

# University of Ferrara - Case Study

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## 1. The University of Ferrara

The University of Ferrara (founded in 1391) is composed of eight faculties and 19 departments located all over the city of Ferrara, one of the capitals of the Renaissance, whose historical centre is included in the UNESCO World Heritage list. The University of Ferrara is an actual "city-campus", which ensures its students a lively and challenging learning and research environment for the development of humanities, science and technology, at both national and international levels.

## 2. The Unife Portal in numbers

The Portal ([www.unife.it](http://www.unife.it)) of the University of Ferrara is composed of about 200 sites and 9.000 pages, with a storage occupation of 10 Gbytes, with 51 plugins (eg. for LDAP authorisation, custom subsites, Web form etc.). The Portal has 2.200.000 page views per month and 300.000 visits per month. There is a network of 878 people (mostly not technicians) that constantly keep the information on the Portal up to date. The size of the University Portal makes it one of the biggest Plone installation in Italy.

## 3. The Design of the Unife Portal

The communication strategy of the University of Ferrara is based on its Portal that is now almost the only medium for interacting with students, visitors, faculty and staff. In addition, it is worth noticing that the organization of the University of Ferrara in several Departments and Faculties required the design of a solution able to spawn many independent Web sites but with a centralised technical management. These considerations led to the following design requirements:

1. the adoption of a very easy to use Content Management System (CMS) suited for people with very different skills and IT abilities;
2. the design of a scalable solution able to cope with a huge number of sites and, even more important, an extensive network of users;
3. the design of an architecture with a centralised maintenance;
4. the provision of groupware and community based operations;
5. an easy integration of content syndication;
6. the support of an extensive workflow system;
7. the adoption of an Open Source CMS;
8. the ability to integrate with already deployed University services (LDAP for user authentication, several different databases, Web services integration, etc.)

The Zope/Plone framework provides a solutions to all the above outlined requirements.

## **4. Main Features of the Zope/Plone Installation at Unife**

The Zope/Plone infrastructure deployed at the University of Ferrara has several interesting features and is able to satisfy all the above outlined requirements. In particular, let us focus on the main technical feature of the installation and on its main impacts on the whole organization.

### **4.1. Zope/Plone as an integration technology**

From the technical point of view, the University of Ferrara adopted Zope/Plone as an integration technology, in order to exploit its ability to integrate different third party components. The Unife portal retrieves data from several databases, e.g., Oracle and Mysql, and integrates with external applications via Web Services.

This ability has made possible to make the Unife portal the main point of access to all University services, such as VoIP, WiFi, e-mail, and all the administrative services (see Figure 1).

The Zope/Plone Object-Oriented Database provides the mechanisms to index and to catalogue data, which allow to transparently achieve several interesting results:

- to access to the data stored in several and heterogeneous databases. Data is imported as a framework object and can thus be presented in several ways;
- to present information with several customised layout (PageTemplate);
- some Unife PageTemplate export information by means of RSS feed and/or XML pages;
- to create catalogue query (searches on the Unife databases) in order to retrieve detailed information depending on user needs;
- to develop integration services to facilitate interoperability with third party technologies
- to develop applications that can retrieve data from external repository via Web Services. The data are managed by means of Native Plone Workflow.

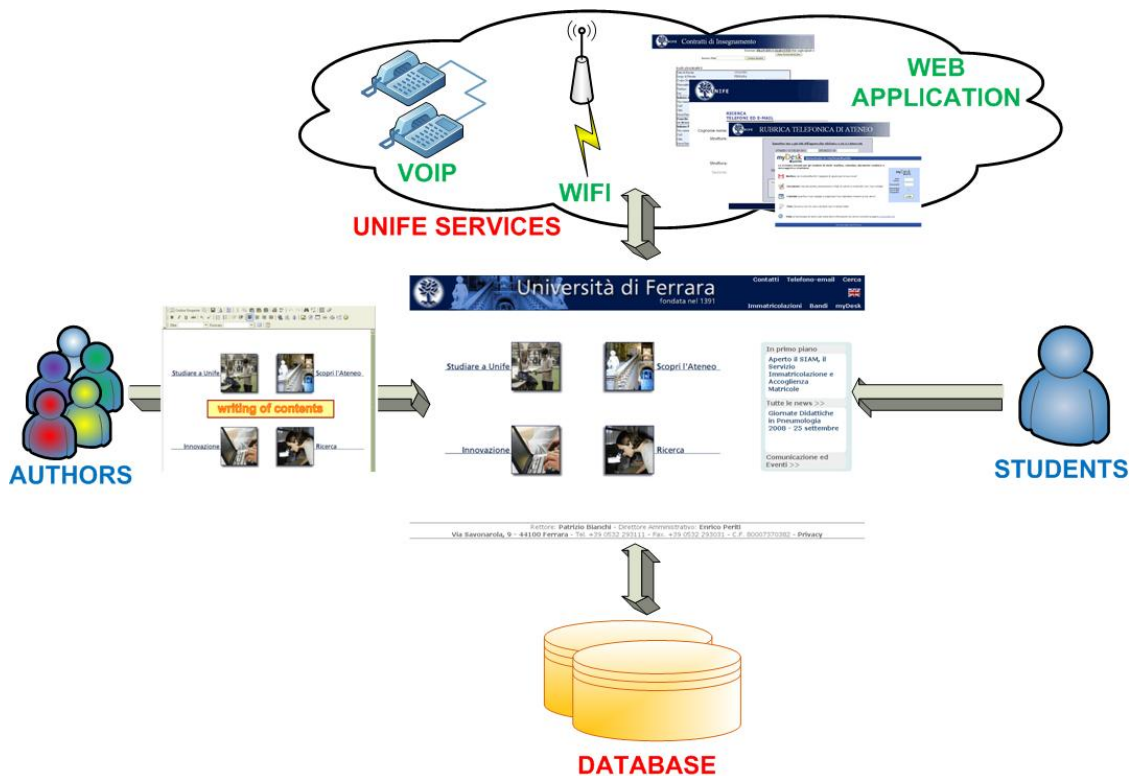


Figure 1. The Unife portal big picture

## 4.2. The impact of Zope/Plone on the Unife organization

Plone offers a very easy to use Content Management System (CMS) that is suited for people with very different skills and IT abilities. This is one of the main reasons behind our choice of Plone. We had the target to provide any Unife user with a simple mean to upload information in the Unife portal, completely by-passing the IT staff, that can now concentrate on IT technical issues.

However, in order to achieve this ambitious goal, the University of Ferrara has had to design an hierarchical organization of IT/administrative people in charge of guiding and coordinating the Portal evolution. Otherwise, giving full autonomy to the 878 Unife users of Plone would have easily led to anarchy and to a heterogenous communication solution. In particular, the Unife groups that collaborate for producing the Unife portal, as depicted in Figure 2, are:

- the "portal design group" is the small group (8 people) that has defined the initial guidelines of portal development and periodically discusses/upgrade new guidelines;
- the "portal control group" is in charge of controlling the Portal development, to ensure its compliance with the general guidelines. It monitors day-by-day activities, interacts with Plone users, adds/remove Plone users, etc.
- the "portal office" of the IT department Plone that designed, and installed Zope/Plone and is in charge of its support and upgrade;
- several networks of editors. Unife has many different kinds of Portal sites, the teaching ones (one for each Laurea degree it offers), the research ones (the departments), the academic ones (many professors and researchers are embracing the Plone CMS) the administrative ones (providing services to

students). Each category of site is managed by an homogeneous network of Plone editors that follows common guidelines. We have currently 4 networks of editors: Teaching, Department, Academics and Administrative, totaling 848 people. Each network, in particular the Administrative and the Teaching one, is specifically trained, with short courses and seminars, in order to provide common web writing and technical background.

As a general consideration, Plone has demonstrated to be a really easy to use CMS, that made really possible to delegate the management of Portal information to offices and in general to anybody producing the information.

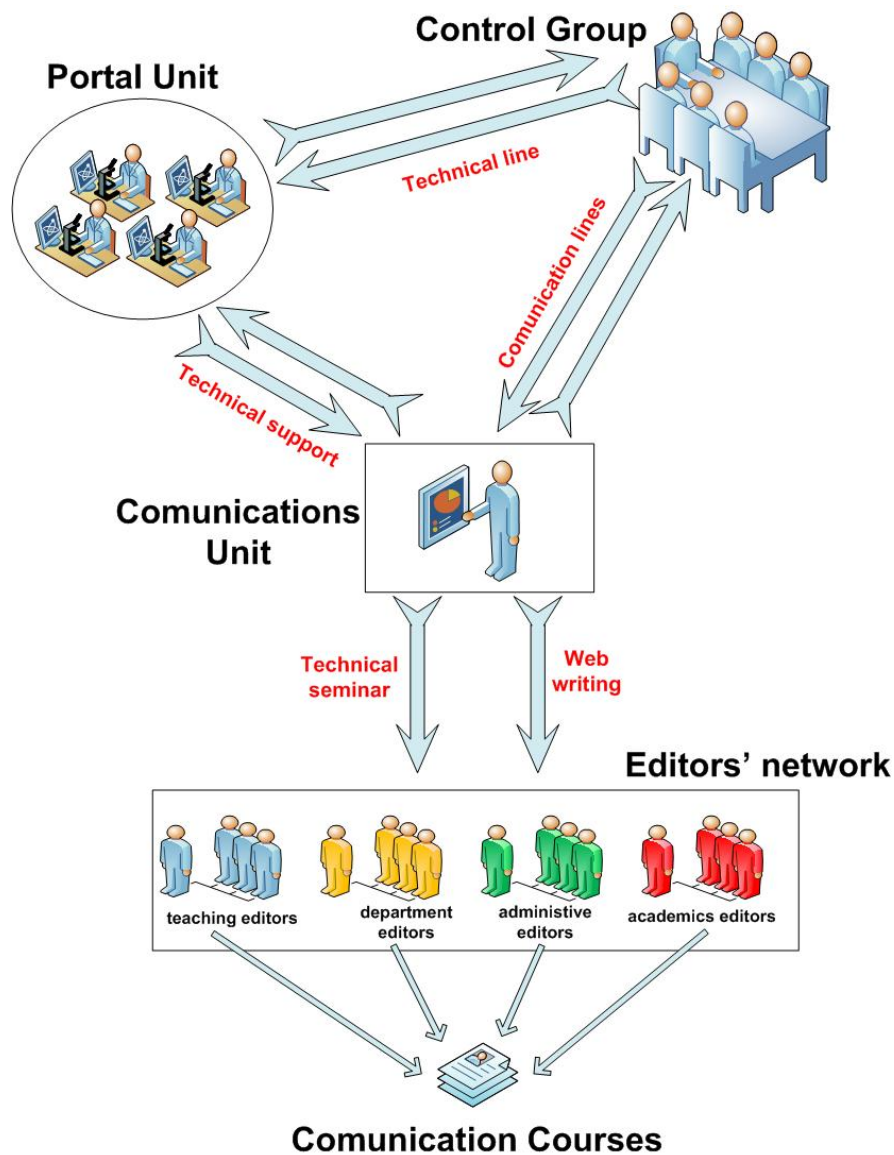


Figure 2. The Plone impact on Unife organization

## 5. The Unife Portal Architecture

The portal is built on top of Zope/Plone and has rapidly grown to reach about 200 sites and 9.000 pages. Figure 3 shows the portal architecture and its main components. In particular, let us notice the databases (both oracle and mysql), the VoIP interfaces integrated with Asterisk PBX, the CovaChilli/ChilliSpot captive portal, the XT radius authentication, the openLDAP user authentication, and some of the Web application (mainly in RoR and python).

With regard to Asterisk integration, let us note that all the voip services are integrated in Plone by means of Web Services. In more detail, there is a Web Service that wraps Asterisk and provides several methods, for example:

- click2dial, for initiating a call by clicking on the numbers displayed on a Web page;
- conference call, to permit user to use a simple web form to initiate a conference call;
- voice mail, for receiving voice messages in the user mailbox.

With regard to application integration, the Plone/Zope architecture has permitted Unife to interoperate and to integrate with several applications, both internal developed and externally provided:

- we developed several applications in different languages (mainly Ruby, but also PHP and Python) that are visualized inside the Plone templating;
- we developed also some distributed applications that are accessed via Plone and mashup data from different sources via Web Services (both RPC/encoded and RPC/literal);
- we integrated with some Google Apps services, such as mail and calendar, in order to provide a Web Desktop mashup and several other services.

Let us notice that all Unife services are based on a single sign-on authentication service. When using Web Services, the portal supports different authentication technology, e.g., SOAPHeader, certificates, public/private keys (cert\_file, key\_file), etc.

Finally, the Zope/Plone platform has several plugins that has permitted to activate multilingual support, to integrate with the University LDAP service, to exploit several communication tools (RSS, BLOG, FORUM, etc).

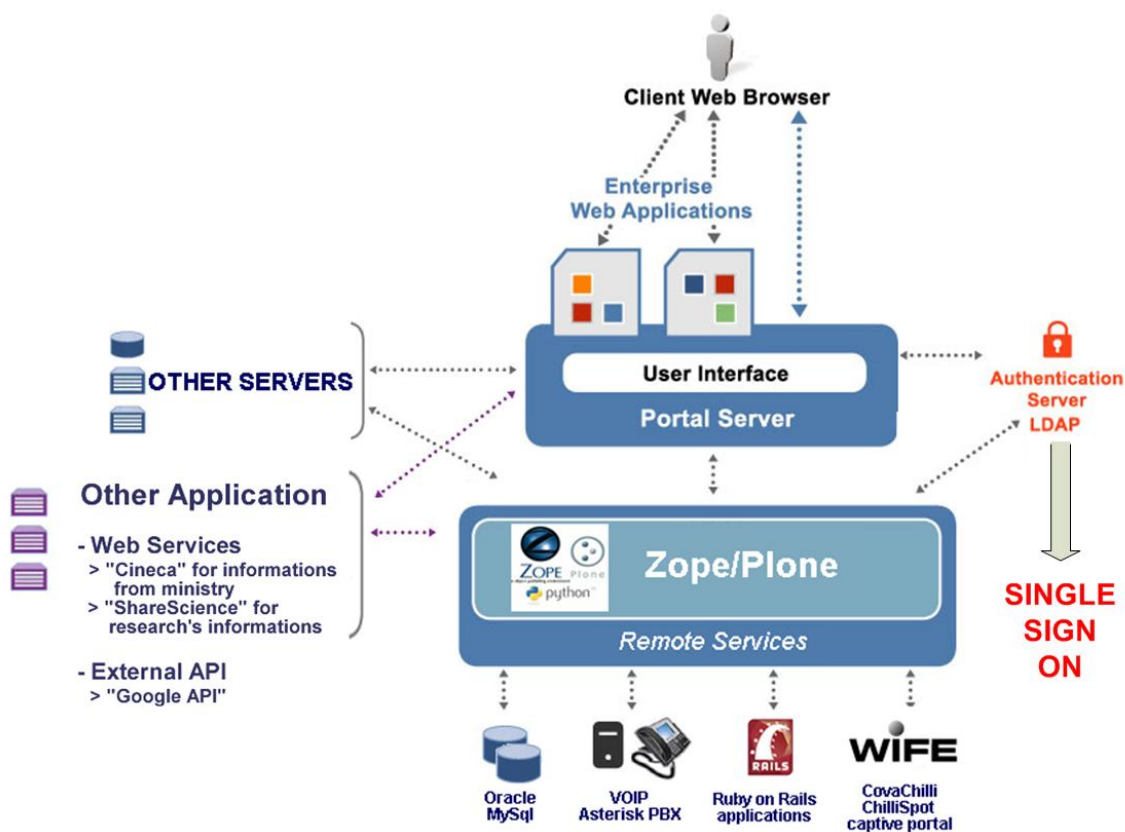


Figure 3. The Architecture of the Unife Portal

## Conclusions

The adoption of Zope/Plone at the University of Ferrara has permitted to dramatically improve the process of information publishing on the Web. The possibility to share information with a very active and collaborative Plone community has added value to the software choice and the University of Ferrara is planning to further contribute to this community, by sharing its experience with other italian universities and users.