ADDIS ABABA UNIVERSITY

SCHOOL OF GRADUATE STUDIES

FACULTY OF COMPUTER AND MATHEMATICAL SCIENCES

DEPARTMENT OF COMPUTER SCIENCE

Localization of Open Source Content Management Software into Amharic Language

By

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A Project paper submitted to the School of Graduate Studies of Addis Ababa University in partial fulfillment of the requirements for the Degree of Master of Science in Computer Science

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Table of Contents

List of Figures iii

Acronyms iv

Abstract v

1. Introduction 1

1.1. Statement of the problem 2

1.2. Objective of the Project 2

1.2.1. General objective 2

1.2.2. Specific objective 2

1.3. Scope of the project 3

1.4. Methodology 3

2. Literature review 4

2.1. Open Source Software 4

2.1.1. Open Source Software for Developing Countries 6

2.1.1.1. Lowering costs and improving access 6

2.1.1.2. Adaptation to local needs 6

2.1.1.3. Creates local business opportunity 6

2.1.1.4. Developing local skills 7

2.2. Content Management 7

2.2.1. Key Benefits of CMS 8

2.2.2. Functions of CMS (core features offered by most CMS) 9

2.3. Virtual Keyboard 9

2.4. Localization 10

2.5. Related work 11

3. Selection and localization of a CMS 12

3.1. CMS selection 12

3.2. Language translation package development 13

3.2.1. Tools used for development 13

3.2.2. Steps followed to develop a language translation package 14

3.3. Virtual keyboard localization 14

3.4. Content development with the localized Joomla 14

4. Future Work 32
5. Conclusions 32
References 34
Glossary 36
WAMP Server Installation 36
Joomla! 1.5.x Installation 43
User Manual 51
Language Translation package installation 51
Amharic Virtual keyboard module Installation and User Manual for Joomla 55

List of Figures Page

Figure 2.1: how CMS works 8
Figure 3.1: Login dialog box 15
Figure 3.2: Administrative panel 16
Figure 3.3: New article insertion window 16
Figure 3.4: Components (ምንዝሮች) menu 17
Figure 3.5 : Contents (ይዘት) menu 17
Figure 3.6 : Website (ድረ ገፅ) menu 18
Figure 3.7 : Language manager (ቋንቋ ማናጀር) window 18
Figure 3.8 : trash manager window(ቆሻሻ ማናጀር) 19
Figure 3.9 : Extension Manager Window(ቅጥያ ማናጀር) 19
Figure 3.10 : Module Manager (ሞዱል ማናጀር) window 20
Figure 3.11 : Template Manager (ቅንብር ደንብ) window 20
Figure 3.12 : Private message (የግል መለእክት ፃፍ) window 21
Figure 3.13 : Banner Manager(ሰንደቅ ማናጀር) window 21
Figure 3.14 : User manager (የተጠቃሚ ማናጀር) window 22
Figure 3.15: Contacts Manager (የዕውቂያ ማናጀር) window 22
Figure 3.16 : Search Statstics (የፍለጋ ስታትስትኪስ) Window 23
Figure 3.17: Drop down list 23
Figure 3.18: Amharic Virtual keyboard layout 24
Figure 3.19: Amharic number pad 24
Figure 3.20: Amharic Virtual keyboard 25
Figure 3.21: English keyboard layout 25
Figure 3.22: English number pad 26

Acronyms

CMS Content Management System

FTP File Transfer Protocol

HTML Hyper Text Markup Language

OSS Open Source Software

WYAIWYG What You See Is What You Get

GPL General Public License

GNU GNU's Not Unix (a project to create an OSS/FS operating system)

FSF Free software foundation

ICT Information Communication Technology

FTP File Transfer Protocol

URL Universal Resource Locater

CSS Cascading Style Sheet

Abstract

Open source software is attracting the attention of most developing countries for benefits it provide like software license cost minimization and free access of the source code for localization. The attempts to localize the open source software like OpenCMS content management system and Linux operating system in Ethiopia are some of the good examples.

In this work a well known and most widely used open source web development tool called Joomla is localized into Amharic to make professional and non professional individuals who wants to develop a web site comfortable. The front and back end interfaces are translated in to Amharic and a virtual keyboard is designed to make Amharic text entry easier. To demonstrate the convenience of the translation package and the virtual keyboard for Amharic web content development, an application is selected and a web based e-commerce system is developed with Amharic interface.

Key words: Content Management System (CMS), Localized Open Source Software, Joomla for Amharic content development, Virtual keyboard for Amharic text entry.

1. Introduction

The life of today's society is highly influenced by information communication technology (ICT). ICT can help developing countries tackle a wide range of health, socio and economic problems. By improving access to information and by enabling communication, ICT can play a role in elimination of extreme poverty, combating serious disease, and achieving universal primary education. However, the benefits of ICT are not fully realized in many developing countries because of so many reasons.

One of the reasons is lack of appropriate content. When content is designed they don't take into consideration local language, culture and needs of the majority of the developing countries. Of those who can read, many know only a local language, while many of the applications on the internet are dominated by the language of the developed nations. Another reason is financial problem. Many of the potential users are unable to afford the cost for the hardware and software products. Lack of technical skill required is also another problem in situation where there is access to the technology [1, 2].

Many studies suggest adoption of Open Source Software (OSS) can be one means in improvement of information technology in developing countries. Open source refers to a program in which the source code is available to the general public for use and/or modification or customization is encouraged from its original design free of charge [1,2].

OSS has received much attention from developing countries for two reasons: the software is cheaper to use due to the absence of cost associated with the license and have large support than proprietary software. The second point builds upon the modifiable nature of free software which allows it to be adapted to local needs. It also gives an opportunity for innovation through customization and localization of the different products to meet the inside demand even to the extent of having indigenous software industry.

A number of different applications were developed following the principle of open source. Some of the well known include operating systems like Ubuntu and Linux, MySql a database server, Apache web server most widely used on the internet, Firefox web browser and content management systems like word press, drupal and joomla [4].

1.1. Statement of the problem

Web sites are used to promote companies and their products, offer services and information and facilitate communication. Web content needs to be managed quickly at a qualitative level. There are a number of tools for creating web sites, but it takes time to learn and use them. Now a days, the time which requires you to become a computer professional to develop a web application seems to pass away because of the introduction of content management systems (CMS). Using open source CMS to develop a website is becoming common and considered as a good opportunity by most software developers. But it is not well known and used by people with little knowledge about computer applications from non-English speaking countries like Ethiopia because the default language that is used in front and back end of CMS is different from the native language that they know and understand well. This has also limited the rate of adoption of open source software and open source CMS in those countries. In addition to this users will face a problem in using the English keyboard to insert a text different from English.

1.2. Objective of the Project

1.2.1. General objective

The general objective of this project is to develop an effective and user friendly Ethiopic language content development environment by selecting and customizing appropriate CMS that is mostly used in Ethiopia. The effectiveness of the customized system will be demonstrated by developing an Amharic application for E-commerce.

1.2.2. Specific objective

The specific objective includes:

- Select the appropriate CMS for Amharic content development.
- Customize the selected CMS for Amharic content development environment.
- Adopt or customize a selected keyboard.
- Test effectiveness of the customized environment in developing web sites with Amharic contents by developing an online bookshop system that can be used to sell books written in Amharic. Contents of the application that is going to be developed will be in Amharic; the search query for books in the database will also be in Amharic.

1.3. Scope of the project

This project is limited to the customization of a selected CMS environment in to Amharic language only. Existing translated information technology terms will be used for translation of the environment.

1.4. Methodology

The following methodologies have been used to accomplish our objective:

- Study content management system that is commonly used in our country for web development for this
    - We have conducted an interview with some software developing companies and web master of some universities.
- Review what has been done in other non-English speaking countries to customize the selected CMS.

2. Literature review

2.1. Open Source Software

In order to use proprietary software the user is expected to pay money to buy a license which allows him/her to use the software proved by the company. The license has limitation on the number of users who could use the software, the number of computers it could operate on and the location where it could be used.

Open source software starts to emerge in the late 1970s and early 1980s as a reaction to the proprietary software. Richard Stallman, formerly a programmer at the MIT AI Lab launched the GNU Project and the Free Software Foundation (FSF) who strongly believe availability of the source code and freedom to redistribute and modify software are fundamental rights. The ultimate goal of the GNU Project was to build a free operating system, and Richard started by coding some programming tools (a compiler, an editor, etc.). In order to prevent unfair exploitation of the software produced by GNU and promote the production of more software GNU General Public License (GPL) was designed. In 1989, after a brief period of development, Stallman (aided by attorney Eben Moglen) started to release software under GNU Public General License [5,6].

Stallman and the FSF had developed some excellent software tools, including the multi-purpose text editor EMACS and a suite of compilers such as GCC, as well as other significant parts of an operating system (called 'GNU'). The first free open source operating system called Linux is then released by Linus Torvalds under the GPL. It progressed rapidly using the collaborative model made possible by the Internet and hundreds of widely dispersed programmers worked on the various different facets of the system to produce the first versions of Linux capable of running quickly and reliably. Since then it has been developed to produce the stable and mature versions of Linux which we see today [5,6].

During the 1990s, a number of high quality software has been produced by many open source projects. Some of them are Apache (widely used as a WWW server), Perl (an interpreted language with lots of libraries), XFree86 (the most widely used X11 implementation for PC-based machines), GNOME and KDE (both providing a consistent set of libraries and applications to present the casual user with an easy to use and friendly desktop environment), Mozilla (the free software project funded by Netscape to build a WWW browser), etc.

The late 1990s are very exciting times with respect to open source software. Open source systems based on GNU/Linux or *BSD are gaining public acceptance, and have become a real alternative to proprietary systems, competing head to head with the market leaders (like Windows NT in servers) [5,6].

When software is developed using open source software the new software should be distributed with the following distribution terms [7,8,15].

Free Redistribution

Selling, giving away as a component of an aggregate software, or distribution of open source software shall not be restricted by license.

Source Code

The new application should be distributed with the clear source code which can be easily understood by programmer. If it is not possible to distribute with the source code, there should be some mechanism to access the source code for no more than a reasonable reproduction price.

Derived Works

The license that is distribution with the software must allow modifications and redistribution of the software under the same terms as the license of the original software.

Integrity of the Author's Source Code

The license may restrict the distribution of the source code if only the license allows the distribution of "patch files" with the source code for the purpose of modifying the program at build time.

No Discrimination against Persons or Groups

The license must give equal opportunity to any person or group to contribute to the open source.

No Discrimination against Fields of Endeavor

The license must allow any one from any field for example, business to use the software in appropriate way.

Distribution of License

When the program is redistributed the rights attached with it must apply without the need for execution of an additional license.

License Must Not Be Specific to a Product

When a software package is distributed with a license any application that is developed using this software should be distributed with the same license as the original one.

License Must Not Restrict Other Software

The license must not restrict the distribution of proprietary software along with open source software.

License Must Be Technology-Neutral

No provision of the license may be predicated on any individual technology or style of interface.

2.1.1. Open Source Software for Developing Countries

The three main advantages of Open source software are minimization of cost, support and adaptability. By Making open source software first choice developing countries can gain lots of benefits. We will describe the advantages of open source software for developing countries in detail in the next few paragraphs.

2.1.1.1. Lowering costs and improving access

Most of the developing countries are poor and cannot afford the license cost that is required to use the proprietary software. This becomes a barrier to ICT access and technology growth. Open source software can solve this problem and improve technology access within the developed countries [2, 9].

2.1.1.2. Adaptation to local needs

Another important advantage that comes up with open source software is the freedom to adapt software for local needs. Because the proprietary software companies are usually global and concentrated in a few parts of the world they make investments on the basis of global returns, and may not pay sufficient attention to local needs. However, unlike their proprietary counterparts, open source software developers allow and encourage those who are motivated to adapt their software [2,9].

2.1.1.3. Creates local business opportunity

Adaptation to local need facilitate the creation of new local businesses, which are able to provide commercial support for and build upon free software. Because there is a privilege to access the source code a better support with minimum price can be provided by the local businesses which

generate enormous value, all of which is retained locally. In addition to this open source software allow providers to reuse code rather than build from scratch. This also provides better value for many of the customers (who benefit from software representing a large base of cumulative development) and better profit margins for local service providers (who can focus on adding new features faster rather than replicating basic ones, allowing them to charge more for less work) [2,9].

2.1.1.4. Developing local skills

One good reason behind the success of open source software is collaborative mode of development followed. A number of highly qualified professionals around the world will participate in the development process and allows anyone who is interested. This is a great opportunity for individual to get skill for free. These skills are valuable, help developers get jobs and can help create and sustain small businesses. By participation in free software communities one can learn skills like programming, skills rarely taught in formal computer science courses, such as copyright law and licenses. Teamwork and team management are also learnt [2, 9].

2.2. Content Management

The History of Content Management Systems (CMS) is as old as the history of Content, which is coincident with the history of human knowledge, including history itself. Content is any type or 'unit' of digital information. It can be text, images, graphics, video, sound, documents, records etc – or in other words – anything that is likely to be managed in an electronic format.

Content Management is effectively the management of the content described above, by combining rules, process and/or workflows in such a way that its electronic storage is deemed to be 'managed' rather than 'un-managed'.

A CMS is a tool that enables a variety of (centralized) technical and (de-centralized) non technical staff to create, edit, manage and finally publish (in a number of formats) a variety of content , whilst being constrained by a centralized set of rules, process and workflows that ensure coherent, validated electronic content [15]. It resides on a server and replaces web pages as a means of displaying a website. The pages do not exist and instead are created from a database on-the-fly, by the CMS software. The owner can edit content online without recourse to a webmaster. Additional website functions and features are added by means of plugins, so that custom development is not normally required. As shown in Figure 2.1. page design is based on

templates created by design managers instead of the free-form method used in normal web pages, and this means that content is separated from design, so that each does not affect the other. This means the site owner/content contributors can change the content without affecting the page layout, and that design issues are resolved more easily and quickly. CMS is the best way to run a large website, or indeed any site where regular edits or changes are made; and where additional functions will be needed at a later date. A large or complex site will be far quicker and cheaper to build with a CMS [10].

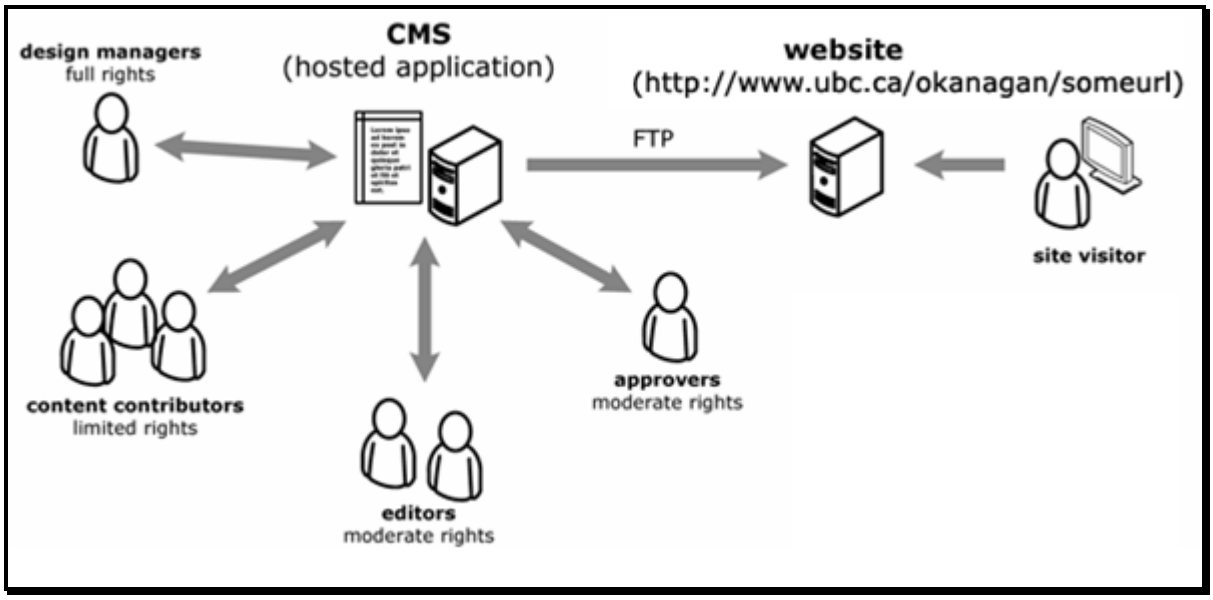

Figure 2.1: How CMS works [11]

A CMS consists of a front end and a back end. The front end is the website—what site visitors and the logged-on users see in Figure 2.1. above the back end, on the other hand, contains the administration layer of the website for the administrator. Configuration, maintenance, cleaning, creation of statistics, and new content creation are all done in the back end.

2.2.1. Key Benefits of CMS

A content management system in general enables a user to manage large amount of contents form different content providers. Some of the benefits it provides are the following:

- Allows non-technical staff the ability to update web site content without knowing HTML, FTP, etc.
- Easy-to-use WYSIWYG tools, similar to Word (code view as well).

- Individuals who have natural responsibility for content can maintain that content themselves (with approval process if desired).
- Content more likely to be kept up-to-date (review reminders).
- Automated end-to-end processes for content creation, publishing, reusing.
- Assures information relevance, currency and accuracy.
- Efficient management of web content and makes site maintenance and (re-)development easier and far less costly.
- Help web professionals to focus on higher-value tasks, i.e. developing interactive functionality, improving site usability

2.2.2. Functions of CMS (core features offered by most CMS)

There are a number of proprietary and open source CMS available for users. Most for them provide the following functionalities

- **Workflow:** is the management of steps taken by the content between authoring and publishing (submit, review, approve, archive). Typical steps could be link checking and review/signoff by a manager or legal team.
- **Authoring:** is the process by which users can create web content within a managed and authorized environment.
- **Storage** is the placing of authored content in to a repository.
- **Publication** is the process by which stored content is delivered. Traditionally this meant 'delivered to the web site as HTML'. However it could also mean as an e-mail message, as an Adobe PDF file or as Wireless Markup Language (to name but a few).
- **Versioning,** so that groups of individuals can work safely on a document and also recall older versions

2.3. Virtual Keyboard

A virtual keyboard is a software component that allows a user to enter characters. A virtual keyboard can usually be operated with multiple input devices like touch screen, an actual keyboard, a computer mouse, a head mouse and an eye mouse. It is an alternative input mechanism for users with disabilities who can not use a physical keyboard. Another major use for an on-screen keyboard is for bi- or multi-lingual users who switch frequently between different character sets or alphabets. Virtual keyboards are commonly

used as an on-screen input method in devices with no physical keyboard, where there is no room for one, such as a pocket computer, personal digital assistant (PDA), tablet computer or touch screen equipped mobile phone.

Virtual keyboards can be categorized by the following aspects:

- Physical keyboards with distinct keys comprising electronically changeable displays integrated in the keypads
- Virtual keyboards with touch screen keyboard layouts or sensing areas.
- Optically projected keyboard layouts or similar arrangements of "keys" or sensing areas.
- Optically detected human hand and finger motions.
- Virtual keyboards to allow input from a variety of input devices, such as a computer mouse, switch or other assistive technology device.

To be of any use, these virtual keyboards must be an integral part of an application or web page. A generic virtual keyboard which will work with any program, including those that are not explicitly written for it will not defeat a key logging program because the virtual keyboard will generate the same keyboard events as a real keyboard, and those events can be trapped and logged just as real keyboard inputs can[12].

2.4. Localization

Localization is the process of adapting a product or service to a particular language, culture, and desired local “look-and-feel.” Ideally, a product or service is developed so that localization is relatively easy to achieve – for example, by creating technical illustrations for manuals in which the text can easily be changed to another language and allowing some expansion room for this purpose. This enabling process is termed internationalization. An internationalized product or service is therefore easier to localize. The process of first enabling a product to be localized and then localizing it for different national audiences is sometimes known as globalization. In localizing a product, in addition to idiomatic language translation, such details as time zones, currency, national holidays, local color sensitivities, product or service names, gender roles, and geographic examples must all be considered. A successfully localized service or product is one that appears to have been developed within the local culture. Language translation, which is a

large part of localization, can sometimes be facilitated with automatic language translation. However, much additional work is usually needed [13].

2.5. Related work

Different attempts were made to localize open source content management system in to Amharic.

Zemen Adego[14] has tried to customize working environment of OpenCMS which is one of the open source content management software to improve document management and exchange in Ethiopian government organizations and enable organizations to provide good service to their clients.

Frezewd Lemma[15] has also chosen to localize OpenCMS content management software from different CMS like WebGUI, Bricolage, Ezpublish, Zope, Typo3 Twiki, midgrass and OpenCMS. he has customized OpenCMS so that it can use the Ethiopian date and time, customize the built in calendar to display the Ethiopian calendar whenever Amharic language is selected. In addition to this he has developed the Ethiopian calendar module that can be integrated in OpenCMS and used during the content creation.

Both of the previous attempts focus on localizing OpenCMS. However it is not seen widely used in government or non government organizations for some unknown reason.

3. Selection and localization of a CMS

In this part of the document we will discuss the steps followed to achieve the objective of the project.

3.1. CMS selection

The main objective of this project is to localize open source CMS that is mostly used in the country for web content development. To achieve this goal we went to some software developing companies and organizations who own a web site with some questions. From the response we observe that Joomla is the most common CMS being used in most higher education institutions (Addis Ababa University, Ambou University, Arba Minch University, Andinet international school, Bahir Dar University, jimma University, Mekelle University, Haramaya University) and government organizations(Ethiopian Wildlife Conservation Authority, Institute of Land Administration, Central Statistical Agency of Ethiopia (CSA), The House Of Federation,) to develop a web site [19].

Joomla is a content management system that allows users to build websites of varying complexity using a combination of user entered data, custom code, and extensions. Although the product is fairly young (the first release was in 2005), it is built on the Mambo codebase, which was first developed in 2000 [18].

Here is a list of joomla features [16, 17].

- Free source code
- Simple workflow system
- Caching mechanism to secure fast page creation with favorite pages
- Wastepaper basket
- Banner management
- Data manager for uploading and administering data
- Publication system for content
- Content summaries in RSS format
- Search-engine-friendly URLs
- Multilingual front end
- Macro language for data content (Mambots)

- Administration interface that is separated from the homepage
- Simple, expandable template, and component system
- Simple, but powerful template system (HTML, CSS, PHP) without a complicated template language
- Hierarchical user groups
- Simple visitor statistics
- WYSIWYG editor for content
- Simple polling
- System of evaluation for contents
- Powerful extensibility
- After the split, a large and eager community of users and developers was quickly established
- Help to find the right contact information
- Easy media files management
- Integrated help system to assist users in finding what they need.
- Web services

3.2. Language translation package development

In this project we have developed a language translation package for Joomla CMS that can be installed and used to change the working environment (interface) to be suitable for people who know and understand Amharic language.

For the translation we have used English-amharic ICT Glossary developed by Ethiopian information communication technology development agency (EICTDA) and document forum on wiki [20]. In this work more than 800 technical words are translated in to Amharic.

3.2.1. Tools used for development

To develop the translation package the following software and fonts were used

- Notepad++ to translate and save English words in to Amharic
- Nyala font
- WinZip

3.2.2. Steps followed to develop a language translation package

1. Translate all the front and back end files in to Amharic and put them in different folders.
2. Create an installable XML file which contains the name of all the translated files.
3. Zip the three files together using WinZip.

3.3. Virtual keyboard localization

A virtual keyboard module that is developed for other languages using java script is localized to contain Amharic keyboard layout. This help users to insert information like username and password to text fields, password fields and text areas of a website in Amharic.

The following tools were used for the development of the virtual keyboard

- WAMP server used as a web server.
- PHP
- Java Script
- MySQL
- Apache web server

3.4. Content development with the localized Joomla

The translation package developed was installed on Joomla and used to develop an online book shop application where a user can search for a book that is written in Amharic and check for the price and availability so that to prove its functionality. Accordingly, the translation package can be installed easily and works properly.

Sample screen shoots of the localized interface and the virtual keyboard

The following figure shows sample screen shoots after the Amharic Language translation package is installed and selected to be the default language for the front and back end of Joomla.

Figure 3.1 shows the login page to the administrator of this particular site or **ሎሊ** book shop.

Figure 3.1: Login dialog box

Figure 3.2 shows the administrative panel after a successful login here the user can manage the website.

Figure 3.2: Administrative panel

Figure 3.3 shows the window in which the user inserts new article.

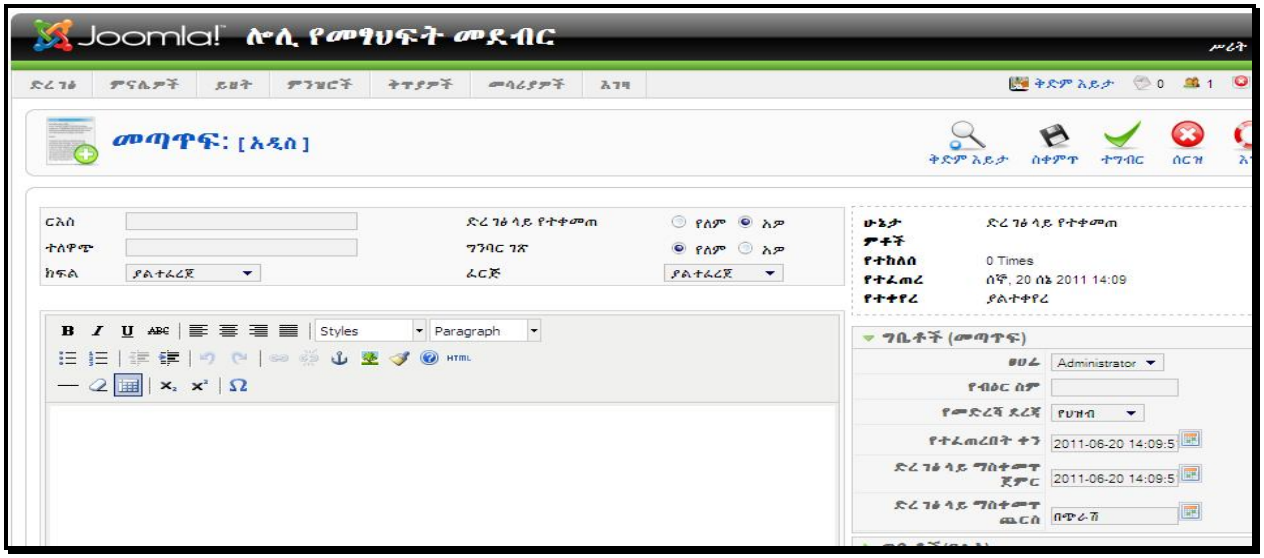

Figure 3.3: New article insertion window

Figure 3.4 shows drop down list of components (**ምንዝሮች**) menu

Figure 3.4: Components (**ምንዝሮች**) menu

Figure 3.5 shows drop down list of contents (**ይዘት**) menu

Figure 3.5: Contents (**ይዘት**) Menu

Figure 3.6 Shows dropdown list of website (**ድረ ገፅ**) menu

Figure 3.6: Website (**ድረ ገፅ**) menu

Figure 3.7: Shows the language manager window where the user select the default language for the site and administrator

Figure 3.7: Language Manager (**ቋንቋ ማናጀር**) Window

Figure 3.8 shows trash manager (**ቆሻሻ ማናጀር**) window in which the deleted items will be stored

Figure 3.8 Trash Manager (**ቆሻሻ ማናጀር**) Window

Figure 3.9 shows an extension manager window in which the used install different extensions for joomla

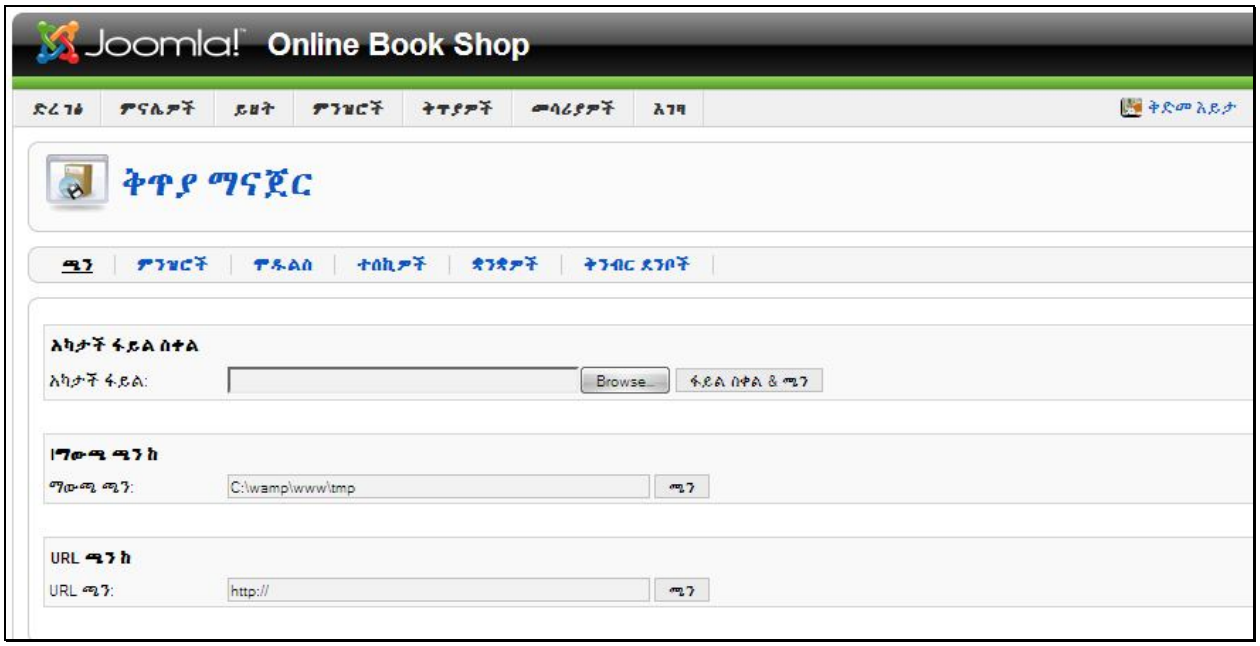

Figure 3.9 Extension Manager (**ቅጥያ ማናጀር**) Window

Figure 3.10 shows the module manager where different modules that are included will be displayed.

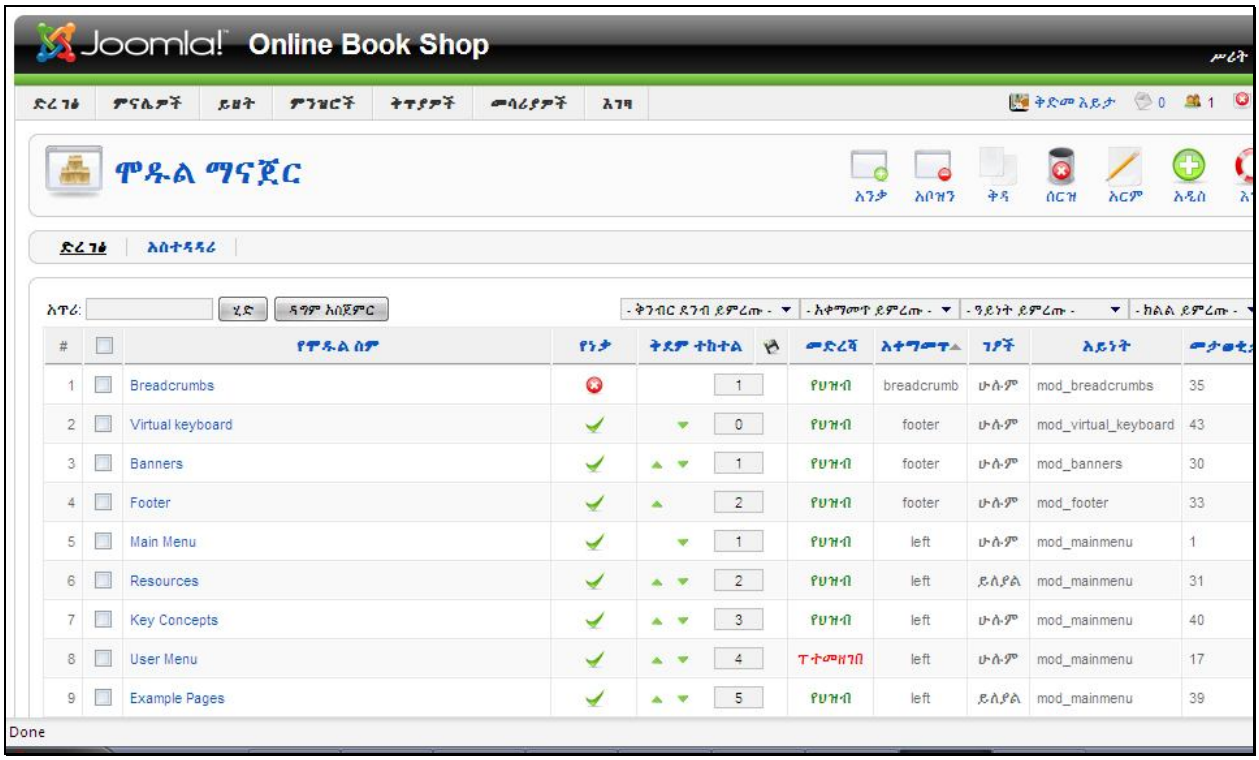

Figure 3.10 Module Manager (**ሞዱል ማናጀር**) Window

Figure 3.11 shows template manager where templates for the web site that can be used.

Figure 3.11 Template Manager (**ቅንብር ደንብ**) Window

Figure 3.12: Shows a window in which private message can be sent to users.

Figure 3.12 Write Private Message (**የግል መለእክት ፃፍ**) Window

Figure 3.13 shows a window that displays different banners for the
web

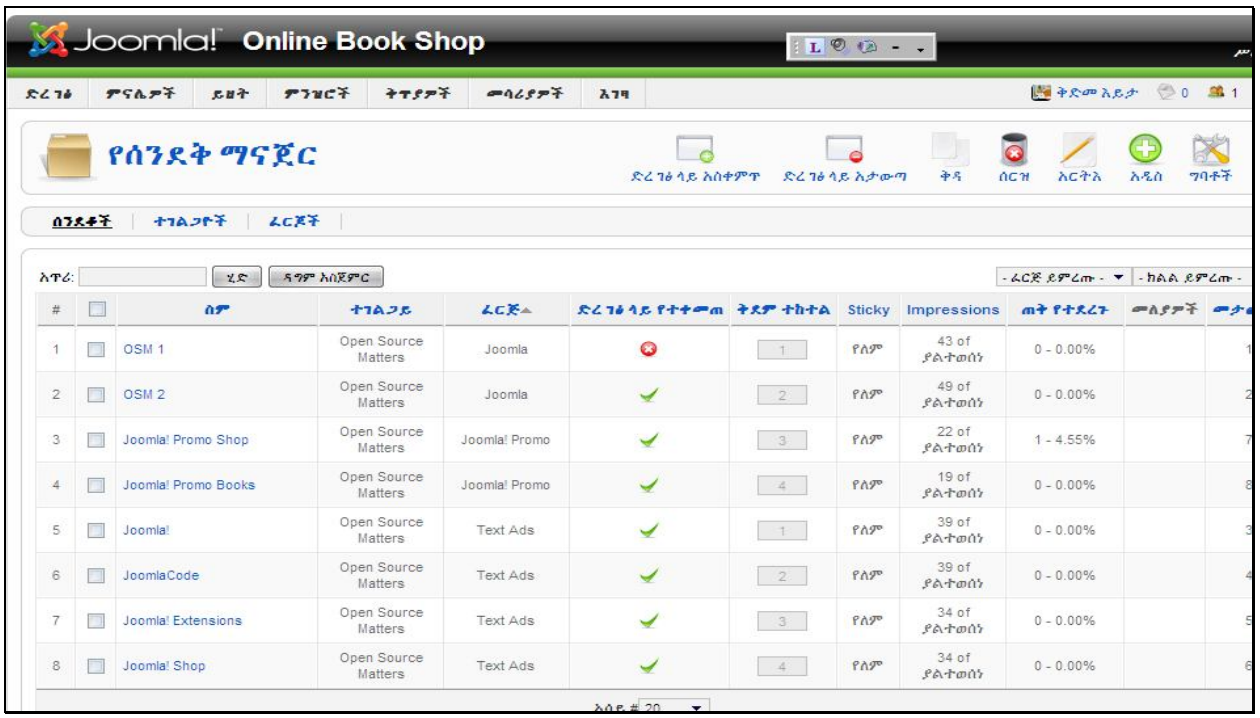

Figure 3.13 Banner Manager (**ሰንደቅ ማናጀር**) Window

Figure 3.14 shows a window where the administrator manages the eligible users of the website

Figure 3.14: User Manager (**የተጠቃሚ ማናጀር**) Window

Figure 3.15 shows the list of contacts for the web site

Figure 3.15: Contacts Manager (**የዕውቂያ ማናጀር**) Window

Figure 3.16: shows the search result window

Figure 3.16: Search Statstics (**የፍለጋ ስታትስትዊክስ**) Window

Figure 3.17 shows drop down menu to select the kind of virtual keyboard to use

Figure 3.17: Drop down list

Figure 3.18 Shows Amharic virtual keyboard displayed when [virtual keyboard interface] is clicked and Amharic is selected from the drop down list

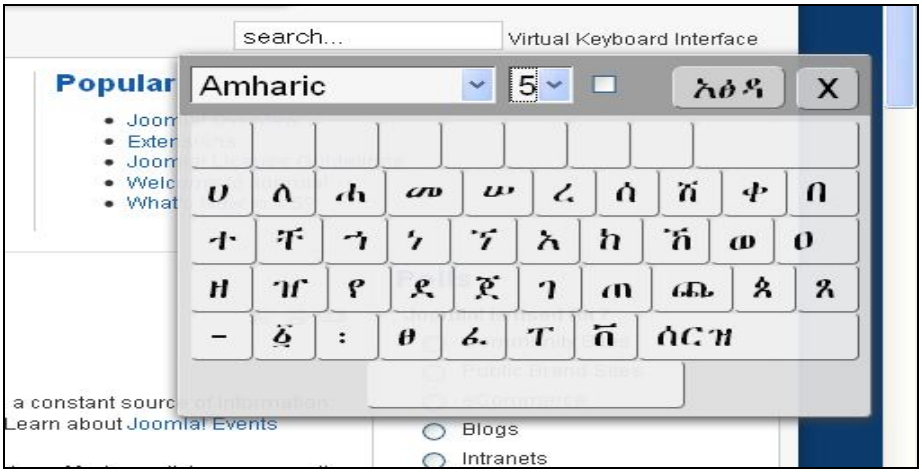

Figure 3.18**:** Amharic Virtual keyboard layout

Figure 3.19 shows Amharic number pad displayed when Amharic Numpad is selected from the drop down list

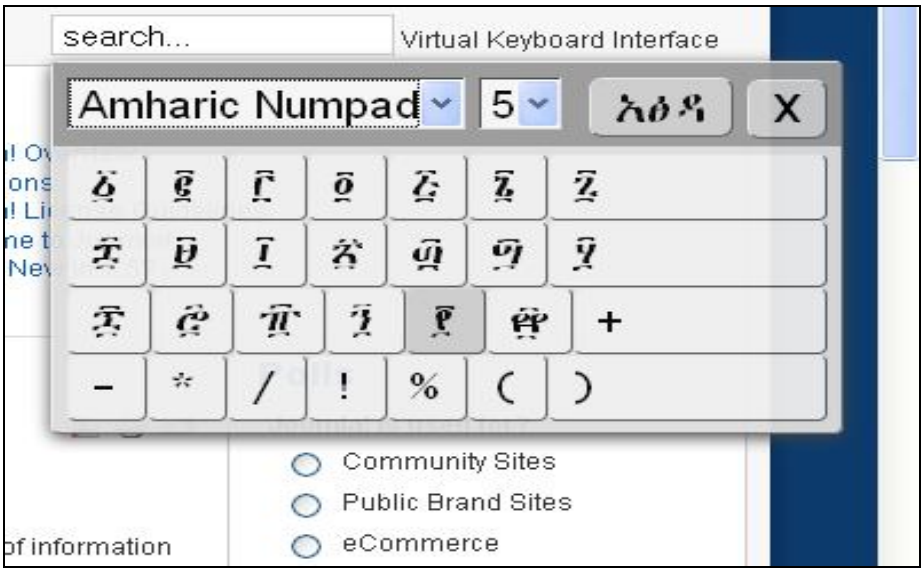

Figure 3.19 Amharic number pad

Figure 3.20 shows Layout of the Amharic Virtual keyboard after letter □ is clicked

Figure 3.20: Amharic Virtual keyboard

Figure 3.21: Shows Us virtual keyboard displayed when [virtual keyboard interface] is clicked and us is selected from the drop down list

Figure 3.21: English keyboard layout

Figure 3.23 shows English number pad displayed when Numpad is selected from the drop down list

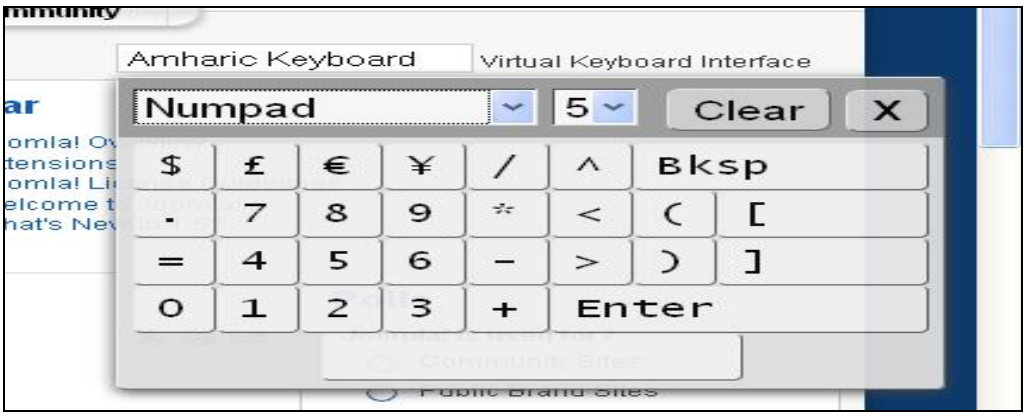

Figure 3.26**:** English number pad

Sample codes for the Virtual Keyboard

```
/*******layout for amharic keyboard**********

    this.VKI_layout = {};

<?php if (($show_amharic == "1") OR ($default_lang == "amharic")) {echo "

this.VKI_layout[\"$label_amharic\"] = [ // Amharic Standard Keyboard

  [[],[],[],[],[],[],[],[],[]],

 [[\"\u1200\"], [\"\u1208\"], [\"\u1210\"], [\"\u1218\"], [\"\u1220\"], [\"\u1228\"], [\"\u1230\"], [\"\u1238\"], [\"\u1240\"], [\"\u1260\"]],

 [[\"\u1270\"], [\"\u1278\"], [\"\u1280\"], [\"\u1290\"], [\"\u1298\"],[\"\u12A0\"], [\"\u12A8\"], [\"\u12B8\"], [\"\u12C8\"], [\"\u12D0\"]],
[[\"\u12D8\"],[\"\u12E0\"],[\"\u12E8\"],[\"\u12F0\"],[\"\u1300\"],[\"\u1308\"],[\"\u1320\"],[\"\u1328\"],[\"\u1330\"],[\"\u1338\"]],

 [[\"-\",\"Tab\"], [\"\u1369\"], [\"\u1361\"], [\"\u1340\"], [\"\u1348\"], [\"\u1350\"], [\"\u1268\"], [\"\u1230\u122D\u12DD\",\"\u1230\u122D\u12DD\"]],

                                        [[\" \"]],

];this.VKI_layout[\"$label_amharic\"].lang = [\"am\"];" ;}

?>


/*****************amharic number pad layout*****************************/

<?php if (($show_amharic_numpad == "1") OR ($default_lang == "amharic_numpad")) {echo "
this.VKI_layout[\"$label_amharic_numpad\"] = [ // Amharic Number pad

     [[\"\u1369\"],[\"\u136A\"],[\"\u136B\"],[\"\u136C\"],[\"\u136D\"], [\"\u136E\"], [\"\u136F\"]],

[\"\u1370\"],[\"\u1371\"],[\"\u1372\"],[\"\u1373\"],[\"\u1374\"],[\"\u1375\"],[\"\u1376\"]],
[[\"\u1377\"], [\"\u1378\"],[\"\u1379\"],[\"\u137A\"],[\"\u137B\"],[\"\u137C\"],[\"+\"]],

[[\"-\"], [\"*\"],[\"/\"],[\"!\"],[\"%\"],[\"(\"],[\")\"]]

   ]; this.VKI_layout[\"$label_amharic_numpad\"].DDK = true;";}
```

```
?>

/**** keep all main characters in an array **********************/

   var mainKeys = new Array("\u1200","\u1208", "\u1210", "\u1218", "\u1220", "\u1228",
"\u1230", "\u1238", "\u1240", "\u1260", "\u1270", "\u1278",    "\u1278", "\u1280", "\u1290",
"\u1298", "\u12A0", "\u12A8", "\u12B8", "\u12C8",
"\u12D0","\u12D8","\u12E0","\u12E8","\u12F0","\u1300","\u1308","\u1320","\u1328","\u1330"
,"\u1338",    "\u1369", "\u1361", "\u1340", "\u1348", "\u1350", "\u1268");

   var pressedOnce = false, pressedMore = false;


 /**********show other keys in the first row of the keyboard**********/

     if(this.VKI_kts == "Amharic")

     {

     if(mainKeys.indexOf(text) != -1)

     {

    self.VKI_ShowOtherKeys(text);

    pressedOnce = false;

   pressedMore = false;

   //alert("value " + this.VKI_target.value);

     }

   else if(text == " ")

   {

//space is pressed

pressedOnce = true;

}  else

     {

   //alert("pressedonce " + pressedOnce + " pressedMore " + pressedMore);

     if(pressedOnce == false && pressedMore == false)
```

```
      {
      //remove the last mainkey and replace it with the other
      this.VKI_target.value = this.VKI_target.value.substring(0, (this.VKI_target.value.length - 2))
+ text;
      pressedOnce = true;
   }
    else if(pressedOnce == true)
{
pressedMore = true;
  }
   //alert("pressedonce " + pressedOnce + " pressedMore " + pressedMore);
      }
      }
     };
/*********Show other keys in the first row the keyboard for Amahric keyboard******/
  this.VKI_ShowOtherKeys = function(text)
  {
   var keyCode = text.charCodeAt(0);
  var x=4969;
  //alert("keyCode " + keyCode);
  ktype = "Amharic";
for(index = 0; index < 8; index++)
  {
      this.VKI_layout[ktype][0][index] = [String.fromCharCode(keyCode)];
      keyCode = keyCode + 1;
```

```
  }
self.VKI_buildKeys();
  }

  /********show other keys in the first row of the keyboard***/
     if(this.VKI_kts == "\u12A0\u121B\u122D\u129B")
     {
     if(mainKeys.indexOf(text) != -1)
     {
        self.VKI_ShowOtherKeys(text);
        pressedOnce = false;
        pressedMore = false;
          //alert("value " + this.VKI_target.value);
     }
     else
     {
           //alert("pressedonce " + pressedOnce + " pressedMore " + pressedMore);
          if(pressedOnce == false && pressedMore == false)
    {
    //remove the last mainkey and replace it with the other
    this.VKI_target.value = this.VKI_target.value.substring(0, (this.VKI_target.value.length - 2))
+ text;
     pressedOnce = true;
     }
   else if(pressedOnce == true)
   {          pressedMore = true;
```

```
  }
//alert("pressedonce " + pressedOnce + " pressedMore " + pressedMore);
}
```

4. Conclusions

Open Source Software plays a great role for improvement of Information Communication Technology (ICT) in developing countries like Ethiopia. This results in elimination of extreme poverty, combating serious disease, and achieving universal primary education and gender equality. A lots of things need to be done to create an awareness about open source and the opportunity that comes up with it, like software license cost minimization, small business opportunity, skill for free and adaptability to individuals interest with in the society. In this project we have chosen to localize a well know content management system used for web development by web developers in Ethiopia called joomla in to Amharic Language. For the localization we have used standard technical term translations by EICTDA. We have localized a virtual keyboard to be used in the process of local Amharic content development. In order to help user to easily install and use the translation package and the virtual keyboard we have developed installation manual. Finally we develop a web based ecommerce system using the localized Joomla. And we believe what we have done on this project is a good starting point to create awareness on open source software and content management system.

5. Future Work

In this project the Interface of Joomla content management system is localized in to Amharic language to help non professional individuals who speak and understand Amharic in web content creation. In the future different components like Calendar, Extensions and plug-ins that were developed for other language can be translated in to Amharic to make users of Joomla much more comfortable. This work can also be extended in to other local language such as Tigrina in the future.

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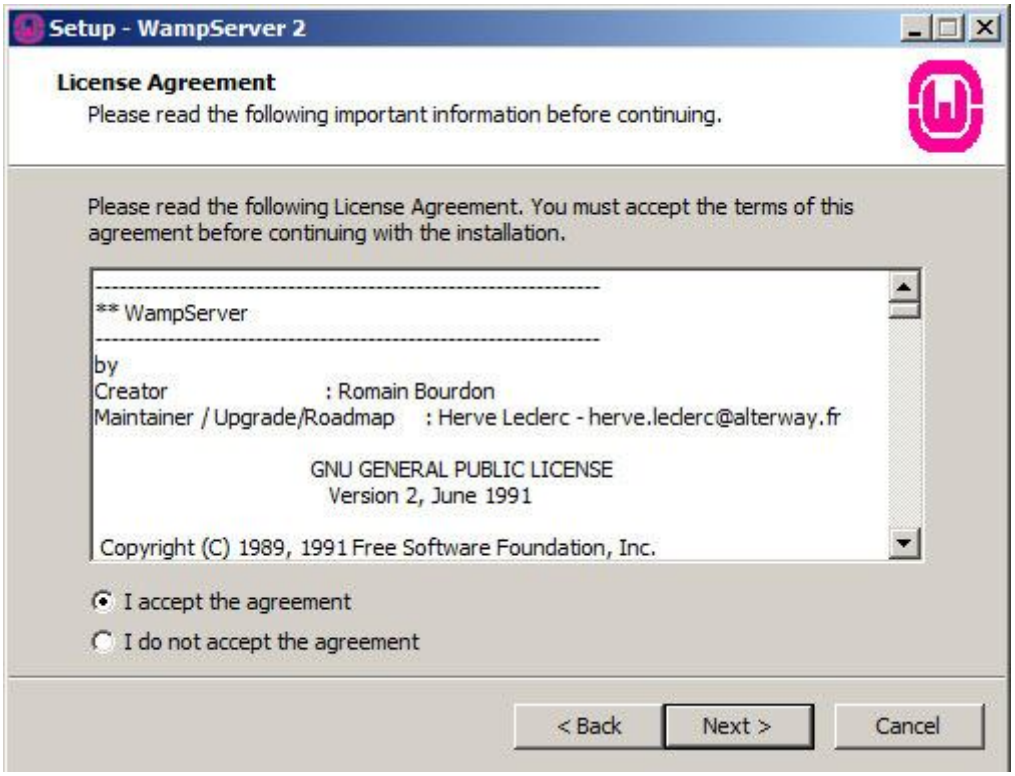
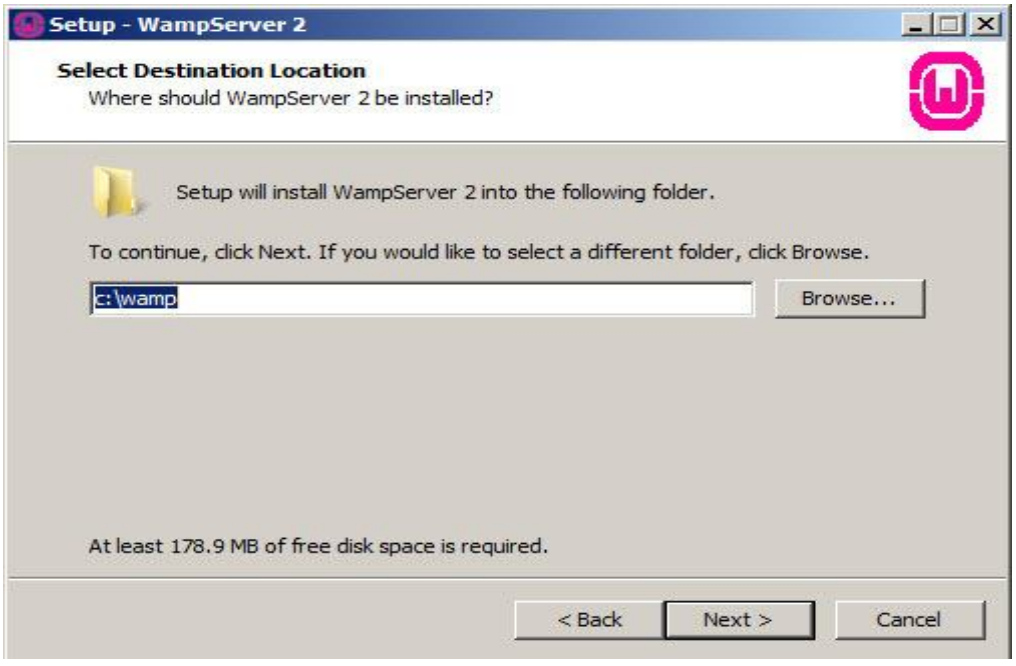
Glossary

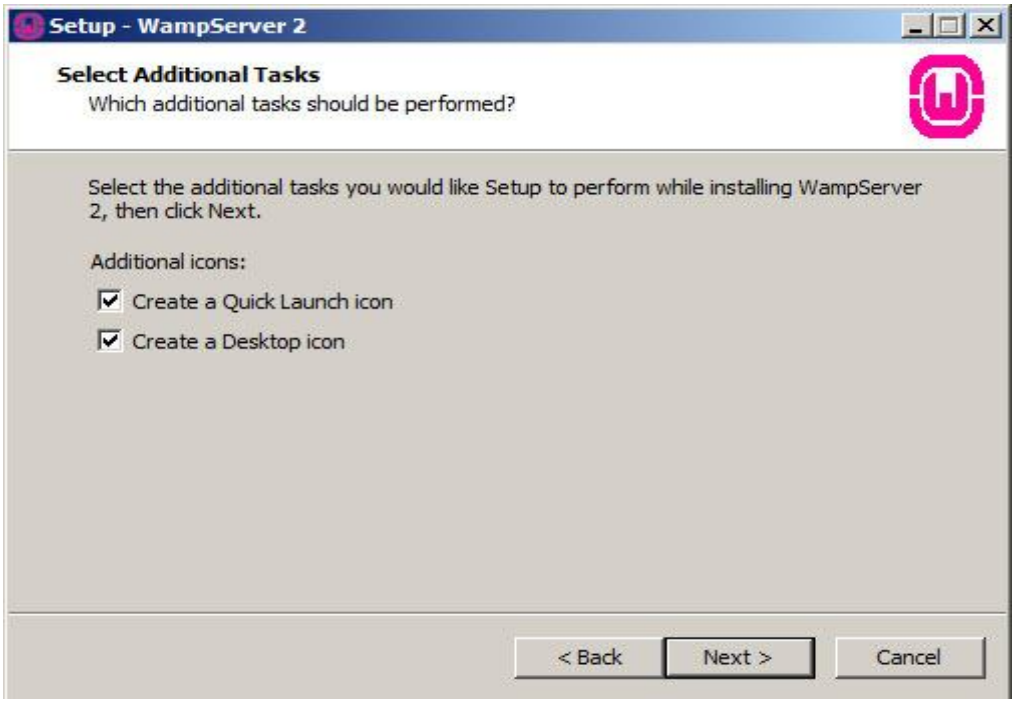
WAMP Server Installation

1. Go to wampserver.com and click on download the latest version of wamp.This will redirect you to http://sourceforge.net and you will be asked " to run or save the file ? " Click on save the file.This process will take about 20 minutes.
2. When the download is complete click on run and you will be asked " are you sure you want to run this software ? " and just click again on run.You will then see " welcome to the WampServer set up " and just click on next.Click on " I accept agreement and click on

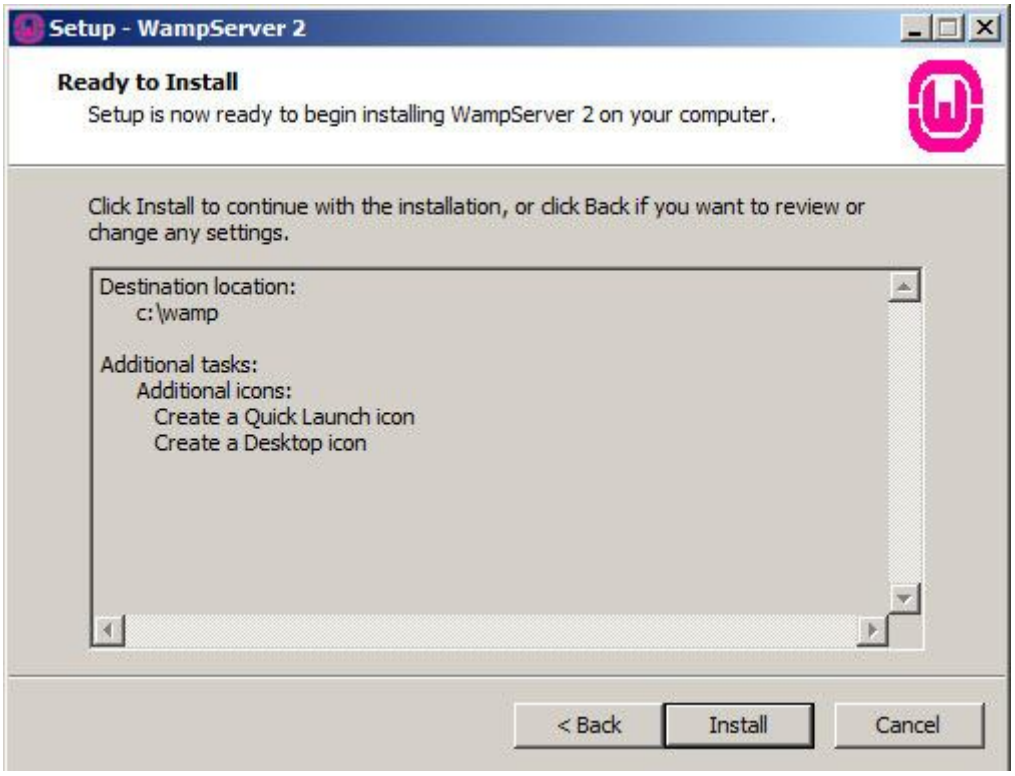


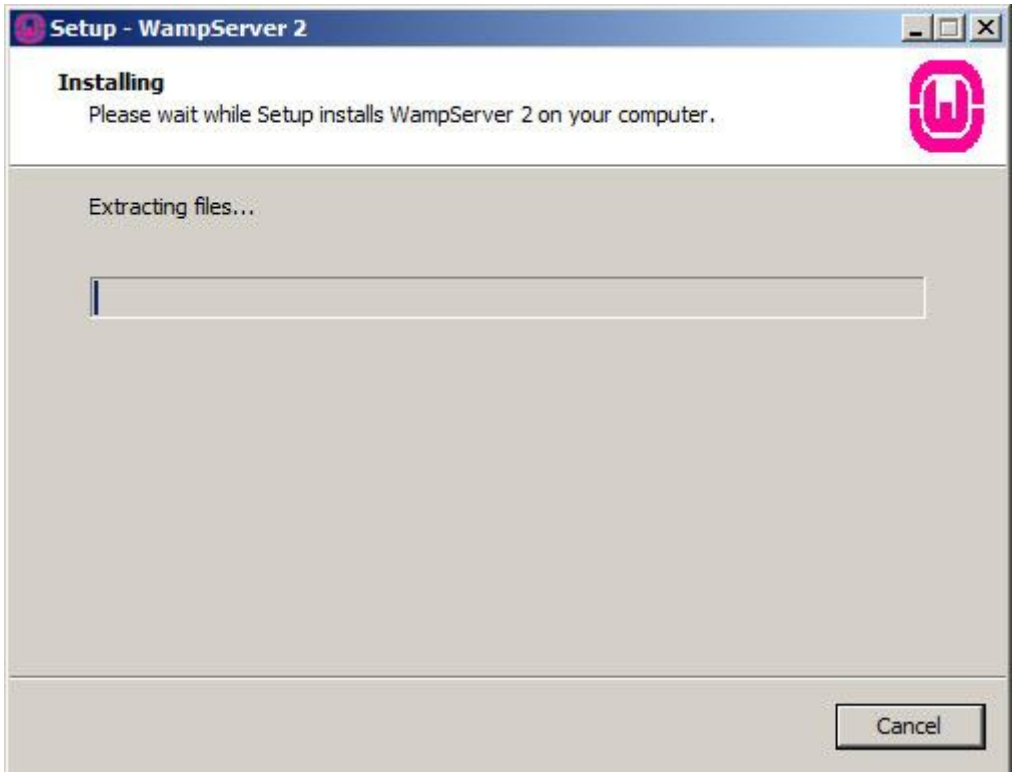
3. You will then see " set up will install WampServer in the following folder c:\wamp " and just click on next. The next question that appears is additional icons ? (a) Create a quick launch icon (b) create a desktop icon and just tick both boxes and click on next.



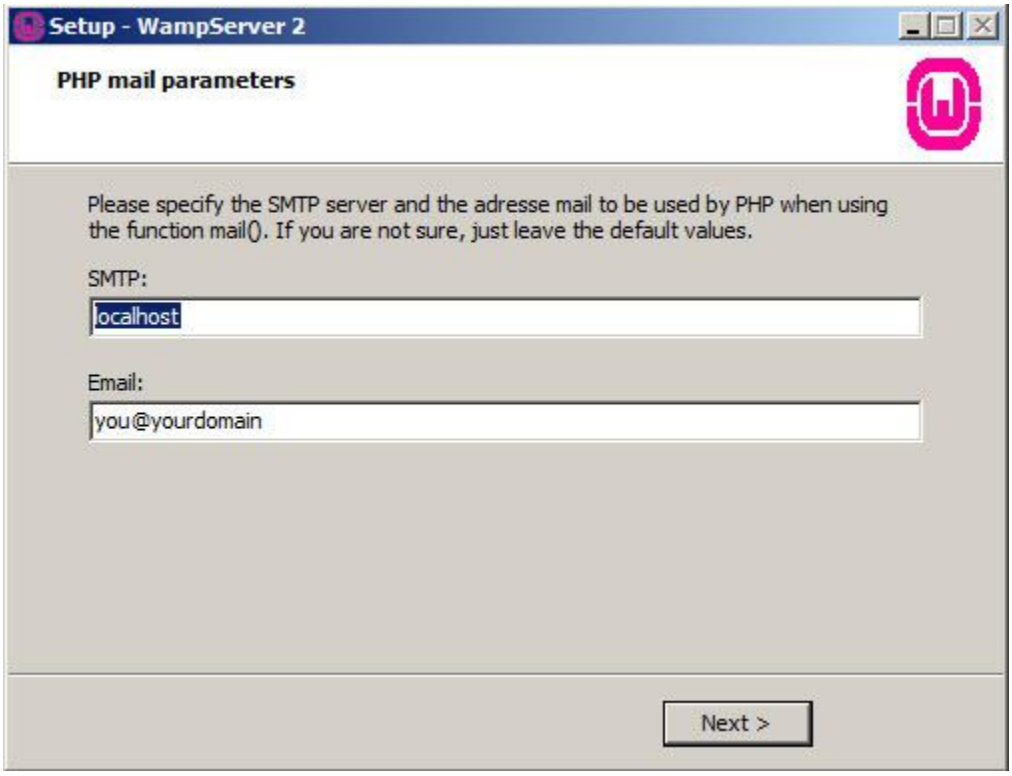

Setup - WampServer 2
Select Additional Tasks
Which additional tasks should be performed?
Select the additional tasks you would like Setup to perform while installing WampServer 2, then click Next.
Additional icons:
Create a Quick Launch icon
Create a Desktop icon
< Back
Next >
Cancel

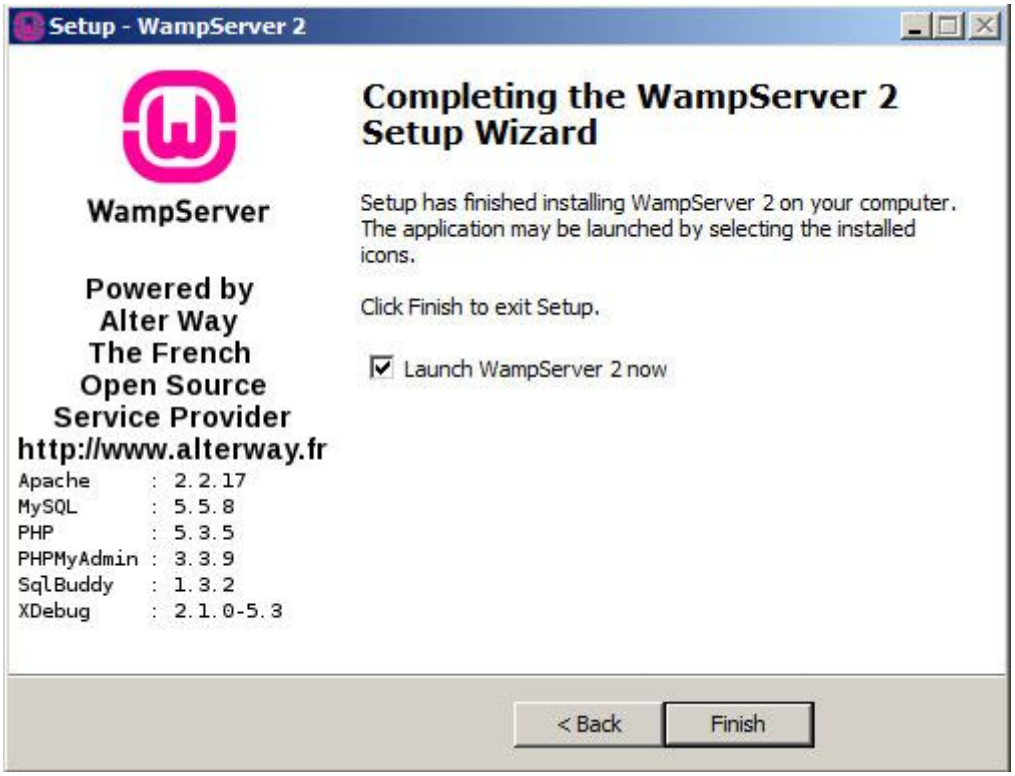
4. The next question that appears is " ready to install ? " and just click on install.You will be asked,if you have firefox installed on your computer,that we have detected firefox on your computer would you like to use it as your default browser with wamp Server ? and click yes if that is what you want.




Setup - WampServer 2
Installing
Please wait while Setup installs WampServer 2 on your computer.
Extracting files...
Cancel

5. The next question that appears is php mail parameters? (a) SMTP will be localhost (b) email will be your email address ie you@localhost.com and then just click on finish and your wamp server has been installed.





6. Now that the **WAMP server** it's installed we have to verify if it works properly. To do that open in a web browser the next address http://localhost/

Joomla! 1.5.x Installation

The latest stable version of Joomla! can be downloaded from **http://www.joomla.org/**. NOTE: The file will be a zip file (i.e. **Joomla_1.5.10-Stable-Full_Package.zip**). Once downloaded, follow these steps to prepare for the installation:

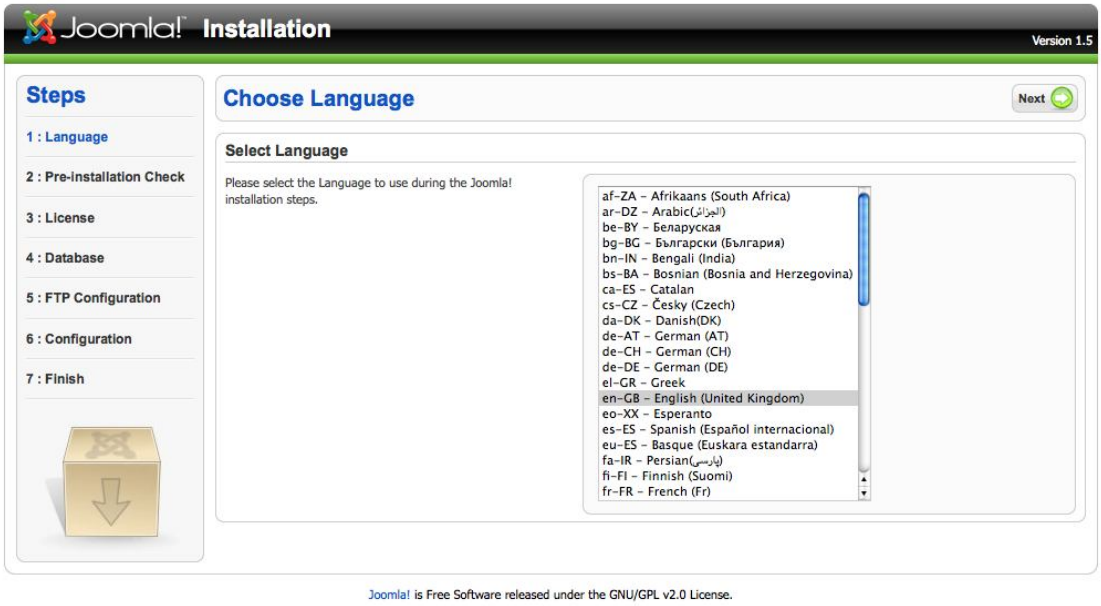
- Uncompress the zip file into a folder with a suitable name, for example, **Joomla 1.5.7** or **MySite** (i.e. give the folder your site name).
- Move this folder into the **www** folder of the WAMP installation.

The files are now in place for the installation to commence.

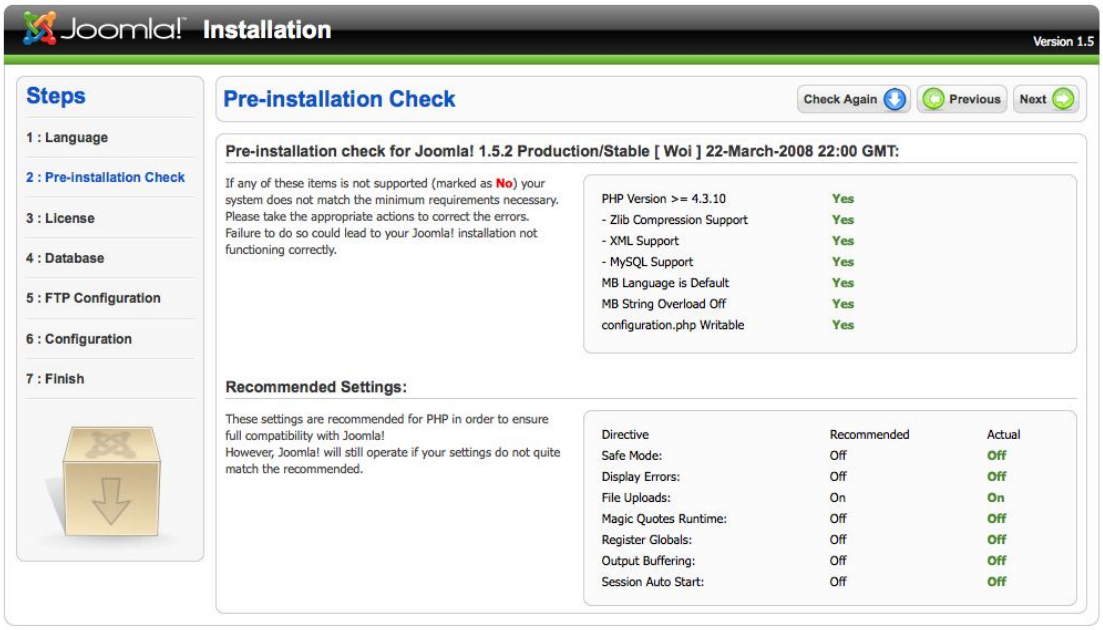
To install Joomla! 1.5.x follow these steps:

1. Start WAMP server if it not already running. All services need to be started (Apache and MySQL).
2. In order to install joomla on your wamp server we must now create a database within the phpMyAdmin of your wamp server.You do this by left clicking the small wamp icon on your desktop and clicking on the phpMyAdmin panel.The steps involved in creating a database here are as follows : (1) click on privalages (2) click on add new user and fill out your username-can be any user name,host will be localhost,and password will be the one you create (3) Global privalages-click on check all and hit go.The last step involves creating the database itself and just click on the home icon within your phpMyAdmin panel and you will see create a database.Put a name in for your new database and just click on create and you are finished.
3. Using a browser, enter the URL to the folder. Remember to include the port number if your local web server is using a port other than the default port 80. For example, if you are using the default port, the URL will be **http://localhost/MySite/** or if you are using port 8080 the URL will be **http://localhost:8080/MySite/**. **NOTE:** The use of localhost as the server name depends on whether your PC is set up to resolve localhost to the local IP Address of 127.0.0.1. You can of course substitute localhost for 127.0.0.1 in the URL (i.e. **http://127.0.0.1/MySite**).

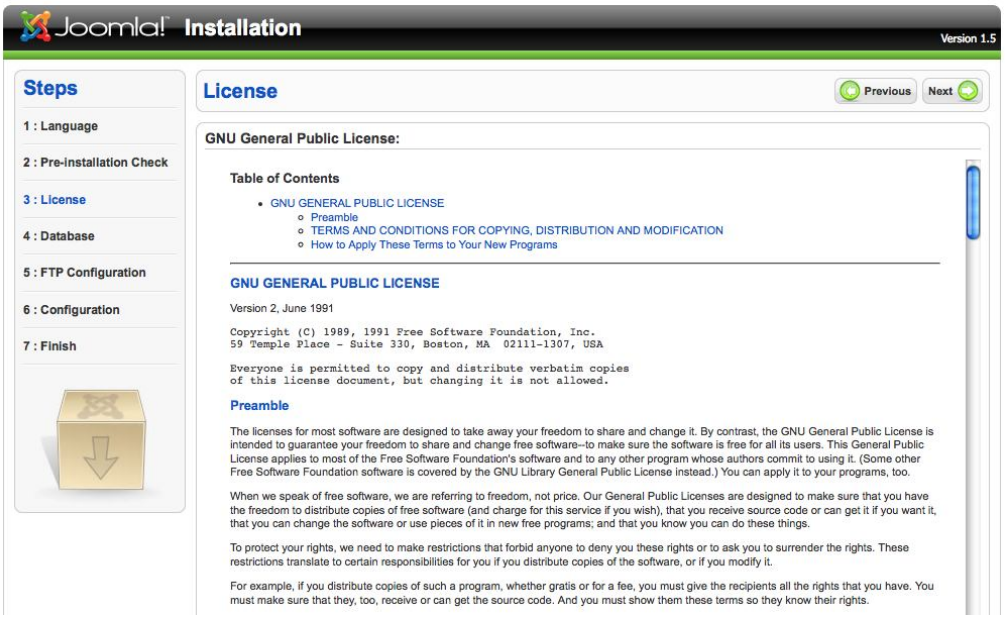
4. You will be redirected to **http://localhost/MySite/installation/index.php** and faced with the **Language Section** screen**.**



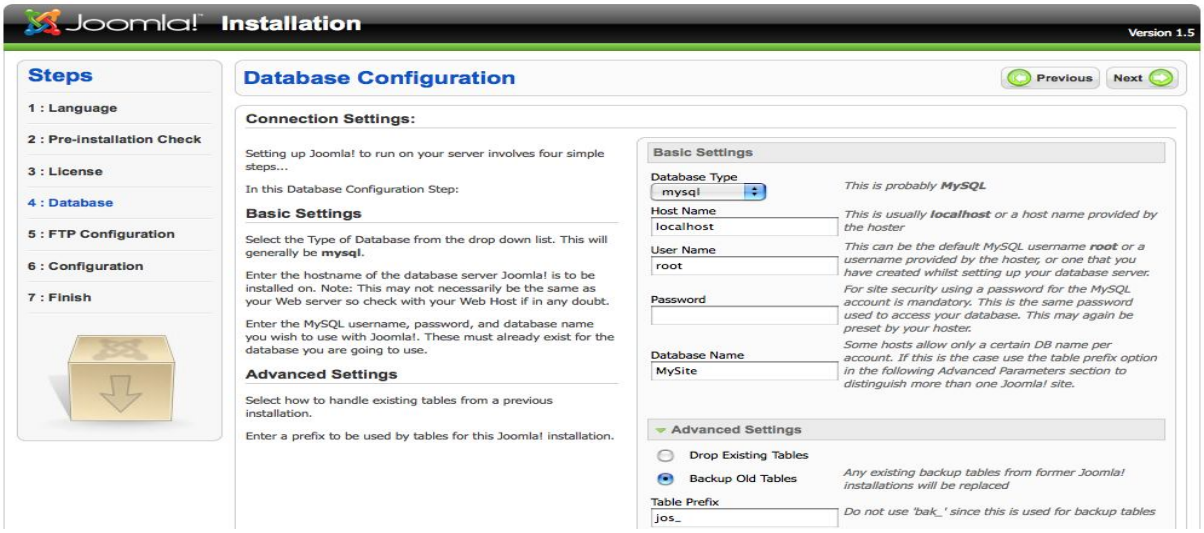
5. The default language is **en-GB** so leave the default if this is applicable or select the relevant language and click on the **Next** button.
6. The **Pre-Installation Check** screen is now loaded. As this screen states, if any of the items listed are set to No and highlighted in red, your system does not meet the minimum requirements needed for installing Joomla 1.5.x and these need to be resolved before proceeding. If there are no items listed as **No**, you can move onto the next step by pressing the **Next** button:



7. The **License** screen is loaded next. Read, then accept the license agreement by pressing the **Next** button



8. The **Database Configuration** screen is now loaded:



You are prompted to enter the following information:

Basic Settings

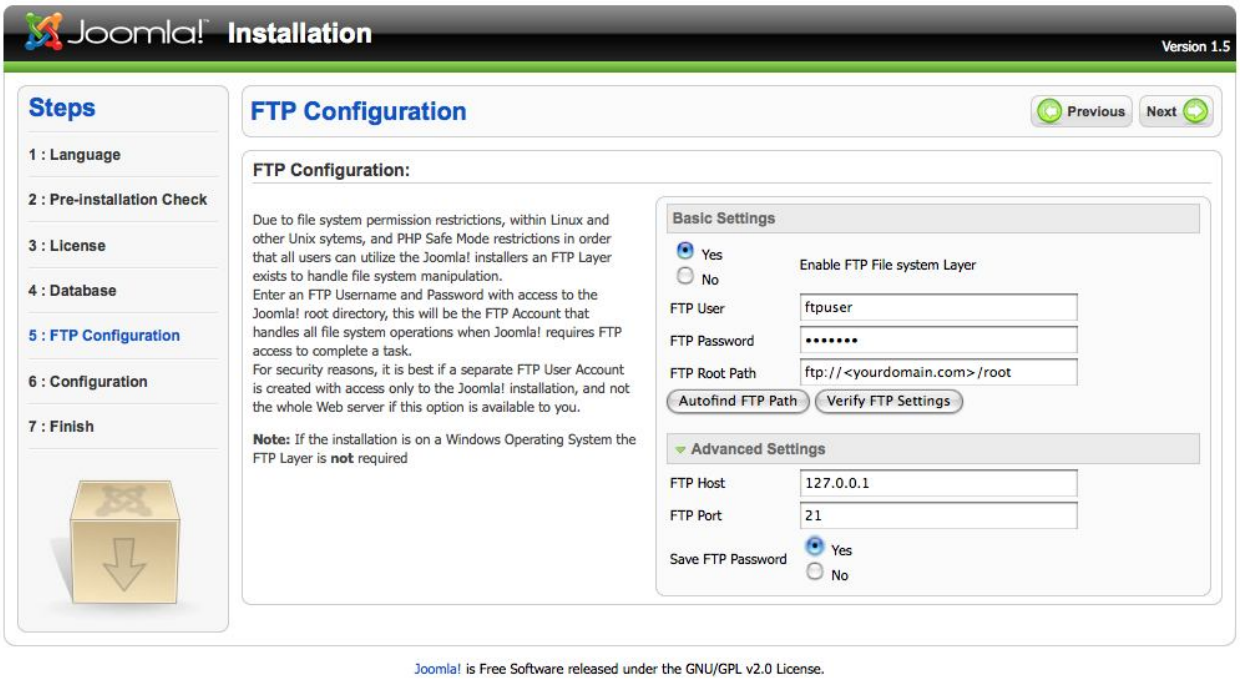
- **Database Type** - leave this to the default value of **mysql**
- **Host Name** - the server name of the local web server (localhost)
- **User Name** - this is generally the default user name of the MySQL database (root). This can also be set to a different user if one has been set up but only if the different user has top-level administrator privileges in the database. NOTE: when installing Joomla locally, user name root is sufficient. When installing on a live web server, for security reasons, select a user created with admin privileges
- **Password** - the password for the user. This is generally left blank when installing Joomla locally. On the live web server, enter the password for the user specified in the step above
- **Database Name** - a name for your site's database. This can be anything, but make it suitable for your site. For example, **MySite**

Advanced Settings

The default advanced settings should be accepted. However, you may override these:

- **Drop or Backup Tables** - if you have a previous installation of Joomla, it is advised you backup the old tables by selecting the Backup Old Tables radio button. If you do not wish to back the old tables up, select the Drop Existing Tables radio button (this will delete the tables and all data before re-creating them)
- **Table Prefix** - a prefix to be used for all table names. Generally, the default value of jos_ is sufficient, but you may specify your own prefix is desired. **NOTE:** Do not use **bak_** as this is used as the prefix for backing up old tables

9. Click on **Next** to proceed
10. The next step is to enter the **FTP Configuration** settings:



If installing Joomla locally, you do not need to enter these settings since you will not be FTP transferring files to/from your local PC while you develop your site. If installing Joomla to your live web server, it is good practice to enter the FTP settings. This is so Joomla can use the FTP settings and make the files writeable on the web server. When specifying a FTP account, the account must have access to the Joomla root directory. FTP settings are:

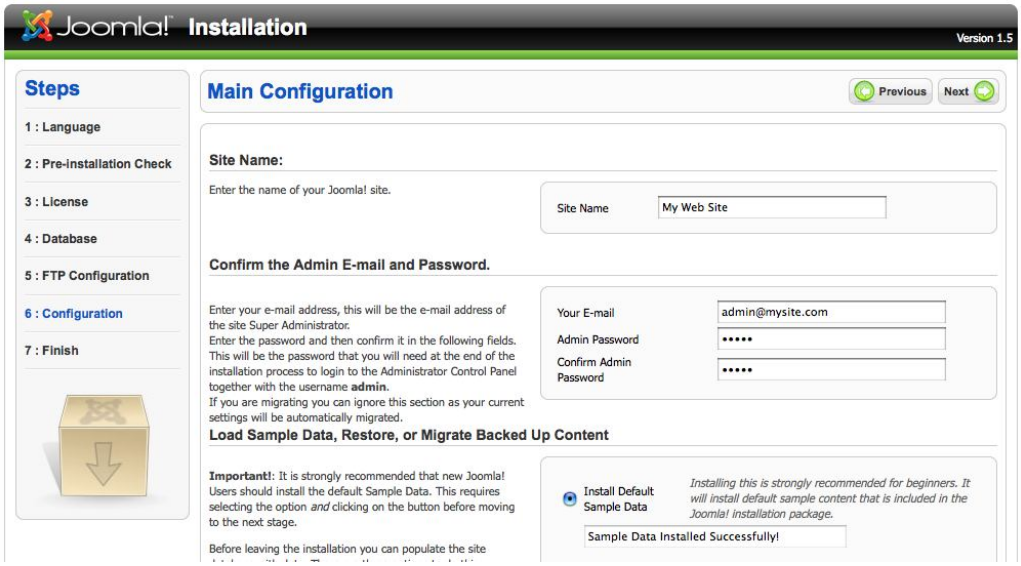
Basic Settings

- **Enable FTP File system layer** - whether to allow the File system layer to handle file system manipulation. The safest option is to set this to **Yes**
- **FTP User** - the user name of the FTP account
- **FTP Password** - the password for the FTP account
- **FTP Root Path** - the URL to the Joomla root directory

Advanced Settings

- **FTP Host** - the IP Address of the local host (**127.0.0.1**)
- **FTP Port** - the local port number used for FTP. The default is **21**
- **Save FTP Password** - whether to save the FTP password or not

11. Click on **Next** to proceed to the **Main Configuration** screen:

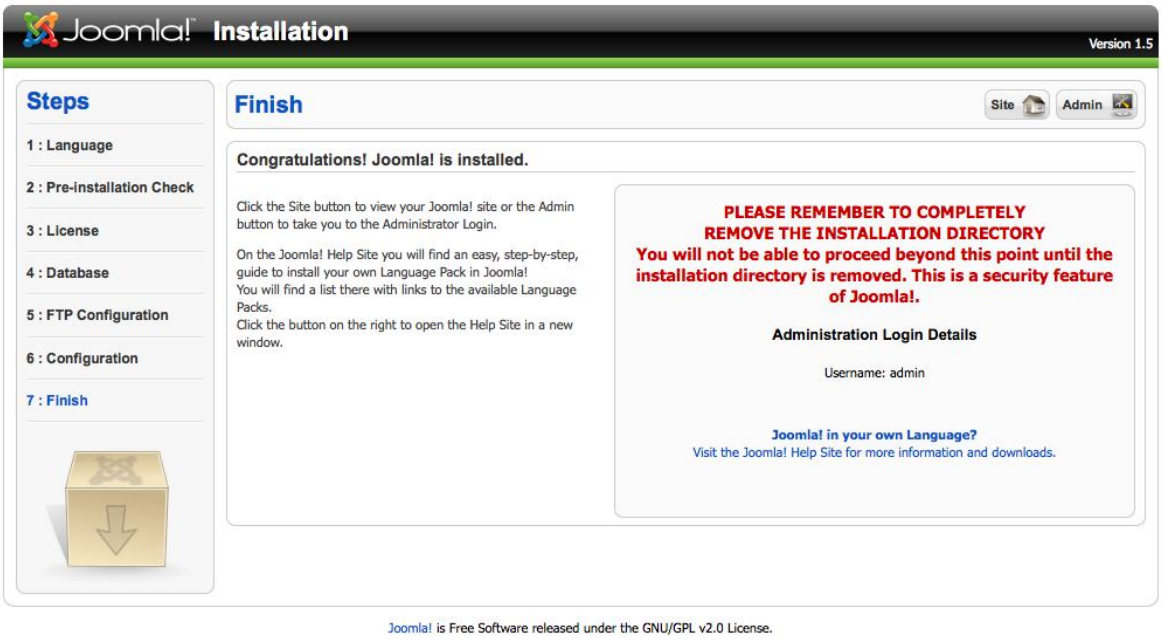


You will need to do the following:

- **Site Name** - enter an appropriate value for your site name
- **Admin Email and Password** - enter an administrator email address, as well as the password for the **admin** user (super-administrator account that Joomla installs by default)

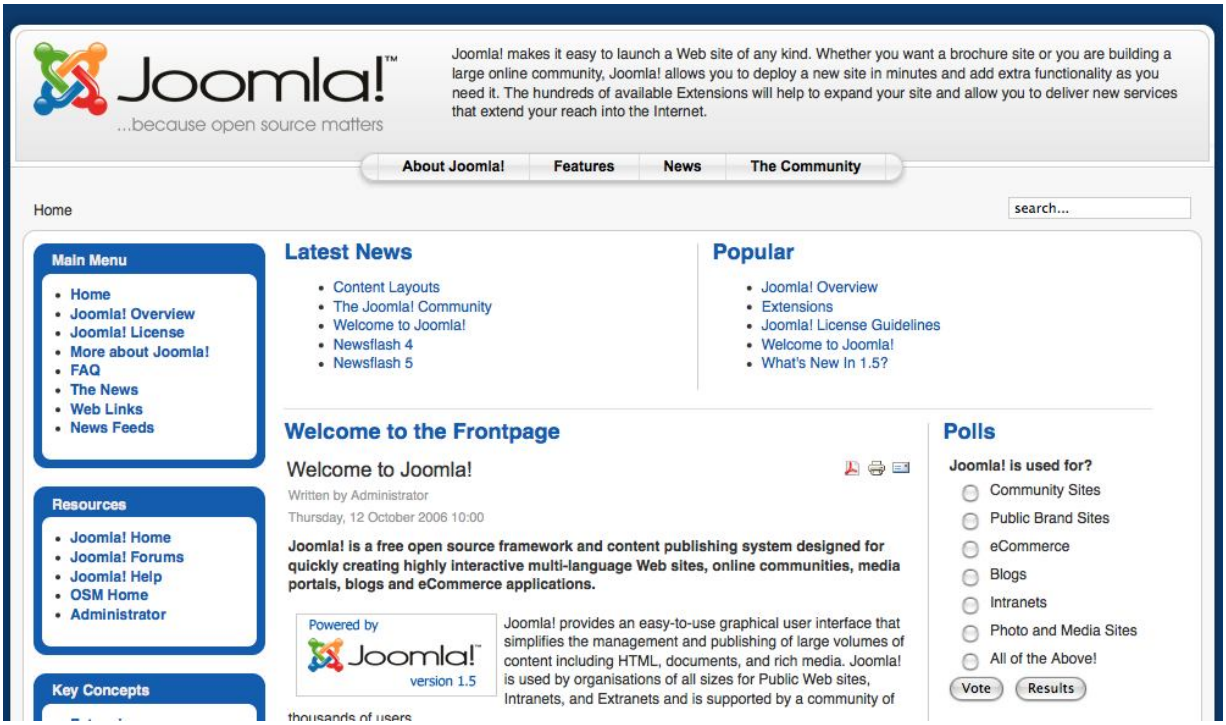
- **Install Default Sample Data** - it is highly recommended that you install the sample data so that you have data at hand to assist you with your site development. Simply click on the **Install Sample Data button**. You will be alerted with the message **Installed Sample Data Successfully**

12. Click on the **Next** button
13. The **Finish** screen will be loaded with the message **Congratulations! Joomla! Is installed**. As the screen highlights, installation is now complete. You are also reminded to remove the Installation directory (i.e. the directory named **Installation** from within the unzipped folder in step 2):



14. If you do not remove the Installation folder and attempt to load your site (i.e. http://localhost/MySite/) you will be redirected to the installation path (i.e. http://localhost/MySite/installation/index.php) and the following screen will be loaded:

15. Your site will load as follows once the Installation folder has been removed:

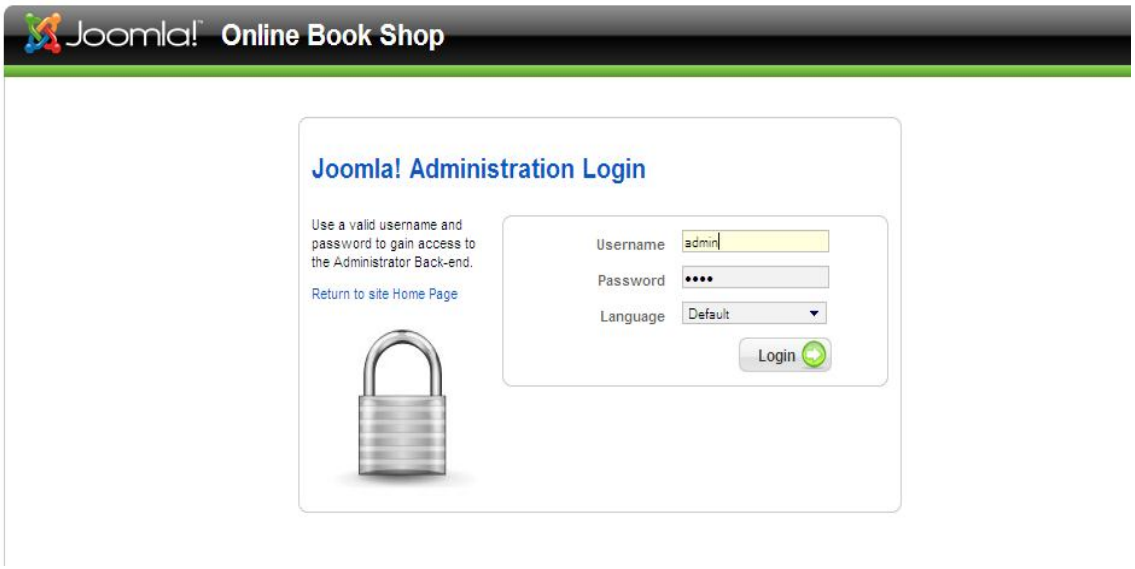


User Manual

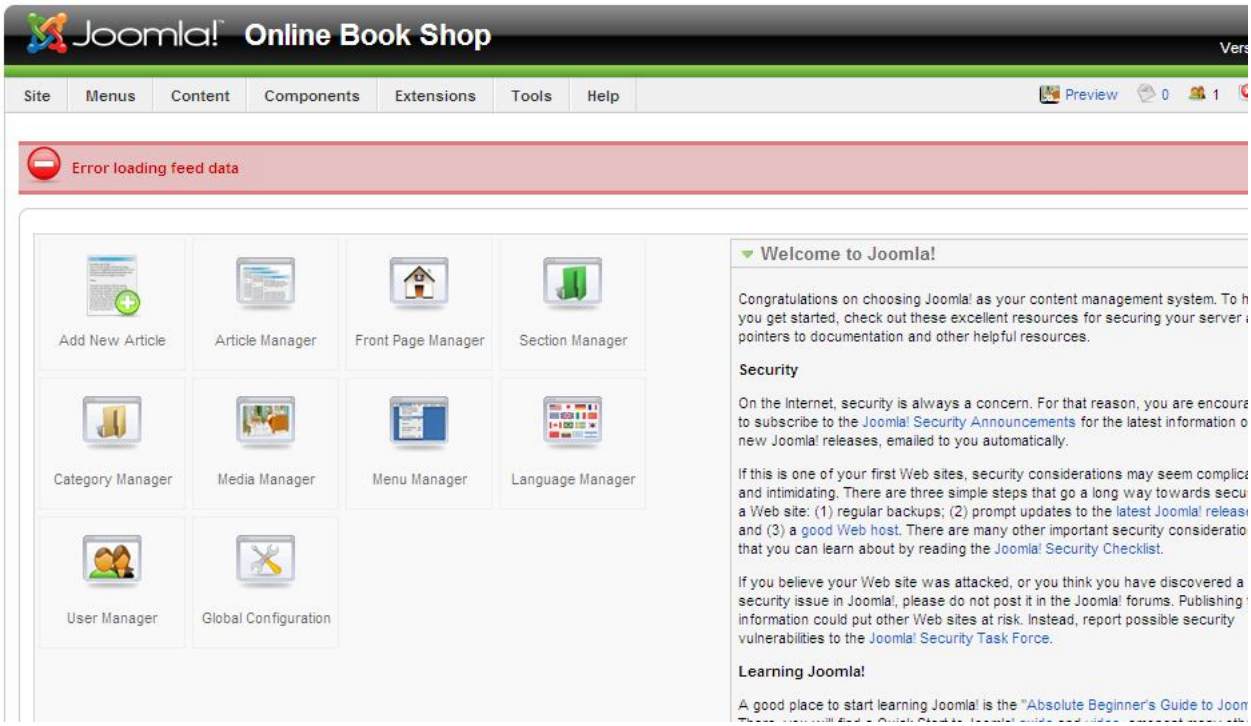
Language Translation package installation

First of all, you should have the language pack which you wish to install in our case the Amharic translation package.

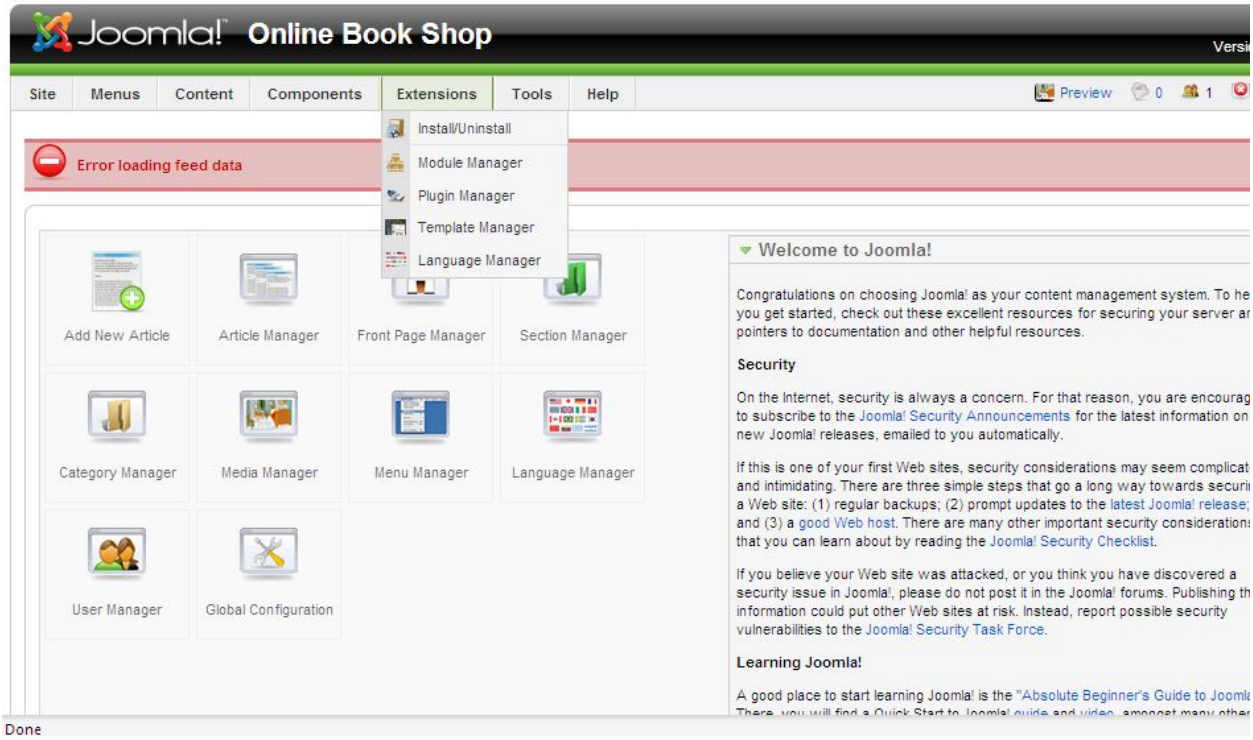
1. Login through the administrator page



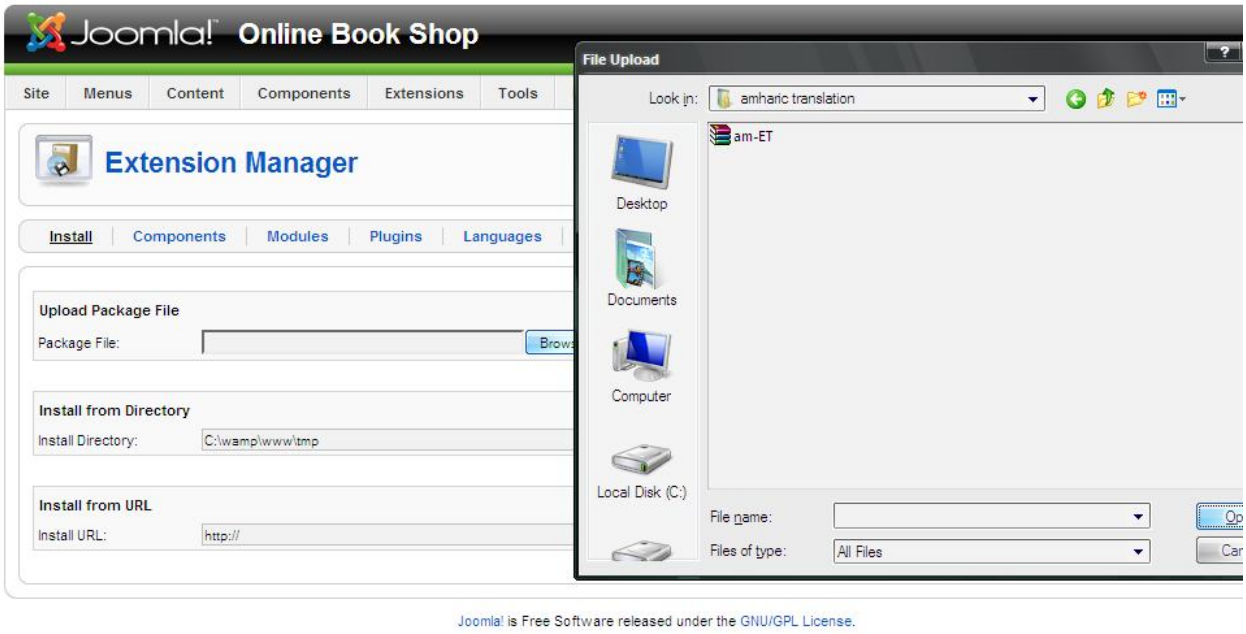
2. When you enter the administration panel, you will first see the index page with all management options.



3. Go to the Extensions menu then click Install/Uninstall**.**

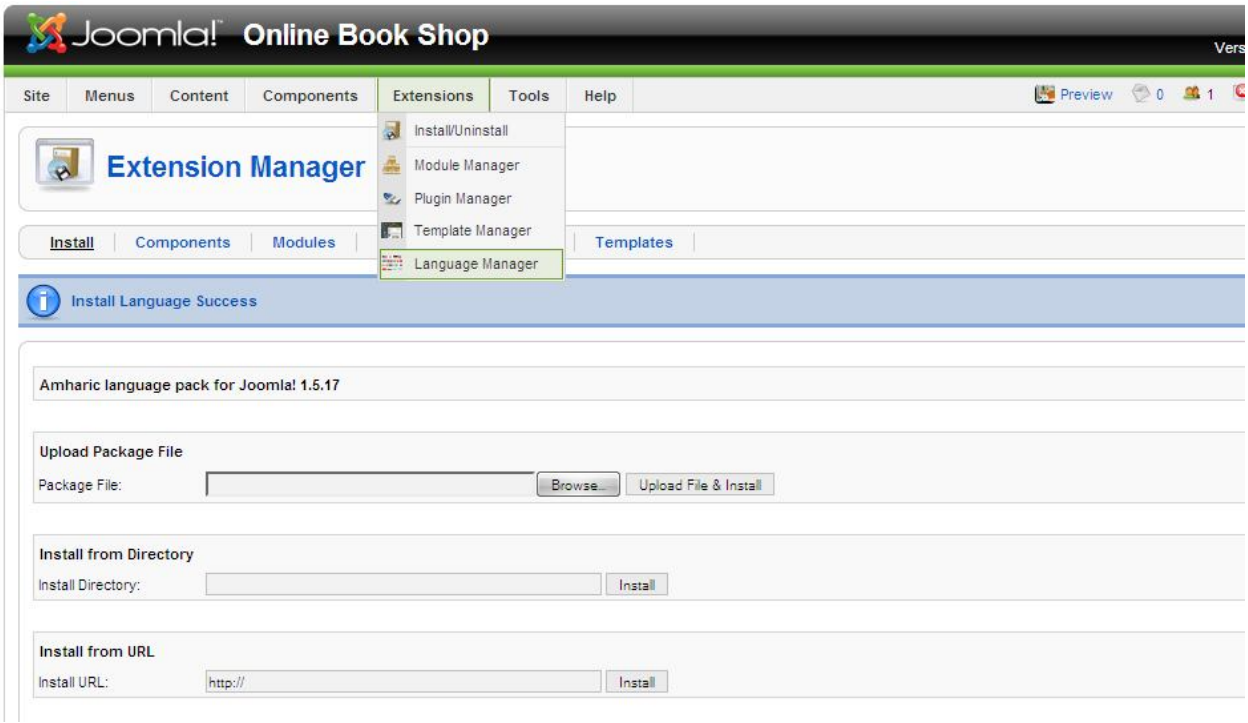


4. Press the [**Browse**] button to locate the installation pack for your language...



...and then select the [**Upload File & Install**].

5. Wait for the confirmation and go to the extensions menu and click on language manager.



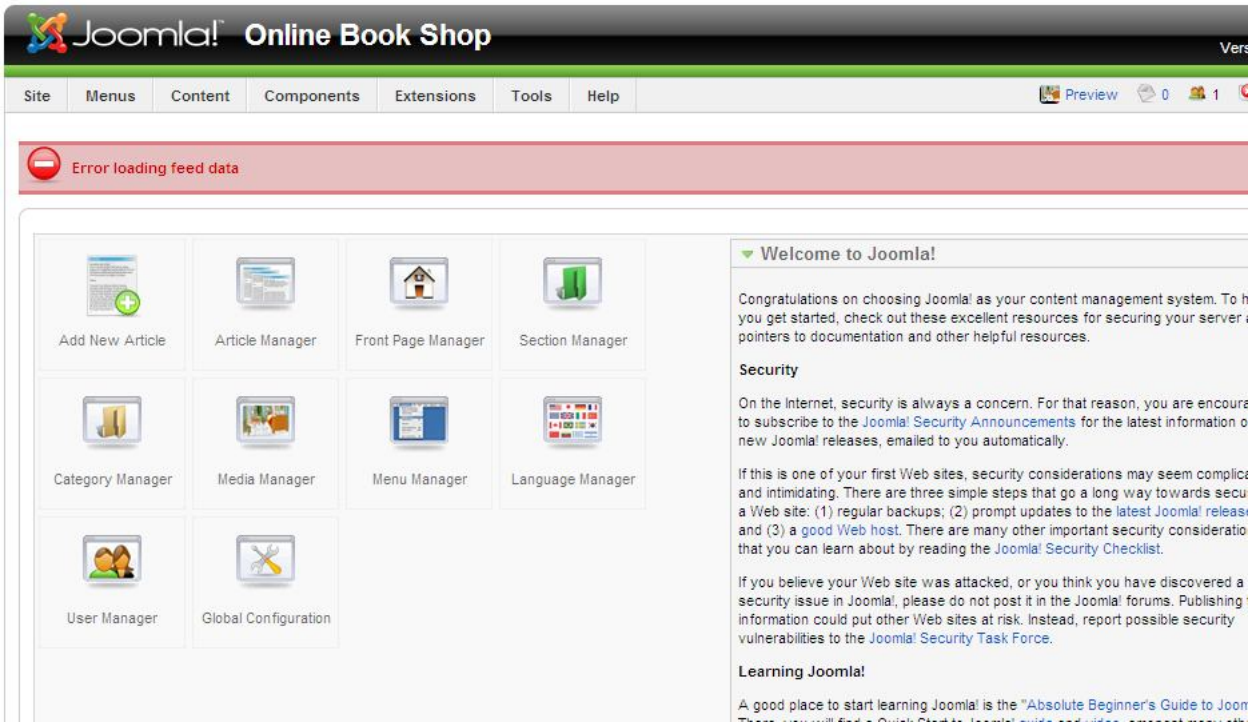
6. From the listed languages select the new one and then click the default icon for both the site and or administrator.
7. Now you have successfully installed a new language pack on your Joomla system.

Amharic Virtual keyboard module Installation and User Manual for Joomla

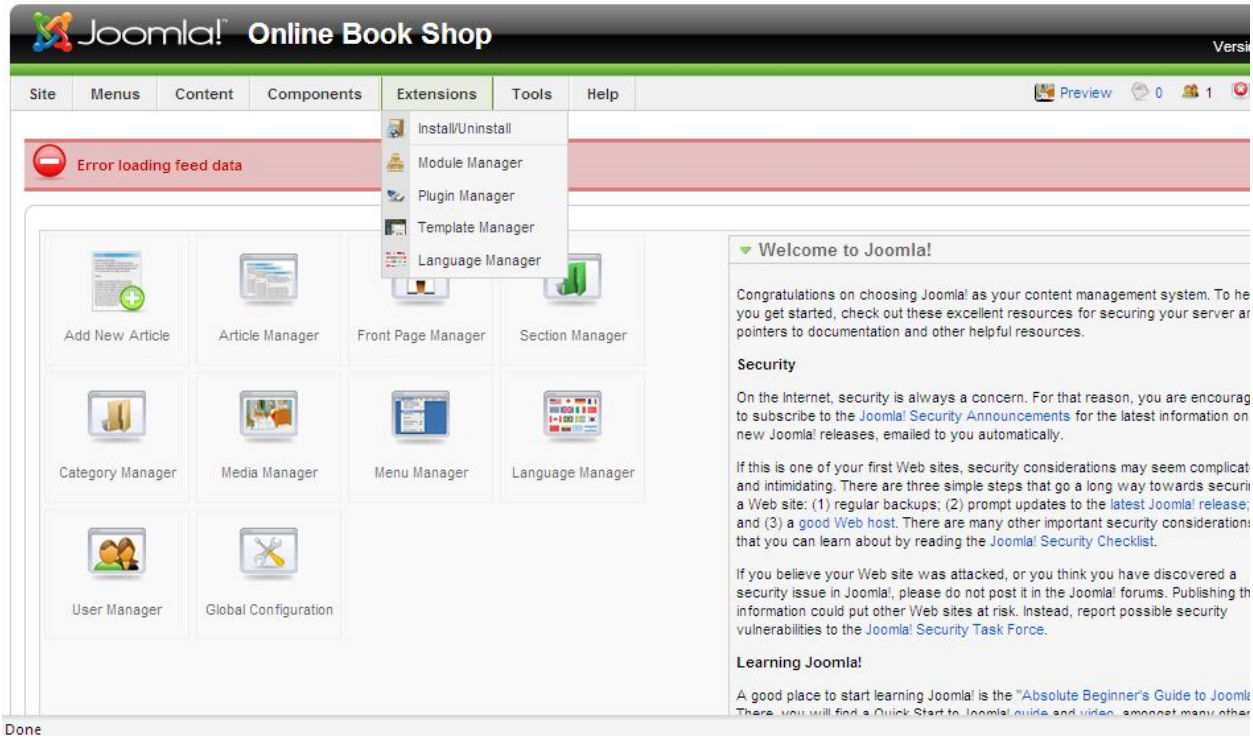
First of all, you should have the virtual keyboard pack which you wish to install.

1. Login through the administrator page

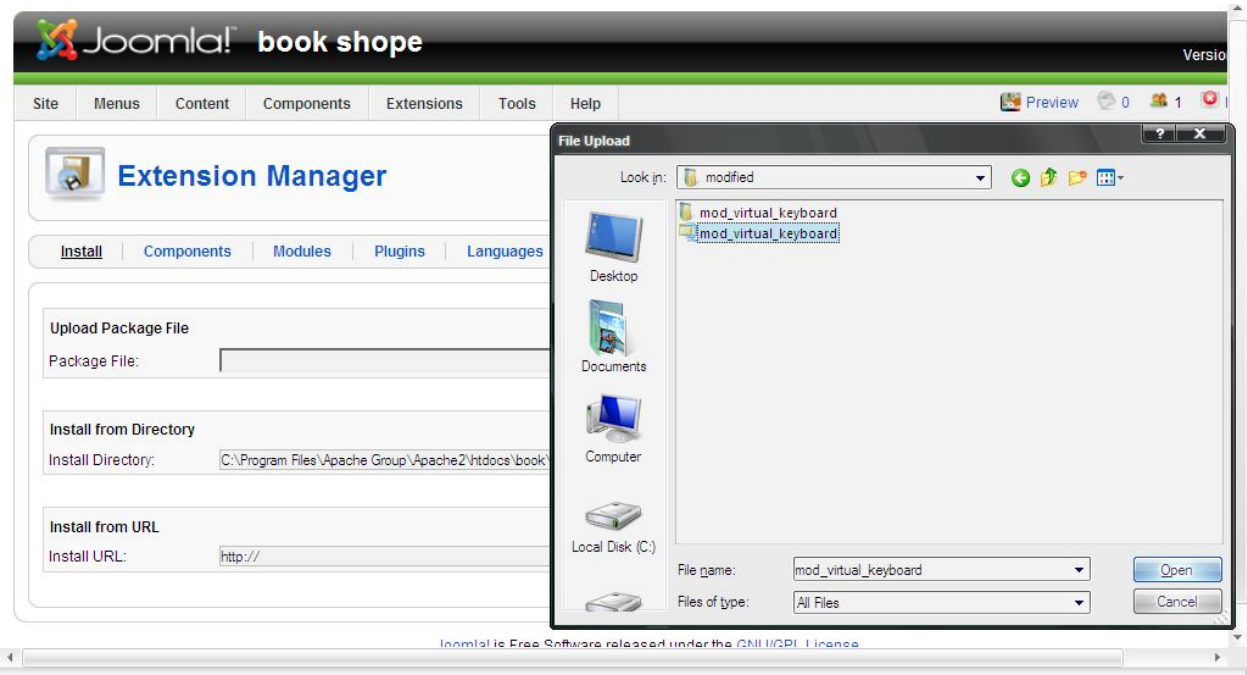
2. When you enter the administration panel, you will first see the index page with all management options.

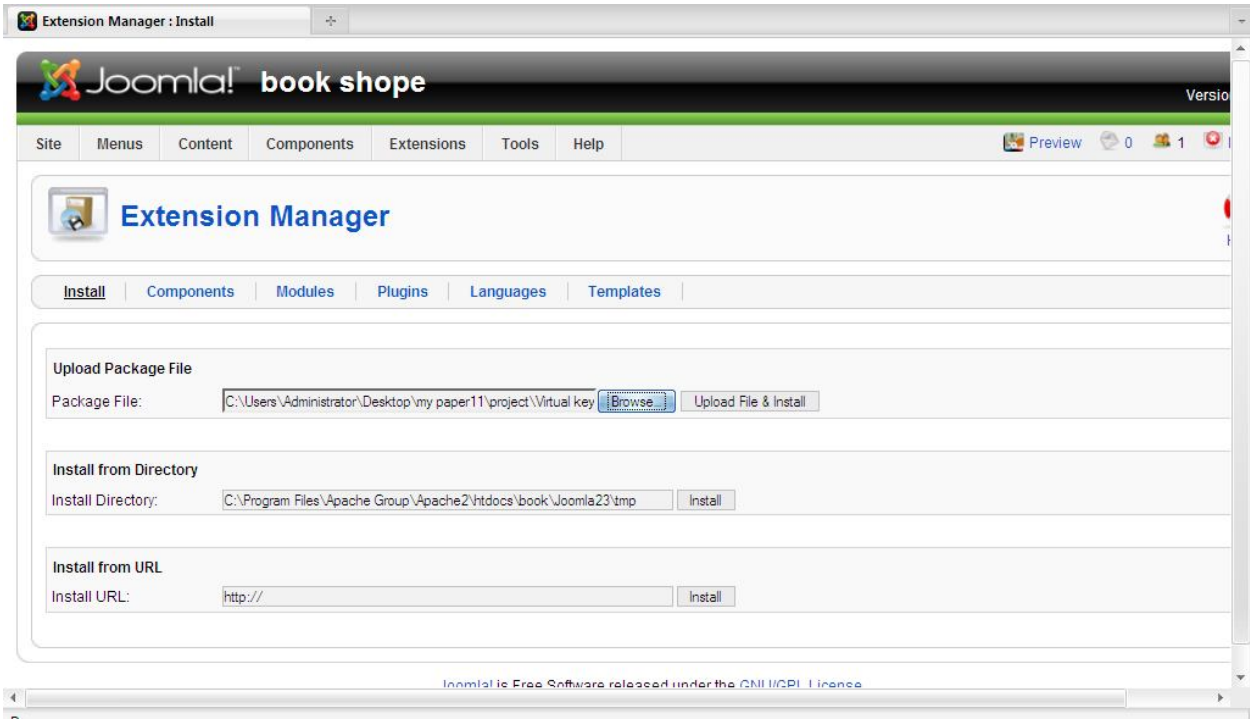


3. Go to the Extensions menu then click Install/Uninstall**.**



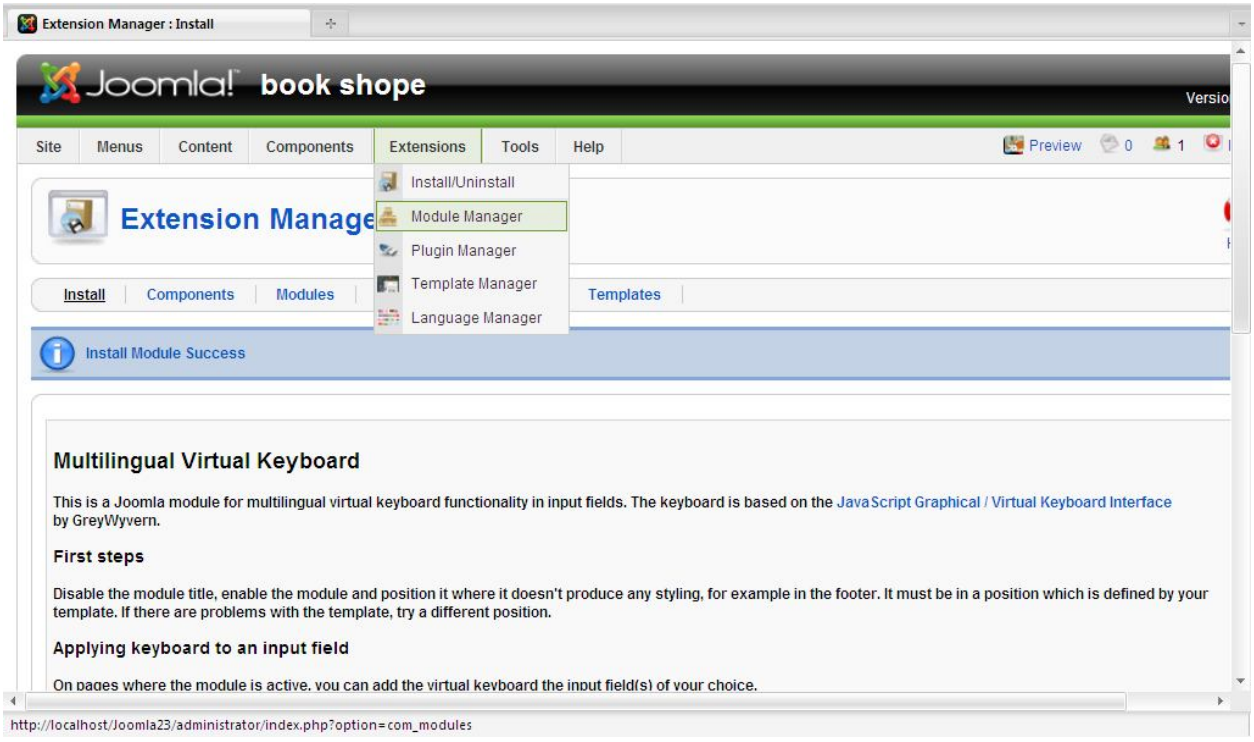
4. Press the [**Browse**] button to locate the virtual keyboard module...



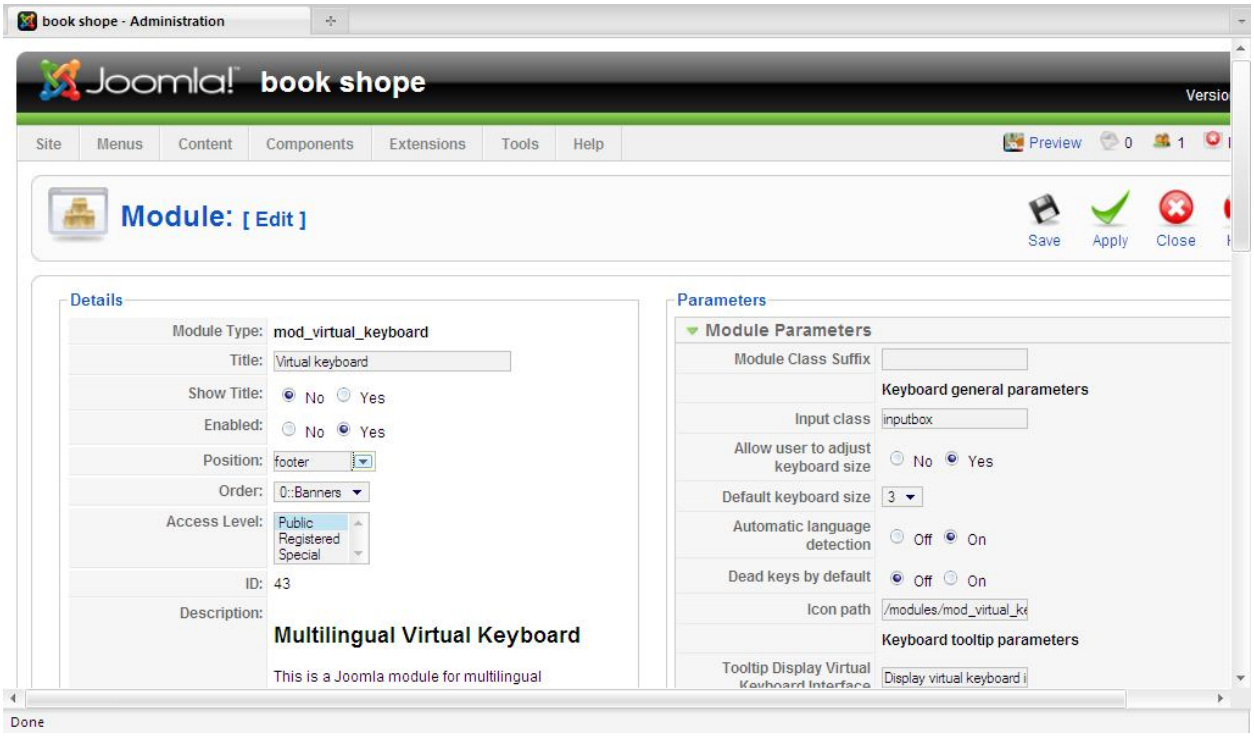


...and then select the [**Upload File & Install**].

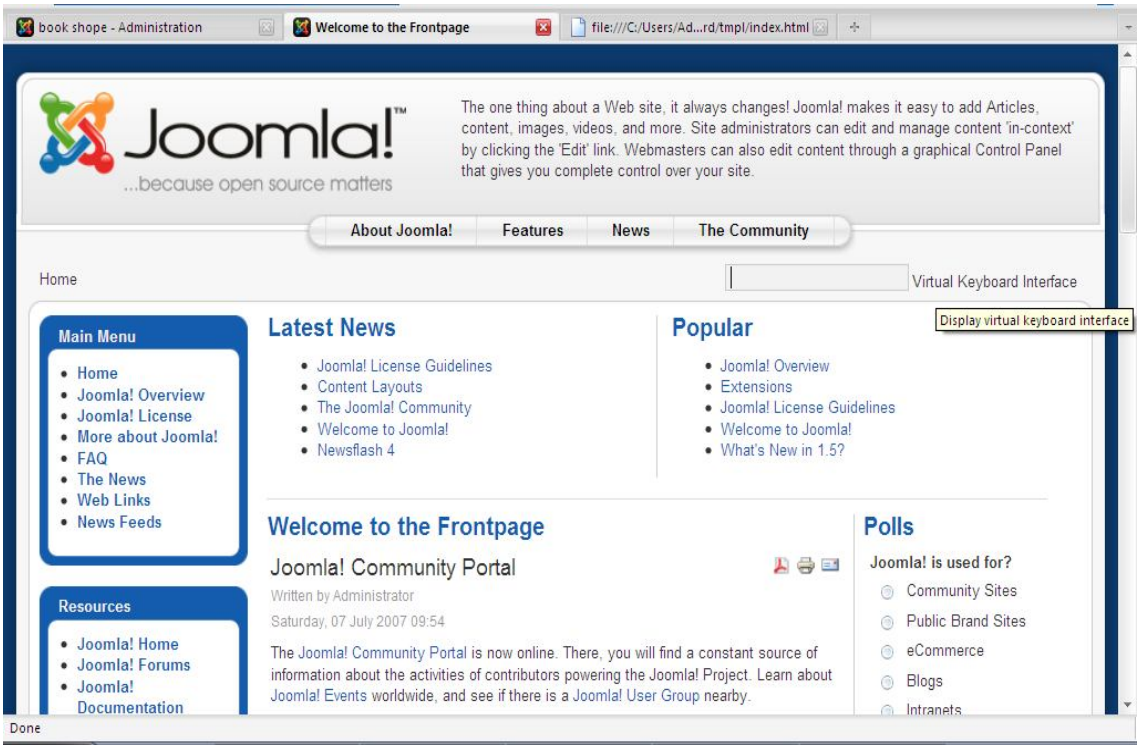
5. Wait for the confirmation and go to the extensions menu and click on module manager.



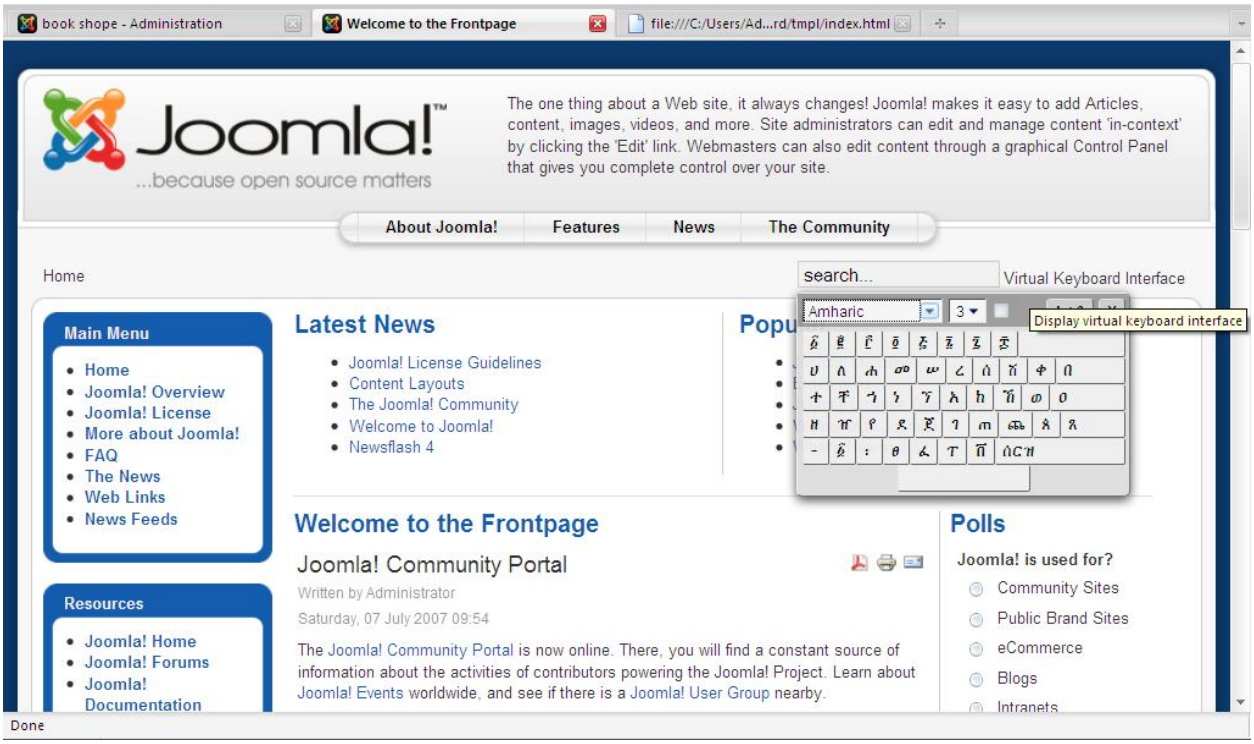
6. From the listed modules select Virtual Keyboard and disable the module title, enable the module and position it where it doesn't produce any styling, for example in the footer . It must be in a position which is defined by your template. If there are problems with the template, try a different position. Finally save the changes.



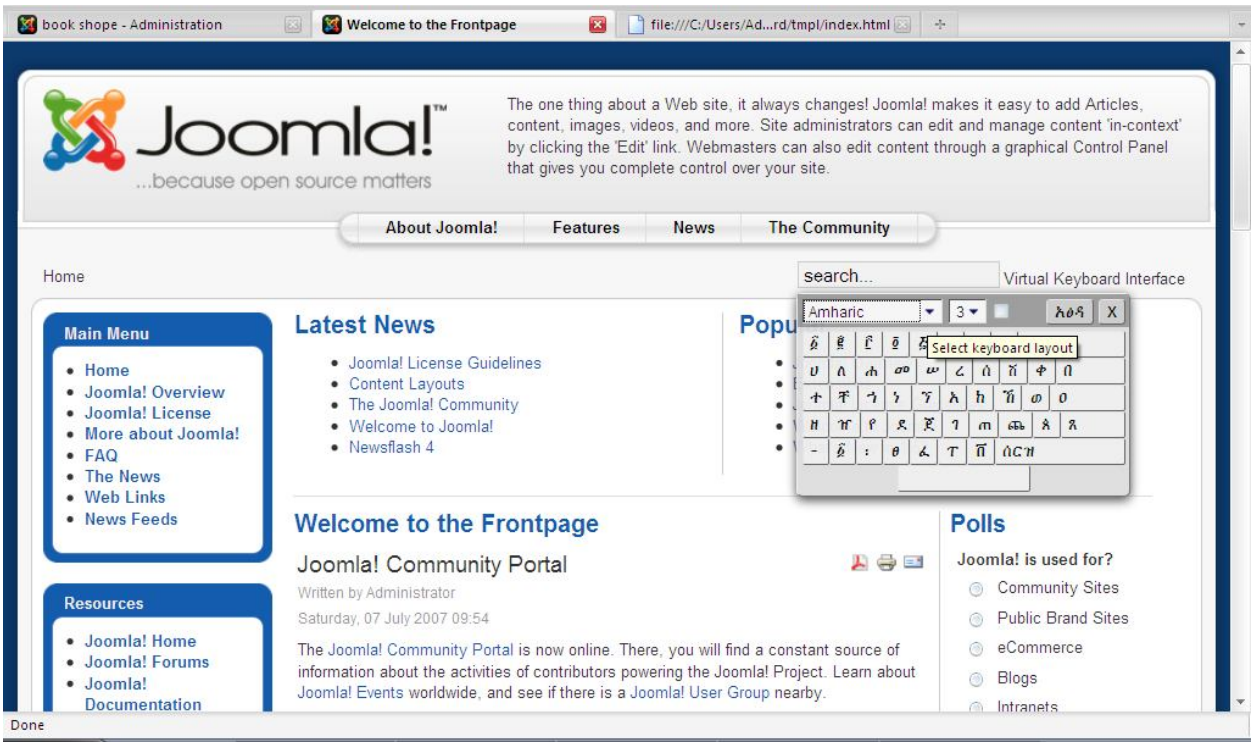
7. Go to the page where the Virtual Keyboard is enabled in this case the home page. If you see the [Display the virtual keyboard interface] on the search input box and the login form like the figure below you have successfully installed the virtual keyboard module on your Joomla system.



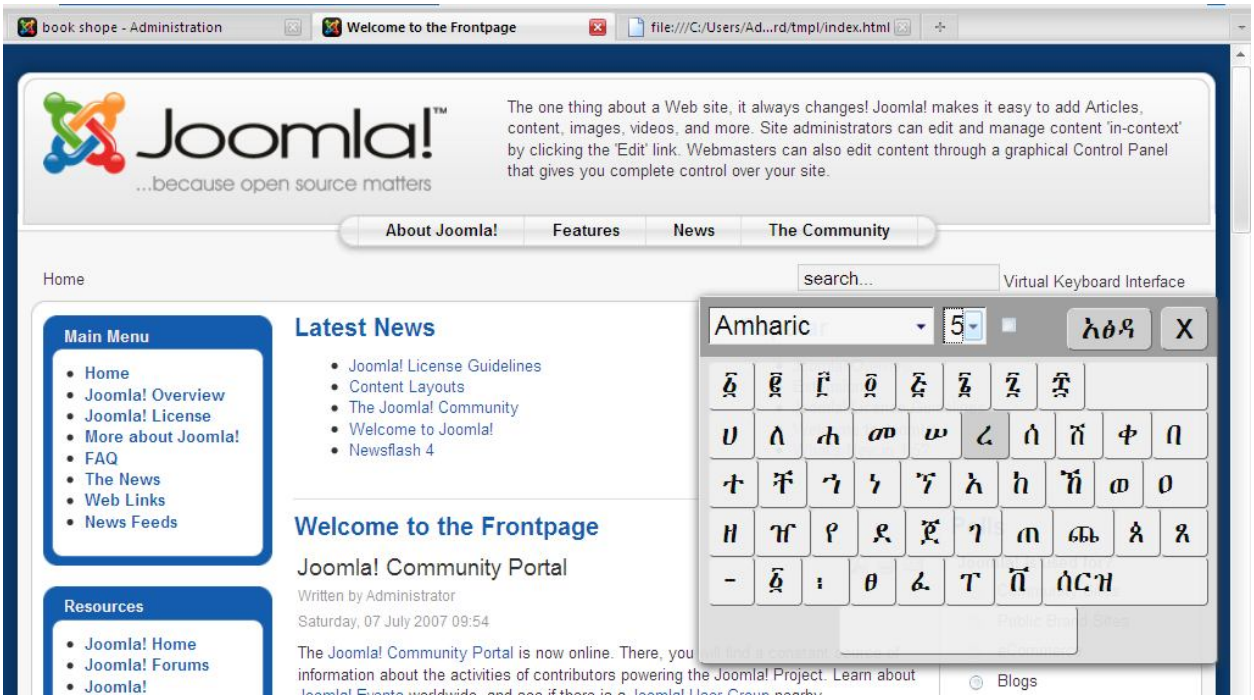
8. To display the virtual keyboard click on the [Display the virtual keyboard interface]



9. To select the virtual keyboard click in the first dropdown list



10. The default size of the virtual keyboard is 3. You can increase or decrease the size of the keyboard. To change the size of the keyboard click on the second drop down list and select the size.



Declaration

I, the undersigned, declare that this project is my original work and has not been presented for a degree in any other university, and that all the source of materials used for the project has been duly acknowledged.

Declared by:

Name …….

Signature ……..

Date …….

Confirmed by advisor

Name …….

Signature ……..

Date …….