University of Buea

Faculty of Engineering and Technology

Department of Computer Engineering

CEF 512: ERP Systems Engineering

Customization of OpenEduCat on OpenERP (Odoo) for a

School Management System (SMS)

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Introduction

This project implements OpenEduCat on Odoo as a school management for Institutions and lower level schools. In the report, we shall handle the various aspects of the Odoo ERP and OpenEduCat and also how the OpenEduCat is used for creating a school management system. The case study here shall be the University of Buea and some few faculties.

But due to the large nature of this ERP system to manage information for an institution, I will focus just on 1 module and makes sure it works, since ERP systems are very large, customizing them for a particular purpose is the implementation and takes a lot of time.

What is an ERP System?

ERP is short for *enterprise resource planning*. Enterprise resource planning (ERP) is business process management software that allows an organization to use a system of integrated applications to manage the business and automate many back office functions related to technology, services and human resources. ERP software integrates all facets of an operation, including product planning, development, manufacturing, sales and marketing.
ERP software is considered an enterprise application as it is designed to be used by larger businesses and often requires dedicated teams to customize and analyze the data and to handle upgrades and deployment. In contrast, Small business ERPapplications are lightweight business management software solutions, often customized for the business industry you work in (by *Vangie Beal*, http://www.webopedia.com/TERM/E/ERP.html) .

About Odoo

Odoo (formerly known as OpenERP and before that, TinyERP) is a suite of open core enterprise management applications. Targeting companies of all sizes, the application suite includes billing, accounting, manufacturing, purchasing, warehouse management, and project management.

The source code for the OpenObject framework and core ERP (enterprise resource planning) modules is curated by the Belgium-based Odoo S.A. Additionally, customized programming, support, and other services are provided by an active global community and a network of 500 official partners. The main Odoo components are the OpenObject framework, about 30 core modules (also called official modules) and more than 3000 community modules.

Odoo has been used as a component of university courses. A study on experiential learning suggested that OpenERP provides a suitable alternative to proprietary systems to supplement teaching.

Several books have been written about Odoo, some covering specific areas such as accounting or development.

Odoo has received awards including Trends Gazelle and BOSSIE Awards[13] three years in a row.

It uses Python scripting and Postgres database. Its community edition is supplemented with an Enterprise edition @ USD 240/- per user per year and a commercially supported online edition. Development repo is on GitHub.

In 2013, the not-for-profit Odoo Community Association was formed to ensure the ongoing promotion and maintenance of the Odoo community versions and modules to supplement the work of Odoo S.A. This organisation has over 150 members who are a mix of individuals and organisations.

What makes Odoo different?

A smooth and friendly user's experience that has been built to ensure the user seamless adoption.

Fluidity and full integration cover the needs of even the most complex companies. The flexibility of Odoo is such that apps can be added according to the growth of your company, adding one app at a time as your needs evolve and your customer base grows.

Thanks to the open source community, Odoo is actively maintained by a large base of developers to meet evolving customer needs and provide new, innovative applications.

What is a school management system?

(For most people) a **Student management system** (SMS) is software to manage all day to day operations for a school. They are also called **student information systems** (SIS), **Student information management systems** (SIMS), Student records system (SRS). Functionalities of such systems are not the same and this may reflect in the name adopted by users and vendors.

Prerequisites

This section is used to show the third party applications that odoo depends on and how to set them up on a development environment.

Step 1: Update and upgrade your system

Run the following commands against the terminal and wait for a while;

sudo apt-get update

sudo apt-get upgrade

Step 2: Install prerequisite python libraries and postgres database

*sudo apt-get install git openssh-server graphviz ghostscript *

*python-dateutil python-feedparser python-matplotlib *

*python-ldap python-libxslt1 python-lxml python-mako *

*python-openid python-psycopg2 python-pybabel python-pychart *

*python-pydot python-pyparsing python-reportlab python-simplejson *

*python-tz python-vatnumber python-vobject python-webdav *

*python-werkzeug python-xlwt python-yaml python-imaging *

*gcc python-dev mc bzr python-setuptools python-babel *

*python-feedparser python-reportlab-accel python-zsi python-openssl *

*python-egenix-mxdatetime python-jinja2 python-unittest2 python-mock *

*python-docutils lptools make python-psutil python-paramiko poppler-utils *

*python-pdftools python-scipy python-decorator python-requests python-pyPdf *

antiword postgresql postgresql-client postgresql-server-dev-9.3

```
derick@d3r1ck:~/odoo$ sudo apt-get install git openssh-server graphviz ghostscript \
> python-dateutil python-feedparser python-matplotlib \
> python-ldap python-libxslt1 python-lxml python-mako \
> python-openid python-psycopg2 python-pybabel python-pychart \
> python-pydot python-pyparsing python-reportlab python-simplejson \
> python-tz python-vatnumber python-vobject python-webdav \
> python-werkzeug python-xlwt python-yaml python-imaging \
> gcc python-dev mc bzr python-setuptools python-babel \
> python-feedparser python-reportlab-accel python-zsi python-openssl \
> python-egenix-mxdatetime python-jinja2 python-unittest2 python-mock \
> python-docutils lptools make python-psutil python-paramiko poppler-utils \
> python-pdftools python-scipy python-decorator python-requests python-pyPdf \
> antiword postgresql postgresql-client postgresql-server-dev-9.3
[sudo] password for derick:
Reading package lists... Done
Building dependency tree
Reading state information... Done
gcc is already the newest version.
make is already the newest version.
python-dateutil is already the newest version.
python-decorator is already the newest version.
python-dev is already the newest version.
python-docutils is already the newest version.
python-egenix-mxdatetime is already the newest version.
python-feedparser is already the newest version.
python-imaging is already the newest version.
python-jinja2 is already the newest version.
python-ldap is already the newest version.
python-libxslt1 is already the newest version.
python-mako is already the newest version.
python-mock is already the newest version.
python-openid is already the newest version.
python-openssl is already the newest version.
python-paramiko is already the newest version.
python-psutil is already the newest version.
python-psycopg2 is already the newest version.
python-pyparsing is already the newest version.
python-reportlab is already the newest version.
python-reportlab-accel is already the newest version.
```

Step 3: More packages for Odoo 9

sudo apt-get install build-essential libldap2-dev libsasl2-dev npm nodejs

libxml2-dev libxslt1-dev libjpeg-dev python-pip gdebi

Step 4: NodeJs and other packages to run Odoo website

sudo npm install -g less less-plugin-clean-css -y && sudo ln -s /usr/bin/nodejs

/usr/bin/node

Step 5: Wkhtml to print odoo 8 and odoo 9 reports

cd /tmp && wget

http://download.gna.org/wkhtmltopdf/0.12/0.12.2.1/wkhtmltox-0.12.2.1_linux-tru

sty-i386.deb && sudo gdebi -n wkhtmltox-0.12.2.1_linux-trusty-i386.deb && rm

wkhtmltox-0.12.2.1_linux-trusty-i386.deb

sudo ln -s /usr/local/bin/wkhtmltopdf /usr/bin/ && sudo ln -s

/usr/local/bin/wkhtmltoimage /usr/bin/

Step 6: Passlib for ubuntu 14.04

sudo apt-get install python-passlibsudo apt-get install python-passlib

Step 7: Configure postgres server

sudo su postgres

psql -t template1

template1=# create user {your-username} with superuser password 'postgres';

template1=# \q

```
postgres@d3r1ck:/home/derick$ psql
psql (9.3.13)
Type "help" for help.

postgres=# \du
                          List of roles
 Role name |                   Attributes                   | Member of
-----------+------------------------------------------------+-----------
 derick    | Superuser, Create DB                           | {}
 postgres  | Superuser, Create role, Create DB, Replication | {}

postgres=#
```

Step 8: Download/Install sublime text editor

https://www.sublimetext.com/3

Step 9: Fork the source code and clone source code

https://www.github.com/{username}/odoo

Step 10: Run the code

cd path-to-odoo-project ;python odoo

```
derick@d3r1ck:~/odoo$ python odoo.py
2016-07-07 08:55:00,191 20593 INFO ? openerp: OpenERP version 9.0c
2016-07-07 08:55:00,191 20593 INFO ? openerp: addons paths: ['/home/derick/.local/share/Odoo/addons/9.0', u'/home/derick/odoo/openerp/addons', u
'/home/derick/odoo/addons']
2016-07-07 08:55:00,191 20593 INFO ? openerp: database: default@default:default
2016-07-07 08:55:00,338 20593 INFO ? openerp.service.server: HTTP service (werkzeug) running on 0.0.0.0:8069
2016-07-07 08:56:34,677 20593 INFO ? openerp.addons.bus.models.bus: Bus.loop listen imbus on db postgres
2016-07-07 08:56:36,464 20593 INFO ? openerp.addons.report.models.report: Will use the Wkhtmltopdf binary at /usr/local/bin/wkhtmltopdf
2016-07-07 08:56:37,813 20593 INFO ? openerp.http: HTTP Configuring static files
2016-07-07 08:56:37,833 20593 INFO smsodoo openerp.http: Generating nondb routing
2016-07-07 08:56:37,874 20593 INFO smsodoo werkzeug: 127.0.0.1 - - [07/Jul/2016 08:56:37] "GET / HTTP/1.1" 200 -
2016-07-07 08:56:37,996 20593 INFO ? werkzeug: 127.0.0.1 - - [07/Jul/2016 08:56:37] "GET /web HTTP/1.1" 303 -
2016-07-07 08:56:38,229 20593 INFO ? werkzeug: 127.0.0.1 - - [07/Jul/2016 08:56:38] "GET /web/database/selector HTTP/1.1" 200 -
2016-07-07 08:56:38,280 20593 INFO ? werkzeug: 127.0.0.1 - - [07/Jul/2016 08:56:38] "GET /web/static/lib/fontawesome/css/font-awesome.css HTTP/1
.1" 304 -
2016-07-07 08:56:38,390 20593 INFO ? werkzeug: 127.0.0.1 - - [07/Jul/2016 08:56:38] "GET /web/static/lib/jquery/jquery.js HTTP/1.1" 200 -
2016-07-07 08:56:38,404 20593 INFO ? werkzeug: 127.0.0.1 - - [07/Jul/2016 08:56:38] "GET /web/static/lib/bootstrap/js/tooltip.js HTTP/1.1" 200 -
2016-07-07 08:56:38,405 20593 INFO ? werkzeug: 127.0.0.1 - - [07/Jul/2016 08:56:38] "GET /web/static/lib/bootstrap/js/dropdown.js HTTP/1.1" 200
-
2016-07-07 08:56:38,435 20593 INFO ? werkzeug: 127.0.0.1 - - [07/Jul/2016 08:56:38] "GET /web/static/lib/bootstrap/js/modal.js HTTP/1.1" 200 -
```

After Installation of Dependencies

Install Odoo on my system

Configuring the Database so that Odoo can use;

Database schema and tables after installing the Database

| Table	Owner	Tablespace	Estimated row count										Comment
academic_month	derick		0	Browse	Select	Insert	Empty	Alter	Drop	Vacuum	Analyze	Reindex	Academic Month
academic_subject	derick		0	Browse	Select	Insert	Empty	Alter	Drop	Vacuum	Analyze	Reindex	Student Previous School
academic_year	derick		0	Browse	Select	Insert	Empty	Alter	Drop	Vacuum	Analyze	Reindex	Academic Year
account_account	derick		0	Browse	Select	Insert	Empty	Alter	Drop	Vacuum	Analyze	Reindex	Account
account_account_account_tag	derick		0	Browse	Select	Insert	Empty	Alter	Drop	Vacuum	Analyze	Reindex	RELATION BETWEEN account_account AN account_account_tag
account_account_financial_report	derick		0	Browse	Select	Insert	Empty	Alter	Drop	Vacuum	Analyze	Reindex	RELATION BETWEEN account_financial_report AND account_account
account_account_financial_report_type	derick		0	Browse	Select	Insert	Empty	Alter	Drop	Vacuum	Analyze	Reindex	RELATION BETWEEN account_financial_report AND account_account_type
account_account_tag	derick		0	Browse	Select	Insert	Empty	Alter	Drop	Vacuum	Analyze	Reindex	Account Tag
account_account_tag_account_tax_template_rel	derick		0	Browse	Select	Insert	Empty	Alter	Drop	Vacuum	Analyze	Reindex	RELATION BETWEEN account_tax_templa AND account_account_tag
account_account_tax_default_rel	derick		0	Browse	Select	Insert	Empty	Alter	Drop	Vacuum	Analyze	Reindex	RELATION BETWEEN account_account AN account_tax
account_account_template	derick		966	Browse	Select	Insert	Empty	Alter	Drop	Vacuum	Analyze	Reindex	Templates for Accounts
account_account_template_account_tag	derick		0	Browse	Select	Insert	Empty	Alter	Drop	Vacuum	Analyze	Reindex	RELATION BETWEEN account_account_template AND account_account_tag
account_account_template_tax_rel	derick		0	Browse	Select	Insert	Empty	Alter	Drop	Vacuum	Analyze	Reindex	RELATION BETWEEN account_account_template AND account_tax_template
account_account_type	derick		0	Browse	Select	Insert	Empty	Alter	Drop	Vacuum	Analyze	Reindex	Account Type
account_account_type_rel	derick		0	Browse	Select	Insert	Empty	Alter	Drop	Vacuum	Analyze	Reindex	RELATION BETWEEN account_journal AN account_account
account_aged_trial_balance	derick		0	Browse	Select	Insert	Empty	Alter	Drop	Vacuum	Analyze	Reindex	Account Aged Trial balance Report
account_aged_trial_balance_account_journal_rel	derick		0	Browse	Select	Insert	Empty	Alter	Drop	Vacuum	Analyze	Reindex	RELATION BETWEEN account_aged_trial_balance AND account_journal
account_analytic_account	derick		0	Browse	Select	Insert	Empty	Alter	Drop	Vacuum	Analyze	Reindex	Analytic Account
account_analytic_account_tag_rel	derick		0	Browse	Select	Insert	Empty	Alter	Drop	Vacuum	Analyze	Reindex	RELATION BETWEEN account_analytic_account AND account_analytic_tag
account_analytic_chart	derick		0	Browse	Select	Insert	Empty	Alter	Drop	Vacuum	Analyze	Reindex	Account Analytic Chart

Installing phppgAdmin

To Install phppgadmin on the linux OS, just type this command on the command prompt in Linux

$ sudo apt-get install phppgadmin

PhppgAdmin was used as the client for PostgreSQL Database management system and here is the login interface for the client.
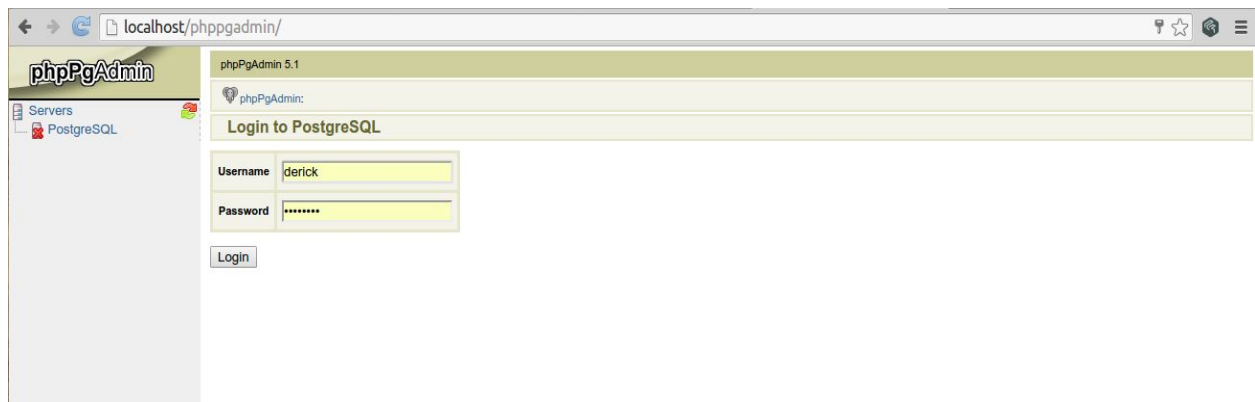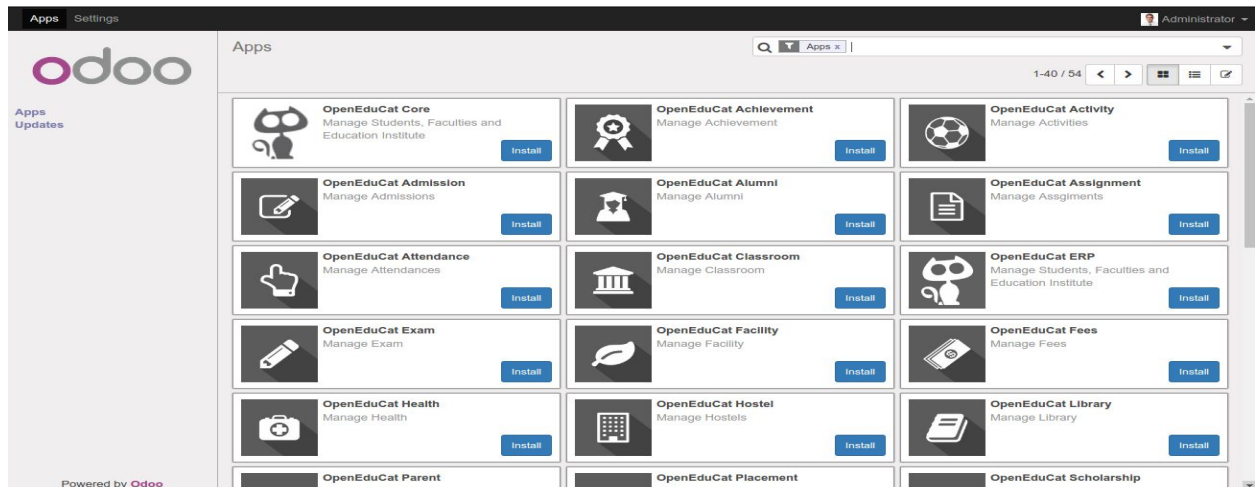

OpenEduCat

As **OpenEduCat** is a comprehensive Open Source ERP solution for Educational institutes, it's NOT JUST a student management system, but a complete package for serving different facets of school management.

Features

- [Student](#)
- [Faculty](#)
- [Course](#)
- [Enrollment](#)
- [Exam](#)
- [Financial](#)

Like most institutions, this one is very similar and can be divided into the various categories; An institution is divided into Faculties and Colleges and then under these, we have Departments like; Department of Mathematics which is under the Faculty of Science. Under each department, we do have specialties and then below we have students and students have their Identification number which is given to them by the school.

OpenEduCat Apps and modules

Home page of the project
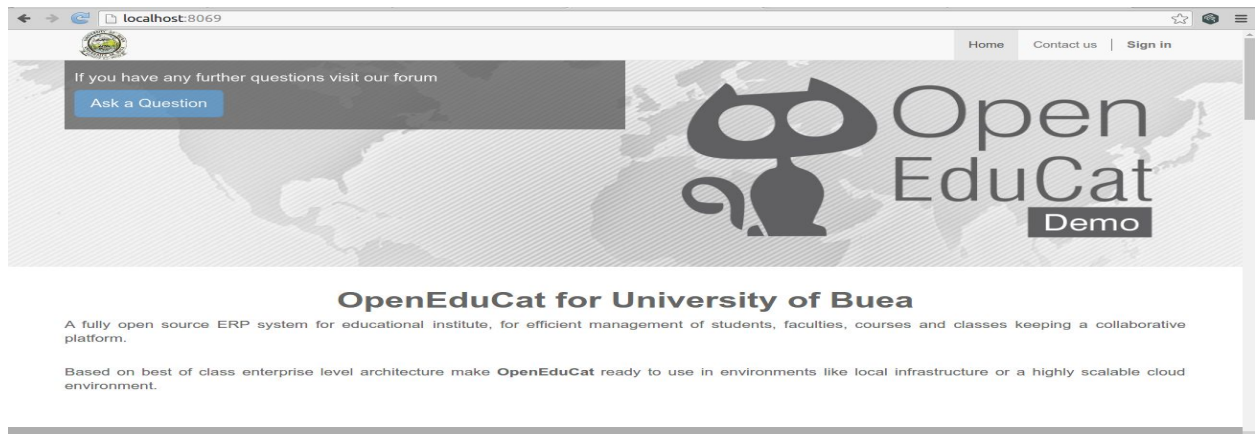
Enrolment of Students

To enroll a student, on the menu bar, click on OpenEduCat and then click on students on the left sidebar and then click create student to enroll the student.

Course Management

Adding a course in the system is pretty easy to do, all you need to do is go to Courses and then click on Add course (create course) and we are done.

Login to the Backend of the System

Discussion

OpenEduCat is a fully open source ERP system for educational institute, for efficient management of students, faculties, courses and classes keeping a collaborative platform.

Based on best of class enterprise level architecture make OpenEduCat ready to use in environments like local infrastructure or a highly scalable cloud environment.

To install OpenEduCat, Install Odoo / OpenERP and go to Settings -> Apps and search OpenEduCat and that's it module is available for installation, click on install, that's it.

Work done

As mentioned above, I followed all the steps through;

- Dependencies management and installation on Linux
- Creating of DB users and databases
- Installation of Odoo and OpenEduCat
- Creating of courses, students and others on the System
- Customization of the System for University of Buea
- Custom website for the system

Hardware and Software Specification

Name	Type	Capacity
RAM	Hardware	4GB
HDD	Hardware	500GB
CPU Model	Hardware	Intel core i3
Number of Processors	---	4
Ubuntu 14.04	Software	LTS
Odoo 9	Softwaare	----
OpenEduCat	Software	---

Development Model Used

I used the Incremental Model or traditionally the waterfall model to work on this project and it was closely followed since I was learning and Implementing the project at the same time. Odoo itself is an ERP and is very module and deeply follows the content of the course CEF 512 tutored by our Lecturer Mr Ngatchu Harry.

Research and Other Issues

A lot of research was done in this project and I also faced a whole lot of issues especially when it comes to configuration of the Database server to have the integrated offline database for the whole project.
I faced some issues too since the version of Odoo I am using is the latest and it's not very stable. Also, the Odoo body/community refused to give me access to some functionality of the software since it's not that open / free. I requested for a demo but they refused.

Conclusion

In conclusion, as the above report documents, it was not easy to setup this system locally on my computer for development, It took me a long time to customize just a few modules like student admission, course management. Using ERP Systems like OpenEduCat and Odoo is a very nice domain to step into because of the full functionalities and the robust nature of the features of these systems.

A highly customized and powerful database management system also used like PostgreSQL for the database transactions will also make the system very reliable.

References

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