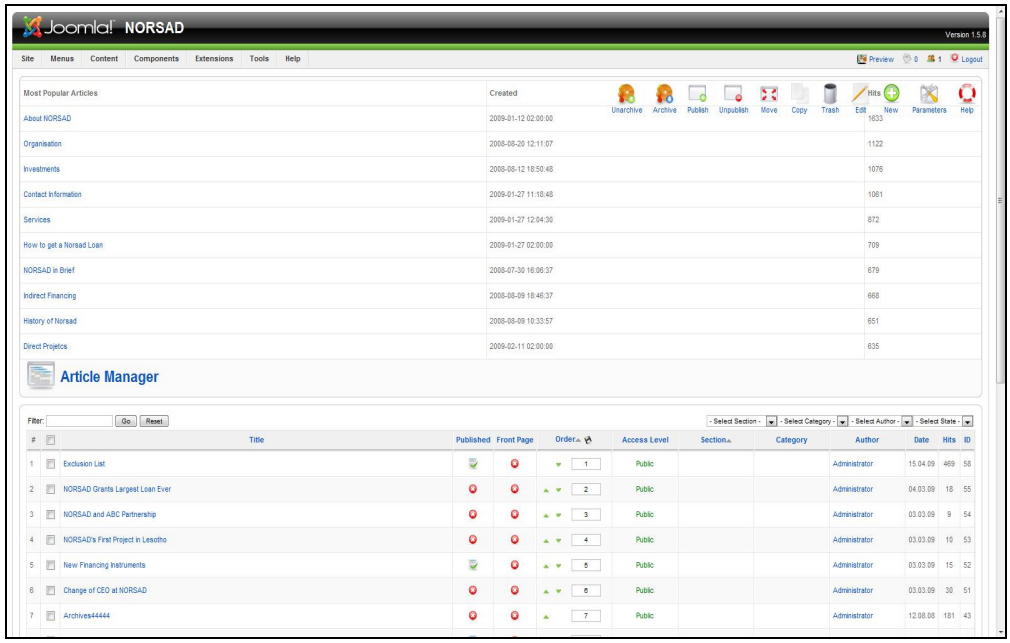
When WAMP is successfully configured screenshot number 10 is what you will see.



Screenshot 11: Creating article or web page

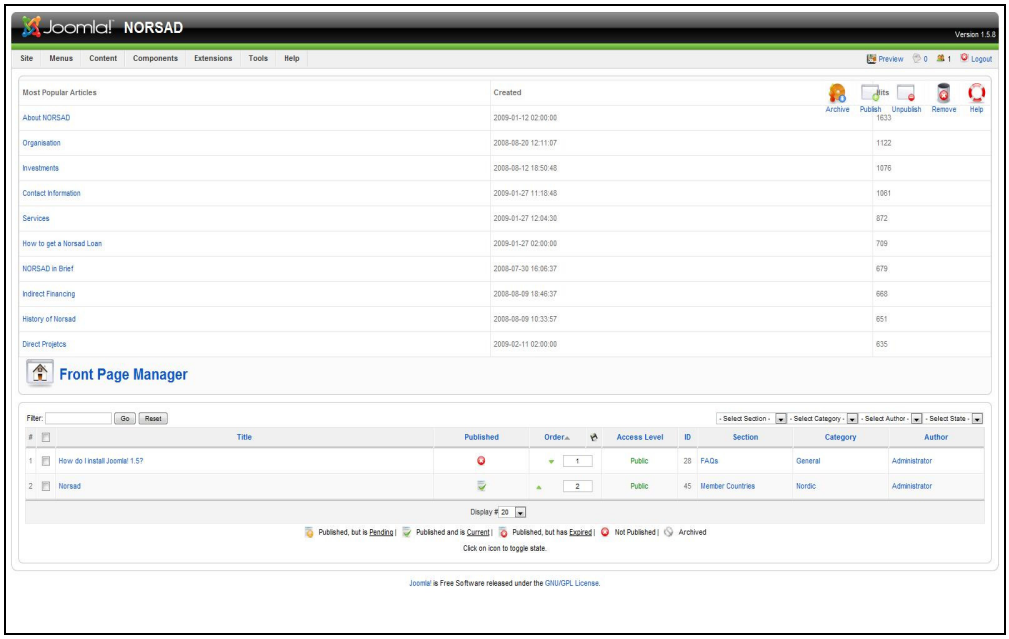
The Article manager icon helps you in managing the articles; in some large organizations the website can have hundreds to thousands of articles to manager.

Once you click this button, it will display all the articles on your site, it's easy for a web developer or non-technical member of stuff to edit, delete, update or unpublished an article. The screenshot below shows the features of article manager.



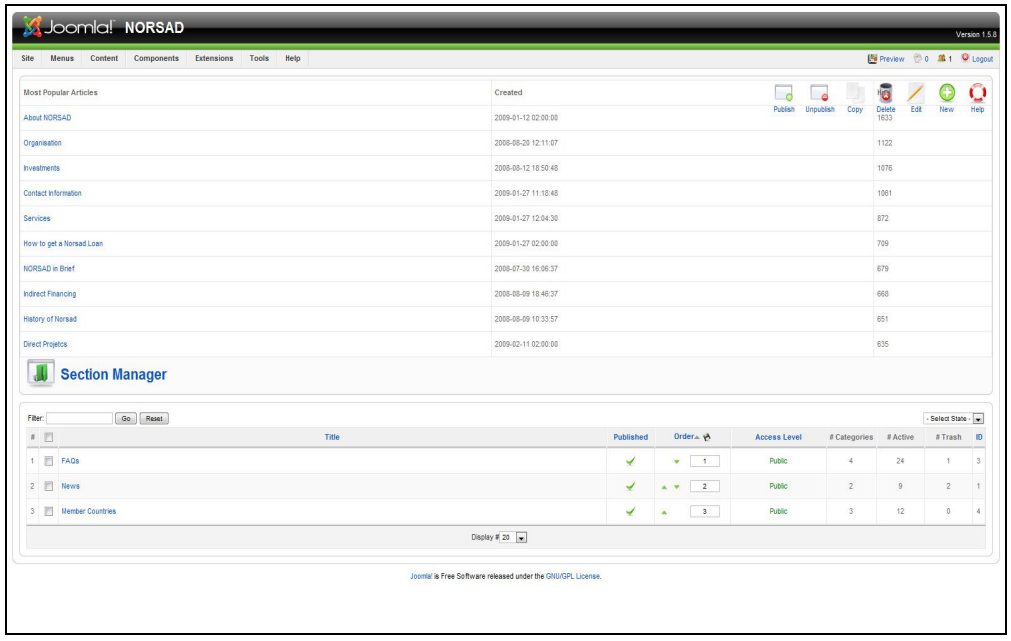
Screenshot 12: Article manager

The front-page component publishes content to home page. You can assign any content item to the home page by checking the parameter show on front-page within the edit content item page in the back-end of front-page of your site. The front-page manager icon is specifically for the management of the front-page, what article and article layout, on which position the article will appear on the front-page, right or left, bottom or up, what image would you like to include on front-page, positioning and size will be managed by this feature. The default configuration sets the link to front-page component to the first published item in the main-menu.



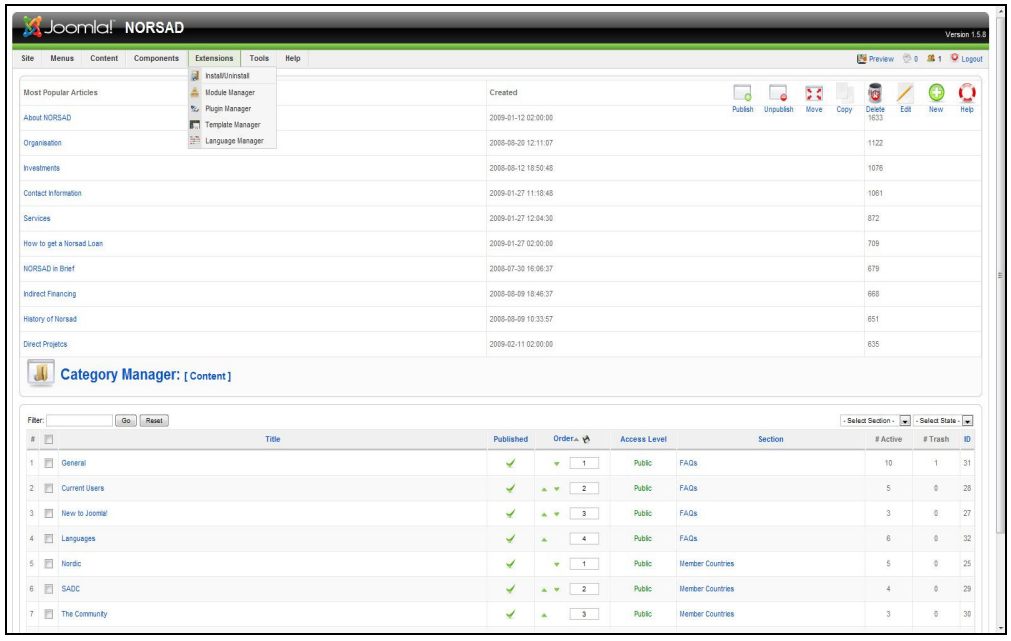
Screenshot 13: Front-page manager

The Section manager icon aid you in publishing the content in the section selected. To create a section, give the title (enter a shot name of the new section) to appear in the menus, then enter a long name for the new section to be displayed in the headings fields, and finally select which level of user can see the section, (Public, Registered, and Special). The user (the user here means a non-technical member of staff trained to update the site) can be given access to the section. By clicking on the title of the section, you can toggle between, public, registered, and special. Public means that the user has access to the content, registered means that the user should be registered by the supper administrator for the rights to write on this section, special is only the supper administrator has rights for the section in question.



Screenshot 14: Section manager

Category manager icon is there for the management of all categories of the site. You can edit, delete a category. The category manager screen displays includes column name, category name (title of the category), published (the published or unpublished status), order (you can enter the order in which you want the menu items to be displayed), access level, and category ID (the ID of the category as held in the database).



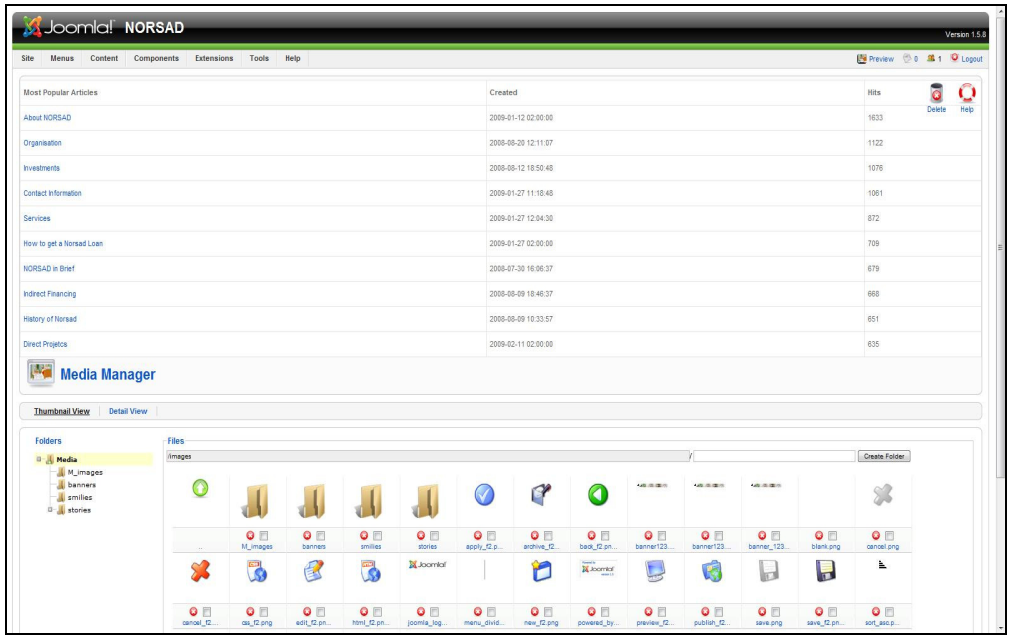
Screenshot 15: Category manager

Media manager icon screen presents all existing root directory media folders and images. The media manager allows you to perform two basic tasks:

- Create, and delete directories for your media files
- Upload media content to any folder, or delete existing files

To create a new directory, enter name of the new directory, and then press create icon on the toolbar. The directory will then be created and available to you for storing media files. You can delete a file by clicking on the trashcan icon under the image of the file in the media manager window.

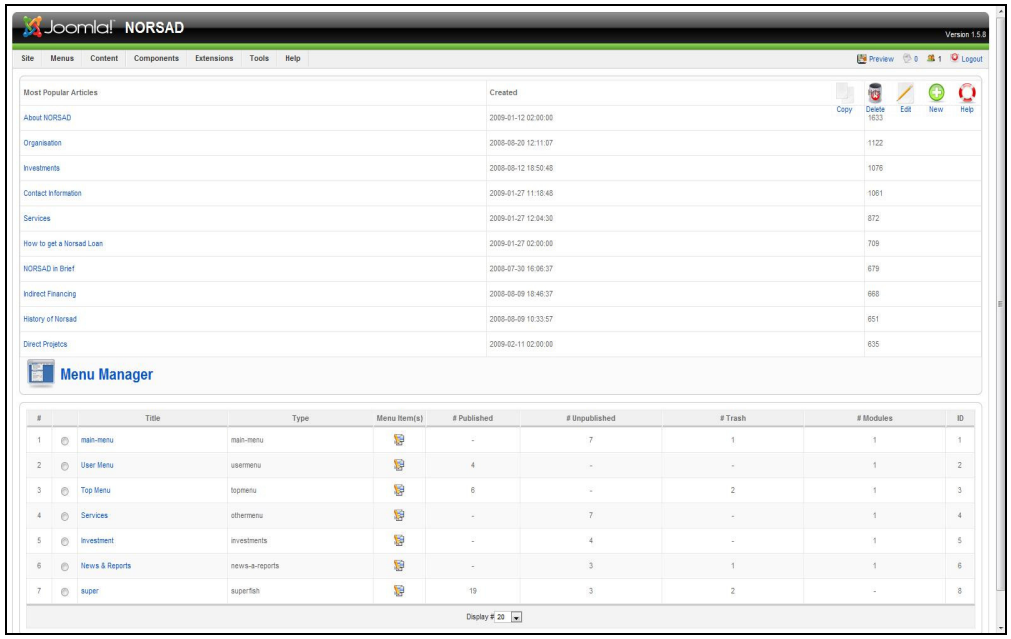
To upload a file, click the browse button. The browse button will open a new pop-up window, from which you can navigate to the location on your computer hard drive to the file you want to upload. Select the directory that you wish to upload to. Click upload icon in the toolbar. The image or document will be uploaded and then be available in the chosen directory.



Screenshot 16: Media manager

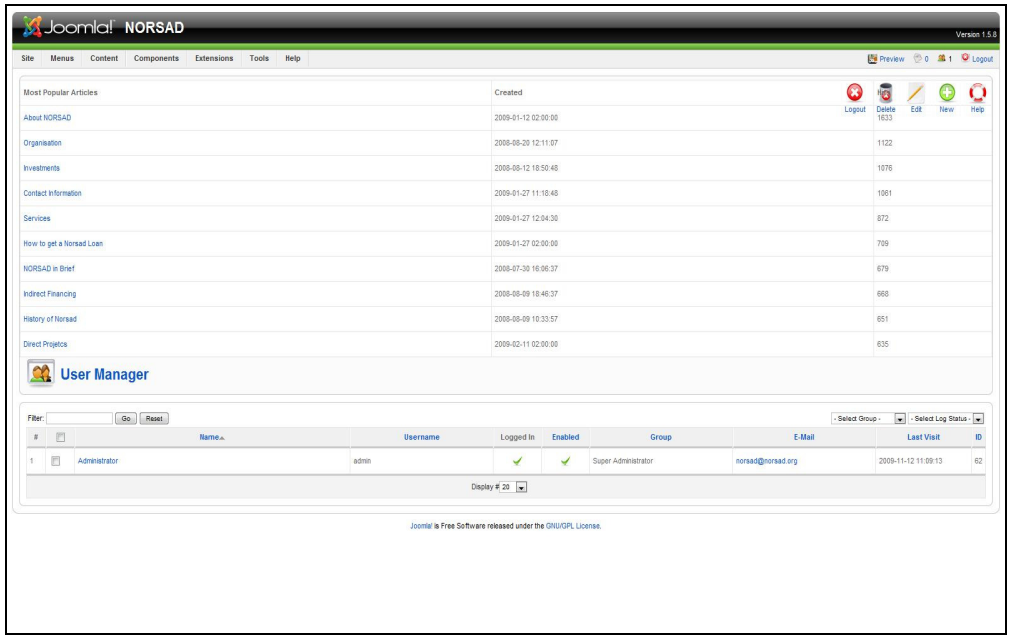
Navigation and access to content of the website is provided through menus and menu manager icon managers this feature. Menus are groups of links to sections, categories, content items, components or external pages. These links are called menu items. Each menu must have an identification name, which is only used internally by Joomla. A menu only becomes visible on the site if it has a published main-menu module that references it. You may create, or edit menu items for each of the menus showing on the menu manager list page.

To create a menu click on the new icon in the toolbar, it opens a new menu item window with a list of the menu item types and a description of each of the through a mouse-over of the information icon. Once the choice has been made and the next icon has been clicked, a new window pop-up with the name add menu item (the type of link chosen).



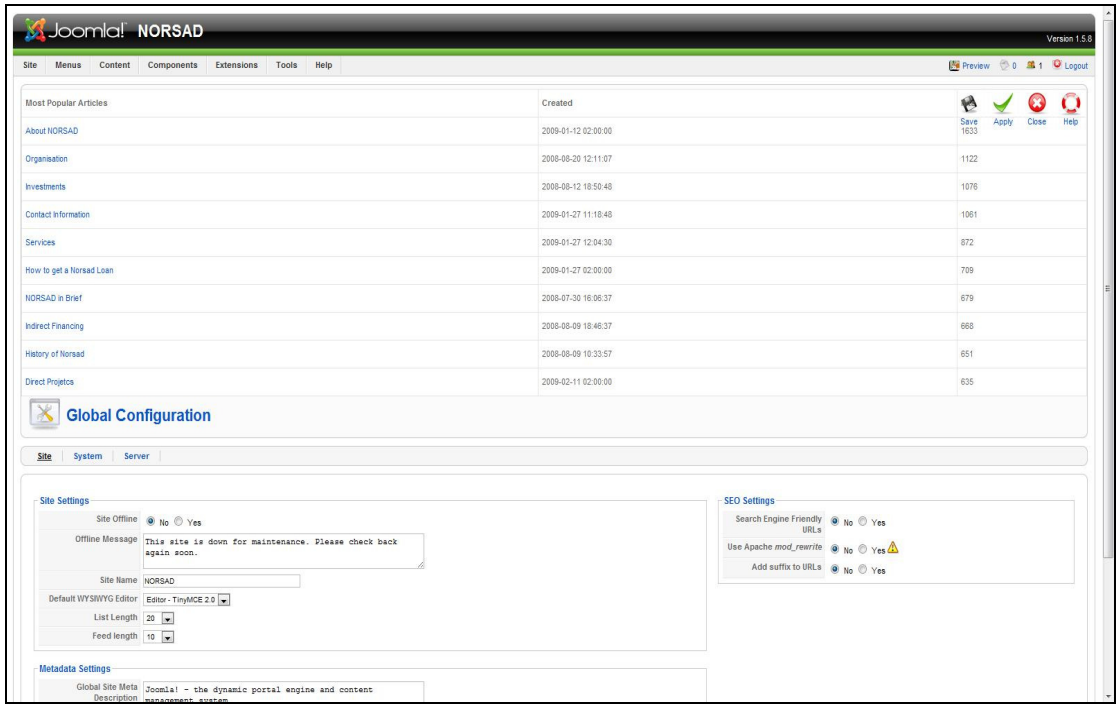
Screenshot 17: Menu manager

The User manager allows you to add, edit and delete users. The supper administrator is has all access to all administration functions and can assign users (managers of the site, as is the case with NORSAD project; the two members of staff trained to create content and other system information).



Screenshot 18: User manager

The Global configuration is the main configuration centre in Joomla. Changes made in this area will update the PHP configuration file. The global configuration file needs to be writable in order for it to be editable. To edit the file, open the FTP File Transfer Protocol program. I will not describe further on this feature because of the security sensitivity associated to the global configuration file and the FTP.



Screenshot 19: Global configuration

2.9 Designing the Website

The design NORSAD wanted was the one that would accommodate news article, search engine, drop down menus, downloadable annual reports and multi media content just to mention but a few. To build a content management system website with the features mentioned above, you need a database, script language for programming, and a web server. Based on the information on the planning phase the needs and what NORSAD expected from the site was clear that all pages should be linked to the home page as figure 1: show, the navigation links such as home, about us, NORSAD in brief and services and all text, organization logo were obtained and

the building of the project began. The directory for the new site was established on a private machine with a testing server so that every time there was staff meeting the staff may see the website development. CSS style sheet was used to define fonts size, style, and colour for consistency throughout the website project.

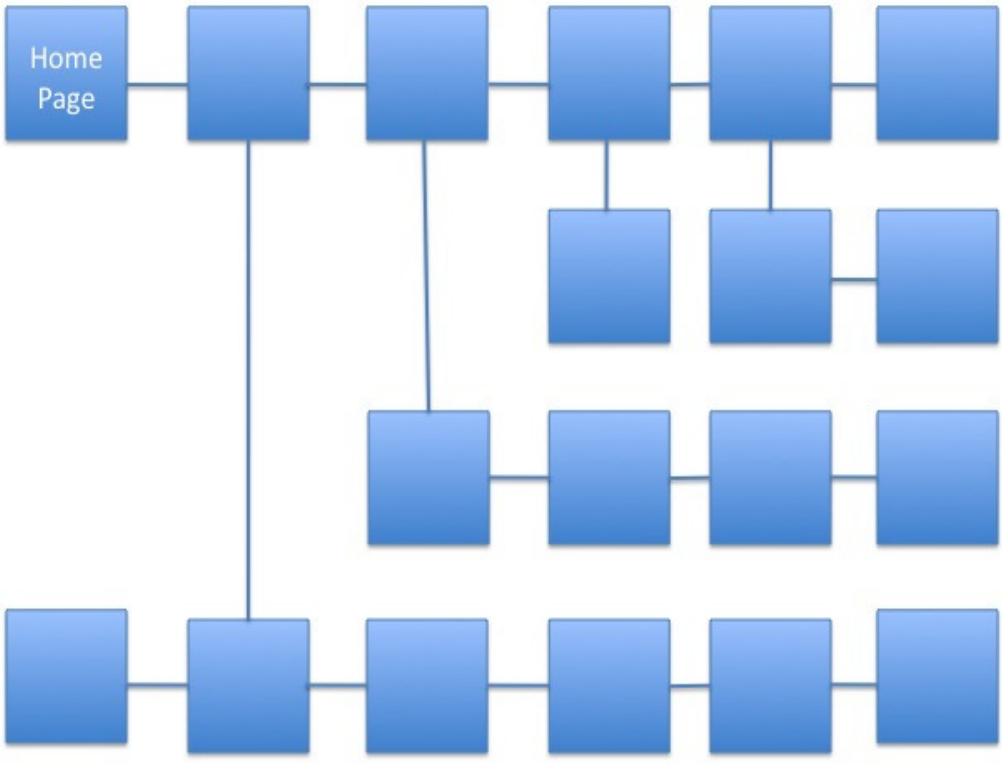


Figure 1: NORSAD Joomla website layout

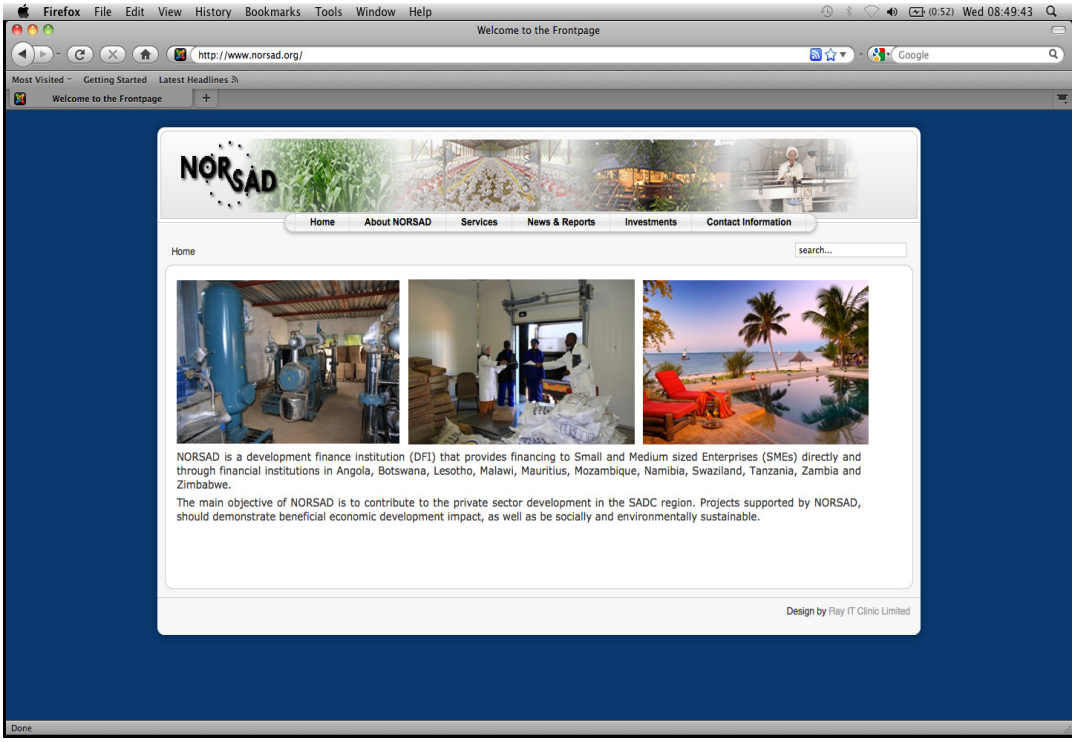
2.10 Testing the System

The website testing was done on the localhost machine and when the site was live. Page Titles and Page Headings, Links Text, Page Body text, and Image tags were evaluated and adjustments were made throughout the website. Browsing compatibility testing was done on a three operating systems namely Windows, Mac Apple and Linux and browsers Mozila Firefox and Explore for Windows, Safari and Mozila Firefox for Mac Apple, and Mozila Firefox for Linux respectively. A thorough check for dead links and missing files was done prior to launch and after. After the website was live, NORSAD staff were asked to check out all the links, to verify proper functions, grammar and spellings was performed to insure there are no

mistakes, and final test on the search engine testing and fixing small issues that were seen. All the NORSAD website files and scripts were transferred using (FTP) File Transfer Protocol via the Internet to the domain and a database was set up on Yahoo web hosting server. Minor adjustment to the website continued for some good three weeks, these included adding, changing text, adding and changing photos and putting a comma in the right place.

2.11 Final Outcome of the Project

The current Joomla (CMS) website for NORSAD under went a face-lift and the content is up to date. All features that the organization wanted were finished except the photo gallery. The Internet in Zambia is generally so slow since this is the time the government is just deploying an optic fiber network, the optic fiber project will be completed by the end of this year at the moment we will continue to use slow internet connects. The management of NORSAD decided to remove the photo gallery from the site due to slow bandwidth from the Internet Service Provider (ISP) that NORSAD is affiliated to. Plans are there to restore the photo gallery as soon as the fiber optic project is completed that is by the end 2009. The photo gallery is important to NORSAD because it's a tool they use to market and show their projects to Directors in four Nordic countries and eleven Governors in (SADC) member states. The screenshot 20; is the current site in full colour and it also illustrates the successfulness of the project.



Screenshot 20.0 NORSAD Joomla website

5 SUMMARY

The NORSAD Joomla website project was successful, the NORSAD management was happy with the project outcome, so was the web developer. The website is hosted by Yahoo in the United States of America since April 2009, many website hosting companies in the world have no problems to host a Joomla sites. The NORSAD website begins with a design that is simple to use. The graphic design and the content on the home page grab the user's attention and its easy to navigate. The management team wanted every page to have a link to the home page so that in just one click, the user can be lead there, this was done, as figure 1 illustrate.

The challenges I faced with NORSAD was regarding the information I should put on the site, some information was coming from the Management staff, and other departments such as Portfolio and Investment. The departments are so busy such that days would pass by before I was given the information to put on site. The training of two members of staff to update the site was another challenge. The two members of staff to be trained were supposed to find their on time from their already busy working day to come for the website updating training, this meant ten to fifteen minutes of training each week. Since this meant extra work, the support was not encouraging at all.

The installation of Joomla and WAMP package was easy to do. The difficult thing in joomla was making the drop-down menu. In order to make the drop-down menus I had to install a package called super-fish, the super-fish package enables a web developer make the menus side ways or drop-down on mouse cursor. The joomla extensions should include the super-fish package to make the job easy. I have become familiar with Joomla application and I have been using it to build content management system websites since this project with NORSAD. My new laptop is Apple Mac Book Pro, I am using MAMP and Joomla 1.5.14 latest version to do my new website project that is due in spring next year.

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