Case Studies of Portal Implementation in FE and HE

Institution Wide Portal – The University of Edinburgh

"A broad vision for the individual's needs"

JISC

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1. Executive Summary

The University of Edinburgh is an Old University established in 1583 with strong research traditions. It has grown to become the largest in Scotland (based upon student numbers), with a significant international community and multi campus sites within the city of Edinburgh and beyond. The University has approximately 7,000 'regular' staff and about 21,000 students.

The portals experience of The University of Edinburgh was one that began with a period of familiarization both with the products and experiences of other institutions. This included environmental scanning for portal related documentation and case studies, but also getting involved with the 'portal debate' and those HE institutions that were already making progress.
This case study primarily focuses on the methods used to assess the portal product options that were available to us, from the early stages of familiarization, to being able to formulate our own Enterprise Portal vision and choosing a product most suited to that vision. This work primarily occurred between February 2003 and the end of July 2003.
This case study aims at those currently embarking upon preliminary stages of portal initiatives, including elements of establishing the vision, stakeholders, product short list and evaluation.

Having made a fairly bold product short-list, we found that final product selection needed to be broken down into the stages of what I have called 'selection in principle' and 'selection in practice'. Having made a choice that one product met our institutional needs in principle; we wanted to continue evaluation focusing on this one product throughout early stages of implementation. In this way we could gain confidence with our technology choices and prove the concept of our vision by developing a demonstrator Enterprise Portal.
This case study submission aims to be hand crafted in aiming to provide useful advice and models based upon our experience for those within the wider JISC community that may be at a similar stage. The case study will particularly aim to motivate readers towards trying to make good effective decisions rather than be frozen by the scale of the subject and attempting to make "perfect decisions".
The case study will offer reusable templates and information that will help institutions gain project buy-in, resource commitment, strategic focus; clarifying user requirements and helping resolve some stumbling blocks with architecture modelling for an Enterprise Portal. Those words used within the body of the case study that require definition, have been highlighted in **green** and will be defined within the appended glossary.

2. A Limited Legacy – Introducing ESP

The University of Edinburgh embarked upon their portal development in 1999 through a SHEFC (Scottish Higher Education Funding Council) backed project that was then called **SCWEIMS**. This unusual name was actually a rather wordy acronym for: Student Centric Web-based Educational and Instructional Management System.
SCWEIMS was a collaboration between the Universities of Abertay, Edinburgh, Paisley and Queen Margaret University College. The vision of this project was to provide students with on-line access to the key pieces of information each University held about them; through providing a personalised web environment. The intention was that when a student logged on to the system, they would enter a space that provided information that was specific to them. The student would be best placed to see whether the information held about them was correct, and they would then be allowed to make changes either on-line or via a standard process. Even at this early stage, the University had been looking towards methods of providing ***'reduced'*** or ***'single' sign on*** (SSO) to multiple systems, but had found this a stumbling block.
Following partial completion of the SCWEIMS portal, the then project manager had a career change and moved on. It was around this time that Management Information Services were proposed as being the most suitable centrally managed department able to take the project through to full implementation specifically for The University of Edinburgh. Indeed some of the system development had already been the responsibility of MIS developers. Despite this, it was a fairly tight schedule from around May 2002 getting familiar with the software and portal concepts, specifying rework, some enhancements and managing a testing and pilot phase prior to full launch in September 2002.
The launch incorporated some re-branding with the portal being renamed **ESP (Edinburgh Student Portal)**.

During the ESP roll out, the project team found it useful to provide an automated presentation for students that were waiting to matriculate. Posters were also used, although feedback indicated that the credit card sized 'flyer' handed out to students at matriculation was more useful than the posters in advertising the service and login URL.

ESP has now become a stable live service with over 14,000 users registered. The service was available to students for greater than 99.9% of the whole academic year 2002/3. The ESP service includes:

- Common Registration (using Cold Fusion and SOAP technology to enable some SSO, and online password management)
- Login styles and assistance online.
- Welcome screen hosting mandatory and opt-in announcements.
- Read only personal details.
- Program of study and course details with links to associated web pages and SSO link to WebCT course pages
- A large selection of service links including SSO to a careers vacancy system (**SOLVE**) and the **Virtual International Community (VIC)**. The Edinburgh University Student Association (EUSA), who has worked closely with the project team throughout, manages many student and society links.
- Online student elections.
- News and weather feeds.
- An organizer containing calendar, address book, bookmarks and personal notes.

ESP currently runs on three Sun Blade 100's, using a simple 'round robin' approach to load handling. Its database is running on a single SUN Enterprise 250 server with 2 UltraSPARC-II 398MHz CPU's, 2G of Memory and 4 internal 36G USCSI-III disks. This machine is shared with a small number of other web applications.

3. Definition and Drivers of an 'Enterprise Portal'

Despite the relative success of ESP and the main benefit that it can be developed solely around the University of Edinburgh's needs, it has been recognized at Edinburgh that a 'home grown' portal solution has some significant limitations. These were largely associated with having to unilaterally shoulder the costs of R&D associated with a bespoke portal and its infrastructure, tied with the fact that portal standards such as J2EE and WSRP were becoming more prevalent within established third party enterprise and web integration products. In short, the university was looking for a portal technology platform that had been designed around current standards and had been proven within a sizeable academic environment. Development within a standards framework aimed at increasing the likelihood of greater integration with other systems, whilst perhaps enhancing future proofing. Fully willing to commit and participate in knowledge sharing, Edinburgh aimed to buy-in to an established portal development community and benefit from associated economies of scale.

The University of Edinburgh's requirements were to implement a scalable portal that would offer the potential for a truly 'Enterprise or Institutional' portal. We have found a number of definitions useful and have used the following two regularly:

A unified network in which disparate systems, communities and individuals interact in a seamless secure personalised University environment
Source: JA-SIG

A thin layer, which aggregates, integrates, personalises and presents information, transactions and applications to the user according to their role and preferences.
Source: JISC

These definitions have proven useful for MIS managers when trying to explain some of the central features of an Enterprise Portal to other departments and staff. Common themes seem to include:

- Aggregation and unification of systems, data and communities from both within and outside the institution.
- **Personalisation**, allowing information to be presented based upon what is already known about the individual and their organizational roles.
- **Customisation** allowing users to change content and presentation of information according to their personal preferences.
- A **thin layer**, where the portal does not aim to reinvent or replace business logic, but in many cases acts as a presentation layer for information and systems held elsewhere.
- **Seamless access,** where information can be presented without requiring multiple re-authentication.
- Secure, where seamless access to information requires appropriate measures to protect data delivery across the institutions network.

Further to the realization by The University of Edinburgh that ESP in its current form was not sustainable for long-term portal development, a number of additional factors emerged as drivers for the implementation of an Enterprise Portal. These have proved useful as a list when explaining the initiative to the wider university community:

- Competitive advantage
  - Revenue from marketing and status
- Reduced costs
  - Efficiencies through awareness and knowledge sharing.
  - Central coordination in order to avoid what has been termed **'portal wars'**
- User centric – customisable and personalised
- Institution wide – scalable portal solution and migration strategy for ESP
- Standards based and packaged product.
- Improved **usability, accessibility** and availability
  - The ultimate **Webtop** ambition, where equivalent mature functionality is available through a web portal as is currently available via client server desktop.
- A vehicle for "single and reduced sign on"

- Improved service value through integration. Where integration of data presentation can have greater utility and integrated processes promote shared service standards.
- A vehicle for security standards such as SSL encryption, system time-outs, infrastructure zoning and reduced password proliferation.

Appendix 1 offers some guidelines as to how the above drivers could be translated into broad estimates of the cost or benefit that an institution might gain from their enterprise portal.

4. Comparing Solutions

4.1 Familiarization – the Evolving Vision

When embarking upon a project aimed at implementing an institutional portal, the learning curve can initially be quite steep. It is recommended that the project manager might start by gathering together a central repository of information and reference material relevant to the project. This may be broken down into separate project stages. This at Edinburgh is termed the project index page and is held on the MIS intranet. The project management documentation is also stored here such as the Terms or Reference, progress log and reporting templates.
Within the index page we established our own project glossary, which we find useful in beginning to understand all the portal jargon. It also allows us to hold our own agreed definition for terms being used. The index could also provide a useful on-line library of links to existing publicly available reference material that might have been published by institutions both within and outside the H.E. sector. Some resources that The University of Edinburgh have found particularly useful include:

- http://www.fair-portal.hull.ac.uk/
  ”Presenting natiOnal Resources To Audiences Locally (PORTAL) is a partnership between Academic Services Interactive Media at the University of Hull and UKOLN.
  The project is funded under the Joint Information Systems Committee's (JISC) FAIR Programme, and will run until the end of February 2004. During the project, the PORTAL team will explore a wide range of issues relating to institutional portals, and the integration of national resources with institutional information and services.” (Source: fair-portal.hull.ac.uk)

- http://www.bris.ac.uk/is/projects/portal/portalbytes
  University of Bristol’s Information Services pages “Portals and Portal Frameworks”

- http://www.ja-sig.org/
  The JA-SIG (Java Architectures Special Interest Group) home page. Links are provided to uPortal product information.

- http://www.owasp.org/index
  ” OWASP was started in September 2000 with its mission to create an open source community where people could advance their knowledge about web application and web services security issues by either contributing their knowledge to the education of others or by learning about the topic from documentation and software produced by the project.” (Source owasp.org)

- http://www.cetis.ac.uk/
  ” CETIS represents UK higher-education and further-education institutions on international learning technology standards initiatives.” (Source – Cetis.ac.uk)

- http://www.ariadne.ac.uk
  ” Ariadne magazine is targeted principlely at information science professionals in academia, and also to interested lay people both in and beyond the Higher Education community. Its main geographic focus is the UK, but it is widely read in the US and worldwide.”

  The magazine has as its principle goal:
  “…to report on information service developments and information networking issues worldwide, keeping the busy practitioner abreast of current digital library initiatives. It has reported in depth to the information community at large on progress and developments within the UK Electronic Libraries Programme since its inception, and now additionally reports on newer JISC-funded programmes and services, including the DNER, the JISC Information Environment, and the RDN…”
  Ariadne is published every three months by UKOLN. (Source: http://www.ariadne.ac.uk)

- http://www.oasis-open.org/committees/tc_home.php?wg_abbrev=wsrp
  A technical Committee aiming “to develop a web services standard that will allow for the "plug-n-play" of portals, other intermediary web applications that aggregate content, and applications from disparate sources.” (Source: Oasis-open.org)

- http://www.infoconomy.com/pages/eip/index.adp
  ” Infoconomy.com is the web site operated by Infoconomy Ltd, a London-based company set up in February 2000 to provide high quality but low-cost analysis, data and comment for Europe's rapidly expanding community of technology managers, executives and investors.” (Source: infoconomy.com)

The institutional portal learning curve can also be reduced by involvement with any forthcoming portal related events within the H.E. community. This can be particularly useful for networking opportunities and leaning from others experience. For example, the Edinburgh team attended the Portals 2002 conference that was jointly hosted by the University of Nottingham and JISC. Delegation also attended the JA-SIG portal conference hosted by The University of Hull during 2002.

A further source of help for those embarking upon an institutional portal project would be to consult with willing H.E institutions that have already made some progress within their own portal development. Edinburgh were fortunate enough to visit and gain advice from The University of Nottingham, The University of Aberdeen and The University of Bristol, in addition to attending presentations at local Oracle events including a presentation of portal implementation at Glasgow Caledonia University.
Primary factors when considering which H.E. institutions to contact will likely depend upon which portal products your institution have short listed and geographic proximity. The advice and knowledge shared by such visits however has been highly valuable to the Edinburgh team and should be approached in a manner appropriate to mutual benefit.

The following items might act as a high-level checklist of issues that could be covered through contact with H.E institutions and may be used as the basis for an agenda:

- Introduction, background and goals of meeting
- The story so far – progress and demonstrations of portal development.
- Strategic plans and vision including timetable for development.
- Critical success factor – such as Institutional champion or senior buy-in.
- Employee skills, the project team and training requirements
- Integration and legacy systems
- User customization features
- Portal groups and data source
- Portal architecture and load handling
- Portal authentication mechanism and evidence of SSO
- Potential pitfalls and known product problems
- Quick wins and available API’s
- Shared ideas for portal content – focus on **killer applications**.
- Contact details exchange

Any such meeting is likely to require involvement from a number or representatives within the host institutions portal team. This might include the project manager, lead systems developer and perhaps a network or infrastructure manager. These meetings from our experience proved to be most beneficial when approximately half a day was available for adequate discussion. Obviously this depends upon the level of detail being discussed and the level of commonality between institutions. A significant factor is also the mix of those within the evaluation team. Evaluation should certainly involve those with sufficient decision-making status but also those that have a more technical or coordination role.

4.2 A Confident Start – the Shortlist

Following preliminary environmental scanning, the Edinburgh team was in a position to consider their product short list. The short list should be based upon a high level set of requirements for any product. These requirements may relate to strategic integration with existing student, teaching and learning systems such as Blackboard and Banner, or perhaps integration with existing technology and associated skills such as Oracle, Microsoft or Java.

The Edinburgh team in particular wanted to focus upon a scalable solution that was standard based and provided potential for strategic integration. Significant for Edinburgh as for others in H.E was the cost factor. The technology background within MIS at The University of Edinburgh was Oracle based, with an abundance of associated skills. An earlier more specialized portal development had already utilized Oracle Portal v1 for a Criminal Justice and Social Work initiative, and the Oracle campus license made cost an insignificant factor. Oracle Portal had already been proven as a scalable solution within a number of universities. This was arguable the most obvious choice for short listing. Edinburgh's second choice was the open source product uPortal, which was again freely available from JA-SIG. uPortal is an open-standard product using Java, XML, JSP and J2EE. It is a collaborative development project with the effort shared among several of the JA-SIG member institutions. uPortal had also been proven with live portal sites at approximately fifty universities worldwide; although largely within the US. Edinburgh did consider other portal products such as Plumtree and SCT Luminis, but found their costs prohibitive.

The University of Edinburgh during 2002 was seeing a ground swell of demand for portal based services, with elements of typical enterprise portal features being included within development initiatives at College level, within the Library, and by a number of centrally managed departments. With the appointment of a new Principal in March 2002 and a new Vice Principal in September 2003, there has been renewed focus regarding web based learning, teaching and integration tools.
Within this climate it was decided that in order to avoid a 'portal wars' scenario, greater value and learning would be achieved through focused evaluation of Oracle Portal v2 and uPortal v2.1 as the final shortlist.

4.3 Application Evaluation Matrix

4.3.1 The Origins

The University of Edinburgh was certainly not the first to compare relative advantages and disadvantages of Oracle Portal and uPortal. The basis for our own evaluation matrix came from:

- **KUMC (Kansas University Medical Centre)**
  KUMC have produced a much used evaluation matrix linked from their portal home page at: http://www.kumc.edu/portal/ or in Excel format at http://www.kumc.edu/portal/Comparison.xls. An associated presentation is also available at http://www.kumc.edu/portal/OraclePortaluPortal.ppt

- **NIIMLE (Northern Ireland Integrated Managed Learning Environment)**
  A summary report of evaluation is linked at http://www.niimle.ac.uk/docs/Portal Evaluation2.PDF. This report is based upon analysis using the NIIMLE rubric for evaluation. This is available at http://www.niimle.ac.uk/docs/Portal%20Evaluation.PDF .

4.3.2 E.U. Adaptation

The University of Edinburgh ***Decision Support Matrix*** is attached as an Excel spread sheet and PDF.


UoE_decision_suppor
t_matrix_template.xls

UoE_decision_suppor
t_matrix_template.pc

This spread sheet was intended to be used as a work book where numerous people involved in evaluation could enter their personal score, calculate weighted scores and display the summary of all scores on the summary page. In this way the intention was that all members of the evaluation team would have an equal contribution to the decision, so that the outcome could not be argued to be technically or product biased.

4.3.3 Matrix Quantitative Value and Recommendations

Although the matrix was a variation of the KUMC (Kansas University Medical Centre) **rubric**, those evolved in the Edinburgh portal product evaluation found that the complexity of the matrix proved very difficult to use as the basis for product comparison. This was particularly the case when using visits to other universities as the basis for comparison. The outcome was that the evaluation matrix proved more useful as a less formal prompt for evaluation questions and notes, and acted as a tool that could be used to tease out the significant issues. Senior staff involved in the evaluation argued that completion of such a matrix in a formal manner might hinder actual fact finding and less formal questioning, and whilst being prepared to use the matrix as a prompt, did not comply with score completion.

In hindsight it would perhaps have been possible to more formally capture evaluation data in this manner by using a much-simplified evaluation form acceptable to all. Evaluation would be no less rigorous, although the requirement for scoring products would be at a less detailed level. It is recommended that a more formal mechanism at least be attempted as the resulting data can be used for future reference and justification. Any such attempt certainly requires an agreed set of rules for evaluation and form completion by all parties before evaluation commences. I would maintain that although a formal approach to matrix evaluation is not perfect given the aforementioned complexity; it is in our opinion a necessary tool whether for publishing findings, for prompting questions or for later distillation of the pros and cons of particular product offerings.

It was a process of distillation of findings from informal discussion and matrix completion that prompted the Edinburgh team to decided to focus upon factors that they felt were differentiators between the two products, and used weighting consistent with the more complex decision matrix. The project manager captured general feedback from all members of the evaluation team to assess the comparative advantage or disadvantage of the two products. Features seen as differentiators and the associated score was summarized as follows:

Differentiator	**Oracle Portal**	**uPortal**
Skills requirement	15	10
Initial deployment	2	10
Authentication mechanisms	10	15
Portal admin console	12	8
Personalisation & customization	10	15
Scalability	15	20
Technology Integration	12	12
Deployment and hardware costs	6	12
Totals	**82**	**102**

Differentiating factors alone pointed towards selection of uPortal and were broadly consistent with the findings of NIIMLE who concluded that uPortal was a favourable choice for reasons of minimal cost, developer community support, availability of off the shelf **channels** and flexibility. Although the Edinburgh evaluation summary indicated that uPortal was the appropriate choice, however this was not a unanimous conclusion. A final meeting was consequently arranged where the factors critical to project success would be considered

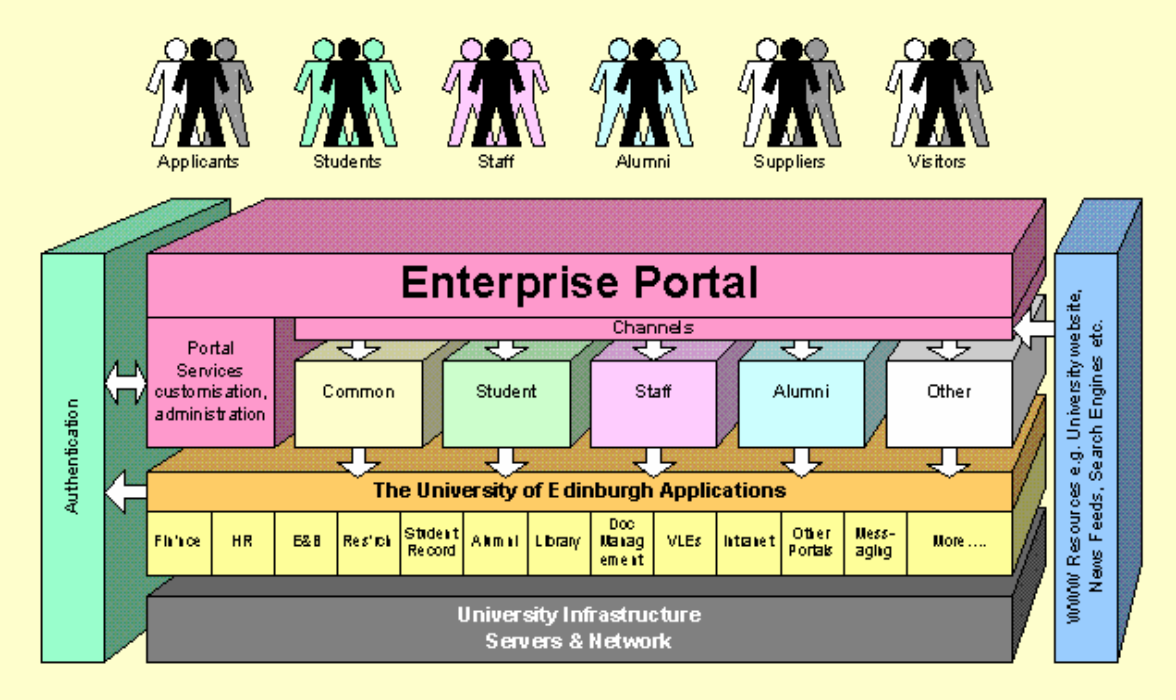
4.4 Strategic Differentiators – Selection in Principle

4.4.1 Broad Implementation – the 'Enterprise Vision'

One of the key considerations for the Edinburgh portals team when considering final product selection was the decision on how broad and inclusive the portal would aim to be. The options for Edinburgh being an institutional portal focusing on corporate MIS system integration for varied user groups, or a truly broad implementation that incorporated the wider university institutions such as the Library, Media And Learning Technology Services and the University of Edinburgh Computing Service. In order to ensure that the product select was most suited to the scope of the project, the project team sought guidance from the Vice Principal and Corporate Services Director. The team was given a clear steer that the project aim would be one that maximized inclusiveness.

The Portals Steering group was at this time reformed from its origins with the ESP project in order to manage a wider contribution of stakeholder interests.

The project team within MIS aimed to inform the group and aid the decision making process through presenting its visionary proposal for the broad implementation of an enterprise portal both for the benefit of the Steering group and a wider audience of senior managers within the university. The following diagram was used to illustrate this broad inclusive model.



The diagram illustrates that the enterprise portal should be able to accommodate all user types that are involved with University life, and that the portal components should consist of modular building blocks referred to as channels or **portlets.** The diagram also shows that the portal should complement existing infrastructure and corporate systems, rather than attempting to re-invent them.

This clearer definition of the University's portal ambition was a decisive factor when coming to a final conclusion regarding portal product selection.

4.4.2 Critical Factors

The portal evaluation team met at the end of March 2003 in order to confirm a final product decision. All members of the team were invited to propose what they felt were the key factors that would impact upon project success. The following table resulted:

		Critical Factors
		Personalisation
U	*	Customisation
		Breadth and Flexibility of Services
U	*	Broad UoE Integration
		Devolved Administration
U	*	Common Published Standards (Service Provider Acceptability)
		Development Productivity
O	*	Security (SSO, RSO, Common Authentication)
		Product Support (inc. external skills availability)
		Ease of Integration (portlets)
U	*	End User Acceptance / Accessibility / Usability
		Concept Buy-In
		Track Record
		Resilience and Contingency Access to Services
		Future Proof, Flexibility, Exit Strategy
		Development User Community Support
		Other Factors
		Cost: Staff/ non-staff

The table shows that those factors with an * were those that the group felt to be most critical. A vote was then taken by the group members to indicate which product the members felt was stronger in these particular areas. The result was conclusive, that uPortal was felt to be a stronger product on all but one area.

There was no evidence that uPortal could not be implemented in a manner that would ensure adequate user and data security. uPortal had been earlier evaluated as being stronger in terms of authentication mechanisms. This judgement was based on potential, as uPortal had proven examples of production implementations in conjunction with authentication systems such as **CAS** and **PubCookie**. These together with uPortal were considered preferable to the Oracle option, whilst based on uPortal out of the box there was an argument that Oracle Portal was stronger. One representative in particular argued that Oracle comes with its own authentication tool, and is bundled with greater administrative functionality that could potentially help manage administration and security. This was conceded at the meeting, but the overall decision and general feeling was that uPortal offered the greatest flexibility; it did not so strongly tie its development path to any corporate branded vision of a portal, and would through its open standards status be more acceptable to a wide mixture of university departments.

4.4.3 The Need for Further Evaluation

The decision was taken to proceed with one product (uPortal) as this was perceived as the best fit for the institution given the scope of the vision and factors that were considered critical. There were however some concerns voiced particularly given the Edinburgh history of Oracle development. These concerns required some more detailed technical experience of the product and associated technology. Clarification of security model, middle tier technology stack, potential for reduced sign on and compatibility with existing applications was required. It was therefore agreed by the team that uPortal would be selected in principle, and that all further work towards proving the concept would be focused upon uPortal

5. Further Evaluation – Selection in Practice

Further research and development within this case study will refer to 'MyEd', which is the name that has been chosen for The University of Edinburgh enterprise portal. The following part of the case study 'Selection in Practice' largely relates to the feasibility of a uPortal implementation at The University of Edinburgh. The document no longer considers Oracle Portal options and concentrates upon key specific issues relating to how uPortal can be best implemented at the University of Edinburgh.

5.1 Technical Investigation

5.1.1 Security

The enterprise portal has a requirement that portal functionality is available to users from anywhere on the world wide web, without imposing onerous requirements for users to configure their browser or download additional **Virtual Private Network (VPN)** software. Recognition was made that staff and students may not have local administration capability over the client machine.
This has posed the problem of how we can offer production system and database security, whilst offering customers a seamless service from any location. The resolution has had to be a value judgment of what constitutes reasonable security.
Security of the portal needs to be considered at different levels. The main areas considered at Edinburgh include:

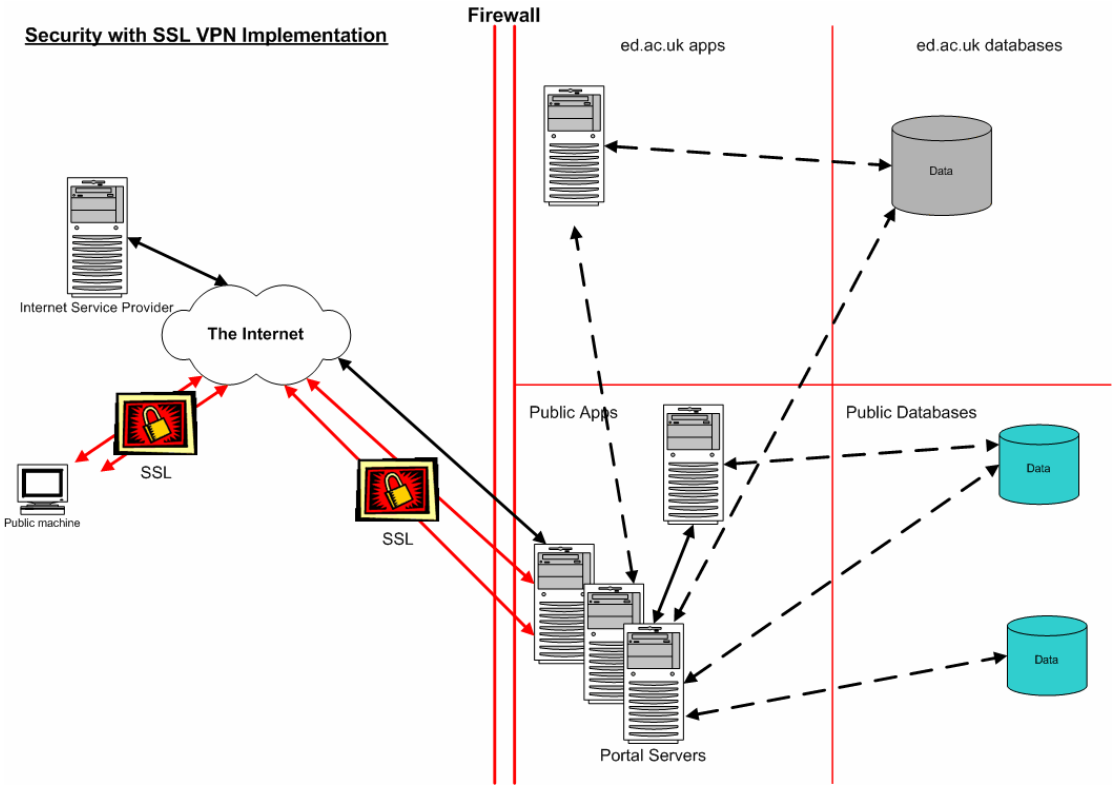
- Encryption of data transfer
- Authentication
- The type of service and data being made available and where the user is logging in.

Secure Socket Layer:
Edinburgh has chosen to use **SSL (Secure Socket Layers)** in order to provide additional security for data transfer. This is a protocol that has been approved by the Internet Engineering Task Force (IETF) as a standard.
MyEd uses SSL to encrypt all traffic between the browser on the users workstation and the portal server. The use of SSL is apparent to the portal user from the use of the URL format "https://www…" rather than the more familiar, and unencrypted, "http://www…." format. SSL may also be indicated by the use of a 'padlock' icon or similar on the browser.
The main purpose of SSL is to avoid unauthorised third parties 'eavesdropping' on sensitive data as it is transmitted to and from the users workstation. SSL is widely used for conducting financial transactions over the Internet, e.g. online banking. SSL is already widely used within The University of Edinburgh, and is currently in use with the ESP student portal.

Authentication
In addition all MyEd users must provide a valid username and password to access the portal. This password may also provide authorised users with access to application and services without further challenge – i.e. single sign on or may be the starting point for additional authentication challenges. Authentication provides a further level of security beyond the basic IP restrictions used to prevent access beyond the 'Ed Only Domain'. This will be expanded later.

Firewall and channel Restrictions:
The MyEd portal servers will run in the public zone and act as a gateway for services running behind the security of the existing firewall. The firewall will, as at present, continue to exclude unauthorised users from accessing services. This configuration, combined with SSL, is increasingly deployed by service providers to provide secure access to services from the Internet and is often referred to as a SSL VPN.

The following diagram represents the proposed SSL VPN implementation for MyEd.
This illustrates user interaction with the portal from the Internet using SSL with the portal communicating with secure services behind the firewall using unencrypted http.



In order to comply with the above description of an SSL VPN implementation and the University of Edinburgh security standards, the client machine trying to access 'Ed only' services must communicate with those services **only** through the MyEd portal. It is not adequate for the portal to simply launch these services from a channel into a new browser window, as this then directs the client machine to the 'Ed only' service and circumvents the portal.

Access to 'Ed only' services can only be provided from outside the University of Edinburgh if the service functionality is held and displayed within a native uPortal channel. This may be satisfied by developing new channels using Java and or XML technologies, but also by using the uPortal CWebProxy channel. The later would additionally allow some legacy applications that meet adequate coding standards to be presented as MyEd channels with global access regardless of their security zoning.
Failure to comply with the SSL VPN standard will cause services to be unavailable from outside the University network in the short term. Adequate communication will be developed within the portal to inform users of this disclaimer. Over time we expect to be able to accommodate all applications that do not comply with the above SSL VPN implementation by managing migration of these individual applications from the 'Ed only zone' into the 'public zone', whilst providing a more restrictive write access to the corresponding database. We do not believe that uPortal as a product selection adds any barriers to our plans for security, and in fact through it's out of the box channels actually facilitates the possibility of an SSL VPN implementation.

Finally, business and data owners are likely to express concern that following authentication a user may walk away and leave the potential for data to be exposed. Edinburgh has adopted a flexible system time out solution that is we believe possible to implement with uPortal. This, with appropriate communication puts the onus on the user to consider their personal environment. Any business owner who is responsible for the content of a particular channel such as HR 'your personal details' will ultimately retain the right to demand re-authentication to that channel where they feel an additional level of security is appropriate.

On the basis of the above proposal, we believe that we can satisfy reasonable security aided by uPortal's channel development models, it's potential for CAS integration and it's potential flexibility in handling user access and time outs is conducive.

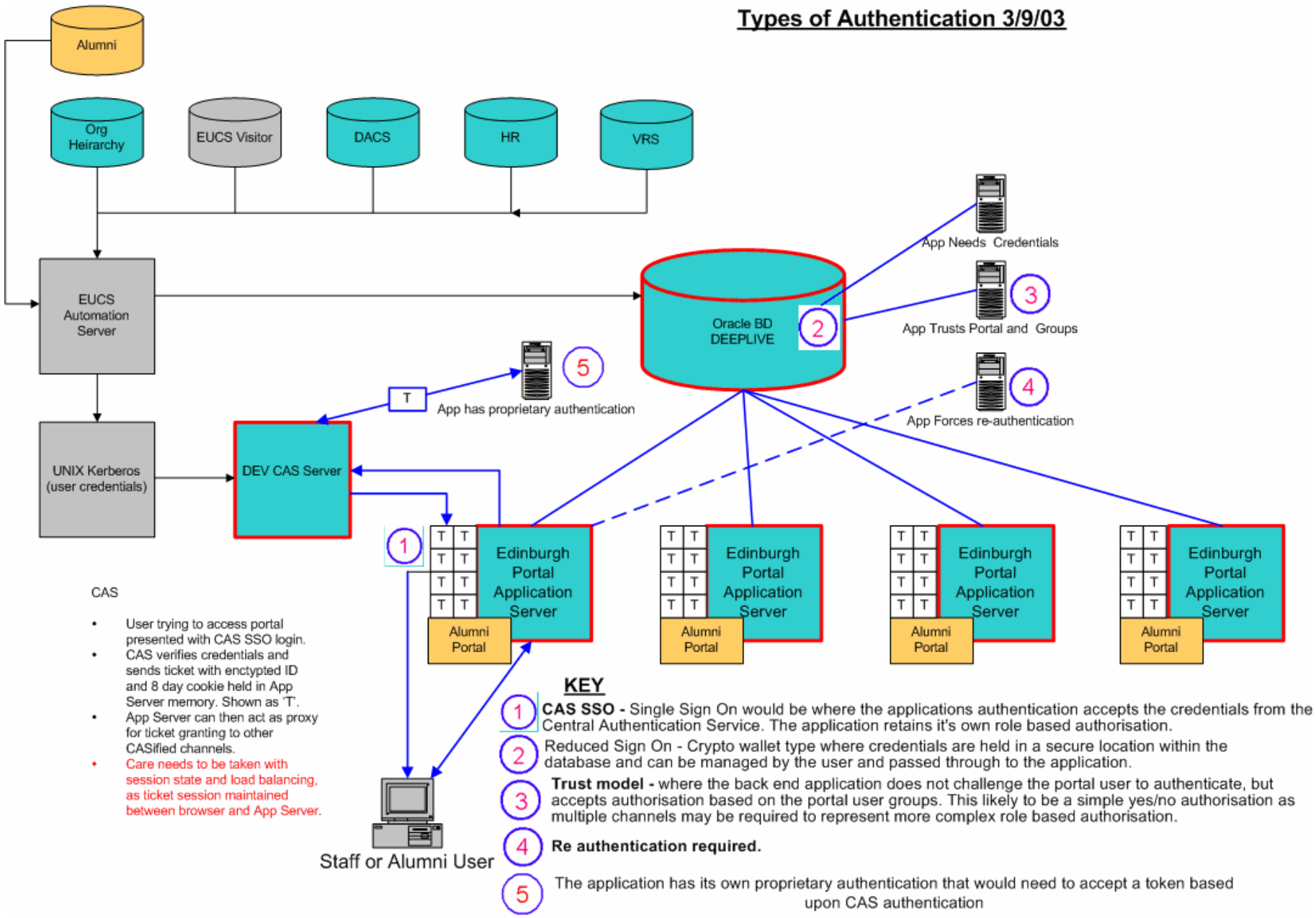
5.1.2 Authentication - Steps to Reducing Sign-On

Although authentication is not a specific uPortal product feature, the reader may value an overview of the University of Edinburgh's plans for integrating uPortal with a variety of authentication options. This again for us illustrates the flexibility of the product and approaches that have been condoned by the uPortal community.

Edinburgh proposes to offer a central authentication service, where users authenticate in one secure area for which we have chosen a **Kerberos** realm to hold user credential data. This will be implemented in conjunction with the software developed by Yale University, commonly referred to as Yale CAS (Central Authentication Server) version 2. This solution has been used by institutions within the US in conjunction with a uPortal implementation. The advantage here is that CAS uses a time limited cookie based certificate to permit applications that accept this certificate to allow single sign on. The Yale model however adds security in that following initial setting of passwords, the CAS cookie does not proliferate passwords around the network as it only holds the users encrypted ID. The time restriction of the certificate also restricts its potential for misuse.
Not all systems will be able to be configured for CAS however, such that user credentials may have to be stored and passed to the recipient application in some cases. Edinburgh has referred to this model as offering Reduced Sign On.
These options include the use of a tool called **Crypto Wallet**, which is again an open source development compatible with uPortal, that stores encrypted user credentials within the database and passes them from the database to external systems in order to simulate SSO. Crypto wallet is an option we have not yet proven, although some further information may be found at: The University of British Columbia or for those registered to the JA-SIG archive information
An alternative may be where systems trust the portals authentication, and offer unchallenged access to users based on the user being populated within a uPortal group held within the portals database. We also have other proprietary systems within the University that have their own SSO authentication. The portal would need to handle this through initially gaining agreement from the proprietary system owner that the portals authentication was trusted. Then to access the system without challenge, a ticket would be passed from the portal to that proprietary system containing additional shared secret information to verify identification of the individual moving between the two systems.

These options for SSO and RSO combine to make quite a complex but pragmatic approach to enable users to pass between systems without needing multiple passwords. There are some issues inherent within this, in that different models may be considered to have different levels of security. Further more the storage of credentials separately from the central CAS model may mean that password could become out of synch and require user intervention. The value of these approaches and firm agreement of their acceptability have yet to be confirmed, whilst as technology changes the roadmap to SSO will also likely change. Our current approach would be to offer these options to our customers, and through informing them of the relative merits allow them to decide the most appropriate model to adopt.

The following diagram illustrates the options for RSO and SSO, where each option can be applied to the whole portal, of which Alumni is the first to launch. Of the options shown

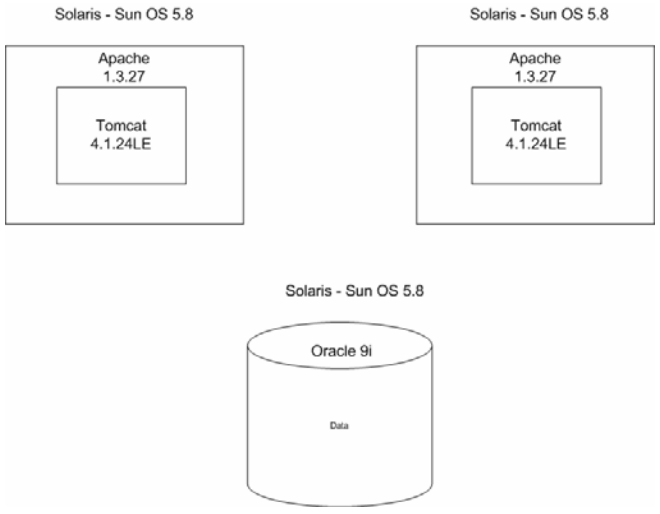

Types of Authentication 3/9/03
Alumni
Org Heirarchy
EUCS Visitor
DACS
HR
VRS
EUCS Automation Server
UNIX Kerberos (user credentials)
DEV CAS Server
Oracle BD DEEPLIVE
2
App Needs Credentials
3
App Trusts Portal and Groups
4
App Forces re-authentication
5
T
App has proprietary authentication
1
Edinburgh Portal Application Server
Alumni Portal
CAS
User trying to access portal presented with CAS SSO login.
CAS verifies credentials and sends ticket with enctypted ID and 8 day cookie held in App Server memory. Shown as 'T'.
App Server can then act as proxy for ticket granting to other CASified channels.
Care needs to be taken with session state and load balancing, as ticket session maintained between browser and App Server.
Staff or Alumni User
KEY
1 CAS SSO - Single Sign On would be where the applications authentication accepts the credentials from the Central Authentication Service. The application retains it's own role based authorisation.
2 Reduced Sign On - Crypto wallet type where credentials are held in a secure location within the database and can be managed by the user and passed through to the application.
3 Trust model - where the back end application does not challenge the portal user to authenticate, but accepts authorisation based on the portal user groups. This likely to be a simple yes/no authorisation as multiple channels may be required to represent more complex role based authorisation.
4 Re authentication required.
5 The application has its own proprietary authentication that would need to accept a token based upon CAS authentication

5.1.3 Architecture

The uPortal framework will run with any application server that complies with the Java Servlet 2.2 and Java Server Pages 1.1 specification. Following investigation of the application server options including consultation with the uPortal suppliers, IBS/Unicon, the team have decided to run uPortal in conjunction with the Apache Tomcat application server. MIS will be using uPortal 2.1.3 for the initial development. It was found that the Oracle 9ias option had a number of problematic issues relating to shared libraries and conflicts with parser versions, that the team had insufficient experience to resolve at the time. This is not to say that the complexities of Oracle 9ias configuration could not be overcome given time.
Some considerable work with this technology has proven Tomcat to be a reliable component, with uPortal having a considerably smaller footprint to install than the comparative Oracle Portal. UPortal was also very straightforward to install in its default form. This proved invaluable for early familiarisation with the system.

The following provides an overview of proposed production architecture as at December 2003, based on expected concurrency reaching about (5% of 7000 Staff and 0.1% of 130000 Alumni) 480 users initially. The concurrency is likely to increase where application use becomes mandatory or is considered a 'killer application'**,** however consideration needs to be given to the fact that some channels will be calling applications that run on servers external to the portal.
Sun Fire Blade servers or equivalent will be purchased. Based on the Blade server specification at the time of writing these will be 650 MHz CPU, 2GB RAM. Based upon the sizing recommendations from the JA-SIG uPortal Sizing Study we can reasonably assume that each server will support approximately 100 -150 concurrent users. A minimum of two servers, each costing approximately £3000, will be required for the Alumni Portal launch in January 2004 (the servers themselves will be required by end November 2003). These will run in the existing Sun Fire Blade B1600 Intelligent Shelf.
Further servers may be required in financial year 2003 for the launch of the full Enterprise Portal in August 2004. Load testing work, backed up by our experience with the production Alumni Portal, will be carried out in the first quarter of the year to assess this requirement. Further servers may be required during financial year 2004 depending on take up of the Enterprise Portal - a minimum of two additional servers for this purpose will be included in the financial year 2004 budget.

The following diagram shows a simple representation of the middle tier architecture, aiming to provide the reader with version numbers for reference. It is anticipated that a **'round robin'** approach to load handling will be initially investigated, with the possible but more expensive contingency of a Cisco hardware load balancer.



5.2 Developer Evaluation

5.2.1 Compatibility with Legacy Applications

The UoE decided that a component of our evaluation of uPortal should be to see how we might integrate our legacy applications with uPortal. This task fell to those team members building channels to fit with the portal.

The uPortal product offers a number of options for those wanting to deliver channels that are based upon legacy applications. Some are options that Edinburgh cannot use for accessibility reasons, as they make use of iFrames, which would not comply with WC3 standards. Other options that we have considered for handling legacy applications through uPortal include:

- **CWebProxy**
- Application link
- Modular redevelopment.

CWebProxy is a type of uPortal channel that is offered as a development tool with version 2.1.3 of uPortal. This channel requires an application to be self-contained and to be coded to XHTML standard. It should also not be using frames. An application that meets these criteria can then be wrapped within a CWebProxy channel. This option can be restrictive in the way it handles channel behaviour, as for example channel sizing may render differently depending upon the nature of the source coding. It is however a very powerful out of the box tool, and seems to be a quick method of sucking content into the portal. It additionally has the advantage of allowing the client machine to interact only with the portal, which may be useful for security zone management and the implementation of firewall rules. This is the primary uPortal tool for integration of legacy applications.

Legacy systems may be linked from the portal through channels that simply launch the application in a new browser window. This method however directs the client machine to the application itself, which actually takes the interaction outside the portal. When employing this method we have ensured that new browser windows are opened that do not use the full screen, so that the user is more aware their portal session is still open. Such an approach is limited however in that certain browsers such as Mozilla for the window to be full screen.

The third option with uPortal would be to do some re development this could be approached in a number of ways:

- Full application redevelopment either to comply with CWebProxy or a native Java channel
- Minimal redevelopment, where the application simply passes prompts or summary information to the channel in XML formal that is transformed into HTML. These type of developments offer only limited functionality through the portal, but may work in conjunction with an option to also launch the full application in a new browser window.
- Modular redevelopment, where the legacy application can be redeveloped in parts and delivered through a portal CWebProxy or java channel. This may make the task of legacy redevelopment less onerous.

At Edinburgh, we aim to use CWebProxy to deliver new Cold Fusion based applications, and have explored using this tool for legacy Cold Fusion applications with some success. The tool comes with a Jtidy facility that attempts to clean up any coding to an XHTML standard. Larger Oracle applications that we use, we plan to simply offer XML based information prompts and links from the portal to the fully functional application external to the portal.

The experience at the UoE is that the CwebProxy tool offers the potential advantage of some quick portal content for those compatible applications. It has not however proved effective in delivering complete large and complex applications such as Oracle HR. We have however been able to deliver some component parts of the larger applications using this tool. The channel that simply offers a link is for us a temporary solution that really only has the potential to offer single or reduced sign on benefits. Longer term we anticipate that, legacy applications will require redevelopment, which will be done via a uPortal channel delivery mechanism. This needs to be a robust message however within the institution in order to engage business partners understanding and approval.

At Edinburgh we aim to evolve a preferred policy for channel development and the handling of legacy applications, however it is important to discuss, agree and document at requirements capture stage how each channel is proposed to be delivered and what implications this has for how the channel behaves.

5.2.2 Channel Types and Categories

Portal product choice may depend upon the types of channels your institution prioritises for inclusion. For example an institution that plans to deliver only 'corporate' (largely Oracle) administrative applications might be better placed using the oracle Portal product that offers some in built integration with Oracle products such as Oracle HR. However the objective at Edinburgh was to select a product that had greatest potential for a broad cross section of channels from all parts of the institution. A structured approach to managing and presenting these priorities has proven useful in confirming our selection. This will likely need to be driven through a representative project board or steering group.

When prioritising the likely content of the Edinburgh MyEd portal, initially the project team were looking for a balanced representation of channel types within the first launch phase. This was important in building the culture of an inclusive portal, with something for everyone, whilst it was also important for proving the various models for channel development.
The balance that MyEd aims to achieve, falls between institutional application content, added value content and transactional 'killer application' content. The objective being that channels offer sufficient scope to be considered truly institutional, enough choice not to be sparse and permit user customization, yet including systems that attract repeat usage; commonly known as 'killer apps.'
The process for channel content prioritisation began with the project team providing a framework for broad cost benefit analysis. The portals Steering Group then discussed this cost benefit justification in order to refine the list of proposed developments. This gave consideration to the amount of available development resource.

The classification and priority tables provided in **Appendix 2** illustrate the channels proposed for the Edinburgh launch. Many of these were inevitably uPortal system-based channels that were considered important for the usability and administration of MyEd. Other channels were included because they were considered 'no brainers'; i.e. they were extremely easy to implement and yet added some value to the user experience. These were channels that were either easy CWebProxy implementations or simple **RSS feeds**. The document provided by Hull Universities Fair-Portal project is useful when considering portal content and requirements. Further explanation of why application-based channels offering institutional integration were selected is provided in 6.1.2.

The table in **Appendix 2** however has been useful for us in providing a high level framework from which to link more detailed channel specifications. It is hoped that this framework may be reused and adapted wherever required.

Appendix 3 illustrates the template used in Edinburgh for recording business analysis meeting notes and the framework for requirements capture. This has proven very useful in forcing certain portal issues from the start such as channel ownership, responsibility for testing, channel names, categories etc. The template allows a draft channel proposal to be discussed in a structured format and has permitted shared access and contribution to channel specification. We have found that a standard form has the benefit of offering quicker reference to information, and particularly when many portal channels do not require detailed technical specification. Where further detail is required we have supplemented the template with a detailed document of more flexible structure.

As has been stated the portfolio of channels selected may impact upon which portal product is appropriate within your institution. We believed that uPortal was more compatible with our broad portfolio due to the flexible nature of its open source roots. This factor certainly remains a positive reason for maintaining our uPortal initiative.

5.2.3 The use of Groups

uPortal as a product offers the ability to manage channel delivery personalisation through use of groups. This was an area that the team felt it important to engage with in order to assess how well uPortal might be able to handle this important concept.
A fundamental purpose and benefit of the portal is that it can recognise the person logging in and will personalise the default channels delivered in accordance with that person's known 'profile', based on the default 'demo' layout.
In addition a 'pick and mix' customisation will be offered where users can choose to change the content and default layout they receive.

Central to dynamic channel management is the use of groups.

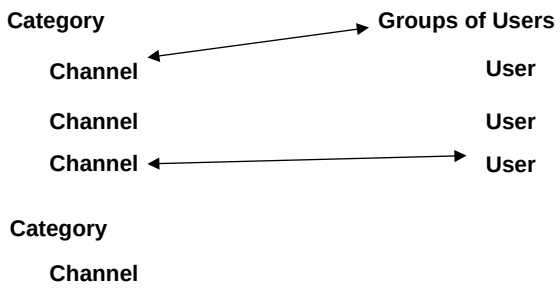
What are uPortal Groups?

Within uPortal there are two types of group:

- Groups of channels
- Groups of users

Groups of channels in uPortal terminology are called "Categories". These categories are simply required to logically index the catalogue of channels in the portal, so that searching, selection and customisation of the portal content is made more intuitive.

Groups of users provide the mechanism whereby channels can be delivered to a specific range of users as part of a personalised default layout. Channels can therefore be associated with a combination of groups of users or individual users as shown simply below:



Groups of Channels

Our initial specification for channel categories was largely driven by the fact that the portal provides an ideal mechanism for dissemination of news, resources or reduced sign on to applications. These functions within The University of Edinburgh context will be contained within the following initial categories:

- News
- Application
- User Support
- System Admin (uPortal)
- Entertainment
- Resources
- Community
- Intranets

It has to be said that the category choice has to date only been through liaison with the portal steering group, MIS department and The Library; the latter having a recognised history of experience in data categorisation. This categorisation however is expected to evolve prior to launch and can be changed in uPortal with minor disruption.

Groups of Users

Groups of users with permissions to channels will see those channels presented as available to the user for selection. It is recommended for the first phase, that channel availability be delivered on a broad basis by default, but on an individual or restricted basis where channel requirements explicitly state this is appropriate.

3.21 User Groups are required for:

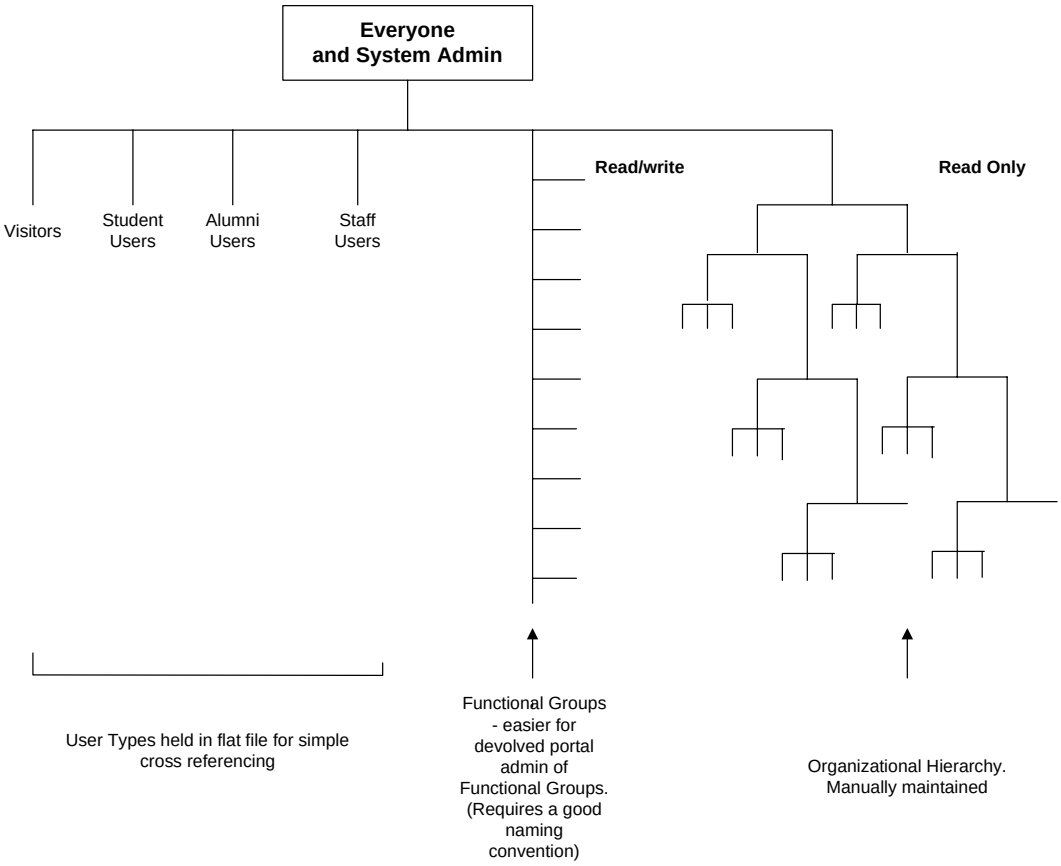
1. **Broad Channel Availability – based on user type** (e.g. student, staff Alumni etc as per the diagram in 4.4.1)

2. **Targeted Channel Availability – based on explicit requirement** (where the channels is deemed sensitive or perhaps otherwise specific to a subset of users)

Both of the above user groups can be used to help control user access to systems in conjunction with different models of application authentication.

Groups Structure

The Edinburgh team aimed at being able to deliver channels initially based upon high-level groups such as User Type (shown towards the left of the wire diagram). Any greater granularity required for channel delivery would likely use the high-level organisational units (represented by the tree structure to the right of the wire diagram). The Organisational Hierarchy already defined many of these structural groups within the institution, so this gave us a starting point.
Any additional requirements not provided for by the Organisational Hierarchy will require the creation of 'functional' groups that exist for specific tasks that cut across institutional structure. E.g. when delivering the MIS Projects web site as a channel to a range of staff spread across many different organisation units and hierarchy levels. Functional groups would be manually populated, and may provide a basis for devolved channel management over time.
The following wire diagram was proposed as the basis for the structure of group data:


Everyone
and System Admin
Visitors
Student
Users
Alumni
Users
Staff
Users
Read/write
Read Only
User Types held in flat file for simple cross referencing
Functional Groups - easier for devolved portal admin of Functional Groups. (Requires a good naming convention)
Organizational Hierarchy. Manually maintained

Data Provision

One important decision for The University of Edinburgh was the choice of appropriate repository for group information, and how the management of such groups could be devolved more widely to channel owners. The team had some concerns about the usability of the uPortal Group Manager channel, and for the potential for its devolved potential for database corruption. The team's preference was to use a directory structure, where data administration would be governed by the directory software rules. This option however proved unworkable in the short-term due to:

- Time restriction prior to launch
- Directory management being a relatively new territory for MIS
- The institutional Directory being outside MIS control
- Hardcode links between an LDAP directory and the uPortal Group Manager that could if devolved be easily broken.

It was decided that the Enterprise Portal first phase would store its data using an Oracle database option. This was largely due to timescales, but also due to MIS control and familiarity with Oracle databases. The database schema also comes with uPortal as standard and can be built upon rather than developed from scratch.
It was recognised that again the database source for group management would need to be revisited after initial launch. This might be an area that other institutions should allow more time to resolve.
It has been suggested that a separate **LDAP** Directory (possibly using OID 'Oracle Internet Directory') could be used to take data from the Universities central Active Directory using the **LDIF** (LDAP Data Interchange Format) standard and might offer a more managed data source environment. This directory based implementation would also more closely conform the uPortal implementations within the US where centrally managed Directory data sources have been the norm.

It should be noted that the database would also provide a repository for user attributes. These might include a core set of data that might then be available for any channel development. Such data was initially specified as requiring the following list, although the **Eduperson** data attributes were largely adopted in practice.

- Forename
- Surname
- UUN
- Email address
- Department/school/college
- Phone number
- Voyager bar code
- Staff Number

5.3 Widening Awareness and Stakeholder Participation

5.3.1 The Steering Group

The MIS management team were conscious of the need to guide The University of Edinburgh's portal initiative through gaining senior buy-in, leadership by consensus and establish a mechanism for handling policy, conflict and debate.

With the onset of ESP, a Steering Group was established, and convened by the University's Vice Principal. With the wider scope of the MyEd enterprise portal however, the Steering Group was joined by a number of business area directors such as from the Human Resource department, Communication and Public Affairs and from the Development and Alumni department. The group convenor changed with the retirement of the then Vice Principal and was taken over by the newly appointed Corporate Services Director who was joined in attendance by the newly appointed Vice Principal.

The Remit of the group was defined as:
The steering group will advise MIS on

- The development of functionality within the Enterprise Portal and ESP
- Help to incorporate new services into the Enterprise Portal and ESP
- Offer a forum for the resolution of service related problems
- Report progress to the Management Information Committee

The steering group currently has representatives from the three Colleges, Students (Edinburgh University Student Association), MALTS (Media and Learning Technology Services), The Registry, EUCS (Edinburgh University Computing Service), The Library, HR, Development and Alumni, Communications and Public Affairs and MIS. The group meets at appropriate times to fit in with the development of the service. There would expect there to be no more than 3 or 4 meetings of the group per year.

Some of the issues discussed are iterative at each meeting such as portal progress and future plans, although proposals are submitted relating to specific issues such as security, communications strategy and portal content. For high profile content, where policy decisions are required, then these may be treated as topics themselves.

5.3.2 Establishing the Team

There were a number of issues around establishing the Enterprise portal and the services delivered through it that suggest a team-based approach would be most appropriate. MIS has been engaged in general discussion, following which agreement was reached by the management team that a team based approach to the enterprise portal was appropriate. It must also be noted that this is a project team and not a line management structure. Line management has remained unchanged.

Scope
The portals team is responsible for ensuring that the portal technology and appropriate standards are established such that MIS are able to competently deliver channels required, involve others in the establishment of new channels, and do the portal administration to deliver an effective service. The portals team is expected to remain until completion of the following:

- The day-to-day portal service is run through Customer Services help desk
- The portal business area support representatives have been established for devolved support
- Development for channels is a well-established skill that the MIS department all understand and use.

It is anticipated that the portals team will not need to continue beyond August 04 in its current form, but for the year 2003/2004 has been responsible for a programme of work encompassing the following projects:

- Exploit Enterprise portal (estimated as 320 days and revised up to 479 days)
- Authentication and single sign on (130 days)
- Alumni portal content (75 days)

The total resource requirement anticipated was 684 days, which when divided by the number of effective working days over the year (210) gave an approximate number of full time employee (FTE's) members required for the team i.e. 3+.

Main activities of the team were to include:

- Understand the technology
- Deliver 'pilot channels'
- Establish the service
- Plan and run projects through 2003-04

Although 3+ FTE's provide a resource basis for the team, it was recognized that these wouldn't be people dedicated 100% of their time to the portals programme of work. Consequently the team structure that was specified included:

- Programme manager 80%
- Project manager and interface coordinator 60%
- No 1 - Lead developer 80%
- No 2 - Developer 80%
- No 3 Developer 40%
- Infrastructure technical coordinator 10%

To supplement this structure a second tier of largely developers have been exposed to the enterprise portal program and have been involved in training.

In reality, we have found that the core team has required supplementary help through a third developer being involved perhaps 50% of the time, whilst the infrastructure coordinator has also been involved about 30% of their time.

Training

A training programme for the project team was established based upon a requirement for skills within the following areas:

- **Java Server Pages (JSPs)**
- Java Servlets
- Enterprise Java Beans
- **Java Database Connectivity (JDBC) API**
- **XML**
- **XSLT**
- **ANT**
- **SQL**

The skills that existed within the MIS developer pool were largely Oracle and SQL oriented, such that the programme of training that resulted included three essential courses:

1. Core Java language
2. Java web development and JDBC
3. uPortal fundamentals
4. uPortal advanced.

The training certainly gave a good grounding, although developers found that putting these new skills into practice shortly after course attendance was important. The coordination and timing of courses to coincide with development work is strongly recommended.

5.3.3 Institutional PR

The project team has been keen to spread the portal word, and particularly increase awareness and buy-in by senior staff within The University of Edinburgh. The strategy to date has been one that targets key stakeholders and department managers generally, whilst also engaging in broader publicity through University periodicals. We anticipate that the communication will broaden over time, particularly nearing service launch.

The University of Edinburgh have a number of important strategic committees that oversee central management (CMG) and management information (MIC). The team aim to present the pilot portal to these groups in order to extend influence beyond the current Portals Steering Group.

A series of road shows have been held to present the MyEd prototype to heads of departments within the administrative and business areas of the University. It is anticipated that this will be extended to academic departments.

In addition the team have submitted articles to appropriate University periodicals, this is particularly useful either just prior to a project milestone, or following a milestone. We have used this option as a method for informing the wider community of key decisions such as the selection of uPortal software, and aim to submit update articles following completion of testing and just prior to launch.

It is recommended that any eLearning or web technology events that are held within the institution are also attended by a portals delegation. The use of rolling presentations at matriculation, or other events with a captive audience might prove useful, so it is worthwhile maintaining a diary of any possibilities. We have perhaps been less adventurous than implementations of uPortal in the U.S. where for example California Polytechnic have used a golf buggy with flashing lights and data projection to create maximum impact. Portal logo design can be particularly useful here as we are aware of images being projected onto the sides of buildings and logo stickers being handed out to students during freshers week.

The actual launch of the portal is likely to benefit from publicity on a number of fronts, such that the MyEd team has made some preliminary plans that include:

- A joint email to all department heads for onward circulation, publicizing the launch. This method proved effective when launching ESP through a similar publicity agreement between the Registry and MIS.
- The University of Edinburgh Web pages as a mechanism for advertising the portal launch, using a home page graphic based headlines linking to further detail.
- In addition a posting could be placed upon the University Web site News page and on the Staff page.
- In addition to established publications, the team plan to submit an article to the HR department for their news updates.

A limited poster campaign could be used at launch, as these are also useful for reuse with subsequent promotional events, as would be a small number of T-shirts branded for similar promotional events. One of the most useful items used at ESP launch was the ESP business card sized ‘flyer’, that the team would recommend using for the Enterprise Portal. This is useful for staff or Alumni to keep in their wallet or bag and may help improve system usage by providing a handy reminder of the login URL.

6. Integration

6.1 Key Strategic Institutional Links:

This section of the case study refers to the prioritisation of MyEd content within the context of providing a broad institutional portal. The team felt that there experience of launching ESP to students provided some lessons in terms of ensuring that priority content needed to pull together some key strategic tools within the university. The intention here was to put a marker down within the institution and hopefully therefore lessen the likelihood of portal wars by encroachment.

6.1.1 The Users: (Staff, Alumni and Students etc)

The vision of an enterprise portal at he University of Edinburgh was one of broad inclusion such that any chosen framework would offer the potential for shared use by numerous user types. The diagram in 4.4.1 illustrates the variety of user types expected to ultimately use the portal, and includes: students, staff, visitors, alumni, suppliers and applicants.

Initially the MyEd portal had been discussed with the intention of being launched to staff. However even before the portal selection project had been initiated, a requirement was communicated from the Development and Alumni Service for the need for a new and more automated framework for contacting and facilitating communication between the university alumni community. The requirement was to launch a fundraising campaign in January 2004 through an on-line questionnaire, but also to offer Alumni a means of communication between each other. The later was a messaging system intended for initial contact between alumni, and allowing them to continue communications as they wished.

In tandem with the Alumni developments were the priority channels for a staff portal launch in July 2004, shown in **Appendix 2**. The two projects had to ultimately be connected through their use of uPortal in the form of MyEd, which has required some over-arching coordination and communication. The types of areas where this has been most evident has been:

- The centralisation of authentication and agreement for unique format of user Ids.
- The centralisation of core data feeds and personal attributes from the Universities Automation Server.
- Coordination of default templates that control layout for user types. This includes agreement on which channels can be made available to all user types.
- General coordination of portal ‘skin’ look and feel
- Regular progress meetings and problem solving discussion.
- Coordination of shared training programmes.
- Reporting to a common steering group.

The alumni launch expects to target an alumni community of around 130,000; although of these, a letter announcing the fundraising campaign will be made to approximately 90,000. Of this community, we don’t expect to exceed a concurrency of 130 users at any time (this based on previous years being a fairly generous estimate). Having the alumni campaign launch provides the benefit of having a community of users that will be making limited use of the live MyEd. It has helped us focus in terms of getting the system working to a known level across a multiple application server platform. It has also helped to widen the knowledge and familiarisation of uPortal both within the MIS department and the University as a whole.

There are however some disadvantages of pushing towards the live alumni community, which include:

- Having to simultaneously manage a live service alongside significant ongoing development following launch.
- Having a live community of A-typical users in terms of location and usage times, but also with unknown operating systems and browser platforms.
- The ongoing overhead of over-arching coordination between alumni and staff services.

In balance it is now felt that the alumni launch target date has been valuable, and the issues it has raised have out-weighed the disadvantages. In particular, the alumni channels have proven the ability for Cold Fusion developed channels being delivered through CwebProxy to also be configured for CAS authentication. In fact for those considering a similar dual approach; once the areas of commonality have been identified and a control process agreed, the actual channel development can remain relatively autonomous in terms of project management.

6.1.2 The Applications:

The priority channels shown in **Appendix 2**, highlight those seen as the highest priority for the MyEd launch to staff. These include developments for the following areas:

- Web mail (predominantly Outlook Web Access and IMP mail)
- Announcements system
- The Registry's on-line student record system called WISARD.
- **WebCT**
- The Library
- Human Resources

When considering uPortal as a possible enterprise portal product, the team aimed to include key legacy administrative systems. These for us included the WebCT **VLE** application, which provides a framework for academic staff to deliver computer-based teaching, and our WISARD application that provides a web interface for the student record. WISARD also offers an interface into which staff may populate a URL for web based course resources that could be fed through and called from a portal. Together with the Library online systems, these applications provide the 'glue' between staff and students and establish this role for MyEd within the institution.

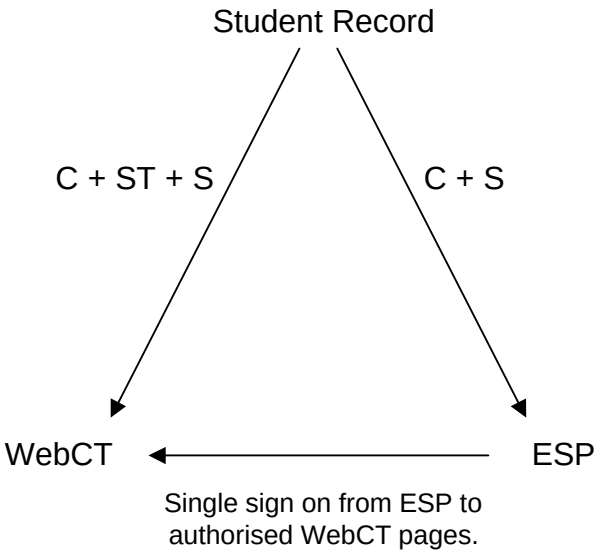
The team also aimed to concentrate on building channels for those high profile systems that had become trailblazers within the institution. In Edinburgh, the College of Medicine had two such VLE's known as EEMeC and EEVeC. The EEMeC/EEVeC team were recognised as having the drive to more quickly push for MyEd integration.
Further types of channels that we considered important were those that provided communications and productivity tools.
Web mail was high on the priority list, as it is a tool recognised as being heavily used by most staff within the university. Hence it's classification as 'essential'. The portal ambition to provide a working environment from anywhere with an Internet connection would certainly need to include mail.

The Announcements system would be a new development for staff that would allow mandatory announcements to be created and sent to 'managed groups', or for users to subscribe to an interest group to receive opt-in announcements. A similar system has already proved successful within the ESP student portal. This system would be developed in such a way as to allow announcements to be sent to multiple user types, which will again increase common process and integration within the university.

It is recognised that the current proposed content largely revolves around offering a gateway to individual systems with single sign on. The longer-term intention however is to provide more process driven integration that may involve interaction between multiple corporate applications. This multi system integration has been piloted within ESP as the Edinburgh University's student record system provides WebCT with course, staff and student data; and ESP with the corresponding course and student information. This permits direct access for students to the appropriate web pages within WebCT from ESP. This relationship is shown in the simple model below.

Data key

C = Course
ST = Staff
S = Student



6.2 The Current Program - up to July 31st 2000

For the purposes of this report, the 'current' period is defined as the period up until the end of July 2003. This covers the main period of software evaluation, prototype development and subsequent plans for how uPortal might be fully implemented at The University of Edinburgh. Final sign off for the prototype development occurred at the slightly later Steering Group meeting on 29th September 2003.

The milestones for this 'current' project stage are shown as 'Enterprise Portal Prototype Milestones' in **Appendix 4.** This period was managed as a project in its own right, as it was felt necessary to take time to assure stakeholders that the uPortal selection was justified, and to understand and prove some of the technical concepts of the project; such as data flow architecture, group management, legacy software handling and authentication methodology.

This period was able to taka advantage of the channels that were quick and easy to implement. For us these included some that we included quickly using CwebProxy and RSS tool:

- Channels that incorporate web search engines such as Google and Alta Vista
- The University of Edinburgh Web and Staff search engines.
- Numerous news feeds

Others that we included quickly were Java channels provided freely with uPortal:

- Bookmarks
- **IMAP** mail client
- Light entertainment channels (Mine sweeper, Daily Business Cartoon etc.)

We had hoped to also quickly include a channel that we purchased perhaps too hastily from **UNICON**. UNICON offer contracts for uPortal support and for individual channel purchase. They also offer a packaged portal solution called Academus, which we found too inflexible for our needs.
The Question and Answer channel that we purchased we found not to be a mature product that we have not chosen to use for our initial launch. This channel was sold to us with the understanding that we were early users of the product, and we subsequently have found UNICON very willing to spend time and fix bugs or even redevelop some of the functionality where this was found to be inadequate. This process can be quite costly though, so we would recommend full evaluation prior to any purchase.

This said, there are many examples of production use of both UNICON and JA-SIG clearinghouse channels (the latter being open source and freely available). Both UNICON and free community channels can all be investigated through registration to the JA-SIG clearinghouse, which is a must for any uPortal investigation.

The reader may also be interested to note that the project team have also been involved with continued development of the ESP student portal during this same 'current' period. The focus of work here has been with regard to the integration of WebCT, and a student specific announcement system; both mentioned in 6.1.2. The intention is to continue limited further development of ESP during the financial year 2003/4 before migrating ESP into MyEd.

6.3 The Forthcoming Program (31/7/03 – 31/7/04)

The forthcoming program includes a significant development component, as the channels listed in the table on **Appendix 2** now need to be built, tested and launched. In addition to this development however, there will need to be a concerted effort to ensure that the proposed architecture works effectively within a test and ultimately production environment.

When drafting the priority of the channels we first proposed for our staff launch, we felt that it was useful to also show the type of channel behavior and authentication expected. The aim here was to try and establish were channels fall into broad development types and where common or re-occurring problems might occur. This to some degree influenced our initial estimates for how long a channel may take to develop, and helped us challenge any wild predictions and begin with some consistency of reasoning. This starting point was however supplemented by discussion with internal MIS developers who had experience of what the individual requirements would likely entail, whilst we also consulted with UNICON technical staff that were contracted to come to Edinburgh for a four-day consultancy period. The consultancy helped provide a reference point for our own plans with what had been proven to be successful or otherwise for U.S. institutions that had 'gone live'. The consultancy was of a good quality and proved a useful catalyst for firming up our plans, the UNICON consultant tended to act as a facilitator rather than to be prescriptive; which may or may not be a preferred approach.

In addition to assessment of anticipated development effort, each proposed channel was assessed for it's potential value. Value was judged by the channel development offering:

- An essential staff works tool or uPortal system admin function that the team felt would have the potential to impact upon project success and/or MyEd acceptance. (These were classified in the table with a priority code 'E' for essential.)
- Integration of a large existing user community, an important works tool of system admin function. These were channel seen as very important, but not critical. (Within the table they have a priority code of 'VI' for Very Important.)
- A nice to have classification was also included although none of these channels made the first cut.

The table below show the numeric value that we attached to either cost (in terms of development effort) or benefit (in terms of project critical value).

Channel Priority Key (based on cost/benefit)			
Cost Benefit	**Code**	**Definition**	**Value**
Small effort		Up to one days effort.	10
Medium Effort		Up to 20 days effort	8
Medium to Large effort		20 - 50 days effort	5
Larger effort		50 - 100 days effort	2
Essential	E	Perceived as a key portal channel that could have a bearing on portal success	10
Very Important	VI	An important channel, but perhaps not success critical	5
Nice to have	NH	A useful channel, but not perceived as institutionally important	1

Once the project team had quantified a cost benefit value, the channels were sorted into priority order and then presented to the project Steering Group for further stakeholder input and discussion. Finally the first cut priority list was created based upon how many man-hours were available to develop the top priority channels.

A subordinate ‘Target Channel’ list was created to cater for those that didn’t make the first cut, but that would provide candidates for any change in circumstances or flexibility within the plan.
Using a cost benefit model in conjunction with a cut off number of developer days available to the project is to our mind an essential stage, not only in establishing priorities, but also in protecting the project team from being swamped with channel requests; all seemingly of a high priority. Again the Steering Group has an important role here. The model that we have used is not a complex one, as no team will begin a project with perfect knowledge, such that priorities will have to remain fluid throughout the duration. Periodic confirmation of priorities through a project Steering group is recommended. Others may want to more clearly define their understanding of ‘essential’ channels. This was not considered necessary for ourselves due to the flexibility we intended in our plans, however essential might consider the context of the portal in that the content must be broad in it’s appeal to the institution, and should consider the well used and established web based tools of the institution.

The MyEd project progress has not been discussed not just in relation to channel development, as regular progress meetings tend to be subdivided into the topics of:

- Channel development
- Authentication
- Hardware, security certification and load distribution
- General project management, PR and communications

A summary of the most important issues raised at each meeting are recorded as actions so that each area of progress can be managed openly. **Appendix 5** shows the major milestones for the forthcoming program, which may be a useful reference point for the reader.

7. Conclusion and Recommendations

The enterprise portal project has and continues to prove a challenging undertaking, particularly in times where all Higher Education institutions are struggling to source funding and have to spend significant effort to justify initiatives. This for many departments means that more is expected of those involved in such projects, with perhaps tighter time scales and resources. This background is compounded when dealing with a project that has the potential to impact upon every area of the university. Many conflicting interests and opinions need to be accommodated and managed throughout the life cycle. At Edinburgh we have managed the implementation through three inter-related projects (MyEd implementation, Portal Authentication and Alumni Portal) with the MyEd project manager having an over-arching role in coordination of effort.

Further more, the legislative climate is one where portal development must consider obligations to the legal requirements governed by a number of Acts. This is a complex area and outside the scope of this case study, although the links may provide further information: Disability Discrimination Act 1995, SENDA (Special Educational Needs and Disability Act 2001), Data Protection Act 1998 and Freedom of Information Act 2000.

The process from project initiation to launch needs to be one that is managed using project best practice, but not to the level of onerous detail that will cause the project to miss its delivery objectives. Hence the team have wherever possible tried to be pragmatic in its approach. We have found that a well represented Steering Group or Project Board that comprises senior university representation is absolutely essential in order to ensure that progress does not get bogged down with internal conflicts. In addition to this the project team needs a combination of open consultation and communication with stakeholders, but also the drive to ensure milestones are met and technical issues are addressed. Most importantly the team needs to be established as a team that support and communicate well with each other.

Although we continue to be comfortable that we have made the right choice for our institution in choosing uPortal, we would perhaps have done a few things differently if we had the time again. We would have benefited from reference material by agreeing and sticking to a formal matrix and scoring system for product evaluation. We should have more vigorously documented portal principles and policy at an earlier date to assist the understanding of those getting involved later who didn't have the background knowledge. Had we been in an institution that had central management and control of IT systems we would have almost certainly opted for a Directory based management of groups and user attributes rather than through the portal channel and associated database. Such centralisation would have also offered greater certainty in our choice of authentication tool. As it is, we await the outcome of an authentication working party that will report and either endorse our CAS approach, or insist upon an early migration to a different mechanism.

We placed a time restriction on ourselves in aiming to turn around a prototype into a production service for our Alumni community within just over three months. This has not been ideal, as the final testing phase has come under time pressure. We found the web based load test simulation relatively inconclusive, as this approach to load testing struggles to represent patterns of real user behaviour. We would however recommend to the reader that an enterprise portal project does aim to launch initially to a user type, preferably that might be expected to only make limited use of the portal in order to reduce risks and any teething problem impact.

For any such project there is an element of good luck and timing. We are however pleased with the way an early training program and a dedicated team focus has help create an effective working project team. We have also benefited from senior leadership and a well-established project management procedure within MIS. The support of employing both UNICON consultancy combined with having on-line help through the JA-SIG community has proven useful in offering access to technical expertise and a sounding board for our own approach. One of the better features of our implementation has been the use of nested DIVs provided by Virginia Tech. This avoids the use of nested tables within the MyEd interface and is interpreted far better by assistive technologies. In addition to improved accessibility, the implementation offers some additional skin options that are unavailable with a vanilla version of uPortal. The current interface (December 2003) can be seen in **Appendix 5**.

The project team continue to keep one eye towards potential project risks. These include:

- That developers are able to deliver priority channels in time for the launch to staff. With approximately 100 working days available between now and final test closure, this would require three full time developers involvement. This risk is considered manageable.
- That the selected target content and publicity for the portal meets community needs sufficiently to attract adequate usage. Although usage is expected to increase over time as the MyEd portal matures, (as has been the experience with ESP) we would hope to achieve 50% of staff usage over the first year.
- That MyEd portal Infrastructure is capable of handling the expected concurrent usage. Initial maximum concurrency is not expected to exceed 480 users at any one time for the July launch. MIS anticipate (based upon industry standard tests) in providing four application servers capable of handling the maximum of 480 users.
- There is a risk that University business does not commit priority to resourcing their channel development. The message that has been given at awareness presentations is however that MyEd can only succeed through a devolved model. Training and consultation services will be developed prior to initial launch to staff.
- There has been a risk identified that MyEd access from outside the Edinburgh domain to current 'Edinburgh Only' corporate services will have to be managed over time on a business by business basis. This functionality will not be provided as default from launch.
- That MyEd security using CAS authentication is accepted by other service providers. CAS authentication is only considered a pilot service that the C&IT working party on authentication have approved for MyEd launch. This authentication model may however be superseded as technology changes. The working party may ultimately approve a different 'Single Sign On' (SSO) model. Managed migration to the finally approved SSO technology may become necessary.
- That the future evolution of uPortal as a product is undermined as a result of the termination of Mellon Foundation funding to the uPortal system project. We believe that UNICON in conjunction with a now well-established JA-SIG community will provide the impetus to take developments forward. A future release due in the new year (version 2.2) will provide a much enhanced aggregated layout, and offers potential for PDA, WAP, Wireless and international character set integration.

The identification, tracking and reporting of risks is now a regular feature of a University of Edinburgh Steering group meeting. The MyEd project manager reports to the Steering Group and regularly appends reports from other related projects. There is some current discussion however that argues for the invitation of these peripheral project manager to attend and report to the Steering Group as required, as it is felt that this would improve the sense of responsibility for any inter-related project deliverable.

The Edinburgh University Portals team have continued in gaining some mileage from the continuation of their ESP initiative, although effort during the planning year 2004/5 will see convergence of Staff, Student and Alumni portal services through the MyEd framework. The experience of those working on the MyEd project at Edinburgh is incomplete however, as we feel that we are continually learning from our successes and mistakes. We have yet to prove the security, performance, usability and acceptability of MyEd. We believe that we have however given some considerable thought to the MyEd implementation, and hope that the reader finds the case study a useful reference point. We can take heart from (at the time of writing 22/12/03) the fact that we still aim to launch a pilot implementation of uPortal to our Alumni community on 16th January 2004. This further experience of a production environment should certainly place MyEd in a good position for successful launch to staff in August 2004 and begin the transition to an enterprise portal of broad appeal.

Appendix 1 – Guidelines for Cost Benefit Justification:

The following provides greater detail of the possible tangible and Intangible costs and benefits associated with Portal project justification. The list is by no means exhaustive but intends to act as a catalyst for further local investigation. These factors may be used in association with financial estimates, which may vary from institution to institution. Some of the estimates are extremely difficult to quantify, and will require some consideration in order to provide credible value figures. When calculating benefit, it must be remembered that benefit may continue over time.

Cost	Guidelines	Benefit	Guidelines
Tangible			
Resource	Number of project days effort multiplied by average resource cost.	Faster access to information.	e.g. number of seconds saved multiplied by each end user. This then should be equated to average salary cost saved.
Training	Cost of external courses.	Reduced duplication of effort.	Consider the costs of replicating central services across school or college units. Consider the resource and training costs saved.
Hardware	Cost of additional application and database servers required.	Integration	Consider the savings of having systems that interact or are held in a single golden copy. Reduce cost of maintenance, hardware and efficient system interaction.
Support and maintenance	This may require an estimated factor for hardware support, customer service support, and software provider support contract.	Revenue Increases	Consider the portal marketing potential, how it may attract increased fee-paying students or better quality of staff and students.
Intangible			
		Staff retention and job satisfaction from skill development.	A factor will need to be included for possible reduced turn over. e.g. 1 person retained saves approximately £x in recruitment costs and £x in retained skills.
		Customer experience	Consider the perceived value that customers attribute to the system and having access to a central gateway to resources.

		Knowledge and standards sharing	Consider the organizational wide value of shared standards for systems and support such as WC3 compliance, or data security.

Appendix 2 - Table of Channel Classifications and Priorities

Priority Channels for Enterprise Portal Phase 1
(target completion pre - August 2004)

Channel Priority Key (based on cost/benefit)			
Cost Benefit	**Code**	**Definition**	**Value**
Small effort		Up to one days effort.	10
Medium Effort		Up to 20 days effort	8
Medium to Large effort		20 - 50 days effort	5
Larger effort		50 - 100 days effort	2

Essential	E	Perceived as a key portal channel that could have a bearing on portal success	10
Very Important	VI	An important channel, but perhaps not success critical	5
Nice to have	NH	A useful channel, but not perceived as institutionally important	1

Channel Behaviour and Authentication Key		
Type	**Behaviour**	**Description**
A	Launch Application	Launches an external application in a new browser window with no challenge for authentication.
B	Integrated Custom	Part of an application displayed through a portal custom channel with no user challenge for credentials. Optional links to trigger application full launch in a new browser window with no challenge for authentication.
C	Portal Custom	An application written for the portal and lives within the portal. No external authentication required.
D	Portal Simple Feed	Existing uPortal channel types e.g. RSS feed or small web proxy functions that don't require authentication. This allows functionality to be displayed without significant development.

Type	**Authentication**	**Description**
1	CAS SSO	Single Sign On would be where the applications authentication accepts the credentials from the Central Authentication Service. The application retains it's own complex role based authorisation.
2	Reduced Sign On	Utilizes a mechanism of secure storage of user credentials within the database that are passed to the application e.g. Crypto wallet. If application credentials are changed external to the portal then the channel will challenge the user to re-enter and store the new ID and password.
3	Portal/Trust	Where the portal or back end application does not challenge the portal user to authenticate, but accepts authorisation based on the portal user groups. This likely to be a simple yes/no authorisation as multiple channels may be required to represent more complex role based authorisation.
4	Portal/Public	A portal owned or public channel requiring no authentication or authorisation.
5	Re-authentication required	This would be a channel that launches an application or part of an application but requires additional authentication. This may be a stop gap requirement perhaps for security reasons. The user will be challenged for User ID and password.
6	Proprietary requires a Token.	The application has its own proprietary authentication that would need to accept a token based upon CAS authentication

Channel Name (grey when fully complete)	Priority Code and value	Description	Audience	Behaviour type	Authentication method	Developer Initials (To be booked in red) Includes date of booking.
WWW search	E - 20	Essential web tool	All	D	4	RG
UoE web Search UoE Staff Search	E - 20	a) Staff/Students Search b) University search engine (Inktomi)	All	D	4	RG
UoE Home	E - 20	A channel embedded in the header that links the University crest to the UoE Home page	All	D	4	AMS
eBulletin	E - 20	CPA owned University related news service	All	D	4	RG
Channel Selector (part completed)	E - 18	A pick list channel highlighting all channels within the portal. Shows channels selected, available and currently unavailable (with contact details).	All	C	4	RG up to 3/10
Groups and Permissions	E - 18	An admin management tool for controlling channel authorisation	Restricted - admin users	C	3	RG 16/10 - 28/11
Header & Skin Channels Welcome	E - 18	Channels that control look and feel that can be customised.	All	C	4	AMS
Password Change	E - 18	Facility to change the CAS username and password online.	All	C	5	?
Report a problem or feedback Channel Help Information (part completed)	E - 18	A form that can be directed to the helpdesk providing structured service support information.	All	C	4	SM up to 24/10
IMAP mail	E - 18	A uPortal mail client allowing access to all IMAP based mail systems such as Outlook, SMS and First Class	Restricted - Staff	C	2	RG
Outlook Web Access	E - 18	Provides OWA client within the portal and therefore access to diary information	Restricted - Staff	A	2	RG
Announcements	E - 18	ESP style announcements for all.	All	C	3	RG
EEMeC	E - 18	Link to EEMeC	All	A	1	SM

EEVeC	E - 18	Link to EEVeC	All	A	1	SM
WISARD	E - 18	Simple link to full WISARD application	Restricted - staff	A	1	RG/CM
WebCT	E - 18	Integration between to University's VLE and the portal, offering staff login to the VLE for data and resource population.	Restricted - Staff	A	6	PP
BITS	VI - 15	High profile IT online news for staff.	Restricted - Staff	D	3	RG
Bookmarks	VI - 15	Permits web urls to be stored and be portable to portal login.	All	C	4	RG
QA & FAQ's (part completed)	VI - 15	A channel that permits questions and answers with search and FAQ facility. Could be used for IT support, but also for staff questions to HR and wider.	Licence Restricted - Staff and Student	C	3	SM
My Library Information	E - 15	Personal information extracted from Voyager	Restricted - Staff and Student	B	2+3	CM
All other resource channels: Library Online Search Library Catalogue Ask A Librarian Library News	E - 15	A menu of library services shown as a suite of channels	Restricted - Staff and Student	D	4	CM
Online Expense Forms	E - 15	New application developed in two parts for 2003/4 and will be transactional potential killer app.	Restricted - Staff	C	3	?
HR Manager	E - 15	Deep links to Manager Self Service, with workflow action flags	Restricted Staff	B	2+3	RG
HR Employee	E - 15	Personal details displayed with deep link to Self Service	Restricted - Staff	B	2+3	RG

Appendix 3 – Requirement Specification Template

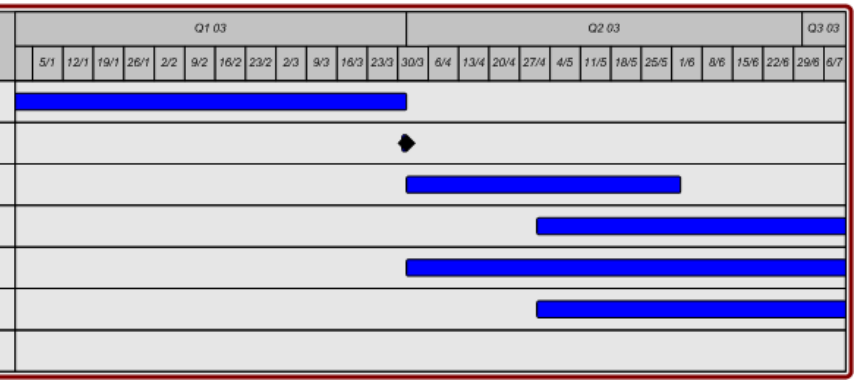
Enterprise Portal Channel Requirements Specification ***(Replace items in italics)***	
Name of Project	Enterprise Portal Launch
Time Recording Code	
Channel Name	
Channel Priority	
Owning Department	
Channel Owner	
Proposed Test Period	*e.g.Nov 2003, June 2004*
Date required	*e.g.July 2004*
Channel delivery mechanism: *e.g. Custom, RSS, Web Proxy, XML Transform, other etc.*	
Channel development software and components	*Cold Fusion, Java etc*
Authentication mechanism	
Channel Category	
Requirements for Policy clarification	*Issues to be raised at MIS progress or steering group*
Business Functional Requirements	TBA
Related Business Processes	*E.g. authorisation and group requirements. Any implications for support teams and communication of support incidents.*
Roles	
Specific Interface Design requirements and implications of delivery mechanism.	
Working Notes	
Release and publicity strategy	
Business Spec Sign off	
Hardware Requirements?	*Any requirements anticipated beyond existing infrastructure?*
DSG developer	*Who will be developing the channel and browser compliance.*

DSG Peer Test Signatory	*Who will do development peer testing*
CSG Test Signatory	*Who will do customer service testing and browser compliance.*
Business Test Signatory	*Who will sign off business testing*
Budget Holder Signatory	*Only if purchasing required.*
MIS Signatory	*MIS project (or delegate) project manager.*
Business Signatory of Channel completion	*Business (or delegate) business owner - change background to green once signed off!*

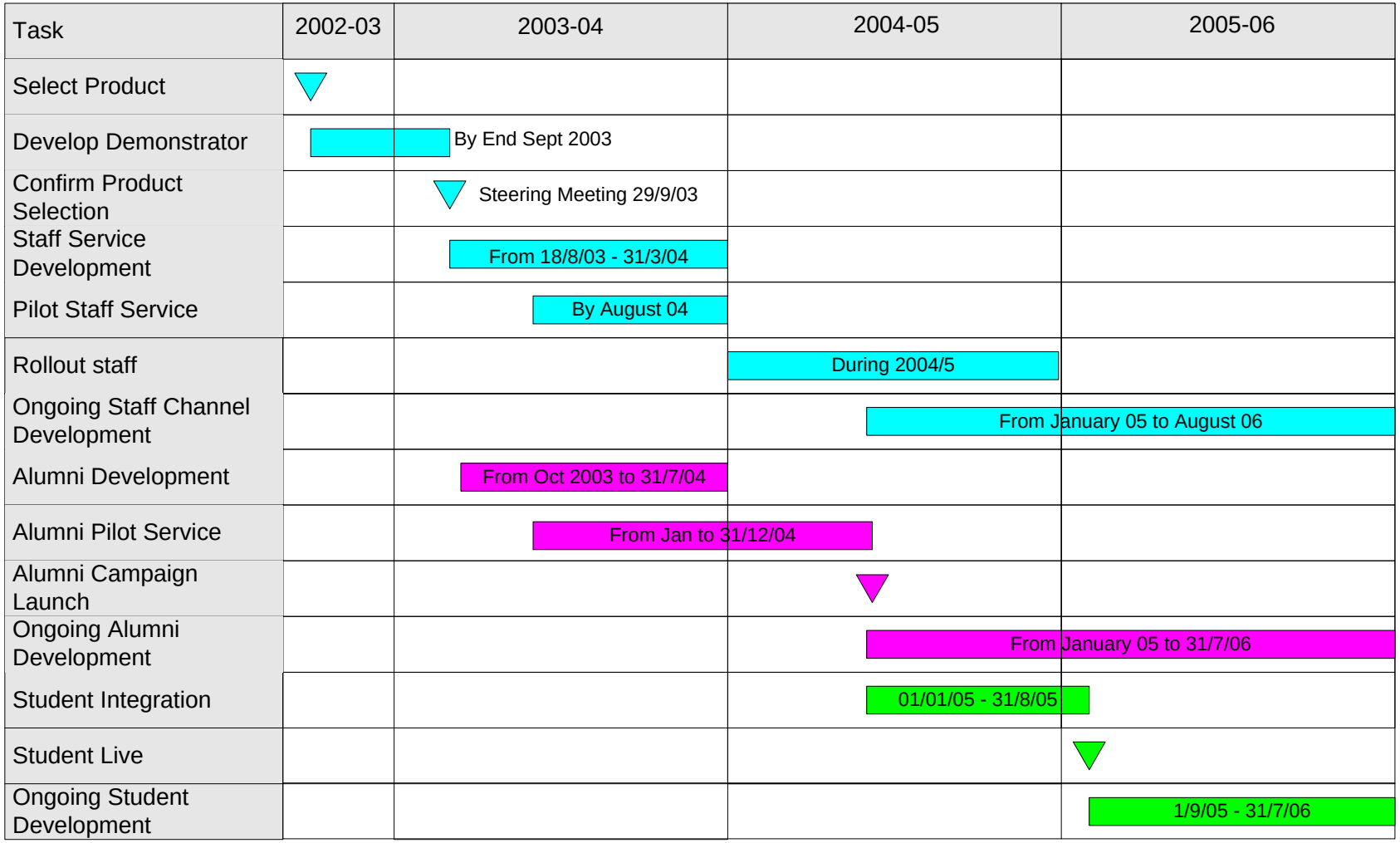
Appendix 4 – Program Time Lines

Enterprise Portal Development Prototype
Milestones Jan 2003 - July 2003

ID	Task Name	Start	Finish	Duration
1	Environmental scanning & product evaluation	01/01/2003	31/03/2003	64d
2	Product Recommendation	31/03/2003	31/03/2003	1d
3	Establish Development Architecture (Application, web server & database)	01/04/2003	02/06/2003	45d
4	Establish Business requirements for channels	01/05/2003	31/07/2003	66d
5	Establish model for reduced sign on	01/04/2003	31/07/2003	88d
6	Development prototype	01/05/2003	31/07/2003	66d
7	Confirm product final selection	11/07/2003	11/07/2003	1d



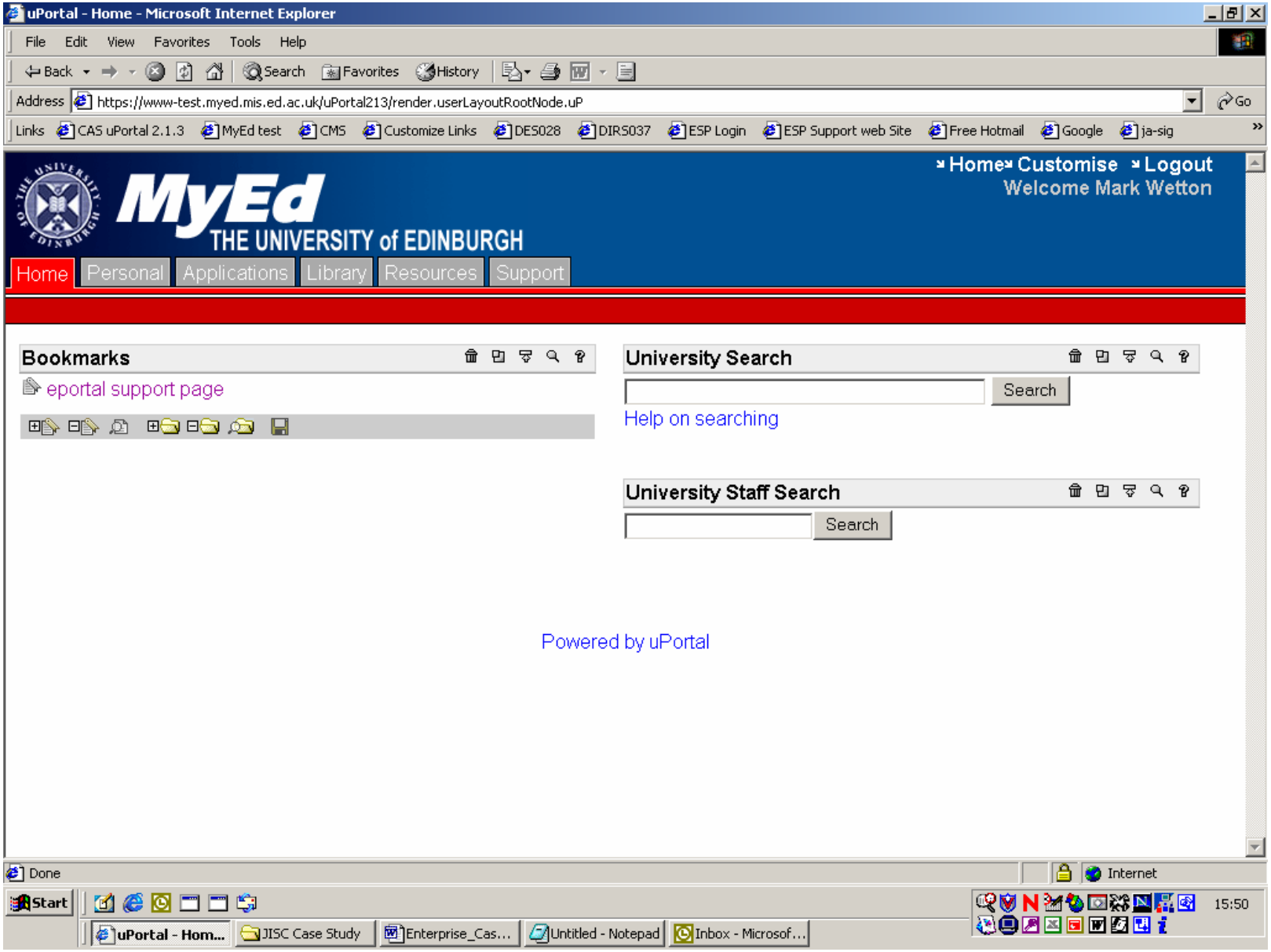
Enterprise Portal Timeline &
Milestone completion dates



Appendix 5 – forthcoming milestones

Milestone	Completion As at 29/9/03
MyEd Prototype approval 29/9/03	☑
MyEd Terms of Reference Approval by MIS 10/10/03	☑
MIS Sign off MyEd Development Infrastructure 7/11/03	☑
MIS Sign off MyEd Test Infrastructure 17/11/03	☑
DAS approval for launch 12/12/03	☐
Sign off test phase 17/12/03	☐
Complete Production Infrastructure 22/12/03	☐
Alumni campaign launch 5/1/03	☐
Alumni launch through MyEd 16/1/03	☐
Completion of awareness programme to Colleges 28/2/04	☐
Complete MyEd Staff service support web site and documentation. 31/3/04	☐
Sign off all models for authentication and reduced sign on 31/3/04	☐
Complete MyEd pilot phase - 14/5/04	☐
MIS sign off of internal test phase 10/6/04	☐
Ensure CPA and HR communication prepared for Staff launch and final periodical publicity drafted 15/6/04	☐
End User pre launch test completed 25/6/04	☐
MIS sign off to approve launch 22/7/04	☐
Launch date 29/7/04	☐

Appendix 6 – The Interface



Glossary of terms

A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z

A

Academus
Portal solution offered by Unicon IBS based on uPortal 2.1.1 At a first glance it appears to be a way of buying all the Unicon IBS channels (also available separately from the JA-SIG Clearinghouse) packaged up as a portal.

Accessibility
This is associated with how easily all user types can access systems, services and information, and is associated with legislation to protect accessibility for disabled people.

ANT
A package incorporated with uPortal for build and deployment. Developed by Apache Jakarta.

B

C

Categories
Categories within uPortal are a method for organising channels. Channels are assigned categories for display, indexing and management purposes. The combination of all categories is the channel catalogue.

Categories are used in conjunction with groups and permissions to control what channels, or groups of channels a user or group of users has access to.
Categories are predefined by the portal implementation team and are attributed to each channel when the channel is first published.

Channel
A channel may be defined as a distinct piece of functionality within the portal that is delivered to the user in a modular manner. Some channels will provide an administrative function whilst others may deliver specific information or launch external applications.

Channel Catalogue
The channel catalogue is the listing of all channels, organised by category, that a user has access to when adding a new channel to their portal layout.

Channel Publishing Document(CPD)
An XML document containing information on the required parameters for the creation of a new channel.

Channel Types
uPortal has several channel types pre-defined, as well as the option to create and integrate your own custom channels. There's a document from Cornell that has good overview explanations of these channels. http://barrett.cit.cornell.edu/JA-SIG-CDS/

Clearinghouse
Area on the JA-SIG US website that allows developers to list document, projects, tools etc. that are available to share. This is also where some info on the channels developed by Unicon IBS can be found (see also Academus). You have to register to get access to this area.
https://www.mis4.udel.edu/JasigCH/

Common Authentication Service (CAS)
Authentication service developed by Yale and used by several other universities in their uPortal implementation.
http://www.yale.edu/tp/auth/

Crypto Wallet
This is as the name indicates a secure mechanism for storing encrypted passwords within a database. It is a mechanism used in conjunction with Central Authentication Systems that do not pass user ID and Passwords for those systems that are proprietary and require ID and password pairs to allow access. JA-SIG Conference provides further info | Electronic Wallet Report

Customisation
This in a portal context can be understood as a means by which an individual user can change the content and style of their portal interface to suit their own individual needs.

Cweb Proxy
A channel development tool that comes with uPortal 2.1.3 and later, that allows external software to be proxied or displayed through the portal when compliant with XHTML development standards.

Cookie
A message given to a Web browser by a Web server. The browser stores the message in a text file. The message is then sent back to the server each time the browser requests a page from the server.
The main purpose of cookies is to identify users and possibly prepare customized Web pages for them.

D

E

Edinburgh Student Portal (ESP)
Edinburgh implementation of the SCWEIMS project. A Coldfusion based application with some portal type features.

EUSA
Edinburgh University Students Association

Eduperson
The EDUCAUSE/Internet2 eduPerson task force has the mission of defining an LDAP object class that includes widely used person attributes in higher education. The group will draw on the work of educational standards bodies in selecting definitions of these directory attributes.

F

G

Groups
Groups within uPortal are a method of organising users. Users are assigned groups for management purposes. Used in conjunction with categories and permissions, groups control what channels users have access to within the portal.

Groups can also be used with permissions to control access to functionality within a channel, where a channel has been written to interact with the portal to this degree.

H

I

IMAP
Short for ***I****nternet* ***M****essage* ***A****ccess* ***P****rotocol,* a protocol for retrieving e-mail messages.

J

JA-SIG
Java Architectures - Special Interest Group
US Site | UK Site

JA-SIG UK Mailing List
www.jiscmail.ac.uk/lists/jasig-uk.html

Java Server Pages
A technology. Java Server Pages are an extension to the Java technology. JSP's have dynamic scripting capability that works in tandem with code, separating the page logic from the static elements.

JDBC
Short for ***J**ava **D**atab**b**ase **C**onnectivity,* a Java API that enables Java programs to execute SQL statements. This allows Java programs to interact with any SQL-compliant database.

K

Killer Application
An application typically that has a transactional quality, but certainly one that makes repeat use common.

Kerberos
An authentication system developed at the Massachusetts Institute of Technology (MIT). Kerberos is designed to enable two parties to exchange private information across an otherwise open network. It works by assigning a unique key, called a *ticket,* to each user that logs on to the network. The ticket is then embedded in messages to identify the sender of the message.

L

LDAP
Short for ***L**ightweight **D**irectory **A**ccess **P**rotocol,* a set of protocols for accessing information directories. LDAP is based on the standards contained within the X.500 standard, but is significantly simpler. And unlike X.500, LDAP supports TCP/IP, which is necessary for any type of Internet access.

LDIF
LDAP Data Interchange Format. A standard protocol used for querying LDAP directorys.

M

N

O

P

Permissions
Permissions are a method of granting or denying access to functionality within Uportal. For example permissions are used to control which groups or users can access a channel. Permissions are also used to control what functions groups or users can access within a channel. See Permissions Manager.

Permissions Manager
The Permission Manager is a uPortal channel that is part of the 'out of the box' functionality. This channel is used to administer permissions in conjunction with other channels, for example the Groups Manager. This channel would be restricted to use by uPortal system administrators.

Personalisation
Within a portal context this can indicate content presentation based upon information already held about an individual.

Portal Wars
A term coined to describe the fragmentation of portal development effort within an institution or environment, whereby effort is less efficient and often duplicated.

Portlets
An alternative word used to describe distinct areas of functionality within a portal. See *Channel*.

PubCookie
A cookie based authentication system. See *Cookie*

Q

R

Reduced Sign On
This is where a set of user credentials (username and password) are stored and passed through to a system to simulate Single Sign On.

Rubric
Similar to a matrix. Typically used for relative evaluation.

Round Robin
An approach to server load distribution relying upon DNS (Domain Name Service) to translate domain names to IP addresses.

RSS Feed
Rich Site Summary: an XML format for syndicating Web content. A Web site that wants to allow other sites to publish some of its content creates an RSS document and registers the document with an RSS publisher. A user that can read RSS-distributed content can use the content on a different site. Syndicated content includes such data as news feeds, events listings, news stories, headlines, project updates, excerpts from discussion forums or even corporate information.

S

SCWEIMS (Student Centric Web-based Educational and Instructional Management System)
Project funded by SHEFC, involving the Universities of Edinburgh, Paisley and Abertay, and Queen Margaret University College.

Single Sign On (SS0)
This is a term used to define a mechanism for providing access to multiple systems through a single or central authentication system.

Searchable OnLine Vacancies and Employers (SOLVE)
Coldfusion based Careers application used at the University of Edinburgh.

Seamless Access
An expression used to describe direct access to systems without need for further authentication. See also *Single Sign On* and *Reduced Sign On*.

Secure Socket Layers (SSL)
A standard protocol used for web security to encrypt interaction between a users browser and a system or service. This is evident to the user by the url prefix of https and a padlock shown in the browser interface.

SQL
Abbreviation of ***s****tructured* ***q****uery* ***l****anguage*, and pronounced either *see-kwell* or as separate letters. SQL is a standardized query language for requesting information from a database.

T

Tomcat
Application server developed by the Apache Jakarta project and used as part of the uPortal server infrastructure.
http://jakarta.apache.org/tomcat/index.html

Thin Layer
This in a portal context indicates that the portal acts simply as a presentation layer or gateway to separate and distinct systems and services.

U

Unicon IBS (Interactive Business Solutions)
Originally developed uPortal. Though the portal framework is now open source, they make their money developing channels and providing training and support.
http://www.interactivebusiness.com/frames-1.htm | http://www.uportal.biz/

uPortal
An open source portal framework developed JA-SIG
Usability
A term used to describe the relative ease with which a system can be used. It is associated with how intuitive and logical the presentation of information is, but also with issues of accessibility. See *accessibility*.

V

Virtual International Community (VIC)
Web content developed within WebCT, and targetted at creating an online community for international students at the University of Edinburgh.

Virtual Private Network (VPN)
A network that is constructed by using public wires to connect nodes. For example, there are a number of systems that enable you to create networks using the Internet as the medium for transporting data. These systems use encryption and other security mechanisms to ensure that only authorized users can access the network and that the data cannot be intercepted.

VLE
An abbreviation of Virtual Learning Environment. A web based learning environment.

W

Webtop
A term used to describe a web based working environment that offers equivalent functionality to that experienced within a desktop environment.

WebCT
An e-learning solution commonly used in HE and FE institutions. WebCT.com

X

XML
Short for ***Ex****tensible* ***M****arkup* ***L****anguage,* a specification developed by the W3C. XML is a pared-down version of SGML, designed especially for Web documents. It allows designers to create their own customized tags, enabling the definition, transmission, validation, and interpretation of data between applications and between organizations.

XSLT

This is a language for transforming XML documents into other XML documents. XSLT is designed for use as part of XSL, which is a stylesheet language for XML. In addition to XSLT, XSL includes an XML vocabulary

for specifying formatting. XSL specifies the styling of an XML document by using XSLT to describe how the document is transformed into another XML document that uses the formatting vocabulary.

Y

Z