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Decision Support Dashboard in OpenERP

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Abstract

This work focuses on the analysis and design of decision support dashboard in OpenERP. With the aim to improve the Operational Information System OIS of the Moroccan university, Hassan 1st University of SETTAT launched MISSION project, in association with 22 academic and institutional partners of Morocco and the European Union. This project is to improve the management of Moroccan universities. The vision of the MISSION project is to modernize the governance of universities in order to improve the quality of services offered by the university administration. The basic idea is to provide each partner university in a OIS using open source ERP (OpenERP) and integrating 4 bricks trades (schooling, Finance, Human Resource Management (HRM) and Heritage). This operational information system is not completed if and only if there is a Strategic Information System (SIS) that uses the information provided by the first to give university leaders the opportunity to take long-term decisions and this is the aim of the second. One of the tools of SIS we find dashboards.

Keywords: *OpenERP, MISSION, OIS.*

1. Introduction

To modernize the governance of the national academic institution and strength its administrative and financial autonomy, Hassan 1st University of SETTAT launched MISSION project, in association with 22 academic and institutional partners of Morocco and the European Union. This project is to improve the management of universities through the implementation of an Operational Information System service by introducing OpenERP.

The vision of MISSION project is to modernize the governance of universities in order to improve the quality of services offered by the university administration that it is level with the HRM, Managing heritage, Pinnacle Financial Management or dashboard for controlling.

ERP (Enterprise Resource Planning) open source allow the university to have comprehensive management tools at the best price, quickly giving them a real benefit in terms of competitiveness. Free software then allowed removing an intermediary (distributor), reducing development costs by reusing of open source software.

MISSION project is to improve the management of Moroccan universities by implementing a Service Operational Information System SOIS. The objective of the project is that every Moroccan university partner will be provided with a SOIS using an open source ERP and integrating 4 bricks trades (Education, Finance, HRM and Heritage) [1].

2. Decision Support Dashboard

Companies are increasingly equipped with a system of business intelligence (BI), which is used to collect internal and external data and transform it into information analyzed by users to make better decisions and improve performance of company.

However, BI systems often treat as internal and quantitative data. It is however necessary for leaders to integrate qualitative and external information that affect their activities. To manage and measure the performance of the company, managers or policy makers need synthetic indicators that are grouped into dashboard.

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2.1.1. Dashboard

Dashboard is a tool for communication and decision-making that enables the management controller to draw the attention of the head of the key points of its management in order to improve [2].

It may be said that dashboards consist of a set of carefully selected information (numbers, ratios, graphs), which are synthesis documents the entire operation and, by practical presentation should allow leaders, without research or loss of time, to be a true and accurate view of the situation of the entity concerned [3].

In short, we can conclude that dashboard is a tool that better meets the needs of a permanent quick control, a set of both financial, quantitative and qualitative variables.

2.2.2. Roles of dashboard:

The dashboard is an instrument of control and comparison. But the information system makes it a tool for dialogue and communication as well as helping in decision making.

To drive business performance, the dashboard is responsible for:

a) Allow to constantly monitor achievements against targets set as part of the budgetary process.
b) Draw attention to the key points of the management and their possible deviation from the standard functions provided.
c) Allow to diagnose weaknesses and show what is abnormal and that has an impact on the result of the company [4].

The dashboard uses tools of dialogue and communication to achieve the objectives set by the company of these tools:

a) The dashboard, soon as it appeared, should enable a dialogue between the different hierarchical levels.
b) It must allow the subordinate to discuss the results of its action, weaknesses and strengths. It gives more specific requests for additional resources or guidelines.
c) The supervisor must coordinate corrective actions favoring the search for a global optimum rather than partial optimizations.
d) Attracting the attention of all on the same parameters, it plays an integrating role, giving to a specific hierarchical level, a common language [5].

As a tool for decision support, provide a set of data to responsible for it can guide its decisions and actions to achieve its goals dashboard's primary vocation. The information should be reliable, understandable, synthetic and often produced. They can be used either under the supervision of delegations (which are then reporting data for the management of the company or responsible senior levels) or in an optical self (all responsible for business may be affected in this case).

The dashboard also has the additional mission to promote the mastery of events that occur upstream of the financial results. It must therefore be reactive (implying periodicities close diffusion) and contain physical indicators in tune on operational variables (quality, time, flexibility, variety) that are the source of value creation process.

2.2.3. Designing a dashboard:

The design of the dashboard is through clear and precise steps. The stages of the design of the dashboard are:

a) Mission Analysis and definition of objectives:

The dashboard is suitable responsibilities; we must clearly position responsibilities, missions and goals assigned to each manager. You cannot judge those responsible on the basis of an objective starting;

b) Identification of key success factors:

The tables are based on skills that must be mastered or conditions; it is key strengths of success to meet to achieve the assigned objective. It is to identify and select the most typical or most relevant, which may include some others. This is the trickiest and most important because the FCS are the means to achieve the objectives. The quality and relevance of the dashboard depends;

c) Selection of indicators

A performance indicator is information to help an actor or group of actors to drive the course of action to achieve a goal or to enable them to evaluate the results.

The indicator is not an objective measure but it is built by the author in relation to the objectives pursued and the action plan that leads. The performance indicator is not necessarily a number. It can be a qualitative judgment, a binary sign, and graphic [7].

3. Presentation of OpenERP

OpenERP is an ERP free license, the flexibility is ideal for independent. It covers virtually all sectors: industry, trade, services, e-commerce, trading, etc... Like most open source software, accessibility, flexibility and simplicity are the hallmarks of development. All features of OpenERP developed in Python while interfaces are developed in XML [8].

3.1.1. Modular Architecture

This architecture is not suitable for OpenERP. It is in fact shared by all ERP. It is the ability to build computer applications in a modular way (independent modules together) while sharing a single database. This makes a significant importance because the data are now standardized and shared. This eliminates multiple entries and avoids the ambiguity of similar information. The modular architecture of OpenERP allows it to cover several areas shown in the Figure 1 [9]:

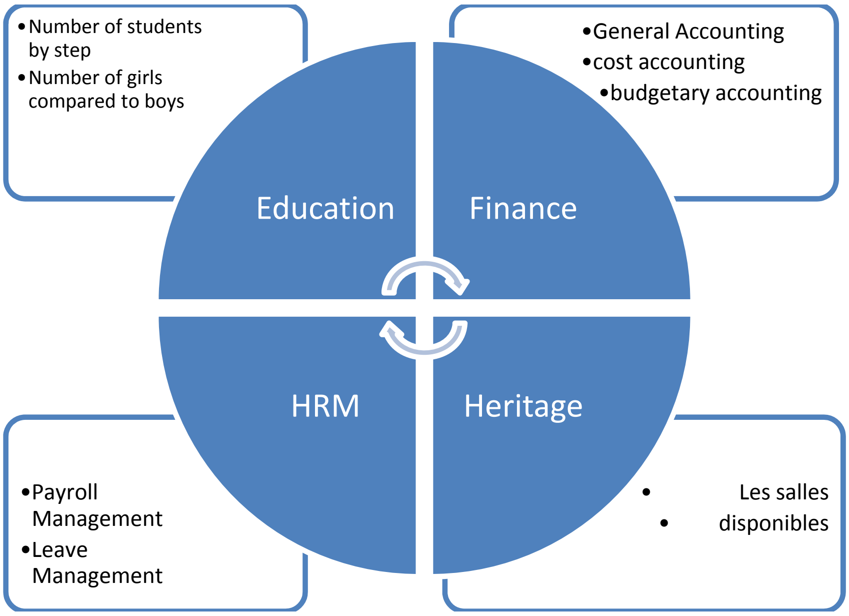


Figure 1. Modular Architecture of OpenERP

3.1.2. Technical Architecture

OpenERP is a multitenant, three-tier architecture. The application tier itself is written as a core, multiple additional modules can be installed to create a particular configuration of OpenERP.

The core of OpenERP and its modules are written in Python. The functionality of a module is exposed through XML-RPC (and/or NET-RPC depending on the server's configuration)[#]. Modules typically make use of OpenERP's ORM to persist their data in a relational database (PostgreSQL). Modules can insert data in the database during installation by providing XML, CSV, or YML files.

a) The OpenERP server

OpenERP provides an application server on which specific business applications can be built. It is also a complete development framework, offering a range of features to write those applications. The salient features are a flexible ORM, a MVC architecture, extensible data models and views, different report engines, all tied together in a coherent, network-accessible framework.

From a developer perspective, the server acts both as a library which brings the above benefits while hiding the low-level, nitty-gritty details, and as a simple way to install, configure and run the written applications.

b) Modules

By itself, the OpenERP server is not very useful. For any enterprise, the value of OpenERP lies in its different modules. It is the role of the modules to implement any business needs. The server is only the necessary machinery to run the modules. A lot of modules already exist. Any official OpenERP release includes about 170 of them, and hundreds of modules are available through the community. Examples of modules are Account, CRM, HR, Marketing, MRP, Sale, etc.

A module (Figure 3) is usually composed of data models, together with some initial data, views definitions (i.e. how data from specific data models should be displayed to the user), wizards (specialized screens to help the user for specific interactions), workflows definitions, and reports.

c) Clients

Clients can communicate with an OpenERP server using XML-RPC. A custom, faster protocol called NET-RPC is also provided but will shortly disappear, replaced by JSON-RPC. XML-RPC, as JSON-RPC in the future, makes it possible to write clients for OpenERP in a variety of programming languages. OpenERP S.A. develops two different clients: a desktop client, written with the widely used GTK+ graphical toolkit, and a web client that should run in any modern web browser.

As the logic of OpenERP should entirely reside on the server, the client is conceptually very simple; it issues a request to the server and display the result (e.g. a list of customers) in different manners (as forms, lists, calendars, ...). Upon user actions, it will send modified data to the server [10].

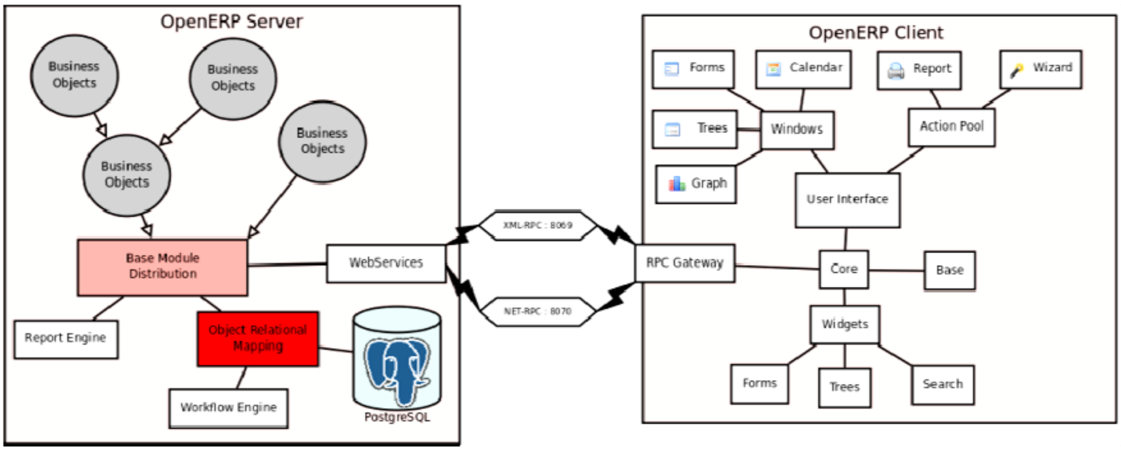


Figure 2. Technical Architecture of OpenERP

3.1.3. Open Object Framework

Open Object is the Framework of OpenERP, or program to generate OpenERP. It is very flexible and comprehensive, and enables the creation of business applications, whatever they are.

Develop management applications with Open Object, far more than any other tool of this type. A Python file containing the description of fields and business rules are created, an XML file describing the screens. Of course, there is no limitation to the codes, this is written in Python, very rich language.

If we need to go further, Open Object allows the creation of Wizards (subprograms), automating tasks and planning, data integration [6].

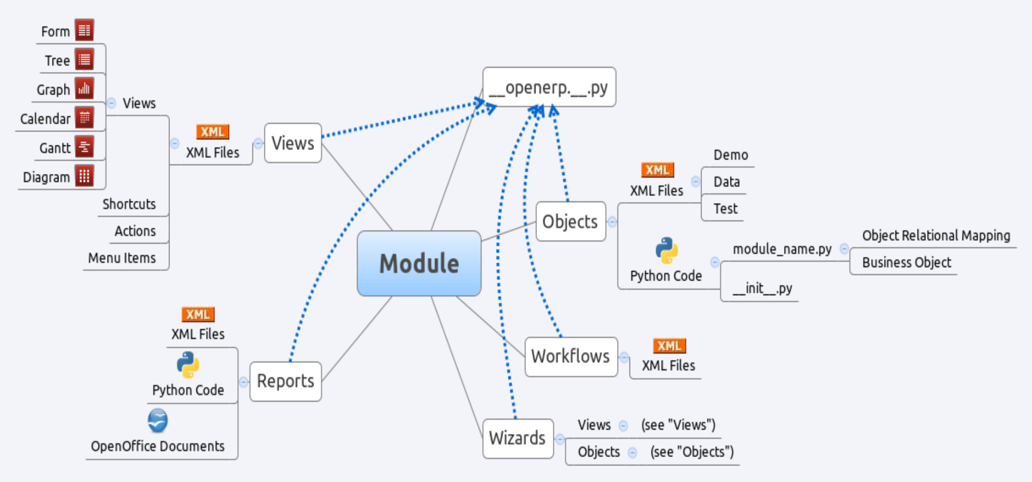


Figure 3. Structure of OpenERP Module

3.1.4. Model MVC

Model–View–Controller (MVC) is a software architectural pattern for implementing user interfaces. It divides a given software application into three interconnected parts, so as to separate internal representations of information from the ways that information is presented to or accepted from the user. The central component, the model, consists of application data, business rules, logic and functions. A view can be any output representation of information, such as a chart or a diagram. Multiple views of the same information are possible, such as a bar chart for management and a tabular view for accountants. The third part, the controller, accepts input and converts it to commands for the model or view [11].

In OpenERP, you can apply the semantics of Model-View-Controller (Figure 4) with:

a) Model: The models are reported in OpenERP objects. They are also PostgreSQL tables.
b) View: views are defined in XML files in OpenERP
c) Controller: The controller is Python which controlling OpenERP

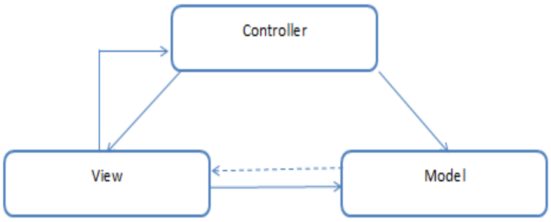


Figure 4. Model–View–Controller

4. Application

To access the application, we must first be authenticated (Figure 5). After presenting the three sections (Figure 5, 6 and 7) that we work with, now we will introduce the module that we developed « Dashboard ».

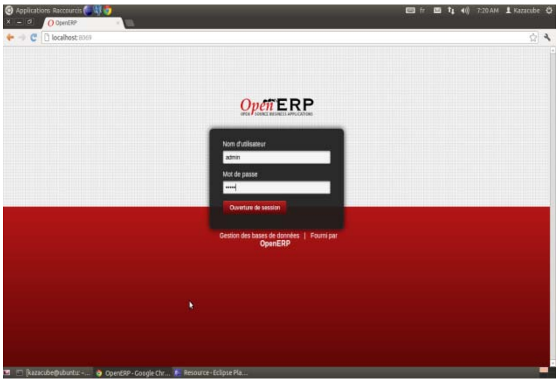
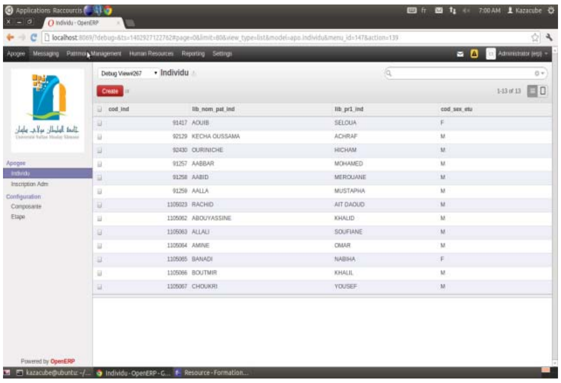


Figure 5. Authentication Interface



cod_ind	lib_nom_pat_ind	lib_pr1_ind	cod_sex_etu
91417	AOUIB	SELOUA	F
92129	KECHA OUSSAMA	ACHRAF	M
92430	OURINICHE	HICHAM	M
91257	AABBAR	MOHAMED	M
91258	AABID	MEROUANE	M
91259	AALLA	MUSTAPHA	M
1105023	RACHID	AIT DAOUD	M
1105062	ABOUYASSINE	KHALID	M
1105063	ALLALI	SOUFIANE	M
1105064	AMINE	OMAR	M
1105065	BANADI	NABIHA	F
1105066	BOUTMIR	KHALIL	M
1105067	CHOUKRI	YOUSEF	M

Figure 6. Apogée section

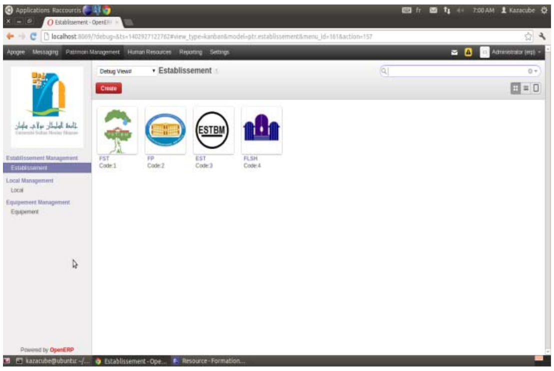


Figure 7. Heritage section

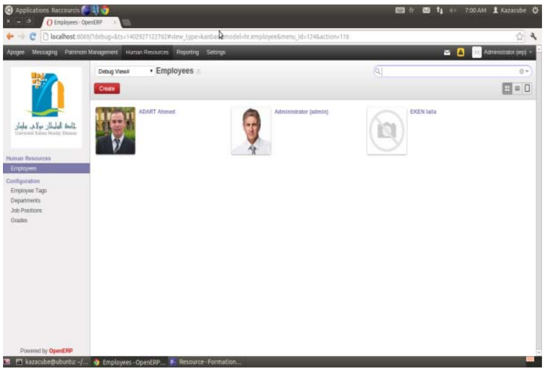
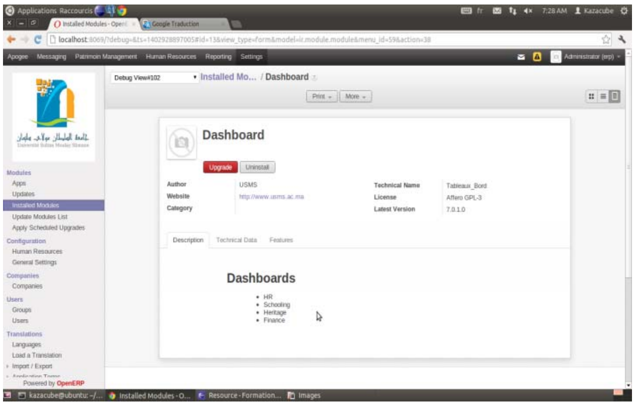


Figure 8. HR Section



Dashboard

Author	USMS	Technical Name	Tableaux_Bord
Website	http://www.usms.ac.ma	License	Affero GPL-3
Category		Latest Version	7.0.1.0

Dashboards

- HR
- Schooling
- Heritage
- Finance

Figure 8. Module Dashboard

In the "Activity Reports" found the miter "Dashboard" that contains three bricks:
a) Grades;
b) Education;
c) Heritage.

a) Grades:

This section (Figure 10) gives us a table and a graph with the number of employees in each grade.

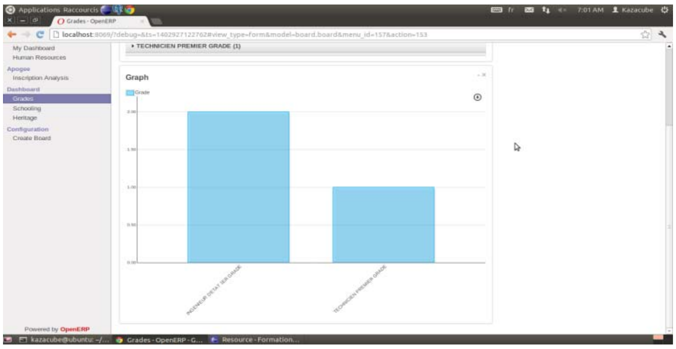


Figure 9. Graph employees by grade

b) Education

In this part, there are four graphs that give us a view of enrollment in the university (Figure 11, 12, 13, 14, 15 and 16).

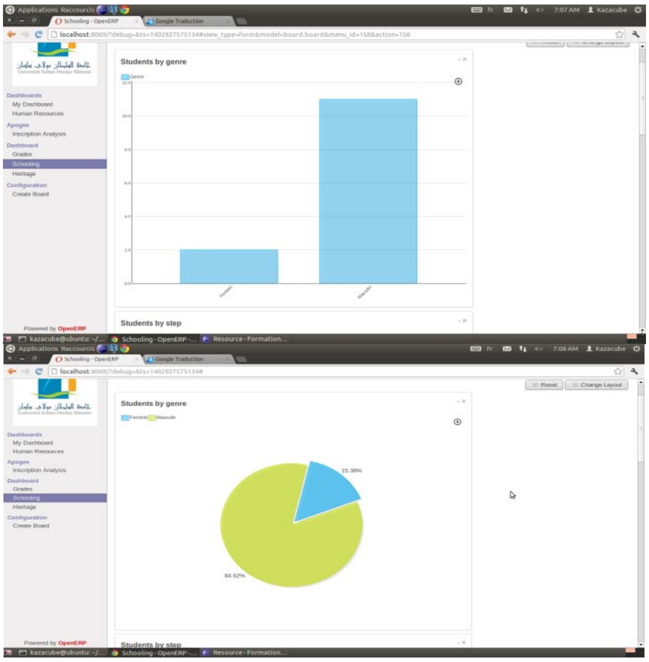


Figure 10. Graph of students by gender

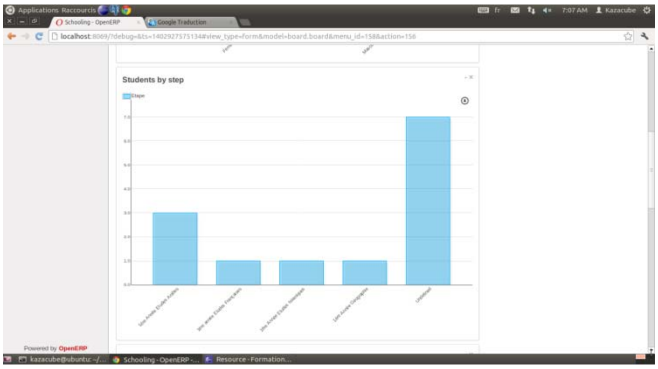


Figure 11. Number of enrollments by step

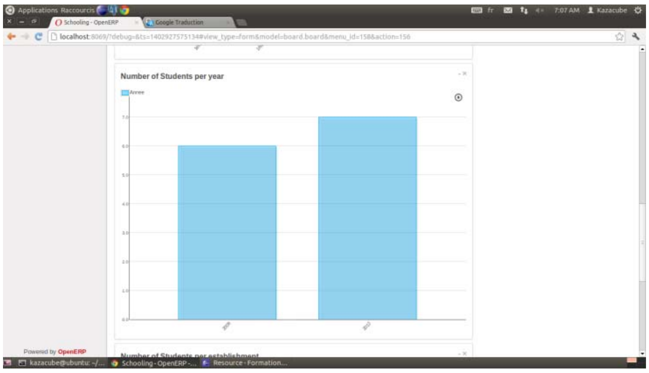


Figure 12. Number of students enrolled each year

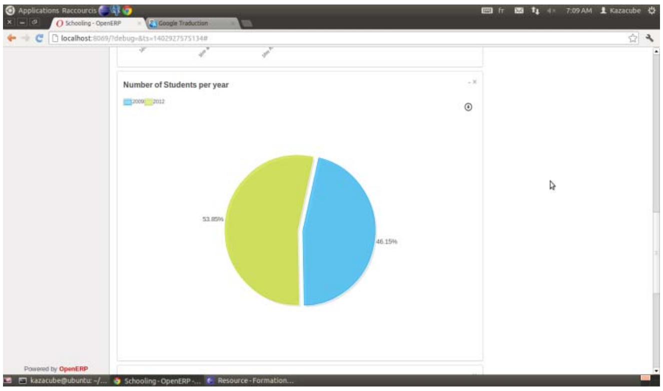


Figure 13. % of students enrolled in each year

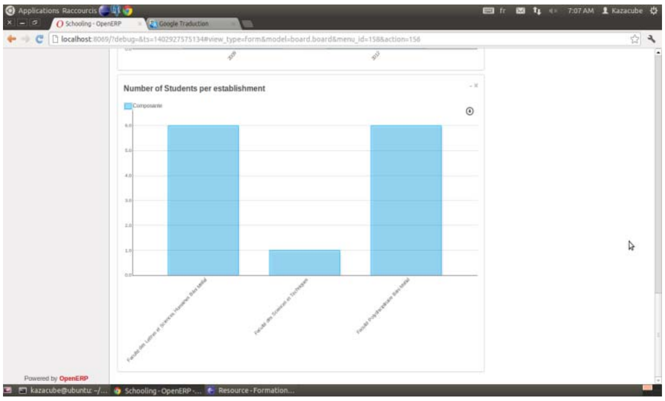

Applications Raccourcis
7:07 AM Kazacube
Schooling - OpenERP
Google Traduction
localhost:8069/?debug=&ts=1402927575134#view_type=form&model=board.board&menu_id=158&action=156
2009
2012
Number of Students per establishment
Composante
6.0
5.0
4.0
3.0
2.0
1.0
0.0
Faculté des Lettres et Sciences Humaines Béni Mellal
Faculté des Sciences et Techniques
Faculté Polydisciplinaire Béni Mellal
Powered by OpenERP
kazacube@ubuntu: ~/...
Schooling - OpenERP -...
Resource - Formation...

Figure 14. Number of students per establishment

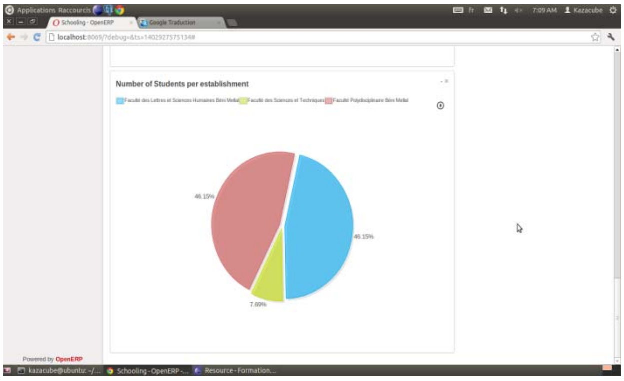
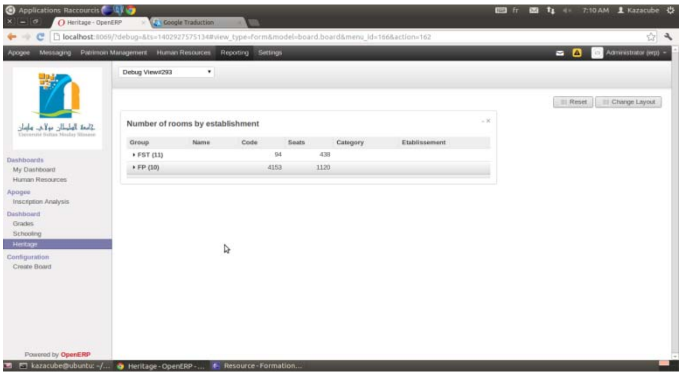

Schooling - OpenERP
Google Traduction
localhost:8069/?debug=&ts=1402927575134#
Number of Students per establishment
Faculté des Lettres et Sciences Humaines Béni Mellal
Faculté des Sciences et Techniques
Faculté Polydisciplinaire Béni Mellal
46.15%
46.15%
7.69%
Powered by OpenERP

Figure 15. Number of students per establishment percentage

c) Patrimoine:



Number of rooms by establishment

Group	Name	Code	Seats	Category	Etablissement
‣ FST (11)		94	438		
‣ FP (10)		4153	1120		

Figure 16. Number of rooms by establishment

5. Conclusion & Perspectives

As a conclusion we can say that the work in the world of open source, and more specifically an ERP (Enterprise Resource Planning) as OpenERP has allowed us to learn more about this area, including the python and use of framework "Open Object", and join a global community of more than 1,500 individuals involved also in research and development of new modules to facilitate the integration of such a solution in all professional and social domains.

As perspective, we propose to add another feature to the application as the occupied rooms.

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