

Developing Online Learning Portals in Low Bandwidth Communities

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INTRODUCTION

University portals are emerging all over the world. Portals have been perceived by many people as the technologies that are designed to enhance work and learning processes at university by making workflows simpler and information more readily available in a form in which it can be processed (Franklin, 2004). There are many benefits for having a portal in a university. First, the portal makes it easy for people to find university information targeted specifically at them. Instead of the user searching the Web for information, a person identifies himself or herself to the portal, and the portal brings all relevant information to that person. Secondly, the portal uses a single consistent Web-based front end to present information from a variety of back-end data sources. Although information about people is stored in many different databases at a university, the role of a portal is to put a consistent *face* to this information so that visitors do not have to deal with dozens of different Web interfaces to get their information. Usability is an important issue when designing the university portal. Principles from human computer interaction must be included in the design of portals. However, there are also other issues that must be considered when designing portals with low bandwidth for universities in countries such as Africa. This concerns accessibility by students to the Web portals using limited bandwidth. Students in these countries have only limited bandwidth to access the portals. The development of portals for universities in these countries must take this factor into account. This article describes the development and use of the portal for an online learning environment (OLE) at a [large distance-education institution](#) in Africa for [students](#) with limited bandwidth. We first present a brief overview of portal, its benefits, and what it is used for in universities. The next section describes the requirements and objectives of the portals for our university. This is followed by our conceptual framework, which we have developed for the implementation of our OLE portal. The article then argues for the importance of customized development for implementing OLE portal for universities that have special needs.

WHY PORTALS?

Organizations need to provide timely, relevant information to customers, employees, and partners anywhere in the world, to meet today's business requirements. It is important that information does not get lost or become irrelevant and outdated. A good solution is to create and deliver highly relevant content on a portal.

Portals can be used to improve document management, communication and collaboration, information access and sharing, and assessment and reporting in education. They can be personalised for different types of users, such as student, teacher, parents, government agencies, and administrators. Relevant and pertinent information and services can be made available to users to enable them to be more effective and efficient in their learning tasks.

A portal is a gateway to the Web that allows organised information to the users through a single entry point. A good portal knows the individual using it and it changes with the individual. It acts as an individual's personal assistant, ready to act on his or her behalf. According to Daigle and Cuocco (2002, p.10), there are three main types of portals:

- **Vertical Portals:** Provide access to a variety of information and services about a particular area of interest.
- **Horizontal Portals:** Are often referred to as megaportals. These portals target the entire Internet community, for example, Yahoo.com or Lycos.com are megaportals. These sites often contain search engines.
- **University or Enterprise Portals:** Can be either vertical—focusing on a specific application such as accounting or financial aid information, or horizontal—offering access to almost all the information that an individual within the university needs to carry out his or her function.

EDUCATIONAL PORTALS

Portals have become one of the most visible information technology (IT) issues in the commercial sectors as well

as in higher education. Portals offer a number of channels including reports and documents needed for class assignments, calendars, administrative information such as grades and degree audits, campus news and events, reference materials, and so forth.

Portals offer the following benefits to students:

- Increased and easier communication with faculty members
- Online access to courses
- Access to communities of interest within university, such as clubs, sports, and community service opportunities
- Access to latest university news
- Increased lifelong learning opportunities

Other benefits for staff members include:

- Instant access to information for advising students
- Simplified course management tools
- Real-time communication with students

When designed properly, a portal can improve the activities required to facilitate, manage, and assess learning. A portal can help teachers and students to discover new learning content and to express ideas in more innovative ways. It can streamline workflow and automate manual tasks. Fundamental portal capabilities include content aggregation, application integration, user authentication, personalisation, search, collaboration, Web content management, workflow and analysis, and reporting (Connect, 2004).

Typically, university portals can be grouped into institutional portals and subject-based portals (Franklin, 2004). The institutional portal provides its users with a wide range of services, integrating these through a common interface regardless of whether particular services are provided by the institution or not. An institutional portal contains information about the user, enabling it to customise itself and be customised to the individual's interests and responsibilities. A subject-based portal brings together a variety of information sources and tools about a common theme, but is unlikely to have much information about the user.

WHY ARE UNIVERSITIES IMPLEMENTING PORTALS?

Englert (2003) gives the following reasons to why universities are implementing portals. These are to:

- Integrate/streamline information and services.
- Improve service to students/staff.
- Offer personalised/customised/targeted service.

- Improve administration efficiency.
- Attract students.
- Enhance university image/raise profile.
- Engage/connect/build community.
- Offer distance/flexible learning.

DIFFERENT METHODS OF DEVELOPING PORTALS IN UNIVERSITIES

University portals can be developed in several ways. Each has its own advantages and disadvantages. The most straightforward option is to work with one of the university's existing suppliers that has a portal offering. Another option is to acquire a portal from a specialist vendor. A third option is to develop the portal in-house. The main benefit of this approach is the complete control it offers. Universities that plan to develop their portals in-house now have the opportunity to base their development on open-source products. This helps to speed up development time and reduce the cost.

In this article, we describe a case study of a university where the students are geographically distributed throughout the country. These students are taking distance-learning courses in different subjects. Broadband services in this area are very expensive for the home user, with less than 10% of the total Internet population having access to DSL services. The average student therefore makes use of a 56K connection. The design of an online learning environment (OLE) portal must take this into consideration. This was also our main reason for developing our OLE portal in-house, in order to customise the portal to our special requirements. Also, while an official student portal system is in place at this particular university, it simply did not cater to our faculty needs

A FRAMEWORK FOR THE DESIGN OF A LOW BANDWIDTH PORTAL

Components of an OLE portal

There are three main components to portals, as shown in Figure 1. These are administration, content, and technology components.

The administration component supports students in their academic pursuits and teachers in their teaching. It:

- manages noninstructional content (e.g., due dates, course/module information, notice boards, forums, etc.);
- manages the learning object repository (LOR), which contains the distinct learning objects used to construct course modules;

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