JISC Final Report

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Table of Contents

1) Acknowledgements

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We would also like to thank our Steering Committee: Dr Chris Davies, Dr Rebecca Eynon, Jill Fresen, Philip Healy, Dr Rebecca Lingwood, Dr Claire O’Mahony, Dr Adrian Stokes and Dr Chris Trevitt as well as our Evaluation Consultant, Henriette Lundgren.

Lastly, and most importantly, we would like to thank the students and staff at the Department for Continuing Education at the University of Oxford, without whom the project would not have been possible.

2) Report Summary

2.1 Project Overview

The Cascade project aimed to use technology to enable the University of Oxford Department for Continuing Education to respond better to the challenges created by the government’s ELQ policy by enabling the Department to undertake its activities more efficiently, develop new, or repurpose existing, activities and augment the services currently offered to students.

Project work was undertaken in the following five focus areas, where the application of technology offered the greatest potential impact, either through financial efficiencies, greater effectiveness, or efficient application across a number of activities:

1. Improving access to VLE support for courses
2. Online assignment handling
3. Development of generic content
4. Extension of online enrolment and payment for courses
5. Review of the course design process

Working with staff and students across the Department, the Cascade team piloted activities and developed new tools, then used the results to implement systems and services. This work produced outputs that a) aid staff to design courses that use technology effectively, b) provide information and tools that help students to find and enrol on the right course for them, and c) use technology to improve the experience of studying with the Department.

Following the Comprehensive Spending Review 2010, the focus of the Cascade project on how technology could help the Department respond to a reduction in funding has relevance to all UK HE institutions. By working on only those areas which offered clear benefits in terms of efficiencies, innovation or improved services, our activities targeted improvements in many of the areas that other institutions will be examining.

2.2 Project Outputs

Reports

- Baseline report: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/Cascade%20Baseline%20Report%20v5-final.pdf
- Interim report September 2009: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/CascadeInterim2009-09-03Web-1.doc
- Interim report (revised) November 2009: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/CascadeInterim2009-11-25.doc
- Interim report March 2010: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/CascadeInterim2010-03-31.pdf
- Evaluation report: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/CascadeEvaluationReport.doc
- Final report: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/CascadeFinalReport.doc
- Completion report – not available online.

Case studies

- Case Study 1: Leveraging technology to drive business performance: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/CascadeCaseStudy1.doc
- Case Study 2: Customizing open source software: benefits and pitfalls: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/CascadeCaseStudy2.doc
- Case Study 3: Using technology to support prospective students: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/CascadeCaseStudy3.doc
- Case Study 4: Enabling staff to easily use a VLE to support course delivery: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/CascadeCaseStudy4.doc
- Case Study 5: Maximising effective use of technology in new programmes: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/CascadeCaseStudy5.doc

Guidance documents

- Why use Moodle? (Promotional guide): http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/What%20Why%20Moodle%202010-11-11.doc
- Editing Moodle: Getting started: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/MoodleEditingGuidelines2010-12-14.doc
- Best practice with Moodle user guide: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/BestPracticeWithMoodle.doc

- Promotional guide to online assignment handling: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/Why use Online Assignment Submission.doc
- Online assignment handling user guides
    - Instructions for students: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/StudentInstructionsCascade.doc
    - Instructions for markers: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/TutorInstructionsCascade.doc
    - Instructions for course directors: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/DirectorInstructionsCascade.doc
    - Instructions for Registry: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/RegistryInstructionsCascade.doc
    - Setting up assignments: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/SettingUpAssignmentsCascade.doc
- Short guide to on-screen marking: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/ShortGuideOnScreenMarking.doc

Technical deliverables

- Moodle extension code
    - Assignment Extensions: https://github.com/Dave-B/moodle/tree/assignment_extensions
    - Assignment submission questions: https://github.com/Dave-B/moodle/tree/assignment_questions
    - Assignment submission zipped downloads: https://github.com/Dave-B/moodle/tree/M19_zip-assignments
- Online assignment handling workflow mock up: http://cascade.conted.ox.ac.uk/Development%20documents%20and%20code/mass-workflow-mockup
- Moodle site request system – internal facing.
- Moodle site request walk through: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/template-mockups_0.6-e/index.html
- Moodle templates - internal facing, password required, can be provided on request[1]
- Generic Moodle template (zipped Moodle backup files) - requires restoration within a Moodle installation: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/backup-modular_-_general-20101220-1237.zip
- Trial XCRI feed of Departmental course information: http://xcri-dev.conted.ox.ac.uk

Associated resources

- Project plan: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/ProjectPlan.pdf
- Evaluation plan: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/Cascade%20-%20Evaluation%20Plan%20v4.1.pdf

[1] Please contact Marion Manton (email: marion.manton@conted.ox.ac.uk)

- Work packages: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/CascadeWorkpackages2010-03-30.doc
- Wish list of assignment handling features: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/AssignmentWishListLatest.doc
- Comparison of CASS and Moodle online assignment submission features: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/ComparisonOfCASSandMoodle.doc
- Assignment workflow flowchart: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/flowchartLatest.xls
- Basic online payment workflow: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/oxford%20ContEd%20process%20flow.gif
- Payment of invoices by instalments workflow: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/instalments_website_overview-2010-11-03.pdf
- Shopping basket workflow: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/web_infosys_basket_interaction-2010-11-05.pdf
- Self managed student profiles system - technical requirements: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/student-profiles-2009-08-19.doc
- Communications and Engagement Strategy: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/CommunicationsStrategy2010-03-30.doc
- Clarification of roles in assignment handling: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/RolesEtc.doc
- Example service description: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/ServiceDescriptionExample.doc
- Course Design Moodle - internal facing, password required, can be provided on request[2]
- Moodle-Users' Moodle - internal facing, password required, can be provided on request[3]
- Stakeholder analyses: http://cascade.conted.ox.ac.uk/project-outputs#background
- Template content check list: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/TemplateChecklist.doc
- Updated course accreditation form: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/Template%20new%20course%20approval%20TT09.doc

Content

- Updated online support site (including screen casts): http://onlinesupport.conted.ox.ac.uk/
- Updated Departmental website: http://www.conted.ox.ac.uk/
- Generic postgraduate-level induction materials: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/PG%20Induction.zip

[2] As above.
[3] As above.

- Postgraduate-level online study skills resources for the historical disciplines - internal facing, password required, can be provided on request[4]

2.3 Impact and Benefits to the Community

The main impact of Cascade has been the development of sustainable new services that have been a key part of the solution to the challenge caused by the reduction in funding for students studying for an equivalent or lower qualification (ELQ). These services have used technology to support and extend curriculum delivery activities in the Department and have resulted in:

- VLE support for award bearing courses, incorporating online assignment handling and access to generic content;
- Wider availability of online enrolment and payment services;
- Support for the course design process.

In doing this we have quantified the benefits these services offer the Department in terms of greater efficiency, improved service or innovation, and we have developed tools, processes and documentation to streamline and embed these.

The challenge faced by the Department is being mirrored across Higher Education making many of our outputs more relevant to a wider audience. In particular they offer:

- Suggestions of areas where other institutions might achieve comparable benefits;
- Information on how to achieve such benefits;
- Shared outputs from all stages of the process on which others can build;
- Open source code for Moodle.

Allowing others to benefit from our developments.

2.4 Main Lessons Learned

Project scoping

- Understanding organisational processes and the cost benefit implications of decisions enables focus on services offering the greatest impact
- Identifying where technology does not add value is as important as identifying where it does

Project management

- Software development requires clear communication and focused objectives in order to be effective, and benefits from an iterative development approach
- Time, availability, support and indirect influence can be as powerful as planned interventions in effecting change
- Small, but crucial interventions can be leveraged to achieve large effects

Innovation

- The largest challenges are often in understanding and improving systems and processes
- Technological innovation can be a catalyst for wider change
- Working with open source software, and balancing project requirements against that of the larger community, creates challenges as well as opportunities
- Reducing costs by increasing efficiency, can also improve the quality of service delivery

[4] As above.

- Improvements to the administrative areas of curriculum delivery can deliver the greatest efficiency gains

Engagement

- Engaging with stakeholder needs and expectations at the right time facilitates implementation of innovation
- Influencing, involving and engaging the right people is one of the most important factors in success or failure
- Staff are more open to using technology than ever before, but need support to capitalise on this

Embedding

- Embedding activities in the wider system of processes, resources, and support, enhances sustainability
- Commitment from senior management is a key factor in sustainability of services

3) Main Body of Report

3.1 What did you do? (Methodology)

Background and context

The Department for Continuing Education at the University of Oxford (OUDCE) is a large multi-disciplinary department that processes over 15,000 student enrolments annually. Students may be members of the public who wish to study a subject out of general interest or for intellectual enrichment, members of professional groups or businesses who wish to update their professional knowledge and skills, or participants in our increasingly large number of courses offered to an international audience. Course types include day schools, short courses, weekly classes, online courses, summer schools, foundation certificates, UG & PG certificates and diplomas, Masters and DPhil programmes. Most of the longer courses lead to a University award or other form of credit, but the large number of short courses on offer may be taken by those who are studying for personal enrichment.

The Cascade project was conceived to face the challenge that the ELQ policy[5] (which withdrew government funding for students studying equivalent or lower qualifications to those they already held) posed to the Department. This change of government policy, which came in to effect in the 2008-09 academic year, resulted in a major reduction in the Department's funding,[6] similar to that now faced by all Higher Education Institutions as a result of the reduction in HEFCE funding for teaching and learning. In order to address this challenge, the Department created a 'ten-year vision' and an associated Five-Year Strategic Plan for the period 2009-10 to 2013-14. The Cascade project worked within this to identify areas where technology could help in the delivery of the strategy and enable the Department to:

- **Undertake its activities more efficiently** so that resources are focused on value-adding activities, such as delivering improvements to the student experience and the creation of tools that support best practice;
- **Develop new, or repurpose existing, activities** to support the delivery of its new vision and provide additional revenue streams;
- **Support its ability to deliver academically superb courses** to students of the highest calibre through the use of new tools and functionality to augment the services currently offered to students.

The project also set the following objectives:

- Identify interventions that achieve our aims, focussing on the areas of course design, online access to the Department and e-administration.
- Implement those interventions that best meet the criteria of impact, achievability, and desirability to stakeholders and add value to the Department.
- Develop models, toolkits, and dissemination techniques that maximise uptake and ensure that the interventions are embedded and sustained.
- Establish approaches to track and report on project activities and measure their success.
- Share the outputs of the project with the wider University and beyond.

5 http://www.hefce.ac.uk/Learning/funding/elq/

6 The University of Oxford was the fourth most affected HEI after the Open University, Birkbeck College and London Metropolitan University and in 2007-08 was expecting to lose over £6m of teaching funding by 2014-15 (at 2007-8 levels)

While the specifics of how these were achieved evolved as the project progressed, the core aims and objectives remained consistent throughout.

Project Initiation

The main challenge at the start of the project was to take these very broad aims and objectives and refine them into an achievable project. Initially, 21 sub-themes were identified, and captured in a project schematic document.[7] These were generated from knowledge of the literature; mapping against the Department's vision; the project requirements; and interviews with key stakeholders in the Department. It was clear from the start that while all the areas identified had the potential to be of value to the Department, it would not be possible to address them all within the timescale and resource of the project.

In order to prioritise the original sub-themes, the team evaluated them individually for impact and achievability, and compared them to stakeholder requirements, which were elicited through a variety of methods including brainstorming, interviews, surveys, and focus groups.[8] These consultation activities with stakeholders highlighted their main needs as:

- extension of online payment and enrolment to more courses;
- improvements to the current online assignment-handling system;
- coherent course support and content development both in administrative and subject-related areas;
- easy-to-use systems and processes;
- consideration of the use of technology at an early stage in the course proposal/design path; and
- provision of training or guidance on using any technology that is implemented.

As a result of this, the team designated some of the sub-themes as outside the project's scope and amalgamated others. This led to the identification of five focus areas:

1) Online assignment handling
2) Virtual Learning Environment (VLE) support for courses
3) Generic content
4) Course design
5) Online enrolment and payment

These focus areas have acted as a structure within which project activities were managed. Reporting on project activities below will be done through the prism of the five focus areas before a consideration of cross-project areas such as evaluation, engagement and sustainability and embedding.

[7] http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/SchematicFeb09.pdf

[8] See stakeholder analyses documents:
http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/CurriculumTechnologiesTutors.doc
http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/CurriculumTechnologiesAdmin.doc
http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/CurriculumTechnologiesStudents.doc

Focus area activities

1) Online assignment handling

Online assignment handling was recognised early on as a high priority for the project, due to the clear benefits it offered the Department both in terms of time and cost savings[9] and in the potential to offer an improved service to students. This was also recognised at the wider University level where there was a parallel pilot of online assignment handling, with which we collaborated to identify any areas of common practice.[10] Within the Department a legacy online assignment-handling system was being used by a few programmes. However this had considerable issues and needed replacing and, as such, was not scalable for wider adoption across the full range of the Department's course offerings.

The project team started by considering a range of possible online assignment-handling systems, both internal and external to Oxford, including Moodle, which is currently used as the Department's main VLE. This analysis suggested that the most effective route forward would be to adapt the standard Moodle assignment-handling module to provide all the functionality required. The project team then reviewed:

- the Department's current paper-based assignment handling processes;
- the functionality of the Department's current bespoke assignment system (CASS);
- the Department's current and potential future requirements for assignment-handling; and
- the existing functionality of the Moodle assignment module;

in order to map the functions required on to what Moodle currently provides and what features needed to be developed.[11] From this, in consultation with the relevant stakeholders, a workflow for the new online assignment-handling system was produced,[12] and offered to the Moodle developer community for review.

There was also significant interest in the integration of Turnitin[13] as a way of combating plagiarism. However, as the University policy with relation to this has been emerging during the project, a decision was taken to focus on core functionality. Moodle does offer Turnitin integration so this is something the Department is likely to incorporate in the future.

Technical development implemented essential functionality not available in the standard Moodle assignment module. This included:

- assignment deadline extensions (as a new module and modifications to existing code);
- a Registry workflow (to reflect the academic quality assurance process required by the Department and University for handling assignments);

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9 See Evaluation Report sections 1.1 and 1.2

10 The University piloted basic assignment-handling in WebLearn, the main University VLE, which does not offer the advanced functionality required by the Department

11 See: Wish list of assignment-handling features: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/AssignmentWishListLatest.doc; Comparison of CASS and Moodle: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/Comparison%20of%20CASS%20and%20Moodle.doc; Assignment-handling flowchart: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/flowchartLatest.xls; and Clarification of roles: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/RolesEtc.doc

12 http://cascade.conted.ox.ac.uk/Development%20documents%20and%20code/mass-workflow-mockup

13 http://turnitin.com/

- new capabilities and roles in the Moodle permissions system to match Departmental roles and processes;
- the addition of optional extra input parameters (e.g. word count, and plagiarism statement) at the point of assignment submission.

This development work was based on the upstream Moodle project's Git[14] source control repository, using github[15] to follow the M19_STABLE branch. Several feature-specific local branches of M19_STABLE were created and shared on github.[16] These branches enabled development of particular features in isolation from each other (and from non-Cascade modifications), made development simpler, and made it easier share the modifications with other Moodle users.

This work was the major technical undertaking of the project, and has involved an iterative development and testing process taking over a year. At each stage the team has worked with relevant testers, including technical, academic and Registry staff and students submitting dummy assignments as well as submitting and marking real assignments.

While, for much of the project, the plan was to have the new online assignment- handling system available to all courses that wanted to use it for the 2010-11 academic year, the launch of the new system was delayed beyond this to allow more time for extensive testing and piloting. Following on from this piloting of the system, all those who used it have opted to continue. We are now offering the opportunity for a number of courses to trial the system for the remainder of this the academic year, and we anticipate a significant take up from the start of 2011-12.

As a result of the planned developments in this area, there was a lot of discussion in the Department around the subject of online assignment-handling, both informally and more formally through academic committees, with a perception that it would be negatively received by many. In an attempt to collate feedback, an online survey[17] was circulated to academic and support staff to enable them to express their views, which were positive overall. One issue was that many academics initially conflated the processes of online assignment-handling and on-screen marking; their support for the former often marred by their concerns about the latter. Although the development of on-screen marking tools is beyond the scope of the Cascade project, an attempt has been made to address concerns and offer some guidance in this area, as a way of reducing potential opposition to the wider implementation of online assignment handling.[18]

In this context, it is worth noting that the decision to delay the full roll out of the system has provided unexpected benefits for its adoption across the Department. In the time it has taken to develop, the initial negative reaction to the idea of online assignment handling (often from staff misinformed on how the system would work) has become more positive in response to the sharing of the plans through, for instance, regular project updates. As mentioned above all pilot courses have confirmed their intention to use the service for their assignment-handling going forward.

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14 Git is a distributed version control system (see: http://git-scm.com/about)
15 M19_STABLE – https://github.com/moodle/moodle/tree/MOODLE_19_STABLE
16 http://cascade.conted.ox.ac.uk/project-outputs#sourcecode
17 See academic questionnaire: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/MASSTutors2009-09-21.pdf and administration questionnaire: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/MASSAdmin2009-09-21.pdf
18 See Short guide to onscreen marking: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/ShortGuideOnScreenMarking.doc

The project team spent more time than expected on developing online assignment handling. This has largely been a result of adapting a complex pre-existing tool (Moodle) whilst trying to conform to its architecture, and balance conflicting goals of modular implantation and tight integration. This issue has been exacerbated by the complexity of the Department's online assignment-handling processes. While we spent a considerable amount of time specifying this, the pilot studies revealed several requirements that were not identified by stakeholders earlier in the process, despite extensive consultation. Thus the assignment workflow process diagram,[19] Figure 1, is one that has had to be consistently updated throughout the process, but which has been extremely valuable in establishing and sharing a vision for how the system should work.

[19] An Excel version of Figure 1 is available from: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/flowchartLatest.xls

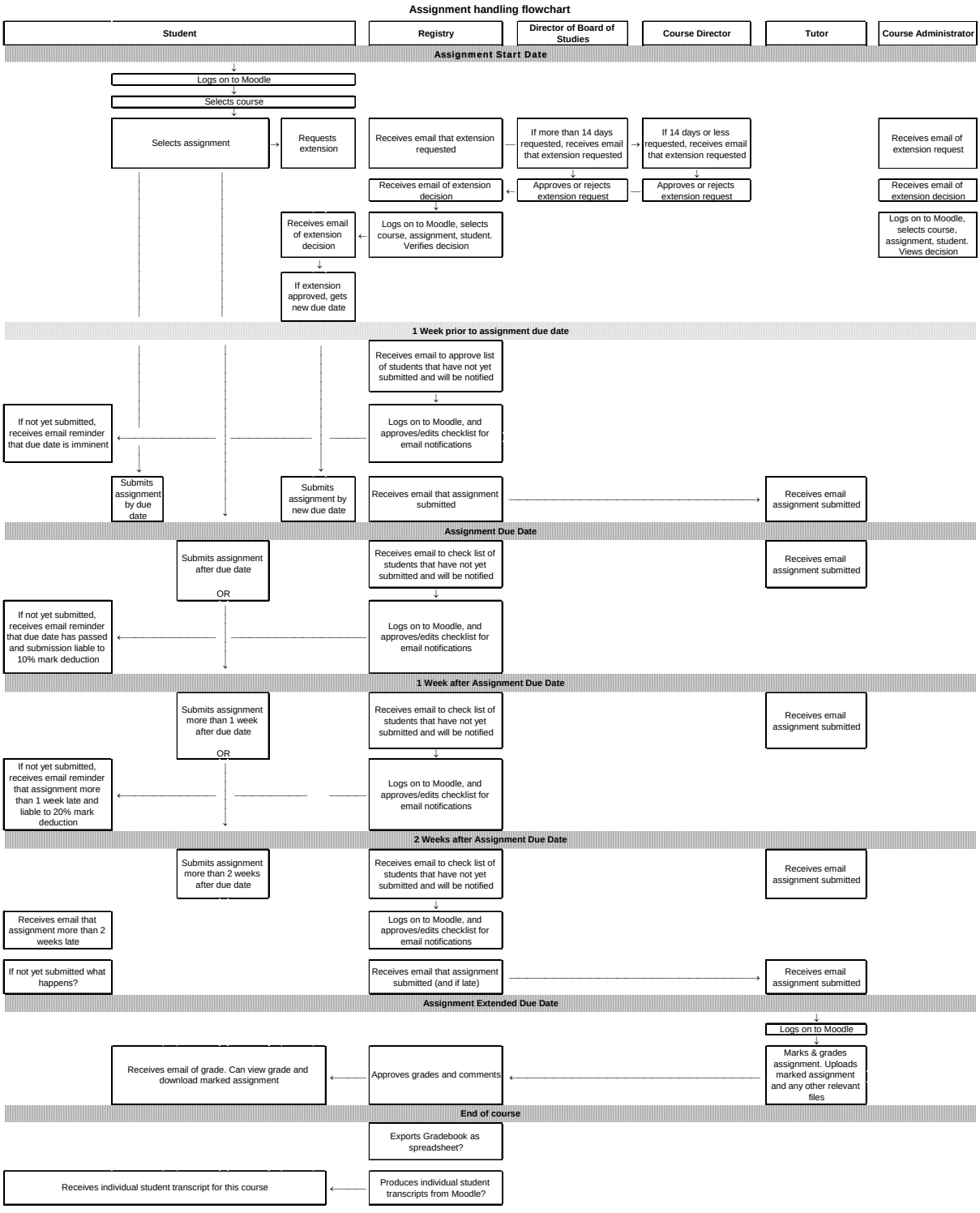

Figure 1 – The assignment-handling workflow

Even with these issues, or perhaps in part because of them, the system has been adopted by stakeholders and is being embedded in the Department's procedures going forward. We have developed complete supporting documentation[20] that is available to all users as well as a detailed service description.[21] Creating the service description has enabled us to define and

20 See supporting documentation http://cascade.conted.ox.ac.uk/project-outputs#guidance

21 See example service description http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/ServiceDescriptionExample.doc

negotiate the processes required to support this service into the future and to ensure everything has been considered in defining what is required to sustain the service beyond the end of the project.

Despite the higher than expected cost of the development work in this area, it is clear that online assignment handling, available across all award-bearing courses has the potential to offer an enhanced service for many stakeholders. Students can now submit assignments much more easily at any time from anywhere in the world. It is also possible to predict significant efficiencies in assignment handling time for the Registry staff who deal with student submissions for approximately 260 course assignments across 48 course cohorts a year: a saving of 30 minutes per assignment or more soon cumulates savings in the order of half a day per week.[22] Other advantages of the new online system are the reduction in paper handling and photocopying, as well as better auditing and control. Reduction in paper storage is a further advantage both in terms of less physical space being required and also in terms of less staff time being required to retrieve data from the archive. The legacy online assignment-handling system was no longer fit for purpose and if not replaced, increasingly ran the risk of loss of service at a crucial point, which was unacceptable for something as central to the student experience of study as assignment submission.

Thus, despite the challenges, the development of a new online assignment-handling system has been a valuable undertaking which provides the Department with a key part of the technical infrastructure required to achieve its broader aims in the future. Moreover, the development work has led to a wider debate about how such technical innovations should be funded to enable them to be more readily adopted. Historically, online assignment-handling was paid for on a programme-by–programme basis, which often resulted in poor take up as programme directors sought to improve the bottom line for their programme. It has now been agreed to fund this service (embedded within the VLE provision outlined below) centrally, and as a result interest in using the system has flourished promising efficiency benefits to all.

2) VLE support for courses

In recent years, the Department has offered VLE support for courses in three main areas: fully online courses, blended learning and for largely face-to-face learning. However, while the first area is well supported and developed, use of a VLE to underpin the other two areas has generally taken place on a more ad hoc basis and was only used on a small minority of the programmes that might benefit from this provision. Addressing this in a more systematic fashion was always intended to be a focus of Cascade. However, identifying which approaches to take has been a significant challenge. Of the original 21 sub-themes, 15 were related to this area and much of the scope refinement focussed on prioritising this work.

In order to specify the features to be incorporated into the Moodle support sites and to develop initial templates for use in pilot studies, needs-assessment activities were carried out including mapping best practice from our existing activities and the literature, consulting current and potential users of the system and targeting key groups of students to better understand their requirements. Pilots were then undertaken with the one-week Global Health summer school[23] to give an insight into providing VLE support for professional learners studying a short non-accredited programme; the Undergraduate Diploma in British Archaeology[24] and the MSt[25] and Postgraduate Diploma[26] in Psychodynamic Practice, and

[22] See time saving tracked in Section 1.2 of the Evaluation Report
[23] http://cpd.conted.ox.ac.uk/globalhealth
[24] http://awardbearing.conted.ox.ac.uk/archaeology/udba.php
[25] http://www.conted.ox.ac.uk/C800-19
[26] http://www.conted.ox.ac.uk/C800-18

the Postgraduate Certificate in Psychodynamic Counselling,[27] which enabled us to focus on students studying award-bearing programmes, either for personal interest or professional development. We also provided VLE support for tutors of our weekly classes programme.

The pilot studies gave the project team useful insight into how the VLEs were used and how well they were received by both students and staff. The course teams were very positive, despite having to spend time learning how to upload and edit content. They found the Moodle environment very useful for communicating with their students on both administrative and academic matters and for streamlining access to information, thus decreasing the need for photocopying and reducing the use of paper. All course teams from the pilot studies are now implementing VLE support more widely across course offerings in their subject areas, and to support new audiences such as alumni. Initial student responses to the VLE support provided for their courses was broadly positive, although some students lacked confidence in their skills with technology, this is something that can be partially addressed through the materials provided in the generic content pilot study (detailed below).

Towards the end of the pilot studies the team started to review the results to decide which features to include in templates to assist Departmental staff to set up VLEs for their courses. In conjunction with the generic content focus area (see below), we also decided what content should be included and how the templates should be structured to cater for the wide range of different course types offered by the Department. The screen shot figure 2, shows a typical example of a template, customised for courses in our Environmental Conservation portfolio.

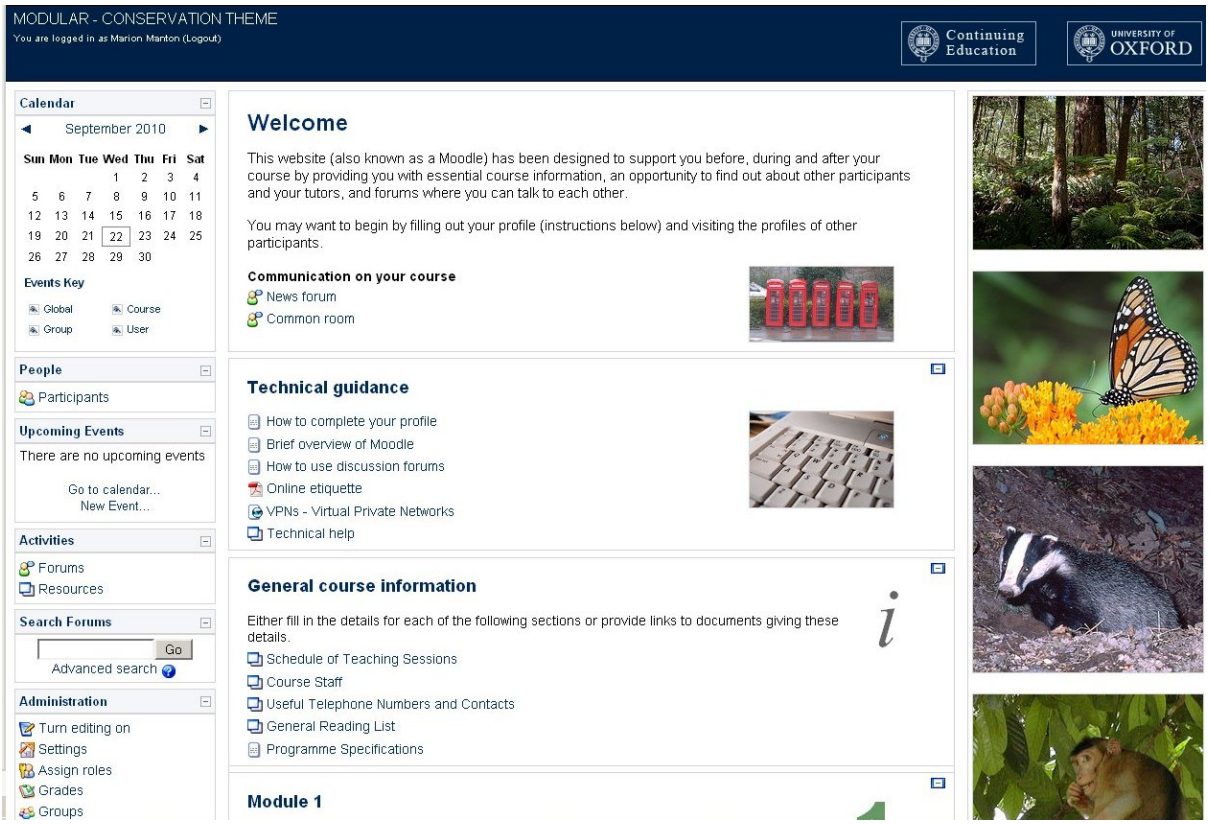

Figure 2 – a screenshot of a Moodle template customised for environmental conservation courses

27 http://www.conted.ox.ac.uk/C800-17

As the templates were refined it became clear that despite widely different programme types the core information and tools required to support most courses was surprisingly similar, so that the number of templates developed has been much lower than expected. Thus all templates contain information divided into the following sections:

- Welcome – welcome message and links to general forums
- Technical guidance – links to generic information to help students to use the site
- General course information – links general course information (e.g. that contained in course handbooks in the past)
- Detailed course information (provided in time structured sections appropriate to the course) including links to slides and teaching resources for sessions
- Tutorials and assignments – information on tutorial arrangements and assignments
- Libraries – links to generic content about libraries and library services
- Study support materials – links to generic study support content
- University links – links to generic University of Oxford systems, such as the past exam papers repository OXAM
- Information about Oxford – links to general information about the city and the University more broadly

The templates are made available to staff through the Department's intranet along with full supporting documentation. For individuals outside the Department we have made all the documentation available online[28] and have created a template checklist[29] as well as a "generic template"[30] available as a Moodle backup file for those who use Moodle, should they wish to take a similar approach.

This provision has been supported by the development of a simple web-based tool that enables staff to easily request a VLE site for a new course and add students to the site, while streamlining the management and support of the course set up by technical staff. Development of this tool required considerable interrogation of the current processes and procedures used to request and set up VLE sites and consideration of how they might be optimised in the future. This involved both clarifying understanding of the wider course lifecycle, as shown in Figure 3, as well as an articulation of the more detailed steps that the 'Request a course' and 'Add students' processes included in the tool would need to follow (see Figure 4).

[28] See guidance documents: http://cascade.conted.ox.ac.uk/project-outputs#guidance

[29] See template checklist: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/TemplateChecklist.doc

[30] A generic Moodle template is available from: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/backup-modular_-_general-20101220-1237.zip

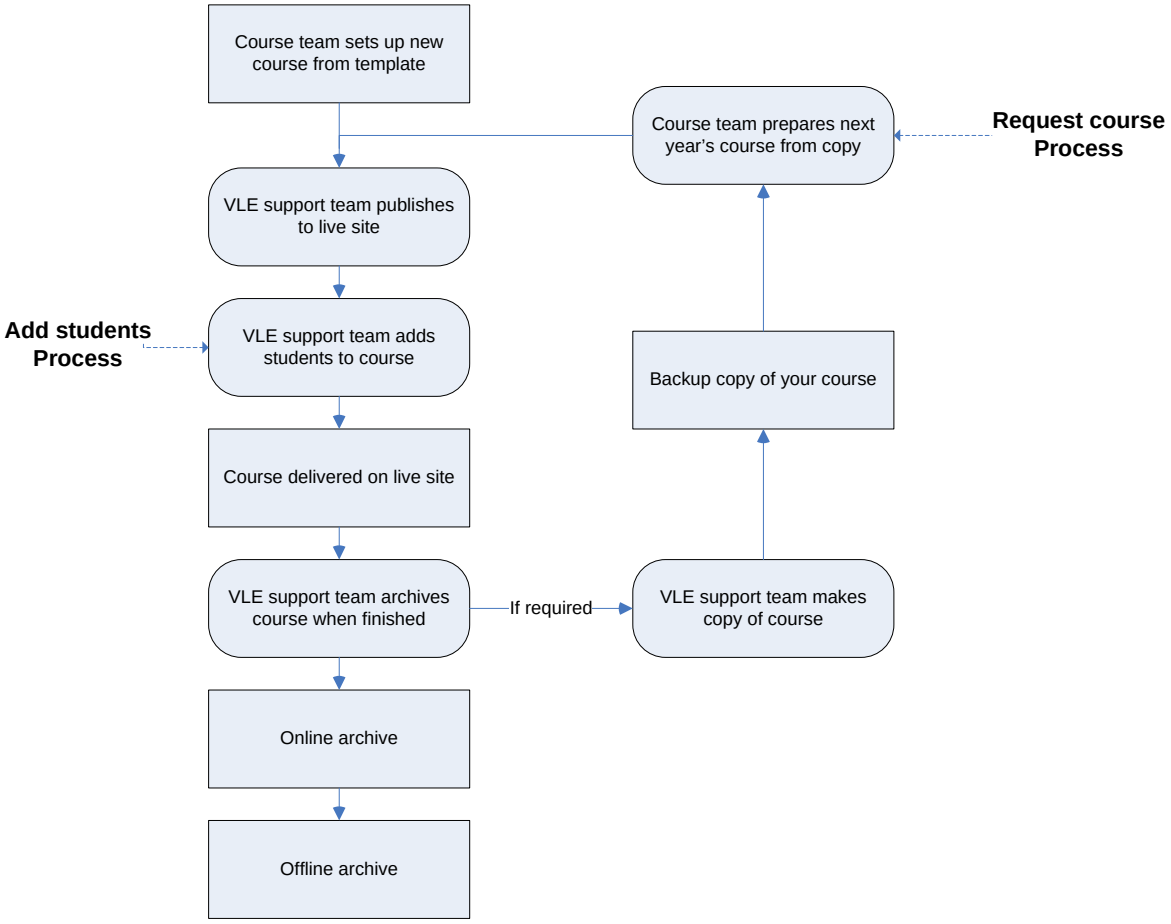

Figure 3 – The VLE course lifecycle

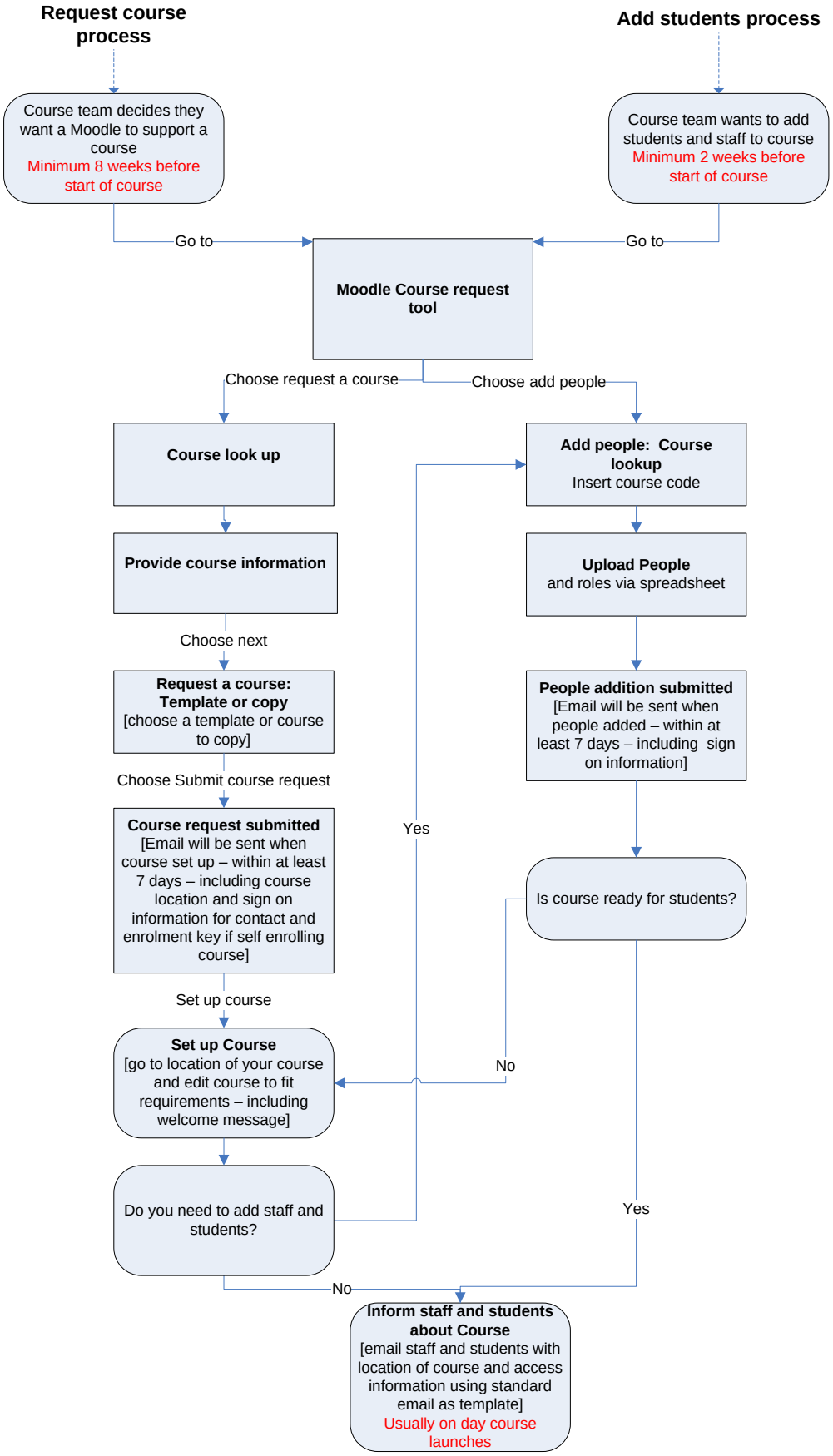

Figure 4 – The request a course and add a student process

For others considering what needs to be captured for this process in similar situations our full "clickable" mock-up of the interface[31] provides the experience of working through this system.

As with the online assignment-handling service, the tools and processes developed in this focus area have been described in a service description,[32] which is being used to define the future implementation of this service. Covering human resources, budgetary and process related issues, this has ensured that each has been considered as the service is rolled out more widely as a centrally-supported Departmental service.

In addition to the growing portfolio of fully-online courses, the number of award-bearing courses using a VLE to support their face-to-face teaching has doubled during the project There are over 25 course offerings,[33] including all new award-bearing programmes, supported by a VLE this year, and usage logs are showing considerable use from both staff and students.[34] Interest from other course teams within the Department indicates that this growth in provision is a trend that is set to continue.

3) Generic content

A finding from our initial stakeholder engagement activities and the review of new course proposals was the inefficiency inherent in the amount of generic content created, and recreated, independently by different course teams across the Department. This content was both in administrative areas, such as that covered by our course handbooks, and in training in what might be called 'academic literacies', especially in areas such as basic study skills and library and information skills. It was recognised that, in many cases, this information was delivered at the start of a course when students were not fully cognizant of its importance; therefore, when students needed a specific skill, they often required retraining. This created a demand for reusable online content addressing these areas, accessible by students at their point of need. The Cascade project team worked with the library staff and with course teams to identify which topics would be most valuable to develop. We also sought to identify whether there was existing content within the Department, the University or the wider HE sector, which could fulfil this need but whose existence was not necessarily known to either students or tutors.

The project also developed a small subset of new materials that were identified as desirable from our earlier consultations with stakeholders or which could be adapted for use by a number of course teams. This material included:

- Screen capture guides for library tasks and use of the VLE[35]
- A series of postgraduate level online study skills resources for the historical disciplines[36]
- A generic online induction for Masters'-level courses[37]
- A wider selection of course-related content publicly available through the Department's website[38]

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31 http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/template-mockups_0.6-e/index.html

32 See example service description: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/ServiceDescriptionExample.doc

33 This does not include fully-online courses which number over 150 course offerings annually

34 See more information in Section 2 of the Evaluation Report

35 See example screen capture videos in many pages of the courseware guide: http://onlinesupport.conted.ox.ac.uk/CoursewareGuide/index.php, for example, how to access a forum, view and reply to a post: http://onlinesupport.conted.ox.ac.uk/CoursewareGuide/Video/forum1.htm

36 Access password controlled, but may be provided on request, please contact Marion Manton (e-mail: marion.manton@conted.ox.ac.uk)

37 Available at: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/PG Induction.zip

- An improved set of online guidance materials, aimed at all students studying a course supported by a VLE[39] (not just those studying fully online courses)

In identifying existing external resources that might be valuable for our stakeholders, the most applicable tended to be those located elsewhere within the University and those that had been created by institutions or departments catering to similar students to ours. In particular, many of the Open University's OpenLearn resources[40] were identified as valuable to our users, although mainly because they were aimed at a comparable target audience rather than due to their specific status as Open Educational Resources (OERs).

Where external resources were identified as valuable, a pragmatic approach was taken to handling these and making them available to staff. These were provided to students and staff through links from VLE templates rather than by incorporating or adapting content. This offered two main benefits; resources could be used in this way whether they were licensed as OERs or not; and this left the burden for updating and maintaining these with the original content creators rather than the project team, who would not have realistically been able to sustain this activity. The downside of this approach is the need to check that these links remain current in the templates on a regular basis, but the relative labour in this process is much lower than the alternatives and has been incorporated in the service level description for the VLE support for courses.

Across this focus area more broadly we are continuing the pragmatic approach with each internal content source also maintained in one place. In real terms the majority of the outputs from this focus area are "invisible" to users as they are either now part of the Departmental website, available through the Course Design Moodle (see below) or Moodle templates (as mentioned above). This provides access to relevant generic content where it is needed rather than as something which has to be looked up as part of a separate process.

Early on in our consultations online course handbooks were identified as an area where there was potential to implement significant time savings for administrative staff in the Department. While the team tried to progress this throughout the project, this proved extremely challenging. The main issues were the variety of potentially interested parties and the priorities of the core stakeholder, the Department's Registry. This meant that development of this work would have been too resource intensive alongside the project's other commitments, so we did not pursue this as part of our mainstream project undertakings. However, the project team did share the results of earlier consultations and recommendations with the Registry and the Cascade Project Director also continued dialog about this through relevant Departmental committees. As a result, during the latter months of the project; the Registry updated their handling of the course handbook using some of the approaches recommended by the Cascade project team.

Now, all standard information is released through the generic Department for Continuing Education Policy and Guidelines for Students[41] document, and two standardised booklets aimed at either postgraduate[42] and undergraduate[43] students, all available online. Course teams can then supplement these with additional course specific information. Ironically, while

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38 See in particular updated student section on the Departmental website at: ,http://www.conted.ox.ac.uk/students/index.php
39 See online support site at: http://onlinesupport.conted.ox.ac.uk/
40 http://openlearn.open.ac.uk/
41 http://www.conted.ox.ac.uk/students/PDFFiles/Policy/PolicyGuidelinesHandbook.pdf
42 http://www.conted.ox.ac.uk/students/PDFFiles/PGInductionBooklet.pdf
43 http://www.conted.ox.ac.uk/students/PDFFiles/UGInductionBooklet.pdf

the Cascade project team were not able to progress this explicitly as part of the project, by raising the profile of this work in the Department we were crucial in its achievement.

From our pilots and wider implementation this academic year, it is now clear that the materials most likely to be included in a VLE by Department's staff have been the more administrative in nature. All new courses have included course handbook materials and links to updated library, technical guidance and support information provided through the website, while more "academic" content has seen more varied uptake by course teams.[44] However, the extremely low cost of sustaining these links, once set up, makes provision of them worthwhile.

While the Department is very interested in releasing all appropriate content as OERs, and has released content under Creative Commons (CC)[45] licenses in the past, we have not been able to do this as much as we would have liked with the outputs of the Cascade project. This has been due to the specificity of certain materials to the Department, which has made the content less relevant to the wider audience (e.g. bespoke course guidance, maps and directions to our buildings etc.), or because materials have integrated content with copyright constraints making the release of the wider resource omitting these elements not worthwhile. More generally, the team have engaged with wider OER activities in the University, such as the Open Spires[46] project, throughout Cascade and plan to look into releasing further outputs in the next few months.

Related to the idea of generic content Cascade has acted as an impetus for the Department to expand access to our online course Effective Online Tutoring[47] to all interested staff from this term. This course was originally developed as mandatory training for tutors on our short online courses portfolio, in recognition that the skills required to be an online tutor are not necessarily familiar to most academics. This course runs most terms, but often has some spare capacity – a problem on a course that has a lot of emphasis on collaborative activity. By making this course available to more staff in the Department we can both ensure the course provides a better learning experience for all involved and improve the skill set of our academics across the Department.

In terms of reusing the more specialised materials developed by the project, the three online study modules developed for the Postgraduate Certificate in Historical Studies (Studying the Historical Disciplines, Using Visual Sources, and Using Documentary Sources) are already planned for inclusion in our new MSt in Literature and the Arts course, which starts in October 2011. We are also arranging meetings with course teams of other relevant courses, such as the MSc in English Local History, to explore how they might adapt and use these resources. The external examiner of the Postgraduate Certificate in Historical Studies has commended the online resources that have been developed and commented on the wider transferability of these resources beyond the Department, and this is something we intend to explore in the future.

44 See further information see Section 2.1 of the Evaluation Report
45 http://creativecommons.org/
46 http://openspires.oucs.ox.ac.uk/
47 For information on the publicly available version of this course see: http://cpd.conted.ox.ac.uk/personaldev/courses/effective_online_tutoring.asp

4) Course Design

Many of the most successful uses of technology in curriculum delivery tend to have been designed into the course from the start rather than added as an afterthought. Thus, while many of the activities of the Cascade project have focussed on existing programmes, we also wanted to apply as appropriate, the lessons learned to as many new programmes being developed by the Department as possible.

Initially, the proposals for all new programmes currently in the Department's accreditation process were reviewed and their designs mapped against the sub-themes of the project. In addition, the project team met with most of the course teams to discuss the use of technology and to investigate where generic approaches could be of benefit. The majority of these programmes intended to use technology, with at least some VLE support and online assignment-handling, but had not fully considered the implications of their plans in relation to staff resources, student time and associated costs.

At an early stage, the Department updated its accreditation documentation to include justification of technology use;[48] this simple intervention resulted in technology being considered earlier in the course design process for all new courses. By making technology inclusion the default option, the up-take and buy-in has increased organically. The Registry now also recommends all course teams consult with the Department's Technology-Assisted Lifelong Learning (TALL) unit at the earliest stage of authoring these documents, which enables a more accurate approach to scoping and costing the technical requirements.

The project team originally considered supporting this process by running workshops for academics in the Department, which we know, from other projects,[49] can be a useful learning experience. However, as the project progressed it became clear that academics are only able to find time to engage with these issues when they are actually designing courses; at any one point this was rarely more than one or two individuals, making a workshop less valuable than one-on-one sessions. With this in mind, our approach evolved to the creation of a reference resource, the Course Design Moodle (see Figure 5), which academics could access at a time that suited them, and by making individual support sessions available to staff at the relevant part of the development process.

[48] See updated accreditation form: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/Template%20new%20course%20approval%20TT09.doc

[49] E.g. Leicester: http://www2.le.ac.uk/departments/beyond-distance-research-alliance/carpe-diem-folder and Hertfordshire: http://www.herts.ac.uk/about-us/learning-and-teaching/blended-learning-institute/projects/blu-national-projects/hea-pathfinder-pilot-project---cable.cfm

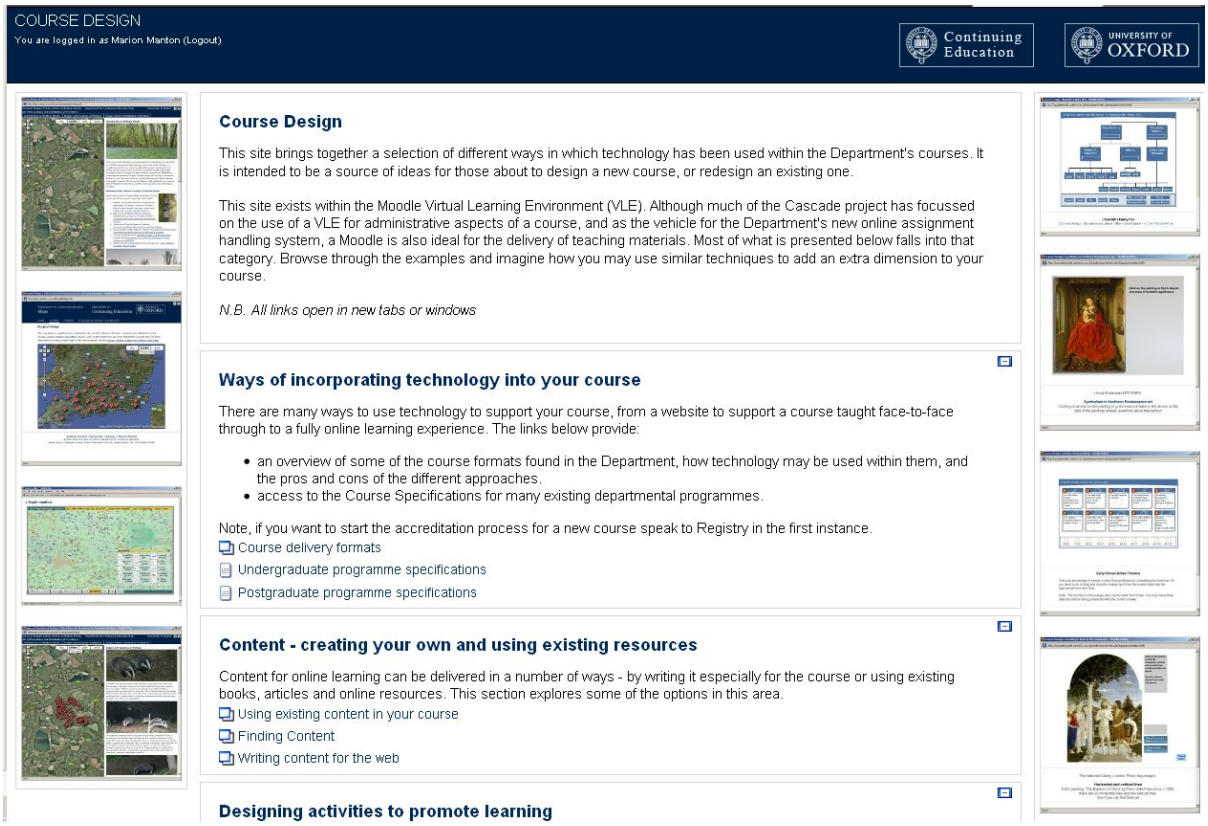

Figure 5 – a screenshot from the Course Design Moodle

The Course Design Moodle contains guidance on using technology within a course and includes examples of best practice and generic content from across the Department. The project team has provided links to relevant outputs from previous projects, such as Phoebe,[50] building on findings from that project that users react better to content that is specifically targeted to their situation. The Course Design Moodle has been designed to complement our outputs from other focus areas, acting as an inspirational resource that staff can use for ideas before engaging with other project outputs. It has been well received by its target audience and acts more broadly as a repository for innovative work across the Department. While targeted at academics engaged in designing new courses, it will be made available to all staff in the Department as a resource for those who want to explore this area further.

Due to the fact that many of the best practice examples come from online courses running in the Department, many of these contain copyrighted materials which we do not have permission to make more widely available. As such we are not currently able to release this resource more widely; however we are investigating ways of streamlining this content so that the material can be made available to the wider world as OER or otherwise.

Access to the Course Design Moodle is also complemented by the new offering of attendance on the Effective Online Tutoring course, mentioned in the previous section. While this does not explicitly address course design, experiencing online learning as a student, and participating in a well designed e-learning experience, as well as the specific training in tutoring provided through this are key to improving confidence in using technology for teaching and learning. As such we are hopeful that those who take the course are likely to use technology in their course design more effectively in the future.

[50] http://www.phoebe.ox.ac.uk

Since the Cascade project began there have been 15 new programmes put forward by the Department for accreditation by the University. Excluding DPhil programmes for which VLE support would not have been appropriate,[51] all but one are using technology to support the programme and within this, two outlined significant plans for delivering elements of the course online and two propose to deliver the majority of the course online. This trend seems set to continue as TALL has already been contacted by other teams about developing significant elements of online provision for new programmes.

5) Online enrolment and payment

Our existing experience indicated that there were major gains to be made by allowing students to enrol and pay for their courses online; in particular:

- savings in processing time by course administration staff;
- improved data management by creating a direct link between enrolments and payments;
- improving accuracy as students input their own data, therefore reducing the number of people involved and removing transposition errors;
- savings in financial administration time due to reduced manual processing of payments and opportunities for batch processing;
- improved service to our globally distributed students as the service is available 24/7.

At the start of the Cascade project, while online enrolment and payment was being used for a few of the Department's programmes, such as online courses, the majority of programmes were not able to take advantage of this service and most of the Department's students enrolled, and paid for their courses, in person, by post, or by fax. In the first quarter of the 2008-09 academic year (August to October), at the start of the Cascade project, 1,731 online enrolments were taken, with a financial value of £300,059. This represented 32% of the total number of enrolments received during the period.

Initial baseline work undertook a simple time-motion study on the amount of time needed by a course administrator to process a paper-based and an online enrolment for the same course. The results of this showed that with savings of over five minutes per transaction possible for straightforward online enrolments there were significant benefits to be made across the Department by applying such savings across the thousands of enrolments processed by course teams each year.

To enable more of the Department to take advantage of the clear benefits offered by the online enrolment service it was important to identify the barriers to greater uptake. Consultation revealed the main reason programmes were not offering online enrolment was because they had specific registration requirements that the basis online enrolment system did not support.

[51] For more information see section 3.1 of the evaluation report.

Extended functionality was identified in key areas, and was prioritised by both ease of implementation, and commercial impact as follows:

1. Discounted enrolments e.g. for alumni or staff;
2. Online enrolment, including the ability to book catering and accommodation (for courses such as weekend schools);
3. Payment of invoices by instalments (for longer programmes of study);
4. Shopping basket feature (to allow students to enrol on, and pay for, multiple courses at the same time).

Technical development

The process for online payment was initially captured in Figure 6, which acted as a reference point throughout the development process:

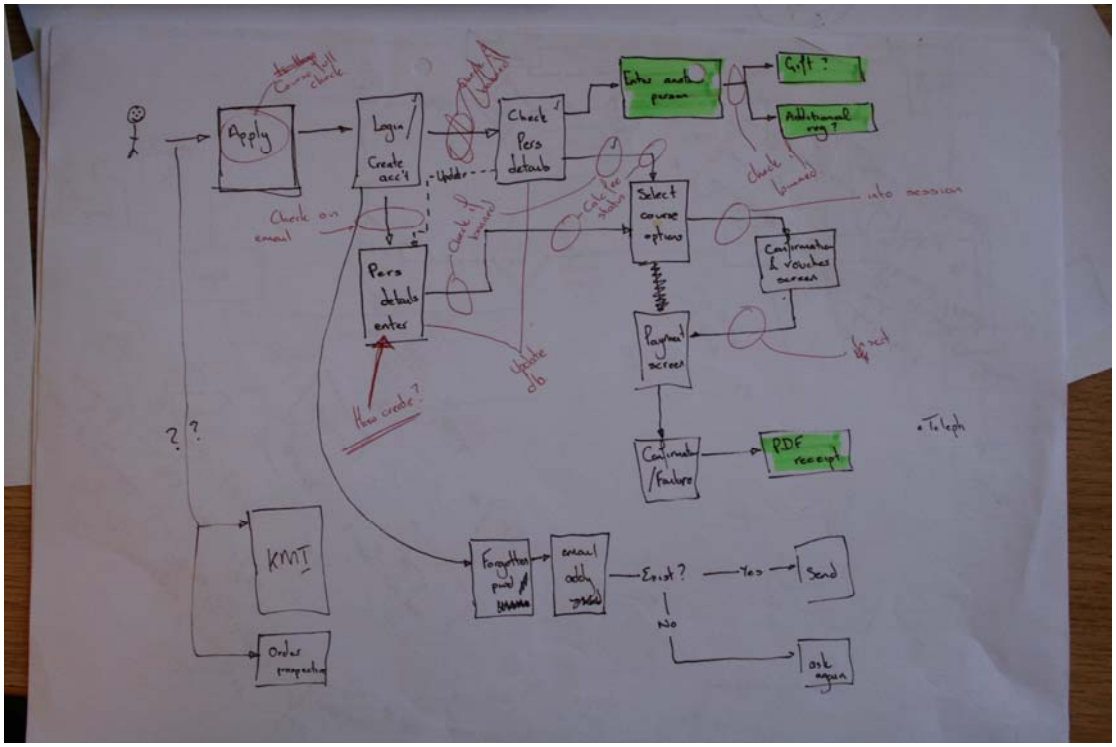

Figure 6 – Online enrolment and payment process

And then more formally in Figure 7,[52] which illustrates the relationship between the Department's systems and the external payment services provided by WPM Education[53] to authenticate and process credit card payments.

[52] An electronic version of Figure 7 is available at: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/oxford%20ContEd%20process%20flow.gif

[53] WPM Education: http://www.wpmeducation.com/

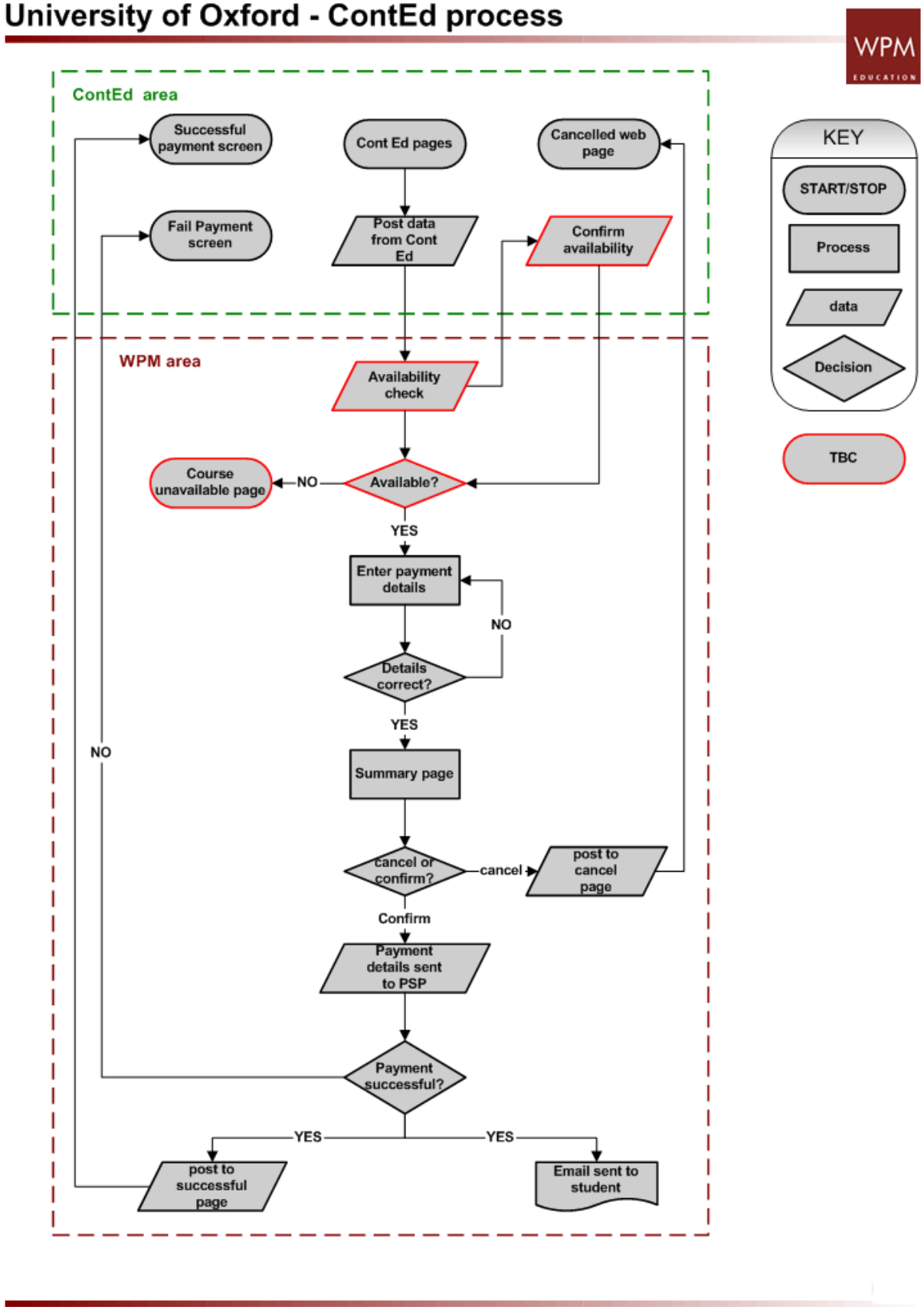

Figure 7 – the relationship between WPM and the Department

The original design for the Department's online enrolment system followed simple and fixed data architecture. The secure front-end of the online enrolment system was developed in PHP, a general-purpose scripting language (via https protocol – with a security certificate issued by Cybertrust Educational CA), and communicated with InfoSys, the Department's administrative database, via the Open Database Connectivity (ODBC) protocol. To enable this, InfoSys, which is built on SQL Server technology, was split into a reduced web database and the original administration database, with a series of SQL procedures being written to trigger synchronisation between the two databases. The final stage of the online enrolment process, online payment, was undertaken by an external third party, WPM Education, and their online payment gateway – developed in ASP (and again using a certificated secure web front-end communicating, via ODBC, to a database built on SQL Server).

With an increasing number of courses allowing online enrolment, and the additional functionality requirements identified above, a number of issues with code enhancements and usability were highlighted. The main issue raised by users was frustration that returning students need to enter their details each time they enrol on a course (some students enroll on four or five short courses per year) something that the shopping basket functionality would also need to address. To improve the user experience, online student login functionality was identified as a priority, providing students with access to manage their data and to help returning students register for courses online by removing the need to input their details again.[54] This major shift in the data model used required major development work in the following areas:

- InfoSys was developed to populate the web database with a student's account details as they login in and to provide mechanisms for this data to be updated and synchronised with the main administration database.

- Rather than attempt to add further developments to the existing code architecture, a decision was taken to rewrite this area of the web front-end using PHP Object-Oriented Programming (OOP) – requiring a number of new skills for the programmers involved. Classes have been created to represent the student and a course, allowing simple data retrieval (during the login process), reuse and manipulation.

It is believed that the flexibility and code reuse offered by OOP will allow future developments and improvements to be applied to the online enrolments system more easily and ensure a more stable platform.

For much of the project a significant focus of the web team was on a comprehensive redesign of the Department's website,[55] see Figure 8.

[54] Captured in the Self managed student profiles system – technical requirement document: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/student-profiles-2009-08-19.doc and overview diagram: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/online-student-services-functional-spec.pdf

[55] http://www.conted.ox.ac.uk

Figure 8 – a screenshot from the redesigned Departmental website highlighting the promotion of the online enrolment option

In particular, this has focussed on making it easier to find courses – for example, allowing filtering by course type, location, start date etc. The information provided about courses has also been comprehensively reviewed to ensure that it provides the data required to enable students to choose the right course. Departmental course teams are now asked to include the following information about their courses in InfoSys, although not all are relevant to all programmes, and thus are omitted if not required:

• Course Name	• CATs points	• Staff	• Level and demands
• Type	• Fees	• Course aims	• Accommodation
• Location	• Course contact	• Certification	• Recommended reading
• Address	• Overview	• Libraries	• Teaching outcomes
• Dates me	• Description	• Assessment methods	• Scholarships
• Subject area (s)	• Programme details	• Teaching methods	• Fee payment options

Developments to improve the InfoSys data model have been made with the dual goals of offering a better user experience and enabling automation, where useful. An example of the latter is the production of an XCRI[56] feed of the Department's courses directly from InfoSys.

[56] XCRI is a JISC-funded, UK-oriented project to establish a specification to support the eXchange of Course-Related Information (http://www.xcri.org/)

This will enable automatic updating of the Department's UCAS course listings, and inclusion in other aggregation services. A trial XCRI feed of InfoSys data was created[57] that showed a useful feed could be simply developed, and would serve as a good basis for generating a more sophisticated version in future. We hope to further explore the XCRI feed at a later date, taking advantage of new developments on the Department's website, such as the use of persistent identifiers for courses across cohorts.

As the new website only launched on 16 September 2010, it is too soon to know if this will increase the volume of online registrations; although there has been anecdotal evidence from course teams of increased enquiries from potential students.

The comprehensive redesign of the website has limited the development time available for both the shopping basket and payment of invoices by installments projects. Following the release of the website redesign the student login was made available internally for testing and the developers concentrated on creating the structure of the shopping basket.[58] As this area of the website had been redesigned using OOP it was found to be straightforward to amend the new login code to accommodate the basket and therefore a decision was taken to delay the release of the new student login to bring in the new shopping basket facility at the same time. The complete student login and shopping basket functionality will be tested internally during January 2011 and tested by external student during February 2011.

During the past few months the highest priority has been adding new functionality to allow the payment of invoices by installments;[59] this has included a complete review of the existing financial processes within InfoSys involving invoices and student registrations. The first phase of development of InfoSys has been completed and reviewed by Departmental programme managers, leading to a number of small changes. These developments are currently being tested internally by the finance team to confirm everything is working correctly. The final database developments, creation of web database tables and procedures, have now been completed and a number of static web pages, within the new student login area of the website, have been created and demonstrated to stakeholders. Development of the dynamic web pages is scheduled for January 2011, at which time WPM, the University's payment provider, will also be working on the changes recently agreed, with the aim to conduct user testing during mid-February 2011.

In the earliest stages of implementation of online enrolment and payment across Departmental offerings there was concern that this method would not be appropriate for our students. This has been countered both by the our rolling survey of the process that indicates over 86% of users would rate this process at 8 out of 10 or above[60] and the overwhelming evidence of uptake of the system by students.

The Department is already seeing measurable benefits in terms of savings in course administration time through the availability of online enrolment and payment. The greatest impact has been seen in the Department's Public and International Programmes division, which delivers the Department's two largest programmes (Day and Weekend Schools and Weekly Classes). In the 2009-10 academic year, 5,683 (87%) of the total of 6,501 online enrolments taken by the Department were for these two programmes. As a result of savings made in course administration time both programme offices have been able to support an

57 Available at http://xcri-dev.conted.ox.ac.uk
58 Shopping basket workflow: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/web_infosys_basket_interaction-2010-11-05.pdf
59 Payment of invoices by instalments workflow: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/instalments_website_overview-2010-11-03.pdf
60 See full data in Section 4.3 of the Evaluation Report

increase in the overall number of course registrations, for example the Weekly Classes programme took 850 additional enrolments in 2009-10 compared to the previous year, and reduced their staffing by 0.5 FTE allowing them to redeploy staff to focus on marketing and the development of new courses.

Across the Department similar gains have been made. Between 2007-08 and 2010-11, the total number of online enrolments transactions in the first quarter of the year increased by 142% from 1,171 in Q1 2007-08 to 2,834 in Q1 2010-11. Growth in financial value was even greater with a 290% increase over the same period. This service has had a significant impact on the finances of the Department and has been a major factor in our continued success in improving service levels and managing the Department's cost base.

Evaluation

The first step in evaluating the Cascade project was to develop an Evaluation Plan,[61] and to define the measures of success. In order to construct this Evaluation Plan, all available Cascade documents, such as the original JISC call, the project plan and activity plans for the five focus areas of the project were reviewed and synthesised. Next, several informal meetings were conducted with the project manager and all project team members. Two days were spent identifying aims and key measures of success for the individual focus areas. Finally, an evaluation matrix was agreed, outlining the various evaluation questions, activities, and suggested data collection methods. This was submitted to JISC, and approved in March 2010.

The second step was to take a snapshot of the initial status of the project to establish a baseline. The goal of the resulting Baseline Report,[62] submitted to JISC in June 2010, was to provide a sound basis on which the success of the project could later be evaluated. The baseline was established following the same structure as the Evaluation Plan; starting with focus area 1 on online assignment handling and concluding with focus area 5 on online enrolment and payment. Where possible, data collection, analysis, and interpretation were separated in to three distinct sub-sections. This Baseline Report focused entirely on the description of baseline information and did not include any summative evaluation on the progress of the project.

The third step was to produce an Evaluation Report[63] based on data collected as the project reached its conclusion. In the Evaluation Report, which will be submitted to JISC alongside this report, the collected baseline data will be compared to the final project data. This report will not only report on the five focus areas, but will also include an overall evaluation of the Cascade project as a whole. Sections on achievements against objectives and project management will be included as well as an evaluation of stakeholder engagement and dissemination of project outcomes.

More generally many of the data collection metrics used in the evaluation of Cascade, e.g. tracking IT support time, uptake of VLE support for course and online assignment-handling, and the value of online enrolments, will continue beyond the end of the project, as these are already embedded within our continual evaluation and improvement of Departmental services.

61 http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/Cascade%20-%20Evaluation%20Plan%20v4.1.pdf
62 http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/Cascade%20Baseline%20Report%20v5-final.pdf
63 http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/evaluationreport.doc

Engagement

With the Cascade project aiming to support cultural change across the Department for Continuing Education, engagement with our stakeholders has been a major theme of this project. Our intentions in this area were laid out in our Communications and Engagement Strategy.[64] Work was undertaken in four phases; 1) project awareness; 2) piloting & development activities; 3) engagement within the Department; and 4) deepening engagement in the Department & wider dissemination. Different approaches were taken at each stage in order to meet the communications and engagement objectives of the project.

In phase 1, initial opinions were elicited from individual interviews with key members of staff[65] and this was followed-up by running a series of focus groups activities with groups of Departmental staff to both raise awareness of the project and prioritise and confirm activities. This phase of the project also included the establishment of a Steering Committee comprised of representatives from JISC, the Department and other University of Oxford departments.[66] The role of this group was to help guide the specification of project activities, perform the duties of a 'critical friend' and to raise awareness.

The piloting and development activities in phase 2 involved working closely with individual staff and also involved communication of the project's progress to staff more generally. To achieve the latter point, we used approaches such as: directing staff to the project website; email updates; reports to relevant Departmental and University committee meetings; articles in newsletters and the posting of messages to the project blog.

Phase 3 included broad dissemination though a project flyer/poster[67] and further workshops with groups of Departmental staff, supplemented by increasing one-to-one engagement with specific individuals and teams. Finally, phase 4, continued the work of the prior phases, but concentrated on the identification of key interventions and their point in the Departmental academic cycle so that staff might be provided with information at the appropriate point in time. More generally, outputs and information have been embedded within systems, processes and procedures that ensure they will become part of ongoing Departmental activity. For example, outputs relevant to an individual's role will now be introduced to staff as part of the standard Departmental induction.

As the project outcomes and deliverables mature and become embedded production services, key documentation will include the service level descriptions for the online assignment-handling, and VLE support for courses. These documents set (and manage) expectations for the services and ensure the provision of accurate information about standards and working practices to Departmental staff.

Beyond the Department, we have been disseminating outputs to the wider University through relevant committees such as OxTALENT[68] and by engaging with key individuals. In this respect the steering committee has been particularly valuable in terms of making connections and ensuring we have been able to identify the right colleagues with whom to liaise.

Beyond the University, the project team is now focussing on making outputs not only visible but useful to a wider audience, both through tools such as the Design Studio, but also through our engagement in events such as the Learning and Teaching Practice Experts Group on supporting learners in a digital age in July 2010, and the JISC Innovating e-

64 http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/CommunicationsStrategy2010-03-30.doc
65 This included operational managers and directors of divisions as well as mangers of key sections of the Department
66 See list of members: http://cascade.conted.ox.ac.uk/people
67 http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/posterD.pdf
68 http://www.ict.ox.ac.uk/oxford/groups/oxtalent/index.html

Learning online conference in November 2010. We also hope to present the Cascade project outputs at relevant conferences in 2011.

Sustaining project activities

The project team has been determined to ensure that valuable project activities and outputs are embedded in Departmental practices. Sustainability has been a key consideration from the very start of the project, for example, the initial definition of the project scope focussed on identifying those activities that the Department wanted to embed and judged most likely to be sustainable. The cost impact matrix[69] in Figure 9 represents this process. Each key project output is positioned on the matrix twice: once to represent its development and once to represent its ongoing sustainability. As the matrix demonstrates, some interventions have been expensive to develop, but are relatively cheap to sustain. The positioning of virtually all the project undertakings in the high impact/low cost quadrant in terms of sustainability is indicative of our approach over the course of the project.

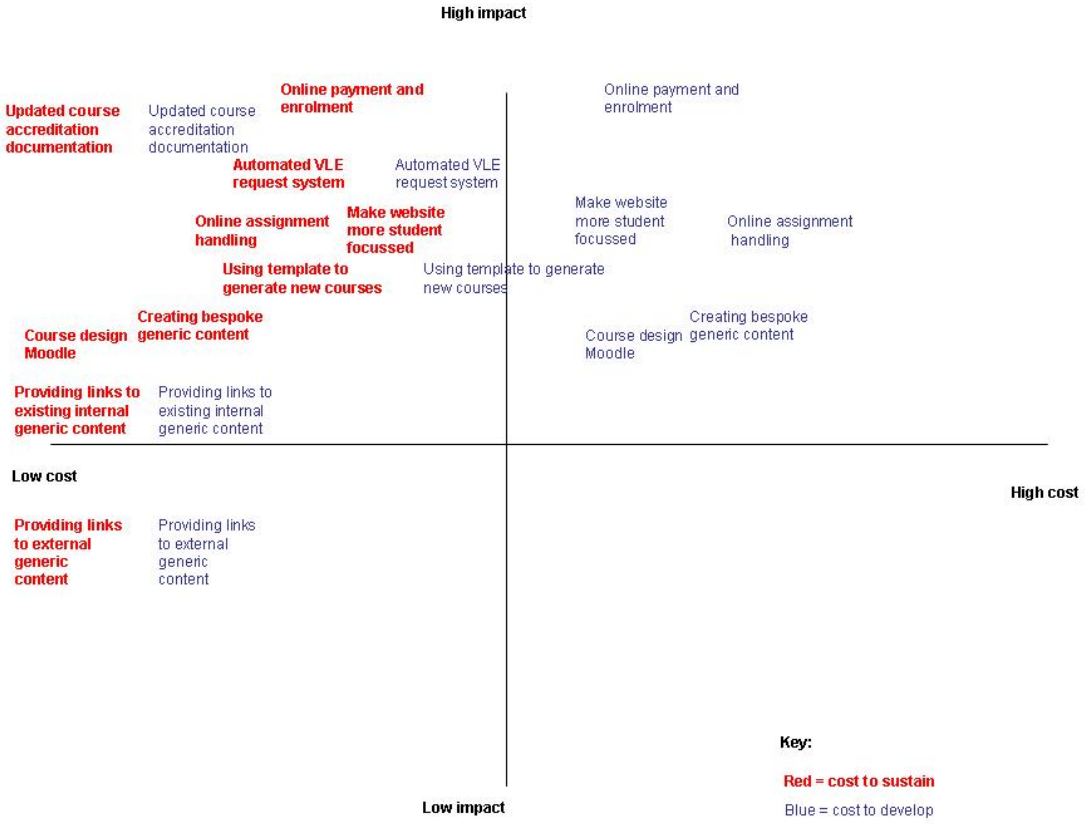

Figure 9 – a cost impact matrix of Cascade activities

As a result of stakeholder engagement throughout the project, many of the activities such as VLE support for courses are already fully embedded within the work of many course teams in the Department. While for other developments, where progress has been delayed, work will continue beyond the end of the project to ensure that the relevant benefits are realised and sustained.

[69] Inspired by the matrix developed by the Duckling project at the University of Leicester, http://www2.le.ac.uk/departments/beyond-distance-research-alliance/projects/duckling

The key documents shaping our approaches in this area have been the service descriptions of online assignment-handling and VLE support for courses,[70] mentioned in previous sections. These provide:

- An overview of the service
- Instructions on using the service
- Information on access
- A clear statement of the responsibilities of all stakeholders
- Shut down and archiving policies
- Information on availability of support and training
- Availability of the service
- How to provide feedback on the service
- Information about additional related services

By explicitly setting out all aspects of how these project activities will run as Departmental services, these act as a framework for consultation with all stakeholders and ensure all areas have been interrogated to check that the correct resources, tools and processes have been developed, and resources allocated to ensure these services are sustainable.

3.2 What did you learn?

The lessons learned by the Cascade project have been grouped, for clarity, under the following five headings:

1. Project scoping
2. Project management
3. Innovation
4. Engagement
5. Embedding

1. Project scoping

1(a) Analysis of organisational processes is essential for indentifying where technology can help

In order to deliver efficient institution-wide services it is essential to take an organisational view of how services should operate and identify those that can be developed and used across departments, sections etc. Consultation and analysis at a strategic level is essential when setting high-level aims. Organisational processes needs to be properly interrogated to discover if and how technological interventions offer real benefits, such as using time motion studies to assess the impact of online enrolment and payment and assignment submission. Engaging in this process was key to the identification of the focus areas chosen for the Cascade project and in specifying the details of the implementation solutions developed in each focus area.

1(b) Identifying where technology does not add value is as important as identifying where it does

Related to the previous observation is that detailed analysis of organisation activities enables the identification of where technical intervention may not offer benefits commensurate with the investment. For example, in the Cascade project, the early

[70] See example service description: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/ServiceDescriptionExample.doc

project scoping stage identified areas where, while technology might have been thought to enhance provision, it became clear that the real value to staff and students did not warrant the cost of the intervention. Put simply, in some cases technology was not the answer. In particular, for our project, this included using technology to support our face-to-face Weekly Classes programme.[71] This is one of the Department's largest and well-established programmes, which currently offers 252 individual courses, delivered entirely face-to-face in 2-3 hour sessions over a period of 10 or 20 weeks. While this represents a significant number of students for the Department, it became clear that VLE support across the whole of this programme would not offer tangible enough benefits to justify the cost. The volume of courses, the rapid turnaround of subjects, and the perceived value to students[72] argued against such investment.

1(c) Understanding the cost benefit implications of decisions enables the focus to be placed on services offering the greatest impact

Broad institutional knowledge and access to relevant data is required in order to research and analyse where cost savings/efficiency gains can be made or additional value can be delivered. Understanding the business case and costs involved is necessary in order to improve efficiency.

Making the correct choices about which solutions add real value to an institution is going to be even more important in the future. Identifying services which are inherently sustainable, such as online enrolment and payment, or which must be implemented to avoid being sub-standard, is central to this. In the Cascade project, being able to measure the real cost/time implications of having VLE support for a course, e.g. looking at staff time, savings on handouts, access to better information and perceived value to staff and students, showed benefits but some real costs too.[73] However, where the VLE also incorporates online assignment-handling the benefits were more obvious and quantifiable. One reason why the project was successful was because it was able to identify the programme types where VLE support allied with online assignment-handling offered real savings. Thus, for example, making it viable for award-bearing courses, but not currently for weekly classes.

2. Project management

2(a) Implementing change took longer than originally planned for

Undertaking a project that aimed to effect widespread change for a large number of people is, unsurprisingly, an extremely complex and time consuming task. While the project team was aware that this was likely to be the case, early stages of the project took even longer than expected and project initiation was extremely slow. A significant factor in this was starting a project with a clear challenge but no predefined solutions. Achieving consensus on what areas to pursue took a long time and, once development started, proved slower to implement than anticipated. The project team had hoped that our previous expertise in using technology to support curriculum delivery would enable us to implement changes quite rapidly; however this was only true to a limited extent. Widespread change management is a complex process, and while it can be facilitated will always take time and effort. We learned that accurate and timely project specification and planning is of paramount importance.

71 http://www.conted.ox.ac.uk/courses/weekly/
72 See sections 2.3 and 2.4 of the project's Evaluation Report
73 See section 2 of the project's Evaluation Report for more information on these.

2(b) Project management for service development projects requires a different approach than research projects

Optimal project methodology differs by project type, and it is important to use the right one. When working with a broad range of stakeholders, processes and innovations it is essential to be flexible in the project management approach. To avoid being consistently reactive it is vital to be forward thinking and identify dependencies, something the Cascade project was able to do better at some points that others. Testing and piloting the online assignment-handling system was a particular challenge, as the project team discovered that the timing of pilot studies were non-negotiable and needed to undertaken when assignments were due to be submitted for courses that had volunteered to participate in the pilot study. Sometimes course assignment deadlines did not always match well with the original testing schedule in the project plan. To effectively manage service development projects, an appropriate amount of time needs to be planned for project initiation and specification. In addition, plenty of time needs to be allowed for testing and piloting, particularly where opportunities for testing are restricted or limited by external factors. While time was apportioned to both of these activities in our online assignment-handling project plan, with hindsight we would have allowed longer for both of these stages of the project.

2(c) Technical developments benefit from an iterative development approach

When developing complex technical interventions, it is impossible to capture all variables in one cycle. Both during the specification and the testing and piloting stages it is essential to use an iterative process to ensure all aspects of the system are adequately addressed. While this had been allowed for in our planning, up to a point, developing online assignment-handling required more iterations than expected. So, although we had the luxury of technical expertise this was still a difficult process, as unanticipated iteration meant our developer was subject to competing priorities. Identification of relevant technical skills is essential, as is ensuring that technical resources are available when required. It's also likely that, for projects such as this, where the overall project is much broader than software development, and is not managed by a specialist technical project manager, whatever estimate is made of the technical resource required, more are likely to be necessary.

2(d) Indirect influence can produce valuable results

It can be possible to make unexpected progress in out-of-scope areas while pursuing mainstream project activities. In our early consultations with stakeholders, some of the areas indentified were deemed out of the scope of the project. However, many of these have progressed in parallel to the Cascade project without explicitly being a project activity, for example, the course handbook developments. Another area has been the growth of new course models that require less frequent attendance in Oxford (therefore opening our offerings to students located at a greater geographical distance from the Department and thus increasing our potential student market). These models have become more prevalent as new programmes are developed and existing programmes redesigned. The Cascade project has supported the understanding of how these alternative models can work, as well as putting the underlying administrative functions, systems and services in place to allow Departmental staff to take advantage of the potentially wider benefits of using technology to deliver courses.

2(e) Time, availability and support are as powerful as planned interventions in effecting change

Our experience suggests that where it can seem difficult, or even impossible, to achieve aims at certain phases of the project, being consistently available and engaged with your stakeholders can result in positive results. In the case of both course handbooks and attitudes to online assignment-handling, there has been a

major turnaround in attitudes and perceptions. This was due both to targeted action and to the wider activities and availability of the project team within the Department, which helped build up trust and reputation over time.

3. Innovation

3(a) Small, but crucial interventions can be leveraged to achieve large effects

Occasionally you can find an "intervention gem" that requires minimum input for significant impact. In our case, the early change in the Departmental course accreditation documentation had a large impact on the use of technology in new courses. Alternatively, moving an obvious barrier can have an effect disproportionate to its significance in real terms. For example, changing the charging policy for online assignment-handling and VLE support for courses from making a charge to individual courses to centrally funding the service has significantly increased interest in using the service. Focussing on the details can be crucial to identifying those operational rather than strategic changes that can provide significant benefits. Reviewing both strategic policy and operational practices throughout the project enabled us to recognise where such interventions might have most benefit.

It is also worth noting that while there are few small changes that have such a large effect in isolation, small steps do progress activities, and often just starting change on one small achievable area can lead to a snowball effect. At times, the progress of the Cascade project appeared less dramatic than it was, and it is only at the conclusion of the project that it is possible to look back and appreciate just how much has been achieved over the life of the project.

3(b) The largest challenges are often in understanding and improving systems and processes

While this project was about transforming curriculum delivery through the use of technology, most of the difficult challenges involved understanding the activities and processes that technology might support. Thus, while technology might offer a sensible solution to a challenge faced by the Department, the complexity often did not lie in the technical solution itself but in understanding the process or activity it was modelling. In some cases this meant that the eventual solution was relatively “low tech”, such as the system to request a VLE site and add students to courses, where the greater part of the value came from clarifying and then streamlining processes and procedures.

3(c) Technological innovation can be a catalyst for wider change

As mentioned above, projects aiming to use technology to improve efficiency force detailed examination of systems and procedures. This can be a useful process, even if after exploration it is decided a technical solution isn't the answer. The interrogation of processes often acts as the catalyst for other changes. For example, within the Department, the development of online enrolment and payment has also changed the way the Department uses its website to support students prior to registration. The information situated on the website actually represents changes in the administrative processes around providing information to support prospective students, rather than a technical development. However, it was the initial technical development work that instigated the improvements.

3(d) Working with open source software creates challenges as well as opportunities

The project team had extensive experience in developing open source software in general and in Moodle in particular. However, in this particular project, our

modifications to the existing Moodle assignment-handling module proved far more complex than anticipated. This was largely a result of working with open source software which, while it has many advantages, does not always have the most well-documented and clean code. This was also exacerbated by unexpected impacts following the modifications we made to the code and resolving this issue was time consuming. With hindsight, we did not allocate sufficient staff resource to technical development, which delayed our progress at certain key points during the project. Our advice[74] to other project teams undertaking similar developments would be to ensure they are aware of all of these issues and to plan their activities accordingly.

3(e) Balancing your requirements and those of the open course community can be a challenge

Following on from the above point, there is also a balance to be struck between planning ahead so the code will be of value to the community at large, versus just getting what you need working. Trying to accommodate the needs of other members of the open-source community as well as your own can lead to unanticipated complications. From this experience, we recommend that developers should consider how their work might fit with upstream at a later stage and should mainly focus on fulfilling their immediate requirements. By taking this approach and releasing early and often, other users can then engage with the developments by providing comments or code. Arguably our developments were unusual in that they included two major features – assignment extensions and Registry workflow – in which the code is closely integrated with each other and also with the standard Moodle features. This has made managing and sharing the code more complicated than most third-party Moodle developments.

3(f) Software development requires clear communication and focused objectives in order to be effective

Different expectations of functionality from various stakeholders, even at a late stage of the development process, proved a challenge. Sometimes documentation had been produced, but not read by all relevant stakeholders and, as a result, some ended up with different expectations of functionality. Comments regarding functionality were sometimes reported as problems in the system and at times these clouded issues around genuine bugs. In addition, incomplete use of project support tools, in particular our issue management system (IMS) “Trac”, proved an issue as feature requests, bug reports (valid and invalid), general comments, and other feedback were mostly made via MS Word documents and emails – resulting in multiple overlapping, hard to manage lists of issues. With hindsight, getting at least the project team, and ideally all staff stakeholders, buying into the use of the IMS system would have greatly helped the development process.

3(g) Reducing costs by increasing efficiency, can also improve quality of service

As outlined in detail in our Evaluation Report, online enrolment and payment has significantly reduced the amount of staff time[75] required to administer course registrations, freeing-up staff time to be spent on improving services in other areas. At the same time online enrolment and payment has bought a number of other improvements including an increase in the diversity of recruitment; offering a better service for students, because, for example, online enrolment is available 24 hours a day, seven days a week.

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[74] The Cascade project team’s experience of working with open source software is presented in more detail in *Case Study 2: Customizing open source software: benefits and pitfalls*, which is available from: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/CascadeCaseStudy2.doc

[75] See Section 4.1 in the Evaluation Report

3(h) Improvements to the administrative areas of curriculum delivery can deliver value

The changes that offered the most value to the Department, either in terms of time saved, efficiencies gained or improvements in services to students and staff, were largely at the more administrative areas of course delivery, in particular online enrolment and payment, access to programme information, VLE support for courses and online assignment-handling.[76] Despite seeming tangential to mainstream teaching and learning, these areas should not be overlooked as they are significant factors in attracting students to programmes in the first place; to ensuring students choose the right course for them; to ensuring student satisfaction and retention during the course; and to maintaining relationships with students beyond the end of their course.[77]

3 (i) Using a project to develop a service can identify and push through innovations that might otherwise never be achieved

There is no doubt that many of the areas within which the Cascade project focussed were those that the Department would have hoped to pursue anyway. However, it is also very clear, that we would have made less progress, both in terms of time and also in the breadth of activities undertaken, without the structure and funding provided by the Cascade project. More broadly, the impetus provided by the project structure has enabled us to indentify innovations, which while simple and easy to implement, such as adapting the course accreditation documentation or providing access to the effective online tutoring course for more staff, were unlikely to have taken place without Cascade.

4. Engagement

4(a) Engaging with stakeholder needs and expectations facilitates implementation of innovation

When considering services to develop, it is essential to understand and meet stakeholder expectations. Implementing change using technology requires buy-in from stakeholders and buy-in is easier if:

- You are addressing a recognised challenge;
- You have evidence and can easily sell the benefits of improvements to stakeholders (e.g. savings in administrative staff time with online enrolment);
- There is an incentive or imperative to change (in this respect outside factors, such as the ELQ policy or the current Comprehensive Spending Review can be important drivers).

The Cascade project was well timed in this respect as the project started at a time when the Department was in a situation where it had to change in order to survive the significant reduction in funding following the implementation of the government's ELQ policy. The project was able to capitalise on the willingness of stakeholders across the Department to consider new ways of working to meet the challenge being faced.

4(b) Engaging stakeholders works best through existing channels

As the Cascade project progressed, it became clear that although the workshops and focus groups initially run by the project were useful for communicating to a large audience and seeking consensus, they were very resource-intensive to organise and often required significant effort to gain the attendance levels hoped for, as staff found

[76] See examples of potential future savings in Section 5.4 of the Evaluation Report

[77] The Cascade project team's experience of using to technology to support prospective students is outlined in more detail in *Case Study 3: Using to technology to support prospective students*, which is available from: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/CascadeCaseStudy3.doc

it difficult to take time out from their mainstream activities to attend. In particular, attendance at the workshops run over the summer was relatively disappointing in relation to the effort made to organise and promote the events.

In contrast, the most effective forms of engagement were those that built on existing activities or communicated the project through existing channels and meetings; for example, updates provided at the Department's Academic Board meeting, articles in the Departmental newsletter and updates given at University-wide groups, such as OxTALENT.[78] Even more valuable was arranging small group or individual sessions with Departmental staff when requirements in their course delivery cycle led them to examine areas where Cascade outputs offered real benefits to their work. This proved especially important towards the second half of the project when many more staff came forward to engage with the team on a self-determined basis as the project outputs started to provide real solutions to their needs.

4(c) Influencing, involving and engaging the right people is one of the most important factors in success or failure

In every organisation there are some individuals whose opinions are more influential than others, either due to their role or to less tangible factors such as personality. Engaging effectively with these stakeholders and building your reputation with them can bring significant benefits. If you can make these key individuals a core part of your project, this is even better as they are often those who have the energy, drive and influence to effect real change. Of particular significance to the Cascade project was involving influential academics in early pilot activities and having the Director of Technology-Assisted Lifelong Learning and Director of Administration for the Department as the Director of the project.

4(d) Staff are more open to using technology than ever before, but need support to capitalise on this

Openness to technology in teaching and learning by staff has increased dramatically in the last couple of years, as technology has become more pervasive in university administration and life more generally. Thus, while not all staff think they have the skills to engage with using technology to deliver their teaching, they no longer dismiss it in the way they may have done even three years ago. Throughout the Cascade project, the team was consistently surprised by the staff that engaged with us, saw the value of, and were prepared to try, what for them were very new and different tools and processes.

Resistance to technology has been a major barrier to adoption in HE in the previous decade, but it does seem that there is now more opportunity for widespread uptake than ever before. However, this will not translate in to real change without sufficient resources to support this process, as openness to engagement is not necessarily matched with knowledge or aptitude. Staff need information, so that they can explore using technology at the time they are ready to engage, and then require suitable tools and resources augmented by carefully designed help and support. If this support is focused on their challenges and is able to answer their questions, it will enable them to take this interest forward into real action.

[78] OxTALENT (http://www.ict.ox.ac.uk/oxford/groups/oxtalent/) is an interest group bringing together representatives from divisions across the University of Oxford to act as a steering group to raise awareness, promote interaction, and stimulate the use of IT in teaching and learning across the University.

5. Embedding

5(a) Embedding activities in the wider system of processes, resources, and support, enhances sustainability

By working with Departmental support staff to create service-level descriptions that articulate exactly how the Cascade project activities will work as production services in the future, the project team has made the case for embedding activities and is confident that everything is in place to continue running key services in a sustainable way beyond the end of the project. As well as carefully describing the services, the project team has ensured that each service is fully supported by user documentation and that transition plans are in place to ensure that adequate staff resources are available to deliver the services, e.g. VLE support for courses, online assignment-handling and online enrolment and payment, on an ongoing basis.

5(b) Providing customised support options for different stakeholders increases satisfaction and uptake

As the Cascade project has rolled-out its developments the team has focused on developing tools to allow staff to use the services with minimal assistance. To support this 'self-service' approach the project has created documentation and support information to answer common questions, making the process more streamlined and efficient. However, pilot studies of these arrangements have revealed a strong demand for one-to-one assistance at key points to prevent staff getting stuck with relatively trivial issues. As a result, we have also explored the use of drop-in sessions and mentoring by expert users of the VLE for staff who require more individual support. It is very clear that many of the support issues to which the project team has responded are from infrequent users of Moodle, for example staff who log on only once every six months or so, and therefore, not unsurprisingly, they experience more difficulties than regular users. More frequent use of Moodle across many activities is helping to reduce the extent to which staff need to relearn skills each time they engage with the VLE.

5(c) Matching project work to the activity lifecycle of stakeholders increases the uptake of project outputs

A key finding of the project is that uptake is greatest when services are made available to the right people at the right time. The Department will build on this finding to ensure that communication about services is targeted to fit into wider Departmental lifecycles so that staff receive information at the point of need. For example, the VLE support for courses services will be promoted in spring when staff begin planning for the next year's course delivery and course design information will be made available to academics as they commence work on new course proposals.

5(d) Commitment from senior management is a key factor in sustainability of services

Embedding of service innovations requires support from appropriate senior managers and decision makers in order that the necessary resources are provided and the required buy-in from key staff across the organisation can be obtained. The involvement of senior managers meant that the implementation of key decisions, in terms of service structure and funding, was more straight forward than might have been the case, but ultimately it was the value of the project deliverables that made the case for change so strong.

3.3 Impact

The project impacts below are presented under the three simplified aims identified in the Evaluation Plan: efficiency, innovation and service, as well as the additional area of culture change, as this proved one of the most significant areas of impact of the project.

1. Efficiency

Impact	Previous situation	Stakeholder	Evidence/Example
Increased online enrolment and payment numbers and quantified benefits to Department.	Paper-based processes predominant, no metrics for defining value of online enrolment and payment.	• OUDCE staff • OUDCE students • Other universities • JISC	See Evaluation Report Section 4.
Defined, shared and refined processes around assignment-handling.	Tacit processes not understood by many.	• OUDCE staff • Other universities • JISC	See online assignment handling outputs at: http://cascade.conted.ox.ac.uk/project-outputs
Developed processes and documentation to streamline and embed project activities as ongoing services.	Activities supported on an ad hoc basis.	• Project team • OUDCE staff • OUDCE students • Other universities • JISC	See example service description and guidance documents at: http://cascade.conted.ox.ac.uk/project-outputs
Increased automation in administration to provide more staff time for value-adding work.	Time spent providing basic services but limited time for additional activities.	• OUDCE staff • OUDCE students	"For part-time administrators, 20-30 minutes a week copying less in term time can be noticeable" (Course Manager, Psychodynamic Counselling). See Evaluation Report sections 2.2, 4.1 and 5.2 for examples
Centralised management of much information included in Course Handbooks.	Course handbooks developed by individual course teams consulting Registry for Departmental information, as required.	• OUDCE staff • OUDCE students	See centralised course handbook resources: http://www.conted.ox.ac.uk/students/PDFFiles/Policy/PolicyGuidelinesHandbook.pdf, and http://www.conted.ox.ac.uk/students/PDFFiles/PGInductionBooklet.pdf, http://www.conted.ox.ac.uk/students/PDFFiles/UGInductionBooklet.pdf

Efficiency savings have been one of the major foci of the Cascade project. We are extremely pleased with the impacts we have achieved up to now, and are also reassured about our projections about the future impacts of implementing our innovations more widely. More benefits will be realised when pilot activities move from pilots in to the implementation stage and those services become fully integrated Departmental activities. For the four areas of course administration examined in detail by the project, [79] we forecast savings equivalent to over 38 weeks of productive administration time a year. These efficiency savings, and our ability to quantify them, have been useful when we have needed to make the case to fully embed and sustain these services going forward. During the project itself, time savings

[79] See Section 5.4 of the Evaluation Report.

though the use of online enrolment and payment have already offered tangible benefits to the Department. For example, the Weekly Classes programme took 850 additional enrolments in 2009-10, compared to the previous year, and at the same time reduce their staffing by 0.5 FTE allowing them to reallocate the staff effort towards marketing and development of further new courses. These kinds of efficiency gains have been crucial in our ability to address the ELQ challenge. More importantly by sharing our processes and outputs with the wider community we have modelled these savings for other institutions who might want to achieve similar gains.

2. Innovation

Impact	Previous situation	Stakeholder	Evidence/Example
Identified where technology can add real value and where it is not worthwhile.	Not necessarily able to quantify the value or cost of technology choices.	• OUDCE senior managers • JISC • Other universities	See Evaluation Report sections 1.5, 2.7, 3.2 and 4.4.
Changed accreditation documentation so that technology is now considered for all new course proposals. Created resources and support systems to enable staff to make the right technology choices for their programme.	Technology use not covered in documentation and considered in an ad hoc fashion.	• OUDCE academics • OUDCE IT, learning technology and library support staff • OUDCE senior managers • OUDCE students • JISC • Other universities	See new course proposal documentation http://cascade.conted.ox.ac.uk/focus-areas/course-design, which is supported by a Course Design Moodle.
Enabled the Department to ensure the uptake of technology has been focussed on solutions that help it pursue its wider vision and strategy.	Use of technology not necessarily led by strategic imperatives.	• OUDCE senior managers	See early mapping of sub-themes and focus areas to the Department's Ten-Year Vision. http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/SchematicJun09.pdf.
Awareness of optimal use of technology across main course types.	Not clear where technology offered the best value to activities.	• All OUDCE staff	See templates and service descriptions at: http://cascade.conted.ox.ac.uk/project-outputs
Developed new functionality for online assignment-handling in Moodle and shared the code with the wider Moodle development community.	Online assignment-handling provided to limited courses via a stand-alone legacy system.	• OUDCE staff • OUDCE students • Other users of Moodle	See documents and code at: http://cascade.conted.ox.ac.uk/development-documents-and-code
Widened access to Effective Online Tutoring course.	Course only available to tutors of online courses.	• OUDCE academics • OUDCE IT, learning technology and	All Departmental academic staff using a VLE for teaching and learning are offered the opportunity to take the Department's Effective Online

Impact	Previous situation	Stakeholder	Evidence/Example
		library support staff • OUDCE students	Tutoring course (see: http://cpd.conted.ox.ac.uk/personaldev/courses/effective_online_tutoring.asp)
Better internal structures put in place to manage and prioritise the development of technology-supported curriculum delivery services to ensure they meet Departmental objectives and can be effectively supported.	Various groups working in the area of technology-supported curriculum delivery with their own sets of objectives and priorities.	• OUDCE staff	New e-administration development group created and other internal groups' membership and mandate reviewed to ensure strategic management of new developments.

What is notable when considering the innovation impacts listed above is that while many of the impacts achieved here represent hours of technical development and project work, others such as changing the course proposal documentation, widening access to our Effective Online Tutoring course and reviewing our working groups in the Department are non-technical and comparatively small interventions that have the potential to make a sizable difference as project work is embedded into Departmental activity. Identifying these areas for improvement has very much been a result of the time the Cascade project has given us to examine and evaluate Department activities using technology, across many areas, at both operational and strategic levels. This has enabled us to step to one side of the ongoing process of evolutionary and incremental change and indentify where more fundamental changes (technical or otherwise) can yield greater benefits. As identified in previous section, while these innovations benefit the Department most directly, by sharing our processes and outputs with the wider community we have highlighted areas that others might want to examine in their own practice.

3. Service

Impact	Previous situation	Stakeholder	Evidence/Example
Developed tools to support processes and procedures providing the infrastructure to support more cost-effective blended learning and other models of course delivery across our programmes into the future.	Not all activities supported by tools.	• Project team • OUDCE staff • OUDCE students • JISC • Other universities	See project outputs, including service descriptions and wider documentation available at: http://cascade.conted.ox.ac.uk/project-outputs
Developed supporting documentation and other resources to support all new services.	Not all activities supported by resources.	• Project team • OUDCE staff • OUDCE students • JISC • Other universities	See project outputs at: http://cascade.conted.ox.ac.uk/project-outputs
Developed an	Paper-based	• OUDCE staff	"System navigation was easy and

Impact	Previous situation	Stakeholder	Evidence/Example
assignment-handling system that will provide sustainable service into the future.	assignment handling and an almost obsolete online assignment-handling system.	• OUDCE students • Other Moodle users • Other universities • JISC	intuitive. It was simple to download student essays and to provide feedback. In fact, it was much more user-friendly than initially anticipated.", (Course Director, British and European Studies) See online assignment-handling outputs at: http://cascade.conted.ox.ac.uk/project-outputs
Departmental information managed better across platforms e.g. website, InfoSys, Moodle.	Much information duplicated or not available to those who could benefit from it.	• All OUDCE staff • OUDCE students	See generic content outputs at: http://cascade.conted.ox.ac.uk/project-outputs, and updated departmental website at: http://www.conted.ox.ac.uk/
Improved services to prospective students, focussing on access to information and the ability to easily enrol and pay for courses.	A website containing basic course information with online enrolment and payment only available for a few course types.	• Potential OUDCE students • JISC • Other universities	See student-facing content available through the new website at: http://www.conted.ox.ac.uk/, and evidence in Section 4 of the Evaluation Report.
Improved services to current students.	Limited online services available to students.	• OUDCE students • JISC • Other universities	The three main service enhancements have been in the areas of online assignment submission, VLE support for courses and online enrolment and payment services. Evidence of the value of these service enhancements is described in the Evaluation Report.
Provided fit for use tools and services.	Innovations not stakeholder led.	• OUDCE staff • OUDCE students • JISC • Other universities	"Indeed a very interesting and useful morning! I would be delighted to set up a Moodle for the Diploma in the History of Art asap, a good trial run for the MSt. My feeling is I am happy to base it on the template you have developed, this all looked grand, and it is pliant enough that I may tinker at the edges easily should the mood take me." (Lecturer in the History of Art) All pilot implementations across focus areas have continued and extended their use of these services. See additional evidence throughout the Evaluation Report.
Obtained commitment to maintain the online assignment	Services available on a pilot basis.	• Project team • OUDCE staff • OUDCE students • JISC	Provided a cost benefits analysis of all the above services to ensure these are sustainable by the Department into the future

Impact	Previous situation	Stakeholder	Evidence/Example
submission, VLE support for courses and online enrolment and payment services beyond the project.		• Other universities	See Evaluation Report and service description at: http://cascade.conted.ox.ac.uk/project-outputs.

With the reduction in funding for teaching activities, allied with the agreement for raised tuition fees in England likely to be implemented by the government, many universities are in the unenviable position of trying to improve the service they offer students at the same time as saving money in the face of slashed funding. This is the very challenge that has been at the heart of the Cascade project, where we have focused on identifying the activities that deliver a better service to our students and staff, while also ensuring their own sustainability through significant cost and time savings, e.g. in online assignment-handling, or by letting us do considerably more with the same resource available before, e.g. through VLE support for courses.

In particular, focusing on prospective students will be even more important than ever. A Higher Education Academy survey undertaken in 2006 showed that, of first year students at university, 41% of those who knew little or nothing about their course before enrolment had thought about leaving, compared to 25% of those who knew a moderate amount or a lot - strongly suggesting that the more students know about their institutions and courses before enrolling, the less likely they are to consider dropping out.[80] Providing better information and services to prospective students through generic content and online enrolment and payment developments, is key to this.[81]

While the exact services and areas of activity that best deliver benefits for individual institutions will vary, the areas explored by the Cascade project, and the evidence, resources and guidance developed, offer other universities a good starting point when considering solutions to this type of challenge. We have sought to provide suggestions of areas to consider first, techniques for judging their value, and tools and resources that will allow easier start up if they choose to pursue similar activities.

4. Culture

Impact	Previous situation	Stakeholder	Evidence/Example
More of Department considering using technology to support the delivery of courses.	Little use of technology by Departmental staff. Many staff would not even consider it might offer solutions to known issues.	• OUDCE staff • OUDCE students	See Sections 2.5 and 3.1 of the Evaluation Report.
Project team/technical support staff better understand the work of the wider Department so can support the	Only partial understanding of Departmental activities by IT and learning	• Project team • OUDCE IT, learning technology and library support	See Section 5 of the Evaluation Report. Also working with wider Department to develop more new activities – e.g. new online courses and

[80] http://www.heacademy.ac.uk/news/detail/2007/First_year_experience_survey
[81] See Case Study 3: Using technology to support prospective students: http://cascade.conted.ox.ac.uk/sites/cascade.conted.ox.ac.uk/files/CascadeCaseStudy3.doc

Impact	Previous situation	Stakeholder	Evidence/Example
Department better in the future to identify where innovation is possible.	technology support staff.	staff • OUDCE senior managers	blended programmes.
Better relationships between IT and learning technology staff and other Department staff.	Learning technology staff did not know who to work with to make changes.	• Project team • OUDCE staff	All staff who engaged in project pilot activities have maintained an ongoing relationship with the TALL team. Encouraged engagement of staff as critical friends. Academics now to come to TALL to ask about using technology. More Departmental staff are aware of what TALL does and what help is available.
Developed new external networks.	Had no previous relationship with these groups.	• Project team • JISC • Other universities	The project Steering Committee providing links into wider University and wider JISC programmes and the JISC CAMEL group created new relationships with other HEIs.
Helped several staff move from novice to confident users of technology.	Many Departmental staff were novice users of technology.	• OUDCE academics • OUDCE course administrators	"I know a lot more and have more confidence. I have now established a skill set and can broaden it. I would not have done a podcast in my most recent course if I would have had to learn everything from scratch. The more one uses technology, the broader and more imaginative one's use is likely to become." (Lecturer in Local and Social History*)* All course teams who took part in VLE and assignment-handling pilot studies have continued to use the services and many staff have requested the services for other courses in their subject area.

The majority of the impacts in the area of culture change relate explicitly to the Department, but they represent the type of impacts and gains that many other departments and HEI institutions are seeking to achieve. The growing pervasiveness of technology in wider society appears to have reached a tipping point where very few would be prepared to reject out of hand the potential value of technology to support curriculum delivery as they might have done in the past. This, allied with a widespread recognition that HE has to change significantly in order to survive in the current climate, gives us opportunities we have not had before. However, as the table above indicates, to transform a general interest in using technology into real change, requires strategic management and the development of supporting tools, processes, documentation and training. In sharing our outputs in all these areas we hope others will be able to build on our work to implement change within their own institution.

Widening impacts

As indicated above, we are confident our impacts can offer value across the HE sector as all institutions now face challenges similar to significant cut in funding the Department faced from the beginning of the 2008-09 academic year as a result of the ELQ policy. In terms of explicitly widening the impact of the Cascade project outputs within the University of Oxford, we have already made all project outputs available to all university staff, and are in discussion with OUCS (the Oxford University Computing Services, which provides learning technology support for the whole University) about how to embed these in their activities in the most effective way. Beyond the University we have already been contacted by other projects who are interested in our work and are pursuing opportunities to disseminate our work more widely as outlined in the Engagement section above. In relation to this last point, it is especially interesting how many major conferences are focusing on areas which chime with the work of the project, for example ALT-C 2011, which has the conference theme “Thriving in a colder and more challenging climate”.[82]

[82] http://www.alt.ac.uk/altc2011/

4) Conclusions & Recommendations

In the aftermath of the Comprehensive Spending Review, the focus of the Cascade project on how technology could help the Department respond to the ELQ challenge (which significantly reduced Departmental funding) clearly has more bearing on the wider concerns of HEIs than ever before. By working on only those areas which offered clear benefits in terms of efficiencies, innovation or improved services our activities targeted improvements in many of the areas that other institutions will be examining to achieve similar impacts.

Both the lessons learned and impacts sections above, as well as the case studies,[83] targeted at the key audiences of senior managers, e-Learning developers, and academic and support staff, suggest many recommendations. The following conclusions and recommendations have been identified for the key project stakeholders:

1. Senior management

1(i) When considering services to develop it is important to:

- spend time to identify the right focus areas;
- understand organisational processes;
- be aware of cost benefit implications;
- understand and meet stakeholder expectations.

1(ii) Service development requires investment (in the form of the allocation of existing staff time and usually additional resources).

1(iii) Staff are more open to change in using technology than ever before but support and resources need to be made available to capitalise on this.

1(iv) Funding may be available to support you to implement efficiency saving projects, either within your institution or from external sources. If you have identified an innovation, investigate sources of funding – you may find you are able to identify external resources to help you realise your project.

1(v) Keep up-to-date with wider external changes you can capitalise on. As well as a challenge, the Browne report, represents a huge opportunity for change, providing arguments for engagement in change that were hard to make to many academics and other stakeholders previously.

1(vi) Focus on services that matter to your potential as well as current students.

2. Project staff – e-Learning researchers and developers

2(i) Change management is extremely complex and implementing change will always take longer than you expect, in particular:

- Don't expect immediate impact or be put off by initial negative reactions.
- If you know you are on the right path, it can sometimes be easier to ask for forgiveness than to seek permission.
- There are few shortcuts in implementing change but good project management can ensure projects run as efficiently as possible. For service development

[83] Available at: http://cascade.conted.ox.ac.uk/project-outputs#casestudies

projects, specification of stakeholder requirements and testing are critical and plenty of time should be allowed for each of these stages of the project.

2(ii) Implementing innovative services and culture change work more smoothly if they happen together.

2(iii) Staff need support, information and tools to make the right choices about when to use technology, what technology to use, and how to use it effectively.

2(iv) Be prepared to think beyond the project – unexpected results and developments can help you achieve your aims.

3. JISC

3(i) Universities must improve how they measure the costs and benefits of their activities, and to do this, staff require training, tools and frameworks to help them make the case for their decisions.

3(ii) As universities look to new ways to deliver learning to their students, it is clear that these will only work if underpinned with the systems, processes and technology that make this a seamless experience. Examining what is required for this is a process that has already been started by bodies such as the HEFCE Online Learning Task Force[84] and the wider work of JISC; however, this will need to be continued to ensure UK HE is able to exploit the opportunities that technology offers for teaching and learning.

3(iii) Projects require time to set up and get started, especially if arrangements need to be made to recruit new members of staff. The project team would recommend, especially for longer projects, that JISC considers allowing more time from notification of the award of a project to the start date of the project to allow institutions sufficient time to make the necessary arrangements to set up the project infrastructure and have a complete project team in place at the start of the project.

3(iv) CAMEL groups can be a valuable source of support and a useful resource for providing a sense of perspective and help with solving problems. However, for the full benefits to be realised, the members of the group need to be working in closely related areas.

3(v) There are different project management requirements between projects which start with implementing a known innovation and those which commence with a problem looking for an innovative solution – it is likely that there will be more projects of the latter type in coming years and that support and project management approaches will need to be flexible to adapt to this.

4. All stakeholders

4(i) In order to realise all the potential benefits of using technology to support curriculum delivery, it is important to look beyond pedagogy and to consider the full experience of a student's relationship with the institution from initial contact to course completion. In terms of efficiency savings, it is often in the areas of administration where real improvements can be made that both save money and improve the student experience (e.g. online enrolment and payment and online assignment-handling).

[84] http://www.hefce.ac.uk/learning/enhance/taskforce/

5) Implications for the Future

Implications
Higher Education as a whole is operating under very difference circumstances than those prevalent at the start of the Cascade project in 2008, so the key focus from our ELQ challenge, on delivering the maximum benefit for minimum input, in a sustainable way, is likely to be of growing interest to all HEIs. For OUDCE, the Cascade project proved that there are still many areas where technology and process review can allow efficiencies to be achieved, services to be extended and improved, and innovations made.

Initial investment is required to deliver improvements; but, if done well these interventions can be sustained, for little or no additional time and cost, on an ongoing basis. However, it is worth noting that the areas with the potential for the greatest savings to be made, for example online enrolment and payment or online assignment-handling, are often the most complex to achieve both technically and in terms of change management.

As a result of the Cascade project, the Department has undertaken the process of reviewing its processes and procedures; identifying service improvements; and developing and implementing new services. This work has been undertaken in as transparent a way as possible. Where possible, we have provided access to the tools and documentation we have used to undertake these activities. It is hoped that many of the outputs of the project will provide a useful starting point for other HEIs undertaking similar activities to allow them to build on our experience to achieve similar benefits.

New development work
Many of the areas where the project has learned lessons or identified the need for further work are those where JISC is already active. However, it is worth noting that providing senior managers and staff with the information they need to make the right choices for their institution, department or programmes in financial/resource terms, as well as in pedagogical terms, will be of increasing importance in the future. Increasing awareness of financial analysis tools, and providing supporting resources and training on how to use them, is likely to be of significant value to the sector.

Cascade project sustainability
Internally the outputs of the Cascade project are inherently sustainable, with work in each focus area developing efficiency gains or service improvements that the Department judges as core to its activities. Indeed much of the project has been directed to developing services in such a way that they are part of regular Departmental activities and thus intrinsically embedded.

Within the Department, all project outputs are accessible to staff through the intranet, with appropriate staff resources allocated to maintaining the services. Beyond the end of the project all external facing outputs will be maintained on the project website: http://cascade.conted.ox.ac.uk/, with relevant links made through the Design Studio to place these in the wider context of the sector and make them more discoverable to a wider audience.

All open source outputs will be deposited in the relevant repositories, listed on http://cascade.conted.ox.ac.uk/project-outputs#sourcecode. The project team will continue to engage in the wider JISC community through groups such as the Learning and Teaching Practice Experts Group[85] and with specific communities such as the Moodle developer community.[86]

[85] http://www.jisc.ac.uk/whatwedo/programmes/elearningpedagogy/elearningexperts.aspx
[86] http://moodle.org/course/view.php?id=5

The project manager, Marion Manton (marion.manton@conted.ox.ac.uk), will remain the project contact.