

Implementing Portals in Higher Education

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PORTALS IN HIGHER EDUCATION

Because of the increasing use of digital information within educational organizations, users encounter problems with finding and selecting the right information. Therefore, the request for personalized information becomes an important issue. Portals are seen as a solution because they can combine various information channels in a personalized way. This was also the conclusion of recent research in which several portals were compared with each other (Keller, 2004) to identify why portals are necessary.

- Management of content (Web-based content, documents and administrative dates, authorisations, versions, fields, and workflow)
- Uniform access (identification, authentication, single sign on)
- Integration of applications: e-mail, electronic learning environments, SIS, CRM, ERP, LDAP, application integration, and data integration)
- Collaboration (e-mail, communities, forums, chat, shared folders, video/audio, metadata, taxonomies, classification of material)

Several definitions (Strijker & Koopal, 2005) of portals are given in the literature, and most of the definitions include the use of different resources, personalized information, and the use of a single interface. A definition that covers various aspects and that is used in this article is the following:

A portal is a system that integrates various applications and retrieves information from different resources to end users through a personalized interface. (Keller, 2004)

The use of Portals in education relates to different closely related aspects such as educational, organizational, and technical procedures. This article describes the current status of the educational implementation of Portals in higher education in the Netherlands in relation to these educational, organizational, and technical aspects.

EDUCATIONAL ASPECTS

Educational aspects relate to activities that take place so that desired learning activities can occur. Terlouw (1997) described these as educational functions:

- Preparatory instructional functions (motivating, connecting with prerequisite knowledge, explaining the instructional goals, giving learning tasks)
- Executive instructional functions (orientation on knowledge, exercising, understanding, integrating and applying knowledge)
- Regulative instructional functions (giving guidance, feedback, testing, and control)
- Constraining instructional functions (facilities)

The formulation of educational functions becomes more detailed as a certain type of educational approach is specifically chosen within an institution. Within one institution, several education approaches will be used (Fisser, 2005). Therefore, the facilities that are necessary within a Portal should be general of nature and adaptable for each program or project. Table 1 gives an overview of examples for the application of technology in education.

Within the current database-oriented course management systems (CMSs), such as Blackboard, WebCT, and Teletop, the major educational functionalities are available that support instructors with activities such as:

- general course organization including a grade book, student mentoring, absence, and planning-related activities for a course;
- lectures and other instructor-led sessions;
- self-study including lectures, activities, tasks, and (may be) practical exercises;
- assignments (such as thesis, report, product, research) that can be done individually or in groups;
- assessment as self-assessment, or to be partly an instrument for grading;
- communication, to support the different functionalities for group work and collaboration; and

Table 1. Types of technology applications related to categories of course support in higher education (Collis, 1999)

Major Educational Use	Examples of Technology Applications
1. Publication, information dissemination	Word processing; HTML editors; WWW sites and browsers to access them, WWW sites associated with database environments; software to facilitate file transfer and document attachments to e-mail; tools for cross-application format retention (i.e., pdf).
2. Communication	E-mail systems, computer-conferencing tools, including WWW boards and other forms of WWW-based conferencing; WWW sites offering communication options for the direct sending of e-mail and forms for structured communication; software for Internet telephony; software environments for audio-video desktop conferencing, for voice-e-mail, for creating video attachments for e-mail; software systems for text-based chat.
3. Collaboration	Groupware, which includes application-sharing software, shared workspaces, WWW-based shared workspaces, WWW-based application sharing, workflow tools; WWW sites designed for collaboration support; tools to allow collaborative writing on documents that are then commonly available to a group.
4. Information & resource handling	CD-ROMs with resource collections, which may or may not be linked with a WWW site; WWW -based search engines; distributed database systems (WWW- and proprietary); WWW sites designed for information organisation, access and sometimes creation; tools to retrieve and display distributed multimedia resources stored as digitised audio and video (including streaming audio and video).
5. Specific for teaching and learning purposes	Stand-alone software for tutorials, simulations, electronic workbenches, demonstrations of processes, collections of resources; interactive software (such as tutorials, quizzes, simulations) stand-alone or accessible via WWW sites; computer-based testing systems; video-capture tools for lecture or presentation capture; video-conferencing (point-to-point and multicasting) for lecture participation; WWW-based pages or environments
6. For course integration	WWW-based course-support (or management) systems.

- management of resources, such as articles, presentations, background information.

The current CMSs can also be considered as a form of content management systems, in which courses define the structure and organization of the content (Strijker & Collis, 2005). The current CMSs are also database-driven and provide already personalized information about the educational process to the users (Strijker, 2004). Instructors only can see, edit, and maintain courses that they are responsible for, and can assess students that are enrolled in that course. Students have access to courses that they are enrolled in, and have access to functionalities such as grade books, course information, and assignments. Personalization of these electronic learning environments has been applied for some time now, because managing the environment became too complicated for both teachers and students. By transferring the content management of the electronic learning environment to portals with a content management system; it is thus possible to support the organization and the structure of the course in an improved manner

ORGANIZATIONAL ASPECTS

Organizational aspects are related to logistics, such as planning of rooms, enrolment, registration of grades, but are also related to personal administration, regulations for scholarships, and management. Within Dutch higher education, a

large set of these processes are already automated because the large scale of the organizations require solutions to manage these resources. For example, the University of Twente (2005) has a large number of applications in use: applications are related to research (3 systems), education (10 systems), staff (10 systems), and finances (10 systems). The systems differ in functionality. Each of these systems have a specific target group, management aspect, and an interface to store and retrieve information. Within the University of Twente, for a number of applications, an attempt has been made to combine them into a portal. The example of the University of Twente with the different systems is not unique. The need of institutions to get insight in several processes and systems has resulted into a gradual increase of tailor-made applications.

Because of the large scale on which a portal has to be implemented, the implementation cannot be initiated by students or employees. The decision on the allocation of different sources and systems that are needed can only be made at policy level. These decisions are not only related to financial issues, but also to choosing a specific strategy for the implementation, and to the exchange information about the implementation of the portal.

TECHNICAL ASPECTS

It is possible to use various data applications, and also the technical interoperability possibilities of systems has

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