

***duo* – Durham University Online: implementing the Blackboard™ Community Portal**



A JISC-funded case study of portal implementation in Further and Higher Education: institution-wide portal (category Bii)



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Executive Summary

This case-study looks at how the University of Durham has implemented Blackboard's Community Portal. By releasing this product, Blackboard Inc (an established vendor of virtual learning environments) have signalled that they see themselves as a player in the embryonic portal providers market, where they must compete with a range of commercial, open-source and bespoke systems.

For existing Blackboard customers, adopting the Community Portal should be a relatively easy process - the product extends the existing user interface. This means that staff and students don't need to find a new web address, or learn a new product. The tight integration with Blackboard's VLE allows the portal to exploit existing course and user data.

It offers tailored views based on a combination of institutionally-defined portal roles and individual user's preferences. Graphical tools are provided for quickly developing standard portal applications – HTML forms, RSS news channel feeds, opinion polls, etc. Further more powerful, fully integrated tools can be developed by harnessing the underlying Java code and tag libraries – both freely available to developers.

The product has all the advantages and disadvantages of a commercial product from a large vendor. The company is relatively long-lived in the rapidly changing IT world and its sole focus is online education. It adds to a well-established product which has an active user-community and a large pool of experienced staff to draw upon. Third-party support and add-ins are readily available for many associated systems and content-providers. There is a large regionally-based support network and the company is working to ensure compliance with the relevant standards and legislation (e.g. accessibility). Yet it is because of its size that we lose some of the flexibility of bespoke systems, and must endure a slightly longer path to implement change. Although Europe is a rapidly growing market, the bulk of the sales are still in the USA and this North American bias is evident in some of the terminology used in the portal tools and documentation.

The Blackboard Community Portal is examined here to see if it meets three criteria: does it allow a strong degree of personalisation, could it act as the primary point of access, and thirdly can it support the range of activities expected in a modern University?

Personalization is achieved through institutional rules – selecting or restricting content based on the user's portal role, whilst at the same time allowing users choice in the content displayed and providing options to save individual preferences and data between sessions.

It offers a range of features for learning and teaching through its *course* model and similar tools to support the work of societies, colleges, sports clubs, administration and departments through its *organisations*. Custom portal modules can be added to deliver tailored information to the user, meaning that it could provide the *first* point of contact for users with the University. The product is still evolving and some key features – notably email integration, and calendar tools are weak, which means that in its present form it is unlikely to be the *only* point of contact used by staff and students. Other functions required of a portal: searching and content management are only just being added.

In its present form the portal product has met many of the needs of users at Durham. Whilst recognising its weaknesses it has expanded the way staff and students communicate amongst themselves and with each other. As such I feel it is a product worthy of consideration.

Glossary of Terms

Active Directory	Directory services are a store of information about network-based entities, such as applications, files, printers or people. Active Directory is a directory service produced by Microsoft. It is used in Durham to store information about the user – such as usernames and passwords, for all networked computing services. When users log on, their username and password are validated by checking their entry in Active Directory. http://www.microsoft.com/windowsserver2003/techinfo/overview/activedirectory.msp
ALERT	A HEFCE funded project looking at the accessibility of Blackboard courses in Durham – ‘Accessibility in Learning Environments and Related Technologies’ http://www.dur.ac.uk/alert
announcements	A message displayed on the opening page of a course in Blackboard seen by all staff and students on the course. These can only be added by staff (Instructors).
API	application programming interface – typically a description of all the commands (objects and methods) available to the programmer to help them write code. The Java API is available on the web http://java.sun.com/j2se/1.4.1/docs/api/
authentication	Logging into a system – determining the identity and access rights of a user – typically by requiring them to type in a username and password.
Building Blocks	Code (JSP) which can be loaded onto the server running Blackboard to provide additional functionality. Building Blocks are available directly from Blackboard, from third-party developers, or can be developed in-house.
client	A computer system or process (such as a web browser) that requests a service (information) from another computer system or process (the server).
college	Durham is a collegiate University. All students apply to join a college as well as a Department. Colleges provide pastoral support through tutorials, a focus for sporting and social activities and accommodation.
course	A unit of teaching – students and staff are enrolled on one or more courses. In Blackboard the course is the primary environment for learning and teaching. Equivalent to the terms “option” and “module” in UK educational parlance.
DSU	Durham Students’ Union – a democratic body elected by students of the University to represent their views at a local and national level. Typically they also provide a range of social and welfare functions. All students at the University are automatically members of the Students’ Union.
DUND	Durham Unix Names Directory – a local copy of student and staff information held in the University, updated nightly.
external web pages (internet)	Web pages accessible to everybody over the internet (e.g. Google). In the University context, public information about Departments, Colleges, Research, Admissions, etc. are often placed on external web pages, e.g. http://www.dur.ac.uk
GUI	Graphical User Interface – a method of communicating with a computer using a mouse, keyboard etc. where many of the actions are facilitated by clicking on graphics which look like buttons, menus, etc. rather than typing commands directly at a prompt. Microsoft Windows is an example of a GUI.

HEFCE	The Higher Education Funding Council for England – a Government Body which distributes public money for teaching and research to universities and colleges. The Council also plays a key role in ensuring accountability and promoting good practice. http://www.hefce.ac.uk
HTML	Hyper Text Mark-up Language – a language used to describe web pages, which uses markers (tags) such as to indicate that the words in between should be displayed in a web browser in bold type.
IMP	IMP is an Internet Messaging Program written in PHP which provides webmail access to IMAP and POP3 accounts, provided under an OpenSource agreement. It is used in Durham to allow staff and students to check their email off-site. http://www.horde.org/imp/
IMS	Quoting from their website “IMS is a worldwide non-profit organization that includes more than 50 Contributing Members and affiliates. These members come from every sector of the global e-learning community. They include hardware and software vendors [including Blackboard], educational institutions, publishers, government agencies, systems integrators, multimedia content providers, and other consortia. The IMS Global Learning Consortium develops and promotes the adoption of open technical specifications for interoperable learning technology. Several IMS specifications have become worldwide de facto standards for delivering learning products and services”. http://www.imsglobal.org/
instructors	One of the course roles in Blackboard. Users with the role of Instructor can add and delete content, set assessments, view the students’ marks, etc. This role is usually assigned to staff teaching on a course.
integration	Linking systems together, sharing data. The classic example is connecting the VLE to the student record system, so that students are added and removed from courses in Blackboard according to the entries in the student record system database. This avoids duplication of data sources and minimises errors.
internal web pages (intranet)	Web pages which are only available to a restricted set of users – typically either those who are physically connected to a local computer network (e.g. any machine on the University of Durham network) or who can authenticate by providing a valid username and password. These are often used to store sensitive local information – e.g. staff telephone numbers which would not be suitable for general release.
ITS	The University of Durham’s Information Technology Service – their remit is to “provide high quality services which facilitate the use of computing and information technology for all academic activities in the University of Durham”.
Java	A programming language developed by Sun Microsystems. It runs on several different platforms (different types of computer e.g. Unix, Linux, Windows, Mac). It allows the developer to build programs which can run within a web browser and so develop server-side applications for online forums, stores, polls, processing HTML etc. http://java.sun.com/
JSP	Java Server Pages – pages of Java code (programs) that are stored on the server and when executed generate their results in HTML format for display in a web browser.
JVM	The Java Virtual Machine is an abstract computing machine. It has an instruction set and uses various memory areas, just like a normal computer, however, the JVM does not assume any particular implementation

	technology or host platform. It can understand (execute) compiled Java code – classes. Many web-browsers include a JVM to extend their functionality.
Java archive (.jar).	A collection of files compressed into a single archive (like a zip file) designed for upload onto a web server. The archive includes specific information about how the files should be deployed on the server, stored in a file known as the manifest. Files are stored in a series of standard sub-directories within the archive. This is the most common file format for distributing Java applications.
JISC	According to their website: <i>“The Joint Information Systems Committee (JISC) supports further and higher education by providing strategic guidance, advice and opportunities to use Information and Communications Technology (ICT) to support teaching, learning, research and administration. JISC is funded by all the UK post-16 and higher education funding councils.”</i> http://www.jisc.ac.uk
Junior Common Room	All undergraduate students are members of the Junior Common Room (JCR) of their college, which is the focus for undergraduate social life in College. Many JCRs have websites, newsgroups and notice boards which they use to publicise events.
LDAP	Lightweight Directory Access Protocol, is a coded language that programs can use to look up contact information from a server, such as a user’s email address. In Durham we use LDAP to query Active Directory.
LTT	Learning Technologies Team – part of the IT Service at Durham, the LTT aims to encourage, support and develop e-Learning throughout the University.
Microsoft .NET	Microsoft .NET is software written by Microsoft for connecting information: people, systems, and devices. It consists of four parts: The .NET Framework which can be used for building and running Web-based applications, developer tools, servers, and client software, (such as Windows). Soon developers will be able to use the .NET Framework as an alternative to Java for developing Building Blocks. http://msdn.microsoft.com/netframework/
migrate	A term used by Blackboard to describe the movement of data from one system to another – typically when upgrading from an older version of Blackboard to a newer one. This method of updating software via migration is being phased out in favour of a series of upgrades which can be applied <i>in situ</i> to an existing running configuration.
MLE	A managed learning environment – typically used when referring to the whole range of information systems and processes of an institution (including its VLE) that contribute to learning and the management of that learning. An MLE implies greater integration of the VLE with other resources. http://www.jisc.ac.uk/index.cfm?name=mle_overview
module	Can be used in two senses – in UK academic parlance, a student’s study is split into discrete modules (more often referred to as “courses” in the USA). Modules can also be used in the context of the portal – portal modules are single tools which are displayed on the portal page – e.g. a list of current courses, an RSS feed from a club the user is a member of, etc.
multithreading	Threading is a way of splitting up a complex processing task into smaller parts – the threads. Often different parts of the program (the threads) can be run at the same time (e.g. writing some data to disk, whilst asking the user for the next bit) – multithreading, which improves performance. Java supports multithreading.

OPAC	Online Public Access Catalogue – used by many libraries to allow users to search their collections electronically. Durham University Library has an OPAC http://library.dur.ac.uk/
organizations	Only available within the Community Portal version of Blackboard, Organizations are structured and managed in the same way as Courses. While they function the same way, they have been designed for different purposes. According to the Blackboard manual “ <i>Organizations should hold content and tools for institutional communities outside the scope of academic learning or training. Clubs, sports teams, and service organizations are all examples of communities that benefit from their own Organization</i> ”. In truth, many institutions use Organizations and Courses interchangeably.
portal	Definition of the term portal is discussed in Section 1.1
protocol	A set of formal rules which describe how to transmit data, typically across a network.
roles	Every user is assigned four types of roles in the Blackboard Community Portal. A <i>System Role</i> , a number of <i>Course and Organizational Roles</i> (one for each) and a <i>Portal Role</i> . The System Role determines their access to the underlying settings (typically none). Their Course or Organization Role determines their degree of access to content and user data within a given course/organization – e.g. a student, instructor, guest. Users are also assigned a single Portal Role, which determines which tabs and portal modules they can see and the degree of interaction (administration) available.
RSS	RSS (Rich Site Summary) is a format for syndicating news and similar content as XML for display in other locations (e.g. within a VLE). Many organisations now supply data in RSS format (such as the BBC, New Scientist, etc.). Data supplied from an RSS feed is automatically updated.
scalability	Scalability is a major concern in programming – it is generally considered to be the ability of a particular feature to perform rapidly even when there are a large number of requests running at once. Thus a scalable portal should run at an acceptable speed whether there are 15 or 15,000 users logged in. Scalability can also apply to the maintainability of code, fault tolerance, and the availability of programming staff.
SCT Banner	The University of Durham uses the SCT Banner system to store and manage its student records. http://www.sct.com/Education/Products/Banner/
SDK	Software Development Kit – a package of tools, documentation, libraries, examples, etc. used by a programmer to develop working code.
SENDA	The Special Educational Needs and Disability Act 2001 (SENDA) established legal rights for disabled students in pre- and post-16 education in the UK. http://www.ukcle.ac.uk/directions/issue4/send.html
server	A computer, often centrally located, which provides some service for other computers connected to it via a network. A common example is a file server which has a local disk and services requests from remote clients to read and write files on that disk.
SMTP	Simple Mail Transfer Protocol - used to transfer email between computers, usually over internet. It is a server to server protocol, and usually occurs in the background.

snapshot	A copy of data at a particular point in time. In Blackboard there is a snapshot tool used to keep data synchronised with external sources (such as a student information system). It is used in Durham to transfer data from SCT Banner, via DUND into Blackboard.
SSL	Secure Sockets Layer - a protocol (designed by Netscape) to provide encrypted communications over the Internet. SSL is often used to hide confidential data e.g. a user's password or credit card details.
SSO	Single Sign On - the ability to access a range of authenticated services (e.g. email, portal, Athens resources) without having to authenticate anew each time, because this data is stored temporarily on the server, or the service accepts the existing authentication.
System Administrator	A user with special privileges allowing them to configure security settings, manage user names and passwords, monitor disk space and other resource use, perform backups, etc.
tabs	The Blackboard interface separates content using tabbed pages (similar to worksheets in Excel/Lotus 123). When you first log in, you see the <i>My Institution</i> tab, where portal content is displayed. There are separate tabs for Courses, Organisations, etc. It is possible to add and delete tabs, and restrict access to tabs according to the user's portal role.
tools	Blackboard courses give users access to the Tools panel. This contains links to other functions – e.g. email, editing your personal information, etc. It is possible to design and add your own tools, as well as those supplied by third party developers.
URL	Universal Resource Locator – the address of a web page e.g. http://www.dur.ac.uk
VLE	A virtual learning environment – as defined by JISC “ <i>an electronic system that can provide online interactions of various kinds that can take place between learners and tutors, including online learning</i> ”. http://www.jisc.ac.uk/index.cfm?name=issue_vle_mle
WAR	A web archive file. Similar to a Java archive (.JAR file) WAR files support a more complex architecture, allowing them to contain many other file types stored in XML format. Building Blocks can be saved in WAR format.
XML	eXtensible Mark-up Language - a simple text markup language (like HTML) designed specifically for the interchange of structured data. http://www.w3.org/XML/
zip-file (.zip)	A method of compacting data into an archive file which is smaller in size, making it easier to transfer from one location to another. It derives its name from the PKZIP algorithm used to compress the data. Zipping is a loss-less process, when the user unzips the archive, the files within are identical to the originals.

I Introduction

This JISC-funded case study looks at the University of Durham's *implementation* of the Blackboard™ Community Portal product in the period 2002-2003. This was largely carried out by staff from the University's Learning Technologies Team (LTT), part of the Information Technology Service. It considers technical and political aspects of the implementation and highlights strengths and weaknesses in the current portal product. The remainder of this section provides some context for the reader: it defines the term portal, outlines the nature and structure of the University of Durham and offers an insight into the portal assessment process.

1.1 Portals – a definition

In keeping with the terms of reference, this study adopts the definition of the term portal available from the JISC Portals FAQ site (http://www.jisc.ac.uk/index.cfm?name=ie_portalsfaq):

Technically, a portal is a network service that brings together content from diverse distributed resources using technologies such as cross searching, harvesting, and alerting, and collate this into an amalgamated form for presentation to the user. This presentation is usually via a web browser, though other means are also possible. For users, a portal is a, possibly personalised, common point of access where searching can be carried out across one or more than one resource and the amalgamated results viewed. Information may also be presented via other means, for example, alerting services and conference listings or links to e-prints and learning materials.

The JISC Portals FAQ recognises that there are several different types of portal. It further defines an institutional portal (the subject of this case-study) as follows:

An institutional portal provides a personalised, single point of access to the online resources that support members of an institution in all aspects of their learning, teaching, research and other activities. The resources may be internal or external and include local and remote 'information resources' (books, journals, databases, Web-sites, learning objects, images, student information systems etc.), 'transaction-based services' (room bookings, finance, registration, assignment submission, assessment, etc.) and 'collaborative tools' (calendars, email, chat, etc.). Access to many of these resources is usually restricted to authenticated members of the institution. In some cases the institutional portal may provide a view of institutional resources to end-users outside the institution, for example alumni and prospective students.

This definition is adopted here. In this study stress is placed on three of these points. A successful portal should allow a strong degree of personalisation, act as the primary point of access and support the full range of activities in a modern University. As such, we seek to create a “thick” portal, which serves tailored material from a range of sources (not necessarily all on the web), rather than a “thin” portal, a simple local directory of online resources.

1.2 The University

The University of Durham is a traditional UK higher educational institution, with a body of around 14,000 students, predominantly within the 18-21 age group. 6.5% of the 2002-3 intake were classified as mature students¹. The University began in the historic cathedral city of Durham, expanding in 1992 to a second, purpose-built site 23 miles away at Stockton-on-Tees. Learning is predominantly campus-based although some programmes (e.g. modern languages) include a year spent studying abroad. The School of Education also offers Masters and Doctoral level courses in Hong Kong and Singapore. The Stockton campus contains a higher proportion of local students than Durham, many of whom remain at home whilst studying. The University is a collegiate body, 16 Colleges and Societies provide pastoral support and the social and residential focus for students.

1.3 Learning Technologies Team

In 1999 Durham established a Learning Technologies Team within the IT Service to facilitate and support communication and information technologies across the University. Its first priority was to select and implement a virtual learning environment. Participation in the TLTP3-86 pilot project 'Facilitated Network Learning in Medicine and Health Sciences'² gave LTT staff hands-on experience of virtual learning environments. In 2000 after extensive evaluation, the University chose a commercial VLE – Blackboard – primarily because of its ease of use. Initially this was purchased at the 'basic' level which supported learning and teaching through a

¹ Admission statistics were supplied by the University of Durham Public Relations Office

² This was lead by the University of Newcastle-upon-Tyne. More information can be found at: http://nle.ncl.ac.uk/nle/resources/TLTP3-86_flyer

course model. In 2002 the University decided to upgrade to the full 'learning system' version (giving access to the underlying Java API) and the Community Portal (version 5.5.1). It recently (July 2003) migrated its Blackboard production server to version 6.0 of the software which contains considerable enhancements to the portal's functionality. This report examines the implementation of the commercial product Blackboard Community Portal as an institution-wide student portal.

1.4 Choice of Portal

The University began actively considering portal solutions in 2002. The long term aim is to integrate services currently delivered via its intranet, external website and the VLE (Blackboard). The ITS management want the integrated portal to be

'the standard entry point to all information. As such, the institutional portal must be the singularly most visible point to staff, students and external visitors' [comment in interview]

The management of information across the University forms part of the Durham's *Strategic Improvement Programme* which will be implemented over the period 2003-2007. In this interim phase, portal projects are largely driven by senior management within the IT Service, a definitive University Policy on portals has yet to be written. ITS staff invited presentations from commercial vendors to seek a solution that would closely align to institutional needs. A requirement was also to ensure integration with existing applications such as email and corporate diary which is used locally within the ITS to manage rooms and facilities such as laptops and portable projectors. Test servers have been established since mid 2003 to evaluate these products, coinciding with the granting of a request from LTT to purchase the latest release of Blackboard. These pilot evaluations are designed to inform the University's IT Strategy Committee in order that a strategic decision is made for seeking financial investment in the appropriate technology.

At the time of these early trials, LTT staff were looking to upgrade the VLE. The move to version 6 of Blackboard was driven primarily by a desire to better accommodate the needs of Durham's Colleges, sports clubs and societies, through Blackboard's *Community* pages, improvements to the Java API and the increased ability to customise the user interface in version 6. Somewhat surprisingly in hindsight, the significant improvements to the functionality of the portal were *not* seen as a prime consideration in its purchase. The new version of Blackboard was installed on a separate test server to plan the migration of course materials. It was during this testing and the development of bespoke portal modules that we began to realise the potential of the product to act as our institutional portal.

At the time of writing, duo has developed as the *de facto* student portal, largely because it is available now and meets many of the needs of the user community. The question of whether to use it or a rival product for the staff portal, or indeed as a final overarching institutional portal will ultimately be addressed through other ongoing projects. The remainder of this report to the JISC confines itself to a discussion of the Blackboard Community Portal product.

1.5 Blackboard

Blackboard Inc. is an established provider of learning environments. The company came into being in 1998 from the meeting of staff from two projects - the 1997 EDUCAUSE IMS standards group for online education technology and a student-faculty team at Cornell University in the USA, which was developing a scalable online education product. Today in its publicity materials it claims to provide 'the industry's most popular teaching and learning environment [which] features a robust setting for content management and sharing, online assessments, student tracking, assignment and portfolio management, and virtual collaboration'. Assessed by market share, Blackboard and WebCT are the two leading players in VLEs. There are over 2380 Blackboard clients worldwide³, of which over 150 are UK higher and further educational institutions. Blackboard offers a range of products, starting with a basic system designed to support teaching using a course-based, instructor-led model. This is expandable by purchasing other options: the Enterprise Learning System, the Community Portal, a Transaction System and a new, Content System. By October 2003 only 350 clients had adopted the Community Portal System worldwide. Further details of all these products are available from the Blackboard website:

<http://www.blackboard.com/worldwide/gb/en/index.htm>

The University of Durham was one of the first Blackboard clients in the UK and is an early adopter of the Community Portal – a fact which has been recognised when Blackboard selected the institution as a portal

³ Blackboard European Users Conference Keynote Presentation - Matthew Pittinsky. Blackboard European Users Conference October 20th 2003. Amsterdam, the Netherlands.

case-study⁴. It is hoped that this experience, outlined below, should prove useful to other UK academic institutions considering adopting a commercial portal solution, such as that offered by Blackboard.

2 Methodology

This case study is based both on the author's personal experience – as a member of the team charged with implementing the Community Portal product - and semi-structured interviews carried out with identified stakeholders. The concept of a stakeholder is well-established in social science research and has been successfully applied to the concept of institutional portals, e.g. the work of Liz Pearce in the PORTAL project⁵. Stakeholders were chosen to represent the many facets of life at the University of Durham: students (representatives of the students union, sports clubs and societies), academic staff (lecturers from several Departments from both campuses), academic-related, and support staff (librarians, IT staff, college tutors) and management (assistant registrars and senior management in the IT Service). For reasons of confidentiality, individuals are not identified.

The report which follows, although based upon a wide range of information is ultimately the opinion of the author. Any views or opinions presented in this report are solely those of the author and do not necessarily represent those of the University of Durham.

3 Implementation

During the time period associated with this case study we used two versions of the software: – the Community Portal available with Blackboard version 5.5 and the new release – the Community Portal for Blackboard 6. The latter is a significantly more functional product, so the majority of this study focuses on our implementation and development of version 6. The discussion below shows how the portal implementation aimed to meet the three key requirements of personalization, to act as the primary point of access and to support the range of activities common to a University.

Implementation followed the timetable outlined below.

3.1 Implementation Timetable

Initial upgrade to Blackboard 5.5 Learning System with the Community Portal	August 2002
Commissioning of a test server running Blackboard 6 with the Community Portal	February 2003
Liaison with early adopters and key stakeholders	August 2002 – June 2003
Migration and snapshot tool-testing	May 2003
Pre-launch publicity (<i>duo Showcase</i>)	June 2003
Version 6 portal goes live on the Production Server	July 2003

3.1.1 Early portal development – version 5.5

The move from the Basic version of the Blackboard Learning System to the Enterprise version with the first Community Portal was carried out in August 2002. The system was installed onto a new pair of servers and Blackboard staff based in the USA logged in remotely to migrate the content onto the new servers (at this time complete user migration tools were not available). Normal service was disrupted for five working days. Some colleges, the Students Union and a few sports clubs and societies were invited to try using the new organisation areas (equivalent to courses in a teaching context⁶). We added a new 'Services' tab which provided links to the Library, Careers Service and URLs requested by students (e.g. online banking). The absence of a test server and the fact that portal module development required us to stop then restart the system meant that there was little development of bespoke tools using the Java API. Out of the box features such as portal modules displaying HTML forms or opinion polls were implemented. For example over 6000 individual users responded to a survey concerning online access to exam papers, and an LDAP staff phone directory tool added. Individual colleges began exploring ways in which they could use duo to support their work – the fostering of communities. The system provides seven standard portal roles (which cannot be edited) but we did not restrict

⁴ Available online at <http://www.blackboard.com/docs/ml/DurhamPortal.pdf>

⁵ Pearce, L. (2003) "Apart from the weather, I think it's a good idea" Ariadne Issue 35. Available online at <http://www.ariadne.ac.uk/issue35/pearce/intro.html>

⁶ For users unfamiliar with the Blackboard interface, more detail is provided in section 3.1.7 and the associated screenshots in the Appendix.

access by portal role (other than making some tools unavailable to users with a role of 'Guest' or 'Other'). This was because we had not implemented the snapshot tool, so many users had no portal role assigned. There were very few options available to customise the number of tabs displayed and restrict access to them. For this functionality, we would have to upgrade to version 6.0.

3.1.2 Implementation Team

Large-scale portal development began with the adoption of version 6, drawing on these early experiences. This required a further migration of existing materials onto the new server (Blackboard have since decided to alter their upgrade methods, to eliminate migrations). The move was planned by Kate Boardman, the LTT's Blackboard Administrator. It was decided to first deploy a new server to test version 6.0 of the software. Blackboard can be installed to run on a single machine, or split in two, one running the web services, the second the database (in our case Oracle). Primarily for reasons of cost, we configured our test server on the single machine model, making it different to the existing two-machine production server. Hardware specifications and details of the current software are listed in the table below:

	Production Server	Test Server
Processors	Quad 1.5 GHz Intel Pentium processors	Dual 933 MHz Intel Pentium processors
RAM	4 GB	1 GB
Hard Disks	2 x 137 MB disks (mirrored)	16 GB disk
Operating System	Red Hat Linux release 7.3	Red Hat Linux release 7.2
Networking	100 Mbit card, plus a 1000 Mbit card to link to the Oracle database	100 Mbit card
Database	Oracle 8i Enterprise Edition 8.1.7.4.0	Oracle 8i Enterprise Edition 8.1.7.4.0
Blackboard	Community Portal Version 6.0.10 hotfix 47	Community Portal Version 6.0.11 hotfix 1

Development of the portal itself was planned and carried out together by Kate Boardman and the author.

3.1.3 Required skills

The technical aspects – configuring the server and installing the software were carried out in-house using existing systems programming expertise. An advantage of the Blackboard product is its use of industry standards – in our case Linux, Oracle, Apache and Tomcat. Alternate configurations for Blackboard using Unix and Windows platforms are also available.

Support was available from directly from Blackboard and informally through the well-developed UK and US Blackboard users group and discussion boards – listed below. Often the informal support networks provided answers as quickly as the official technical support!

Online Sources of Information

Arizona State University – the original Bb Listservers	BLKBRD-L@ASU.EDU BBADMIN-L@ASU.EDU	http://lists.asu.edu/archives/blkbrd-l.html http://lists.asu.edu/archives/bbadmin-l.html
JISC Bb Usergroup	BLACKBOARD-USERGROUP@JISCMail.AC.UK	http://www.jiscmail.ac.uk/lists/BLACKBOARD-USERGROUP.html
Blackboard Client Support	Behind the Blackboard	http://www.blackboard.com/products/services/support.htm
Blackboard Developer's Network	BBDN	http://www.blackboard.com/dev/BbDn.htm (Subscription service)

3.1.4 Authentication

Systems staff within the IT Service configured duo to authenticate not against the internal Blackboard password database, but rather against Active Directory, via an LDAP query. The *System Administrator* panel provides access to the necessary settings to alter the underlying authentication path and also to redirect any change password requests within Blackboard to an internal secure webpage (the same one used by all other users in Durham wishing to change their IT Service password over the web). We chose this authentication route to

minimise confusion - users now have a single, common username and password for all networked computing services. There are options to encrypt authentication requests only, some or all data requests in Blackboard using SSL (secure sockets layer) technology for further security. Although not currently implemented, this is something we hope to introduce in the near future. Colleagues at the University of Dundee report no discernible performance hit when SSL is used for all communications. Neither the Blackboard password database, or Active Directory will return a user's password. As such, attempts to integrate other services (such as an external timetable, email or diary client) requires help from *Global Services* – the consulting arm of Blackboard. They can advise and construct tools which will allow single-sign on (SSO) to other systems via the portal. We are in discussions with Global Service to integrate a single sign-on to IMP – our webmail client.

3.1.5 Portal Roles – the snapshot tool

The portal functionality requires that each user is allocated an appropriate portal role – one of the primary methods of tailoring content to the user. Role allocation is most easily achieved via an automated process, typically when user accounts are created. We used the snapshot tool, available free from Blackboard. For a fee, their commercial consulting arm - *Global Services* – can visit your institution to support the installation, but our Blackboard Administrator managed to implement this with help from other staff in the IT Service and Student Planning and Assessment. We also benefited from informal troubleshooting offered by colleagues in other Universities (notably the Universities of Liverpool and Southampton) that had already implemented the snapshot tool.

The underlying student data is stored using SCT Banner, maintained for the University by an out-sourced contractor. Each night data is fed to a second database – DUND – held in the ITS, which is also populated with staff information. Constructing a data-feed for Blackboard is achieved by running SQL queries against this second database each day. These scripts generate a series of files listing current staff, current students, the college a student is a member of and the courses they are enrolled in. Further scripts were developed later to compile lists for populating organizations – e.g. all postgraduate students, all first years, all international students, etc. These files are securely transferred by ftp to the Blackboard server and the snapshot tool run. This compares the data in these daily update files with the current Blackboard database. New staff and students are added to the Blackboard database as new users. Any differences in the underlying personal data or enrolment information is updated to match the latest information in the feed. Where the feed indicates that users should be removed from a course or indeed the whole system (e.g. a staff member has retired or a student has left the University) then the account is disabled which prevents them from logging in. The account is disabled rather than removed in case there are errors in the feed data – removing a user permanently deletes all associated data e.g. gradebook entries, submitted items, etc.

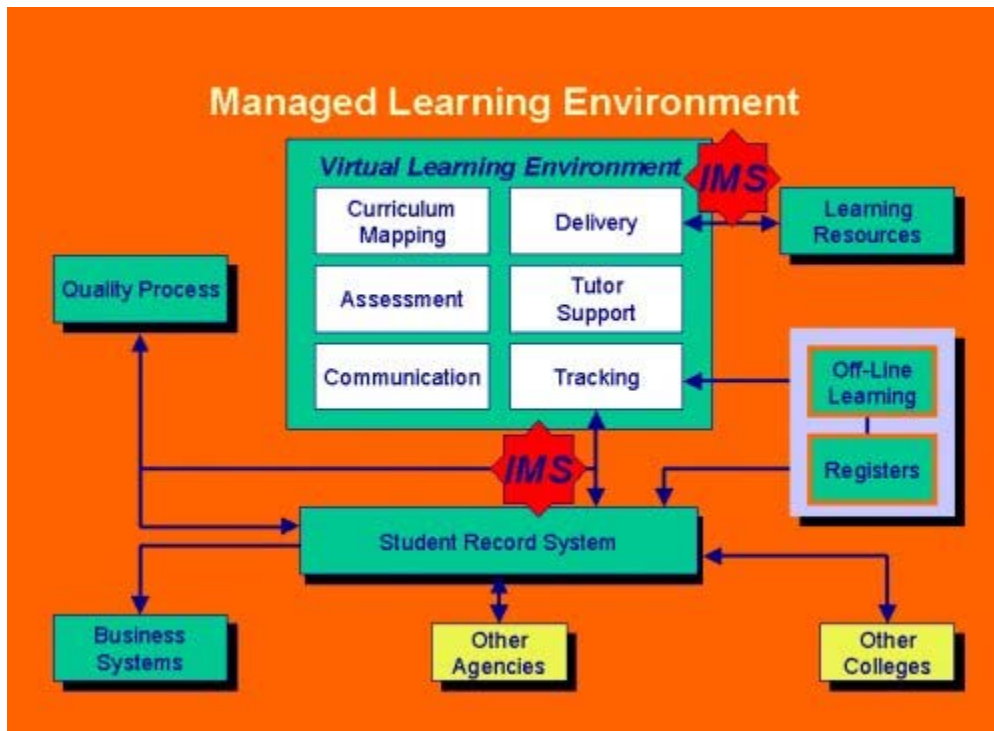
Whilst the present system can cope with our immediate expansion plans to populate all of Blackboard's user information fields from Banner (adding details such as home and term-time addresses) it is anticipated that any further developments may require modifications to the link with Banner, which would incur a service cost from the contractor. An alternative option is to drive these queries from a Building Block, fully integrating these two systems. At the time of writing Blackboard and SCT had just announced that they plan to develop one for release in 2004.

Blackboard comes with 20 customisable portal roles. Currently we have implemented the following roles: *staff*, *student*, *guest*, *fresher* and *summer school student*. We are also looking at using *alumni* and possibly *observer*. The range of required and optional content and functionality available to a given user is determined by their portal role. Appendix I contains sample screenshots showing the different views of the portal for staff, students and freshers.

3.1.6 Connectivity

Another aim of a portal is to make it the primary point of entry. This requires it to interface with a range of other established systems and resources. A key part of the LTT's input into the development of a student portal has been in its planning. Traditionally VLEs have been planned using a "system's approach" - connecting data sources and services together. A classic, oft-cited example of this approach is Richard Everett's diagram reproduced below:

Figure 1 The VLE as a sub-system within the college MLE



Source: Richard Everett (n.d.) JISC Briefing Paper No. 1: MLEs and VLEs explained
http://www.jisc.ac.uk/index.cfm?name=mle_briefings_1

Durham's choice of VLE took a different focus – the product had to meet our pedagogic needs, yet still be simple to use. For it to succeed, it had to be a tool suitable for all staff and students, promoting learning and teaching. The Community Portal builds on this success. The LTT were adamant that playing what could be termed “server Lego” – i.e. just adding more and more servers onto the system – was not a strategy to deliver a successful portal. Instead, from day one, we should design the portal from the perspective of the user. We consider portals as the location for two-way exchange of information and ideas. To this end we kept the following questions in mind:

1. What does the University (and any part of it) require the user to know?
2. What does the user need to tell the University?
3. What does the user want to know/tell others?

These three questions were used to prioritise and guide the development of portal modules.

3.1.7 Building portal modules

Portal modules can be added to pages, providing the user options for displaying content within rules set by the System Administrator. In Blackboard parlance, the user sees a screen displaying one or more ‘tabs’ - tabbed pages. There are two special tabs – one for displaying content relating to courses being studied or taught by the user, another for materials related to organisations that the user is a member of. Tabs can be set to be visible to all users, or confined to one or more of the available portal roles. The other tabs are used to display portal ‘modules’. Depending on the tab's setting, the content may be fixed (in the sense that it is pre-determined by the Administrator) or the user may be able to alter the layout of modules, and add to or remove the modules displayed. Individual portal modules can be set to be available for all users, or confined to particular portal roles. They can be set as required, displayed by default (but removable), or selectable by the user. Modules can be editable, allowing the user to configure them and save preferences and content (e.g. a notepad type application, or to build a list of URLs.) Facilities also exist for module administration – allowing nominated users to configure global settings for the module within Blackboard.

Modules can be developed in two ways. There are simple GUI tools within Blackboard to configure modules from the System Administration Panel (the *Manage Modules* link). This includes HTML, external links, images, RSS channels, opinion polls, multi-choice questions and any custom module-types you have defined). More complicated modules (e.g. those which need to communicate with an external database) can be written

externally in Java and imported as packaged modules into Blackboard (via the *Manage System Extensions* link). Most of our colleagues have opted for the first route when developing modules.

Custom portal modules are written in Java and run on the server within the security of the Java Virtual Machine. As such they are scaleable and support multiple threads. In later releases Blackboard plan to add support for the Microsoft .NET framework.

The third aim for a successful portal is to provide the necessary range of functionality required by the institution. This is explored later in the discussion of examples (section 3.4).

3.2 Staff training

Developing, using and maintaining a portal requires a range of skills. The internal training needs for the LTT staff (who support and develop the portal) have been met in several ways. We made use of recent introductory and high level sessions at conferences looking at Blackboard Building Blocks (the technology behind portal modules, indeed the whole Blackboard product). We joined the Blackboard Developer's Network (at a cost of US\$1,200 a year, now reduced to \$499 p.a.), which provides access to sample code, discussion forums and a test license. In the near future we hope to arrange for Blackboard staff to come over to Durham for a few days of dedicated training. As well as the LTT, the audience should include staff from other parts of the IT Service (e.g. the Web Team, the Helpdesk) and other keen stakeholders, thus broadening the development team.

One advantage of using Blackboard as our portal is that the interface and URL are already familiar – academic staff and students are already using duo in their learning and teaching. As such, we decided not to develop a series of new training programmes aimed specifically at users of the portal, although its functionality has been added to existing duo staff training materials. We are expanding the delivery of training materials online, using portal roles to target material at specific groups, (notably staff) on a dedicated page. Current examples include links to new features in the portal and examples of good practice. To date, most of our efforts have been focussed on canvassing user opinion and working with the various stakeholders within the University. Much of this work is still at an early stage.

3.2.1 Meeting user demands

Staff were originally introduced to the portal during a week of special sessions in June this year (the '*duo showcase*'). We used this occasion to encourage suggestions for portal content and function. We also have a discussion area on the portal where any user can post suggestions and provide feedback. We monitor this regularly and try and implement simple solutions rapidly. Most of the postings have been from students, requesting services such as links to online banking, bus timetables and academic diaries. Larger projects which seek to better integrate existing services require LTT staff to work directly with the individual stakeholder, e.g. Librarians and staff involved with undergraduate admissions. Where appropriate, the staff have been granted access rights to the test server, allowing them to construct their own portal modules.

3.3 Political aspects of the implementation

Construction of an institutional portal is a highly political activity, not least because the portal becomes a very visible face of the University, first internally and then possibly externally. It is also drawing from a range of materials across the institution. By bringing information and individuals together, it forces the institution to rethink the way information is stored, flows, is owned and managed at all levels. There is a demand within the University for a single-point of entry: the phrase "one stop shop" was used repeatedly when staff and students were asked to state what they understood to be, and wanted in, a portal.

At present, duo is still seen primarily by staff and students as the University's *learning environment*, rather than as the institutional portal. As such it retains a relatively low political profile – the value of the VLE is widely accepted across the University, strongly supported by the Teaching and Learning Committee. As the development of duo as a *portal* continues, combined with the culmination of other related projects within the University (such as the *Strategic Improvement Programme*), and as the results of this case-study are disseminated locally, it is anticipated that this situation will change.

That is not to say that there have not been political decisions to take. An apparently simple example is what to place on the new tabs in the portal – should organisations such as the Library, Careers Service, etc. have separate tabs, or content delivered within existing pages? If we do give groups their own tabs, who determines their order? At present we have tried to integrate content within the existing portal pages where possible. An

exception has been made for the Library, because they have produced a complete set of portal modules with a common look and feel, mimicking functionality found on the Library intranet. Some of this content is automatically updated (e.g. RSS news feeds) the remainder – the online search tools - have been designed to require minimal further intervention (only updating should the underlying Library search engine change).

3.4 Use of the portal

The following examples have been selected to highlight the use of the portal by different stakeholders. This discussion exclude actions relating to the basic VLE functionality of Blackboard which have been well documented elsewhere.

3.4.1 Student groups

Sports Clubs and Societies

Several sports clubs and societies use the organisation space on duo. Because the portal is an authenticated service and membership of the individual groups is restricted, students have used the portal for closed discussions – e.g. discussion of team tactics, posting of minutes, arranging social functions, evaluation of team and opposition performances, recommendations of equipment and local suppliers. Many of these activities would not be possible or suitable for public websites. The portal handles the issue of authentication for the users, leaving them to carry on with the business of their group. Furthermore the common interface simplifies the transfer of ownership at the end of each academic year – in previous years some new incumbents had struggled to manage and update existing web services such as discussion boards. Yet clubs and societies who use duo also maintain pages on Durham's external website. This public presence is important – it allows them to keep in touch with past members, attract potential new recruits and raises their profile amongst teams from outside the University circuit. One sports club was invited to join a national league after a person outside the University 'discovered' them via their website.

In this early trial period, there is inevitably some duplication of information – for example both the organisation pages within duo and the external website contain the names and contact details of society/club office-bearers. The balance of usage between duo and the web pages depends on the experience and individual preference of the clubs themselves. Most are still placing the majority of their materials onto their web pages, with links to these available in duo. As such, with the exception of the communication tools (discussion boards, email, etc.) currently they are really only using the portal as a shallow, information gateway. The wide-spread adoption of the portal by student clubs and societies would place significant demands upon the existing IT Service support facilities. In this early period, demand has been manageable, but in the long term a more formal support arrangement should be implemented.

Durham Students' Union

The Students' Union (DSU) has embraced technology. It already has a detailed website, complete with discussion forums and 'D-TXT' – an SMS text alert service for students. DSU was given organisational space in the first version of the Community Portal and has used it ever since. It is seen as experimental and duo is currently badged as 'DSU's second home on the web'. Much of the content remains on their long-established internet site, where they feel they have greater control over the content and layout. Despite this, considerable use has been made of the discussion board areas in the portal, such as a heated discussion last year when students debated whether to meet with or protest against the Secretary of State for Education when he visited Durham.

3.4.2 Colleges

Colleges have full administration rights devolved to their staff. This has been very successful, as college staff feel that they have full control over the content, able to impart materials reflecting the distinctive characteristics of each college. The portal is used to publish documents, canvas opinion amongst students and inform them of forthcoming events.

Each college also supports a range of student-led societies. Traditionally these have had very feature-rich websites, the marked inter-college rivalry fostering creative competition. Some of these features, such as RSS College news feeds, or dynamic listings of the latest film showing are beginning to be added to duo as portal modules. Most of the College Junior Common Rooms use authenticated online voting through duo to elect their office-bearers.

3.4.3 Undergraduate admissions

This year selected prospective students who had accepted a place to study at Durham were sent a (common) username and password to log into our portal, with a role of fresher. Within the portal we provided links to information relating to accommodation, choice of modules, library and IT facilities on-site, travel directions, links to hotels for parents, etc. The discussion boards were heavily used, both to make friends and ask simple but important questions – such as ‘do the colleges provide soap or do I need to bring my own?’ For administrative reasons we decided not to issue each student with a personal ID, instead granting them only a generic ‘Durham Fresher’ login. The success of this portal area (which was highly praised in surveys of incoming first year students) shows that the degree of personalization does not always need to be very fine-grained.

3.4.4 Development priorities

Initial portal module development involved attempts to duplicate services existing elsewhere (e.g. staff directory tools, displaying system messages). This provided the development team with experience in using the Java API and Blackboard portal interface. The next phase of development was driven by requests from staff and students (e.g. to build display user’s library record, mapping tools, news feeds and links to other online services). Full, “thick portal” implementation of such tools may have unexpected cost implications. For example our library record tool simply passes your barcode to the library OPAC (Durham uses the INNOPAC system). The results (your patron record) are displayed in a new window, just as if the request had been initiated from the Library’s web pages. The ability to return data from queries to the Library patron record back to duo (so we could have more control over the formatting, etc.) requires access to the OPAC API. As yet we haven’t purchased this, as it is not required for Library users who are accessing information within the OPAC itself.

In the future we plan to build new tools based on a wider survey of user needs and provide greater integration of user information – e.g. displaying data from corporate calendars within the portal. Where possible, we plan to combine this with the work of colleagues in other parts of the IT Service and develop future web and portal tools in a common language – Java - to minimise the duplication of code and retain flexibility of implementation.

3.4.5 Accessibility

Looking at its website⁷, Blackboard appears committed to ensuring its products are accessible. As a commercial company with a large base of users in the USA, it has acted to ensure compliance with the US legislation, notably the Section 508 amendment to the Federal Rehabilitation Act. Its website includes a Blackboard screen-reader tutorial for visually impaired users. A further section lists 16 ways it complies with the act and has implemented W3C guidelines, although it is notable that the Community Portal System does *not* currently offer full text-only alternative pages. There is no published information stating whether Blackboard complies with the UK SENDA legislation, although this may be unfair as the UK legislation has a different focus, placing the burden of responsibility for accessibility provision onto the individual institution. The accessibility of duo, our portal will be explored further as part of ongoing research in Durham focussing on students with disabilities and their use of duo. This HEFCE funded project, known as ALERT - *Accessibility in Learning Environments and Related Technologies* contains questions specific to the user’s experiences of the Blackboard Community Portal. The project is due to report to HEFCE in July 2005. More details are available from the ALERT website: www.dur.ac.uk/lt.team/alert.

3.5 Strengths of the Blackboard portal

Ease of use

The Community Portal extends the existing Blackboard learning environment, for users running the Enterprise (but not the Basic) versions of the Blackboard Learning System. This means that it can easily be added to an existing Blackboard VLE - staff and students don’t need to find a new web address, or feel that they must learn how to use a new product. The tight integration with the VLE allows the portal to exploit existing course and user data held by the University. The portal maintains the same ease of use we found with the existing Blackboard product.

Rapid Take-off

The built-in graphical tools provided for developing standard portal applications allow administrators and developers to quickly establish a portal presence. Because most of the portal has been written in Java and Blackboard have released their in-house Blackboard API (Applications Programming Interface) and dedicated tag libraries, it is possible for Java developers to quickly build powerful applications which can access Blackboard functionality (e.g. creating Announcements or returning user’s personal information) that maintain

⁷ <http://www.blackboard.com/products/access/index.htm>

the Blackboard look and feel. The Java code base means that the portal modules are run in a secure environment on the server and offer a degree of scalability and multithreading to maintain performance under a large user load. Whilst the documentation and code samples are not always as clear as one would like, the online discussion groups provide a range of examples and expertise. As a side-effect of releasing the Java API, there are a large number of add-ins (often referred to as Building Blocks) available, designed to support third-party products and link to external content-providers.

Development Options

Users with sufficient access rights (and the necessary coding skills) can develop their own portal modules, to integrate the portal with existing services. Portal modules are a series of bundled Java Server Pages (JSP) uploaded into Blackboard as a zip-file (.zip) or Java web archive (.war). Many of the required Blackboard-specific Java methods and classes are available to the developer by downloading an SDK from Blackboard, which means it is possible to develop custom tools which maintain the look and feel of Blackboard and, more importantly, are fully integrated with the VLE. For security reasons not all the classes have been released, which whilst understandable, can prove frustrating. Files are loaded onto the server from the graphical user interface using buttons on the *System Administrator* panel. As the name implies, this is only available to users with Administrator rights. Blackboard has created a range of Administrator Roles, which offer a range of access rights. There are administrator roles which only grant access to course information (*Course Administrator*) or user data (*User Administrator*). For module development only two apply - *System Administrator* (all rights) and the more restricted role of *Portal Administrator* (the latter can install and configure all aspects of the portal – content, layout, tabs, etc. but have no access to individual user or course data). This role is aimed at developers. Their limited access to the interface helps to protect the confidentiality of data held within the institution. In the situation where the VLE contains personal information such as the names and addresses of children at a school, there are significant legal implications of such access. Some users have requested the ability to modify the devolved access rights available to individual staff and students involved in Organisations (e.g. restricting the ability to add Announcements to Club Secretaries). At present such fine-grained rights-management is not possible.

User Community

The large user-base means that institutions are not reliant upon the skills of a single member of staff – there is a large pool of learning technologists experienced in using and developing Blackboard to draw upon. In response to user criticisms, the company has just restructured its product support, now providing a dedicated team based in Europe and allocating institutions a named member of staff as their primary contact.

The portal product has met many of the needs of users at Durham and expanded the way we communicate with our staff and students. It has helped foster a greater sense of community across the two campuses and for students and staff working abroad.

3.6 Limitations of the product

The ease of use of the product has a price – there are restrictions on the way materials can be displayed and the resulting uniformity may not be to everyone's taste. The North American heritage of the product is also evident in some of the terminology used – e.g. the opening screen by default is labelled '*My Institution*'. Whilst this can be removed from the actual product through careful customisation, the terminology remains in the accompanying documentation.

This effect of this imposed layout is most apparent in the display of portal modules, which all have a standard header panel and default spacing. If a user adds a lot of portal modules to one tab, the content soon expands to occupy more than one screen. If the Blackboard Community Portal is compared with some other portals and gateways (such as GEsources, the geography and environment gateway for UK higher and further education <http://www.gesource.ac.uk/home.html><http://www.gesource.ac.uk/home.html>), it can initially appear to lack content due to the limited number of items displayed. Taking an alternate view, this could be seen as a strength, ensuring that important messages don't get lost amongst the detail - retaining a clean look to the portal front page.

In an effort to cater for both the institutional wish to be able to specify *required* content and the user's desire to choose their own materials we are considering a two page solution. The initial *My Institution* screen (which we have relabelled as *Welcome*) will be tightly controlled, displaying material considered essential to users of a given portal role. There will be a second, *Personal* tab, where users are free to add and remove content as they see fit.

The discussion below highlights four areas of the current portal product which merit further development.

3.6.1 Areas requiring improvement

Portal Roles

In the present incarnation, every Blackboard user is allocated a single portal role, chosen from twenty, user-defined roles. Currently the five portal roles we use – staff, student, guest, fresher and summer school student, do not yet provide us with sufficient granularity, nor reflect the fact that many users may have multiple, sometimes nested, roles. In the next release, the restriction upon the total number of portal roles is to be dropped. This would mean that you could develop very fine-grained roles, but the user would still be confined to a single role, e.g. ‘a science student studying Geography based at the Stockton campus’. To be truly useful, users should be allowed to have several portal roles, some of which may be nested, i.e. implying (inheriting) other roles. This would better reflect the different roles of the University – e.g. users belong to a particular Department, which implies membership of a particular Faculty. They will also have a role of staff, student, etc. according to their status, and a primary area for their work – e.g. the Durham or Stockton campus. Some should be able to access materials relating to more than one roles, for example postgraduate students who spend part of their time tutoring classes. This need for multiple portal roles was discussed with Blackboard technical staff at this year’s European Blackboard Users Conference.

Content management and search tools

Content Management, is the weakest part of the current solution offered by Blackboard. At the time of writing an add-on content system was in beta form – more details are available from the Blackboard website – <http://www.blackboard.com/products/cms/index.htm>. A successful portal should combine features to provide immediate, tailored content, with intelligent, tailored search tools. At the moment the Blackboard Community Portal meets the first criteria but fails on the second. The additional content system due for release in early 2004 will contain search tools, allowing the user to carry out text searching of all documents accessible to them. Many of the members of the University interviewed expressed feelings of frustration when accessing online materials, feeling that they were sure that the information was available somewhere if they could only locate it. This emphasizes the need for strong search tools.

In discussions with Librarians, it became clear that they would like to see an even more powerful search tool, to provide cross-linked searches - a single interface which queries multiple databases behind the scenes and returns current data with local availability information (e.g. results include a link to the University OPAC or an electronic copy if the Library currently subscribes to it). Librarians are strongly attracted to the integrated delivery of materials, one stated that they hope we can

use a portal based on duo to position information resources in context

Such functionality is important if we are to truly make duo a single-solution, fully integrated institution-wide portal.

Shared timetables

The calendar function within Blackboard is weak. It is not easy to import external data into it, such as term dates or meetings to which the user should attend. There is no implementation of portal roles or even groups for calendar entries. Access is also restricted to your own calendar, preventing users from being able to arrange meetings with individuals or groups. This feature is in need of a significant overhaul, in its present incarnation it is of little use.

Email integration

Blackboard offers users limited email functionality. The portal does not extend the limited email tools of the VLE itself. There is no direct ability to fully embed an existing web email program such as IMP. Instead, users are able to send emails to a restricted range of recipients (typically other staff or students on the same course) sent via SMTP. There is no facility to send email outside this – no integrated address book, nor standard tools allowing you to type in the recipients address. Whether you see this as a strength (focussing attention on the learning and teaching task) or weakness, is a matter of personal choice.

3.7 Further developments

Direct Portal Entry

It is possible to configure the portal to allow direct entry (i.e. without login). Blackboard have an example of this on their West Sand demonstration site. This means that some of the content is available immediately to guest users, with others requiring the user to authenticate. This effectively blurs the distinction between the portal, local intranet sites and the University’s external web presence, and is something we shall be exploring further. It is particularly interesting because it allows third party content providers (such as the BBC) unrestricted access to parts of the portal, a requirement of their licensing conditions (such as the javascript

newsfeed service available on trial to UK higher education institutions). This functionality will be added to the standard portal product in 2004 as one of the quarterly updates to version 6.1.

Online transactions

Currently the ITS offer users on our website the facility for online credit card payment for a limited number of services – e.g. internal users can buy printer credits, external users can book conferences. This service uses an independent third party provider – SECPay Ltd (<http://www.secpay.co.uk>). This system appears robust, but the system requires a lot of security checks and each transaction requires the user to enter considerable details about themselves. Some users have asked for a simpler solution – we will be investigating whether we can offer one through the portal.

The next logical step would be to extend this system of micro-payments to allow students to pay for a range of services online – e.g. settle library fines or College bills. This might involve a separate transaction solution, or a modification to the University's internal accounting system to allow the exchange of virtual payments – could users end up 'paying' a library fine with printer credits?

3.8 Guest access

Readers wishing to try the portal can log into duo at <http://duo.dur.ac.uk> using one of the following guest accounts:

Student		Staff	
Username	JISCstudent	Username	JISCstaff
Password	information	Password	systems

4 Conclusion

The Blackboard Community Portal has been examined to see if it meets three criteria: does it allow a strong degree of personalisation, could it act as the primary point of access for users at Durham, and thirdly can it support the range of activities expected in a modern University.

The product offers personalization features by combining institutional rules – selecting or restricting content based on the user's portal role, with tools which offer the users choice in the content displayed and provide options to save individual preferences and data between sessions. Whilst there is room for improvement in the organisation of portal roles, notably a need for a system where users can be assigned, multiple, inherited roles, the present system has allowed us to develop a differentiated portal.

If it is to become the primary point of access, then the Community Portal must provide an environment to support learning and teaching, social and sporting activities and the administration needs of its users. The VLE component offers a range of features for learning and teaching through its *course* model, similar tools to support the work of societies, colleges, sports clubs, administration and departments can be found in its implementation of *organisations*. Custom portal modules can be added to deliver tailored information to the user, meaning that it could provide the *first* point of contact for users with the University. The product is still evolving and some key features – notably email integration, and calendar tools are weak, which means that in its present form it is unlikely to be the *only* point of contact used by staff and students. Other functions required of a portal: searching and content management are only just being added.

In its present form the portal product has met many of the needs of users at Durham. Whilst recognising its weaknesses it has expanded the way staff and students communicate amongst themselves and with each other. The availability of the Java API and tag libraries means that it is extremely flexible. With some work, it is possible to tailor the product to meet the local needs of an educational institution – to integrate with existing systems across the University and provide secure systems for the two-way exchange of information between users and the institution. As such I feel it is a portal product worthy of consideration.

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Appendix I – Sample portal screenshots

Student log-in

The screenshot displays the Durham University Online portal interface. At the top, the 'duo' logo is on the left, and navigation links for 'Home', 'Help', and 'Logout' are on the right. Below this is a horizontal menu with 'Welcome', 'Courses', 'Community', 'Library', and 'Webmail'. A left-hand sidebar titled 'Tools' lists various services like 'Announcements', 'Calendar', 'Tasks', 'View Grades', 'Send E-mail', 'User Directory', 'Personal Information', 'Change Password', and 'Check module list'. The main content area is titled 'Welcome, Fred' and contains several floating windows:

- My Announcements:** States 'No system announcements have been posted today.' with a 'more...' link.
- Duo News:** Features a 'duo update' where information has been sent to instructors by email, offering a situation update and mentioning that help materials and new documentation will be available shortly. A preliminary document is accessible [here](#). Dated '22nd July 2003'.
- Using duo as a Portal:** A form with a text input field and a 'Submit' button.
- Durham University Library Record:** A warning: 'For this tool to work, you will need to set your Library Barcode. It is printed on the front of your Campus Card under the barcode. Enter only the 14 numbers:'. Below is an input field and a 'Submit' button.
- ITS Message of the Day:** Dated 'Tuesday, 7 October 2003'. It contains two sections: 'Maintenance of File Servers' (system maintenance on Wednesday 8 October between 07.45hrs and 08.15hrs on file servers Hudson and Stevens) and 'Virus alert update' (two internet worms released in August 2003, with instructions for detection, cleaning, and patching).
- My Courses:** Lists 'Courses in which you are enrolled:' with two items: 'Demonstration Area' and 'Research Postgrad Annual Review', each with 'No Announcements.'
- Duo Course errors:** Explains that courses are populated using data from the University's Student Records System, maintained by SPA (Student Planning and Assessment Office), and that enrolment changes are implemented overnight. It provides a link for queries.

Staff log-in (after clicking on a tab only available to staff, the Instructors tab)

Durham University Online

duo

Home Help Logout

Welcome Courses Community Library Webmail Instructors

Contents Layout

Links
[Blackboard Manual](#)
A link to the online manual - with materials aimed at Instructors

Instructors

Welcome

Welcome to this new tab. It is designed to be your first port of call when using duo. Over the next few weeks and months we will be adding links for you to use such as:

- Information about new features in Blackboard Version 6
- Reports on known problems
- FAQs (Frequently Asked Questions)
- Administration Tools

Let us know what you want!

Documentation for duo

Please note that to the left in the tools panel, you have access to the full Blackboard Manual (Blackboard is the software we run duo on).

[duo guides](#) : [training session materials](#)

[Creating your course](#) : [PowerPoint from Creating your course](#)

Copyright Advice

Staff should be careful before making copyright materials available on duo - this is **not** covered by the CLA licence for photocopying. Some journals we subscribe to allow you to download PDF files and insert them into duo, but others don't. The situation is continually changing, as publishers alter the conditions of their licence.

For the latest advice, please consult the [Library website](#).

New features

Copying Course Content

This new feature should help overcome one of the most commonly reported frustrations - moving material from one course to another. This tool allows you to move anything from individual files to entire folders (including any sub-folders), either within a single course, or from one course to another, providing that you have Instructor status in both.

Here's how to use it:

Known Issues

Currently we know of problems in the following areas:

Virtual chat and classroom tools

Good news for users of Netscape 7! Virtual Chat should now work for users of Netscape 7 (the University's supported browser, which is installed on all NPCS machines). This is because Netscape comes with a 'Java Virtual Machine' which contains the code needed to run chat. Internet Explorer users need to download a new Java file themselves - you will need Administrator rights on your PC to do this.

Assessments

Some users have reported that they don't see any feedback after taking a quiz, even if they have selected this feature. It seems that for some unknown reason, Blackboard have decided to hide this from anyone with Instructor status. Students **will** see the feedback - log on as a student and try this for yourself. The assessment tools have changed - they are worth exploring.

Broken links to documents

If you find an error when trying to open attached files (Word documents, PowerPoint presentations, etc.) and the link shows the giveaway filesize of -1 bytes, this is due to an error in an early version of the Course Coop tool. Contact a member of the

Freshers Log-in

Durham University Online

duo

Home Help Logout

Welcome Community

- Tools**
- [Announcements](#)
 - [Calendar](#)
 - [Tasks](#)
 - [View Grades](#)
 - [Send E-mail](#)
 - [User Directory](#)
 - [Personal Information](#)
 - [Change Password](#)
 - [Check module list](#)

Welcome, Durham Fresher


Contents Layout

Welcome Freshers

This is your Welcome page in duo. When you arrive in October and receive your ITS account, all the links here will be personal to you. For the moment, there is a general space created for new students to provide generic information.

duo includes *Courses* where your academic module support is held, and *Community*, where Colleges and Societies have organisations and there are also general discussion boards.

You are obviously not yet a member of any Course areas, but you can click on the link under **My Organisations** to **Freshers Area: Welcome to duo** as shown below to access the resources. Please check back too - we are adding more throughout August and September.



My Organizations

Organizations in which you are participating:

- [Freshers Area: Welcome to duo!](#)

Weather in Durham



Click here for a five-day forecast from the BBC.

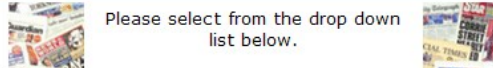
For the weather in Durham at the moment:



Live image of Durham Cathedral from the Astrolab

News/Newspapers Online

Please select from the drop down list below.



Travelling to Durham

streetmap oo.uk

Durham City and approaches from [Streetmap.co.uk](#)
[Or [click here for Queen's Campus](#).]



City Centre streetmap from [Durham City Council](#)
[Or [click here for Queen's Campus](#).]