Above Campus IT Services for Scottish Universities and Colleges – A Shared Road Map for Local Benefit and Collective Opportunity

The HEIDS Shared IT Services Study

July 2011

Sero Consulting

Editor - David Kay

With Paul Bacsich, Dave Hornsey, Bob McGonigle, Dick Moore, Walter Patterson, Barry Phillips, Les Watson

Table of Contents

EXECUTIVE SUMMARY 4

Overview 4
Scope 4
A Scottish Road Map 5
Institutional Readiness 5
Next Steps 7
Acknowledgements 7

1 – SCOPE 8

1.1 – The Assignment 8
1.2 - Scope 9
1.3 – Deliverables 10

2 – APPROACH 11

2.1 – Requirements 11
2.2 - Evidence 12
2.3 - Outputs 14

3 – LANDSCAPE 16

3.1 – Availability 16
3.2 – Imperative & Opportunity 17
3.3 – Desk Research Findings 18
3.4 - Institutional Openness & Readiness 20
3.5 – The Value Proposition 21

4 - ROAD MAP 24

4.1 – Rationale 24
4.2 – Candidate Services 24
4.3 – Indicative Road Map 26
4.4 – Priorities & Synergies 28

5 - PRIORITY PROJECTS 30

5.1 - Approach 30
5.2 – Highlighted Next Steps 32
5.3 – IT Continuity 35
5.4 - Collaboration Tools 40
5.5 - Blackboard VLE Licensing 45
5.6 - Blackboard VLE Hosting 49
5.7 - Moodle VLE Hosting 55
5.8 - Student Record System 61
5.9 – Subscription Resource Management 66

6 – INSTITUTIONAL DECISION MAKING.....69

6.1 - WHOLE BUSINESS ASSESSMENT 69
6.2 – PROJECT BUSINESS CASE..... 69
6.3 – FINANCIAL MODELLING..... 69
6.4 – IMPLEMENTATION & RISK CHECKLIST 72
6.5 ENVIRONMENTAL ASSESSMENT 73

SECTION 7 – CONCLUDING POSITION AND RECOMMENDATIONS.....74

7.1 - ALIGNMENT WITH THE MCCLELLAND REVIEW 74
7.2 - OVERALL HEIDS RECOMMENDATIONS..... 75
7.3 CONCLUSION 76

APPENDIX A – SURVEY REPORT 78

APPENDIX B – FOCUS GROUPS REPORT 91

APPENDIX C - INTERVIEWS REPORT 97

APPENDIX D – IMPLEMENTATION & RISK CHECKLIST 102

Above Campus IT Services for Scottish Universities and Colleges – A Shared Road Map for Local Benefit and Collective Opportunity

Executive Summary

Overview

This study has established the feasibility of a collaborative approach by Scottish higher and further education institutions to a phased adoption of Above Campus IT Services. A range of possibilities associated with such services and their potential benefits has been identified and a framework is proposed for the SFC or institutions to take action and allocate appropriate investments and resources. Seven priority opportunities, some for early wins others with a focus on longer term gains, have been identified, situated in a coherent Road Map and proposals are made for progressing these.

Scope

The Governments at Scottish and UK levels and the funding councils have identified the greater use of shared services as one potential tool for meeting the challenge of rising expectations of services at a time when levels of public funding will be significantly lower. This perspective has been reinforced by the publication of John McClelland's *Review of ICT Infrastructure in the Public Sector in Scotland* in June 2011.

Whilst there remains uncertainty around the potential of *cloud computing* (with its variants such as *Software As A Service*) to transform IT service models and their delivery, they are rapidly maturing and similar approaches (*outsourcing*, *grid computing, repository and licensing services*) are already deployed in the sector.

Consequently, the HEIDS group of Scottish University IT Directors[1] agreed that assessment of these opportunities and challenges is of immediate strategic importance. HEIDS therefore contracted Sero Consulting[2] to conduct a study into feasible and desirable shared IT services for universities and colleges in Scotland. The study was funded by the Scottish Funding Council, to commence in January 2011 and report by July 2011, identifying what may be achievable, supported by a road map and business cases for implementation.

To this end, the project gathered and triangulated evidence of practice and of demand from desk research, an online survey of senior managers and direct consultation. The engagement of institutions and their management with this

[1] Higher Education Information Directors Scotland - www.heids.ac.uk
[2] www.sero.co.uk

process was noteworthy. All 19 Scottish HEIs participated in an extensive online survey assessing appetite and detailing interests from infrastructure to software applications and shared knowledge services. Scotland's Colleges partnered in the process, with over 20 further education providers making contributions. Five workshops and over 20 stakeholder interviews validated the final set of options for the Road Map.

A Scottish Road Map

Based on this evidence, the report proposes a phased Road Map that identifies early wins and activities that will yield significant benefits, including both cashable savings and strategic synergies. Whilst clearly positioning the early advantages to be gained from infrastructure and platform services, the Road Map highlights sector and national opportunities in teaching and learning applications.

In presenting a national road map, the report recognises the variety of initiatives that can deliver localised benefit, while contributing to the overall national picture. In line with the McClelland recommendations, the Road Map therefore seeks to cohere and leverage shared experience, within which regional and peer consortia will be important, offering early traction and clear focus.

In the context of this more extensive Road Map, seven priority projects have been detailed and endorsed by stakeholders:

- Infrastructure & Platform Services (2 projects) - IT Continuity, Collaboration Tools
- Shared procurement (1 project) - VLE Licensing
- Software as a Service (4 projects) - Virtual Learning Environments (Blackboard & Moodle), Student Records, Library Subscription Resource Management

Institutional Readiness

The desk research, survey responses and direct consultation combine to suggest that the direction of travel at the 'approaching crossroads' for IT-enabled services is mutually recognised amongst both IT management and institutional leaders, including Finance Directors[3]. The challenges relate not to strategic interest but to operational implementation (priorities, partners, plans) – the devil, it is repeated, is in the detail.

Senior managers are open to the prospect of shared services. In principle corporate approval recognises reliable technology with established service models backed by reputable exemplars, end users that already trust 'the cloud', legal impediments that are surmountable and, not least, the economic imperative. Meanwhile IT managers recognise the opportunities but are faced

[3] Notably SUFDG, the Scottish Universities' Finance Directors Group

with deep-seated challenges in re-engineering the IT business, its processes and its workforce, whilst delivering a cost saving business case at the same time.

Next Steps

Whilst priority projects may be added or removed as active dialogue develops, it is suggested that the act of progressing these seven priority projects in the context of the underlying Road Map will provide the essential momentum required by the community to develop service exemplars and to progress from interest to implementation.

To ensure that continued momentum, HEIDS should work with the endorsing university and college stakeholders to agree the next steps that would enable the priority projects to be progressed with appropriate speed, transparency and rigour. These steps may involve further development of the project specifications provided here, using the tools introduced in this report. In all cases, the first wave of adopters should consider the opportunities afforded by the SFC 'Invest to Save'[4] programme and the Universities Modernisation Fund[5] (led by JANET UK and JISC Collections) as well as the benefits of services already on the market.

In the cases of shared VLE and library subscription services, this should lead to service implementation during academic year 2011-12. Assessing the practicalities of a shared student records service is also a matter of urgency, even though the enactment is a medium term prospect.

Throughout, HEIDS should maintain a dialogue with the Funding Council to ensure appropriate and timely transition to the national and sector governance mechanisms and planning processes instigated in response to the McClelland Review.

Acknowledgements

In compiling this report, Sero acknowledges the support of the project Steering Group; a large number of Scottish Colleges and Universities and their senior officers; cross-institutional membership groups (HEIDS, SCURL, Scot-BUG, SUFDG); national Sector bodies (Scotland's Colleges, Universities Scotland); and specialist agencies and services (JANET UK, JISC RSC South West, the Scottish Funding Council, the Scottish Qualifications Authority, the University of London Computer Centre).

This report along with the Desk Research report and supporting spreadsheets are available at www.heids.ac.uk/reports/

[4] http://www.sfc.ac.uk/news_events_circulars/Circulars/2011/SFC0311.aspx
[5] http://www.hefce.ac.uk/news/hefce/2011/cloud.htm

1 – Scope

1.1 – The Assignment

Mission

The principal aim of this study was to examine the feasibility of a collaborative approach by Scottish higher and further education institutions to the adoption of Above Campus IT Services[6]. The study therefore sought to establish a range of possibilities and their potential benefits – whether financial, strategic, operational, environmental or enabling activities that the sector might wish to do. To this end, the study developed a framework for the SFC and institutions to take action and allocate appropriate investments and resources, situating early wins and longer term gains within the strategic model.

Benefits

It is suggested that Above-Campus IT Services have the potential for a range of major benefits, which must be tested against specific priority opportunities:

- Offering economies of scale, potentially leading to greater efficiency
- Generating critical mass, potentially leading to improved quality, flexibility, agility and an expanded range of services
- Subcontracting of "commodity" activities, potentially re-focusing local IT resources from basic operations to added value activity
- Lowering the cost of entry compared to "build your own" approaches
- Reducing the environmental impact of IT activities at campuses, helping to meet climate change commitments
- Enabling strategic development of cross institution support services
- Addressing growing demand for collaborative learning & teaching, research and knowledge exchange

Process

The University of Stirling, acting on behalf of HEIDS, appointed Sero Consulting as contractors through competitive tender. The tender requested an approach that combined gathering of opinion and aspiration with direct consultation and comparative desk research to identify exemplar services in comparable settings. The approach adopted by the contractors is set out on Section 2.

---

[6] To avoid confusion about interpretations of the term *shared services,* and related definitions of such as *cloud computing* and *Software As A Service* and to avoid getting sidetracked in discussions about the interrelationship of these services, this study uses "Above Campus" as a generic term to encompass all types of IT service aggregated beyond a single institution. This thinking is expanded in *Above-Campus Services: Shaping the Promise of Cloud Computing for Higher Education*, Educause Review vol 44 no 6 (November/ December 2009).

HEIDS established a Steering Group to provide oversight of the work and to assist in engagement, consisting of:

- David Beards – Scottish Funding Council
- Gerry Dougan – Scotland's Colleges
- Alun Hughes – University of the Highlands & Islands (HEIDS Chair)
- Tom Mortimer – Dundee University (UCISA Deputy Chair)
- Fraser Muir – Queen Margaret University
- Mark Toole – Stirling University (Steering Group Chair)
- Plus representation from Sero Consulting

1.2 - Scope

This is not intended to be a technical study (although it necessarily include some consideration of technical issues). It is principally focused on opportunity and engagement.

Institutions

The study was initially conceived and funded to identify appetite and opportunity for the 19 Scottish HEIs. However the Steering Group took an early decision with the SFC in consultation with Scotland's Colleges that the study should take account of possibilities for joint working across the colleges and university sectors.

Services

Adoption of the term Above Campus was a signal that this feasibility study should consider as wide a range as possible of IT related services and levels of collaboration. The scope was therefore much wider than simply shared data centres and much more strategic. The provision of services (existing, new, extended), staffing, expertise, business continuity, environmental impacts and the step changes in delivery methods are as much in scope as hardware infrastructure. The services may therefore be at any level in the IT 'stack' (infrastructure, platform and software) or may relate to the provision of knowledge (procurement, help desk, support) relating to that stack.

Also in scope was how changes in IT delivery can underpin more wide scale changes in institutional, cross institutional and cross sector delivery of a collection of other support and knowledge services.

Partnership models

It was assumed that there might be different levels of collaboration appropriate for different functions and services. Collaboration could range from an agency to negotiate a common set of terms and conditions with providers to the formation of a collaborative entity to operate the services.

Furthermore, it should be anticipated that collaboration options will change over time as services become more mature, experience is gained and new windows of opportunity present themselves.

The study adopts the categorisation of collaboration types suggested by Waggener & Wheeler[7] - Commercial, Institutional and Consortium Sourcing – and added the local opportunity for National Sourcing, which might occur at Scottish or UK levels.

- Commercial Sourcing – A service offer from a vendor open to any institution, such as the Blackboard hosted service
- Institutional Sourcing – A service offer from an institution to other institutions (or to internal business units), such as the ULCC Moodle hosted service
- Consortium Sourcing – A service offer constructed by a consortium (which may include commercial partners) on offer to members or to a wider community, such as the SHEDL service
- National Sourcing – A service offer from an external agency, such as the JANET UK network, which may be offered on a top-sliced, buy-in or opt-out basis

The commercial and institutional models require no special governance, being essentially external offers based on a commercial contract or SLA. However, consortium services, like a joint venture, require a governance mechanism that recognises the nature and terms of membership and the acts of joining and leaving. A nationally sourced service would typically, but not necessarily, require similar arrangements.

1.3 – Deliverables

The study produced three complementary deliverables in June 2011, which are intended to be of direct value to institutional senior management teams, to cross-sector groups and to funders:

- This report, *'Above Campus IT Services for Scottish Universities and Colleges – A Shared Road Map for Local Benefit and Collective Opportunity'*

- The desk research report, *'Above Campus IT Services – an introduction to experiences relevant to higher education'*

- A template based toolkit to assist the development of institutional business cases and associated decision making

[7] Above-Campus Services: Shaping the Promise of Cloud Computing for Higher Education, EDUCAUSE Review vol 44 (2009)

2 – Approach

2.1 – Requirements

The principal tasks required of the study were to:

- Identify the types of offerings that are potential candidates for above campus services in Scottish higher and further education institutions;
- Synthesise experience from elsewhere to identify successes, benefits, barriers and inhibitors;
- Survey Scottish institutions to establish a range of feasible options, priority opportunities and areas of interest;
- Facilitate consultative focus groups to test the survey findings and to refine definition of motivations, recommendations of candidate services for road map and the associated business cases;
- Interview a sample of representatives and interest groups to explore possible barriers, cultural issues, early wins, benefits, priorities and processes relating to the candidate services; and
- Develop indicative project profiles for priority above campus IT Services which would benefit from a collaborative approach.

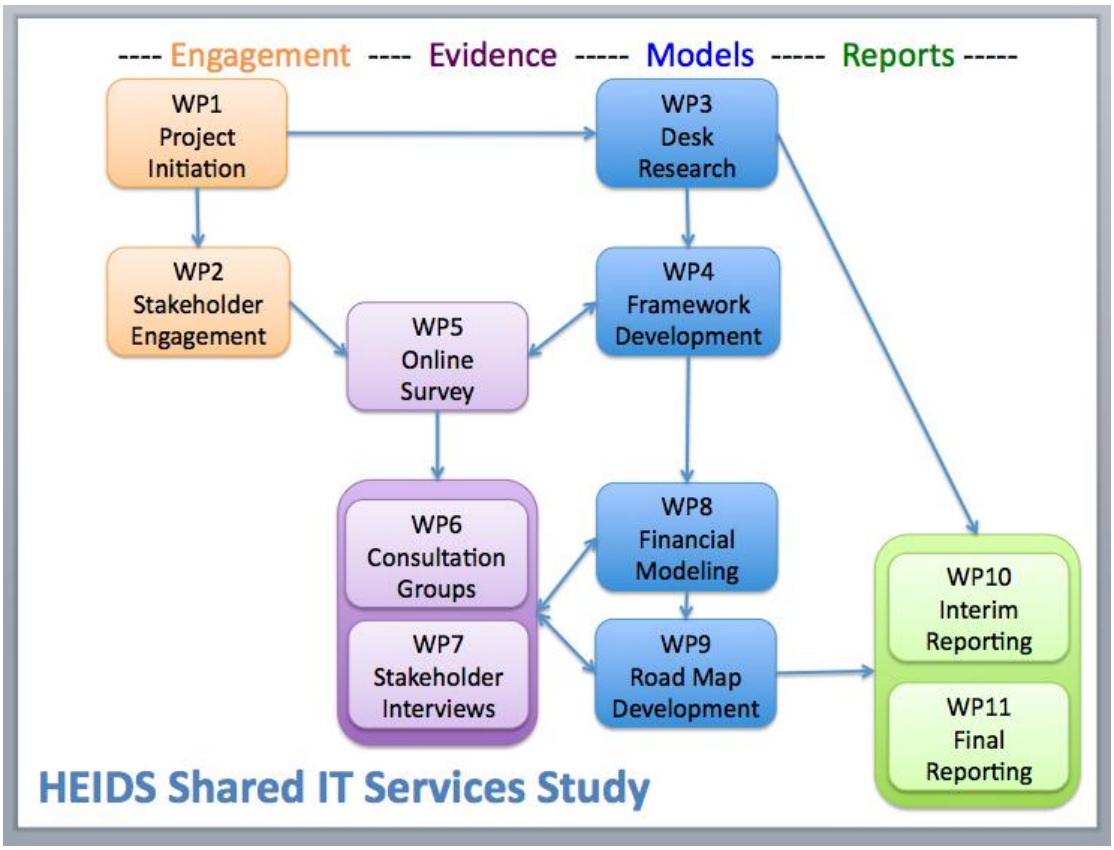


Fig 2.1 – Shared IT Services Study Approach

2.2 - Evidence

The project undertook to gather and triangulate evidence of practice and of demand from desk research, an online survey and direct consultation.

Desk Research

The desk research report aims to synthesise existing literature concerning Above Campus Shared IT Services in support of this Road Map report and with the wider aim of informing policy-making and enactment amongst the Scottish Universities and Colleges. The desk research report is therefore intended to be of value to institutions independently of this Road Map report and its recommendations.

This research draws on over 40 key texts selected for their relevance to areas of interest articulated through the HEIDS Survey and Focus Groups, as follows:

- Vanilla Services (Infrastructure and Platform)
- Teaching & Learning (Software as a Service)
- Shared Expertise (Knowledge as a Service)

Given the resources available, this task focused on services, sectors and countries / regions of likely comparative interest to post-16 education in Scotland. Apart from a handful of exceptional touchstone documents, documents from prior to 2008 were excluded, reflecting the dynamic nature of this field. The appendix contains a bibliography with a brief description of the content of each source and/or the relevance to this paper.

Online Survey

The online survey was conducted in February and March 2011. With the aim of obtaining at least one senior management responses per institution and not exclusively from IT management, the survey was directly addressed to senior managers based on HEIDS and SUFDG membership and key contacts advised by Scotland's Colleges.

A total of 54 responses were received from 40 institutions, including all 19 HEIs and 22 out of Scotland's 42 colleges. Around 40% of responses were from IT Directors and 60% from other senior management roles. The Steering Group was pleased with this level of commitment to providing information.

The respondents indicated strong interest in progressing the Shared ('above campus') IT Services agenda. Amongst HEIs, 62% were open to involvement in the immediate term and 59% were interested in shaping the agenda, with only one respondent expressing no interest in the short or medium term. Whilst only half of the college respondents were open to immediate involvement, 36% identified their interest as shapers. There was general agreement that a well-developed business case is a key pre-requisite for any service partnership.

*A summary analysis of survey results is provided in **Appendix A** and the anonymised survey dataset is available from www.heids.ac.uk/reports/*

Direct Consultation

Following the survey, more detailed consultation explored clusters of priority activity and shared interest, and how they might enable more wide ranging collaborative activities such as cross institutional and cross sector support services, collaborative learning & teaching and expansion of research pooling.

Interviews

The team conducted two phases of targeted interviews focused on:
1) Establishing the current Scottish HE and College IT services landscape; and
2) Validating the draft road map options and their implications for institutions.

A total of 20 interviews took place involving:

- IT Service managers in colleges and HEIs
- Senior managers in other functions, including finance and learning
- National stakeholders and potential partner organisations

*A summary report and contributor checklist is provided in **Appendix C**.*

Focus Groups

The Steering Group regarded the shared service interests identified in the survey as strong candidates for further elaboration. In support of that process, respondents and / or relevant colleagues were invited to attend focus groups in Glasgow and Edinburgh in early May to explore two emerging themes in more detail ahead of developing a first cut 'road map':

- Focus Group 1 - Software as a Service (SaaS) - focusing on opportunities relating to teaching and learning applications and associated tools
- Focus Group 2 - Shared Infrastructure – focusing on shared requirements for large scale storage and for IT / business continuity

Each focus group also considered opportunities for knowledge sharing, in relation to aspects such as procurement, specialised applications, service desk and training, which have synergies with both themes.

A total of 17 institutions (11 HEIs and 6 Colleges) joined the Focus Groups, which confirmed and added considerable detail to the broad themes identified through the survey, enabling the consultants to draft a sector road map. This direction of travel was further reviewed by 7 institutions at a workshop organised by Scotland's Colleges in June 2011.

*A summary report and delegate checklist is provided in **Appendix B**.*

2.3 - Outputs

The major outputs of the project are (1) a Road Map based on shared opportunities across Scottish colleges and HEIs, (2) a series of high priority project business cases drawn from that Road Map and (3) four assets to assist in local decision making and implementation.

Road Map

The triangulation of the evidence from the online survey, direct consultation and desk research, enabled the identification of 20 candidate services that might form the basis of an above campus IT services road map for Scotland.

The Road Map represents opportunities that are

- Of interest to a significant number of colleges and / or universities
- Based on known technologies and / or exemplified by existing services
- Capable of initial implementation within a 3 year timeframe (2011-2014)
- Offer synergies and momentum for institutions or within the wider Scottish context

Whilst these opportunities may be characterised as 'early wins' or 'low hanging fruit' it should be recognised that the timing of full benefits realisation and critical mass of take-up is dependent on

- Initial investment in transition, not least in practice and process – 'invest to save'
- Phasing of current license commitments and equipment depreciation policies
- Synergies between shared opportunities (such as VLE and Student Records) which can only be realised at an advanced stage in the journey

The Road Map is detailed in ***Section 4****.*

Business Cases

Consultation on the Road Map identified 7 priority areas for shared service development. Whilst these were by no means an exhaustive selection of areas of interest identified by colleges and HEIs during the project, this selection is highlighted on account of the level of interest and the synergies that may accrue in addition to direct benefits.

IT Continuity	Infrastructure (IaaS)
Collaboration Platform	Platform plus (PaaS/SaaS)
VLE Licensing	Knowledge (KaaS)
Hosted Blackboard VLE	Software (SaaS)
Hosted Moodle VLE	Software (SaaS)
Student Records	Software (SaaS)
Subscription Management	Software (SaaS)

Each priority project is outlined in a standard proforma that explores business case, partnership linkages, delivery options and likely take up.

*The seven priority project business cases are detailed in **Section 5**.*

Institutional Decision Making

Drawing on the considerations highlighted through the survey and in consultation, the project was tasked to develop a framework to support institutions in making their local business case decisions, especially around costs potentially saved and incurred for a given above campus service.

Four tools (in the form of spreadsheets, checklists and document templates) were found to be of value in this study and have therefore been brought together to assist in these processes:

- Whole Business Assessment
- Individual Project Business Case
- Individual Project Financial Modelling
- Implementation & Risk Management Checklist

Whilst it is recognized that most institutions will have core expertise in each of these processes as part of business case and project development, the Steering Group believes that there is value in the collation of these templates in the specific context of Above Campus services.

*These tools to support institutional decision making are detailed in **Section 6**.*

3 – Landscape

3.1 – Availability

The managed IT services offer has evolved dramatically over the past decade – not least because the web has recast many of the challenges relating to connectivity for the institution and for its public and to the underlying technical service interfaces. Consequently the idea of IT as a commodity is visible in the everyday world in the form of network (the internet based on wired and wireless infrastructure), the storage and application services (ranging from email and office software to social platforms). Commoditisation is now demonstrable and historic models of supply (which have been deeply internalized in institutional IT services) are being called in to question. The questions for the institution are therefore:

- Where to apply it – for example, in IT continuity (such as backup) or user facing applications (such as VLE or student records)
- How to maximize business benefit – for example, use external hardware but continue to administer the applications
- In what type of service partnership – for example, outsource to commodity suppliers or aggregate demand within the education community, perhaps in a shared service

The intended benefits can be delivered through shared or outsourced services at any layer of the IT services stack (infrastructure, platform, software and related knowledge) as illustrated by JANET UK:

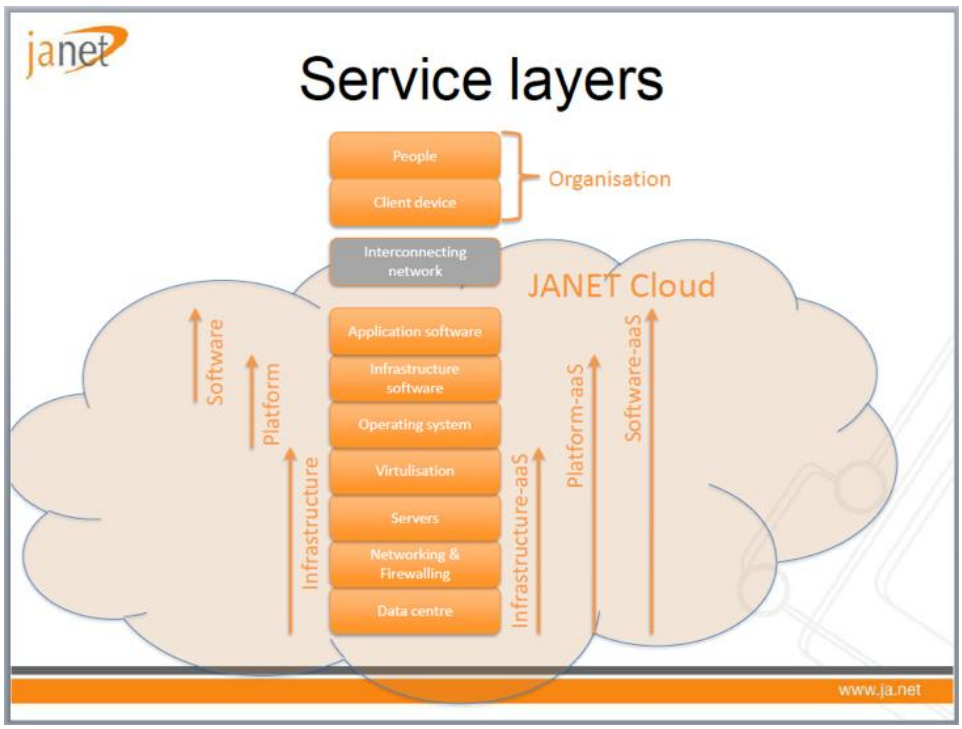


Fig 3.1 – IT Service Layers

3.2 – Imperative & Opportunity

The McClelland Review (June 2010) presents a clear view regarding nature of IT services in the Scottish public sector. The '*overall conclusion is that the public sector is well behind the private sector in the adoption and deployment of ICT.'*

Section 17.4 of the Review offers a snapshot of current ICT investment in Scotland's universities and colleges:

> *'It is estimated that universities and colleges have a total annual ICT spend of around £150m including more than £100m of external procurement spend. The deployment of shared services in ICT is still relatively low and less than a third of the institutions had at least one shared service.'*

However a direction of travel and growing intent in the sector is also noted:

> *'Recent mergers involving nine separate colleges and universities have included in their business cases recognition that sharing ICT services can offer benefits including important financial savings.'*

The Review therefore emphasises the timeliness of the HEIDS study:

> *'In recognition of this opportunity the Scottish Funding Council in 2010 provided financial support to a project being led by the University of Stirling on behalf of the Higher Education Information Directors Scotland (HEIDS). This is studying the feasibility of opportunities for "collaborative above campus shared ICT services".'*

This study report concurs that the education community appears to be approaching a crossroads in its approach to IT services. As reported in the companion Desk Research, the opportunities for above campus services (whether outsourced or shared) have in the current decade graduated from distant prospects to everyday propositions. The question 'Why not?' is now a reasonable and responsible starting point in developing any service business case.

This position is further underscored by the Scottish and UK governments' pinpointing of shared services (not only IT based) as a vital element of the economies and efficiencies required of all aspects of public services in the current time of austerity. The McClelland review not only reinforces that imperative but also underscores the value-added opportunities:

> *'Shared ICT platforms, a connection and spread of exemplar projects and enhanced engagement with the industry would reduce the proportion of cost invested in ICT by individual organisations and deliver local savings which might be partially reinvested in advancing the progress of ICT. It would also open the door to significant additional and wider savings in public sector costs by providing a platform for the operation of other shared services and better support sustainability goals.'*

This crossroads therefore represents a key decision point above and beyond pure IT utility and financial constraint, that will have long-term implications for the way Further and Higher Education does business with its clients (students, researchers, businesses and community partners), within the lifelong learning supply chain (across school, college, university and professional development) and its funders.

3.3 – Desk Research Findings

Desk research covering UK and international exemplars was undertaken in early 2011 as part of this study. The research was literature based and the report therefore restricts itself to synthesising that evidence. The researchers identified a great degree of agreement as to both the benefits and drivers, and the disadvantages and inhibitors of moving to Above Campus IT Services, summarised as follows:

1 - Uppermost amongst the anticipated benefits of adopting shared services are:

- Continuity and resilience of service
- Quality of service
- Cost savings
- Releasing IT staff for more rewarding customer facing roles

2 - Opportunities to implement a more comprehensive and robust network security solution is driving some institutions to investigate collaborations and shared services.

3 - The move from student and/or Researcher as IT 'user' to independent IT 'chooser' is escalating, leading to an increasing variety of user owned devices on the network, availability and adoption of a wide range of tools and applications and growing obsolescence of 'general use computer labs'.

4 - Most commonly cited disadvantages of Above Campus Shared IT Services are:

- Loss of institutional autonomy
- Threats to network and data security
- Loss of competitive advantage through standardisation

5 - Uppermost amongst the commonly recognised inhibitors across the studies were cultural and human factors: for institutions, challenges inherent in creating and maintaining appropriate partnerships; and for staff, the challenges of acquiring new technical skills and working practices.

6 - The slow churn rate for institutional IT systems (sunk investment, licensing and other contractual commitments) is holding back many institutions from moving to Shared IT Services.

7 – Issues of systems integration arising from above campus implementations, for example between enterprise and student facing or research systems, are not highlighted in the literature.

8 – There exists concern that commercial cloud services may lead to new forms of entrapment or monopoly on account of the potential complexity of downstream change, especially where an extended web of services have been adopted over time

9 - Shared IT Services inhabit a shifting landscape. The balance between shared and outsourced services, between private and public cloud will continue to change and will be contingent on the context of the institution (or institutions) and emerging technologies.

10 - Whilst the key industry players in outsourcing and utility computing have acted to address concerns over where data is held in the cloud, there remains unease - often unfounded but sometimes as a consequence of individual cases of data loss or national or state legislative requirements. For this and other reasons, it seems likely that many institutions will opt for a mixed economy of both private and public cloud as appropriate.

11 - To some extent all of the above inhibitors or concerns are contingent upon, or a consequence of, the difficulties in demonstrating tangible proof of the benefits of Shared IT Services – however, this is diminishing as the evidence base builds.

12 – The appearance of large-scale take up of outsourced services in the UK schools sector should be understood in the context of the public funding drivers. Prior institutional business cases were not a focus, though they may emerge from the evidence of implementation and comparative studies.

13 – Outside the UK, away from noted 'leaders' in Australia and North America, this remains an area with relatively few substantial and established examples on a cohesive scale in countries and regions comparable to Scotland, despite strong case studies from individual institutions and localised consortia. Nevertheless, those exemplars, backed by developments within the Scottish post-16 sector, indicate the potential for Scotland to become a leading adopter of above campus IT services.

14 - Above Campus Shared IT Services are identified in post-16 education literature and case studies in the following areas:

> INFRASTRUCTURE & PLATFORM SERVICES
> Shared Networks, Data Centre consolidation, Data Backup / Disaster Recovery / IT Business Continuity, Alternative Storage, Security and resilience, Processing on demand, Web and App hosting, Identity and Access Management
>
> SOFTWARE APPLICATIONS

E-mail and office applications, Library services, Learning environments and/or platforms and communication tools, Social software supporting teaching, learning and research, Student placement sourcing, Research cluster services, Business systems (Financial, HR, Estates) and processes, User services such as smartcards, User IT support and help desks

15 - These are consistent with the Above Campus Shared IT Service 'candidates' suggested by participants in the main HEIDS study report:

- Software as a Service (SaaS): Sector specific - Student Records, VLE, Personal Portfolios, Repository, E-Resource Licensing & Management (ERM), Local Library Systems
- Software as a Service (SaaS): Generic – Email, Office productivity
- Knowledge as a Service (KaaS) - User Help Desk, Specialist Applications Support & Training, Specialist Systems Support & Training, Shared procurement
- Information as a Service (Iaas) / Platform as a Service (PaaS) - Connectivity, Mass Storage, Processing Capacity, Backup & Disaster Recovery, Database Platform, Collaboration Tools

3.4 - Institutional Openness & Readiness

The desk research, survey responses and direct consultation undertaken here (see Appendices A-C) combine to suggest that the direction of travel at the 'approaching crossroads' is mutually recognised amongst both IT management and institutional leaders (notably finance directors).

For example, survey respondents from all 19 HEIs and 22 colleges indicated strong interest in progressing the Shared ('above campus') IT Services agenda. Amongst HEIs, 62% were open to involvement in the 'immediate term' and 59% were interested in 'shaping the agenda', with only one respondent expressing no interest in the short or medium term. Whilst only half of the college respondents were open to immediate involvement, 36% identified their interest as shapers.

The issues in 2011 relate not to strategic interest but to operational implementation (priorities, partners, plans) – the devil, it is repeated, is in the detail. The current setting in many of Scotland's colleges and universities may be broadly characterised as follows.

Upstairs – Openness?

Senior managers are increasingly open to the prospect of shared IT services, with corporate approval in principle recognising the following factors

- Reliable technology – whilst any failure of cloud services is a major news item, industry responses are typically robust
- Range of service models – there are service models to suit almost any eventuality

- Reputable exemplars – global leaders organisations have their heads on the line on both supply and demand sides
- End user acceptance – consumers and businesses trust providers such as Dropbox, Google and Microsoft
- Legal impediments – suppliers have demonstrated their flexibility and precedents are increasingly becoming established
- Economic climate – the time is right

Downstairs – Readiness?

IT managers recognise the opportunity but are faced with deep-seated challenges in re-engineering the IT business, its processes and its workforce, whilst justifying a cost saving business case.

- Transformation challenges – implications in terms of the culture and skills in the IT business
- Demonstrable business case – the factors are complex within the IT business as well as in the wider corporate setting
- VAT challenges – it remains the case that services from outside the institution (even from partner institutions) will attract VAT at the prevailing rate, thus demanding an immediately cashable 20%+ saving
- Systems lifecycle – the term of contracts, the scale of sunk investment and the opportunities offered by solutions churn all mitigate against a shared response
- Appropriate partnerships – in any emerging market, there is difficulty in identifying the best partners 'for the journey'; major options at this moment include JANET UK, sector collaborations (Scotland-wide, consortium, bilateral) and commercial (vendors, affiliates).

3.5 – The Value Proposition

Sector value

As illustrated in Fig.3.2, the opportunities for shared services in post-16 education, training and research involve a spectrum of value propositions. These range from cashable savings, through less direct economic and efficiency benefits to long-term prospects of strategic added value.

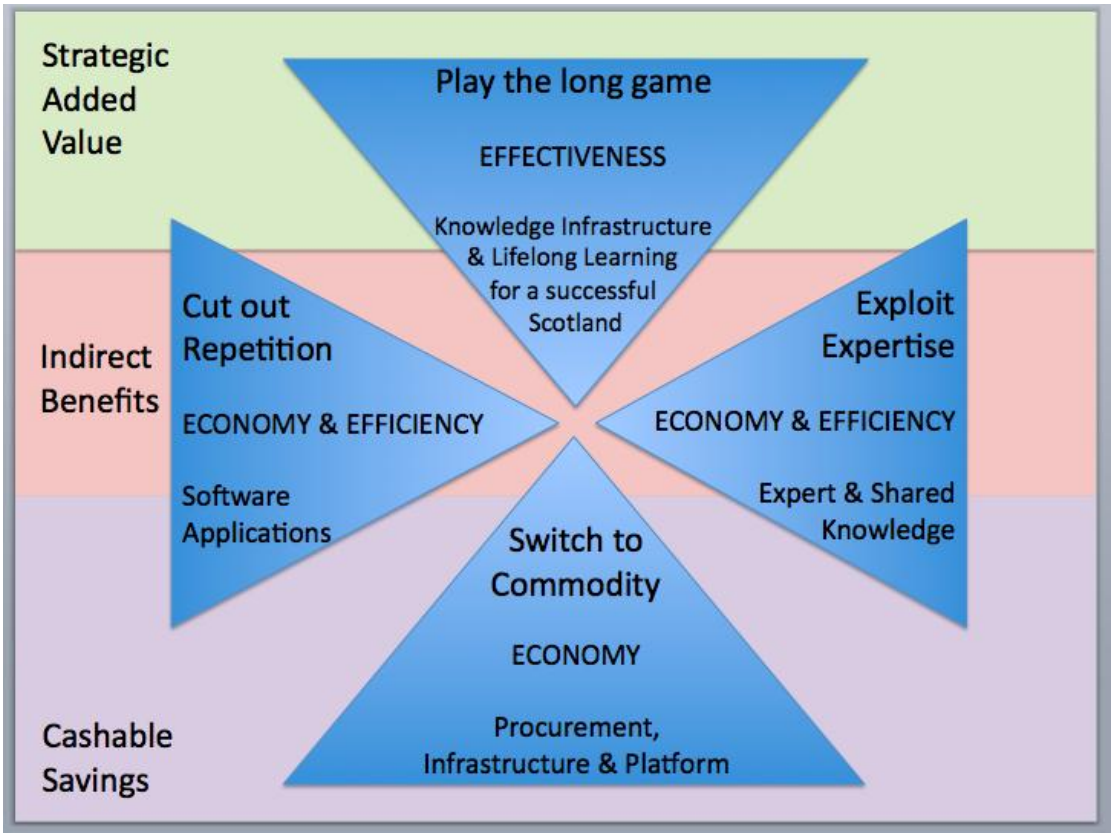


Fig 3.2 – Value Proposition & Service Mapping

The diagram (Fig.3.2) maps four broad above campus service opportunities, each available to Scottish universities and colleges, to the predicted returns:

Opportunity	Type of Services	Results	Return
Switch to commodity	Procurement; infrastructure; platform; generic software	Economy	Cashable savings
Cut out repetition	Software applications – generic and specialist	Economy Efficiency	Indirect benefits & Cashable savings
Exploit Expertise	Technical experts; Applications knowledge; Training; Help Desk	Economy Efficiency Effectiveness	Indirect benefits & Cashable savings
Play the long game	Applications for the lifelong learner; Portfolios; Resources; Assessments	Effectiveness	Strategic Added Value

Each opportunity type may be delivered at consortium (regional, peer, shared interest), Scottish or UK level – as elaborated in Section 4.3. In Section 5, this model will be used to indicate the relative positioning of seven shared services prioritised in a Scottish Road Map.

The bigger prize

Consultation revealed broad recognition that there is opportunity arising from the deployment of above campus services for development of the Scottish

lifelong learning ladder, central to but not exclusive to further and higher education.

The McClelland report points beyond immediate benefits in describing how some shared services may '*open the door to significant additional and wider savings in public sector costs by providing a platform for the operation of other shared services and better support sustainability goals.*'

A number of those consulted through interviews and workshops, emphasised the value added opportunities available downstream given successful implementation of above campus services in the areas of teaching and learning. This might extend beyond the synergies specifically outlined Section 4 & 5 where hosted VLE services (see 5.6 & 5.7) would open the door for hosted student records (5.8).

Furthermore, the bigger prize might be a single student system for learners from cradle to grave across Scotland that would:

- Underpin Lifelong Learning – from school, through further and higher education to adult learning, including continuous professional development
- Enable reuse of curriculum and assessment content - not only supporting Scotland's uniform system of vocational awards but also enabling institutions to respond quickly and effectively as areas of knowledge migrate to lower level awards (a growing trend in the knowledge economy, as experienced in IT, digital media and bioscience)
- Gather critical mass of participation – using the virtual to provide economic numbers for courses through regional and national aggregation and to facilitate access to subject specialists across institutions
- Provide access to scholarly resources – ensuring that students are not disadvantaged by the ability of individual institutions to amass local entitlement to e-books and e-journals

Such a direction of travel would require national intervention to cohere post-16 education and training services with the 3-16 age group services that are becoming established through the ongoing development of Glow.

This study proposes a Road Map (Section 4) and priority opportunities (Section 5) that are explicitly focused on savings and value for the post-16 education sector, regardless of synergistic opportunities for the wider Scottish educational agenda. However, those consulted have also identified the bigger prize, dependent on both the progress of their own sector and the national will to exploit above campus services to differentiate Scotland and Scottish learners in the 21st century global marketplace.

4 - Road Map

4.1 – Rationale

Taking account of initiatives current and emerging initiatives, this section proposes an initial Road Map for the adoption of above campus IT services by Scottish universities and colleges, focused on the period 2011-14. It is noted that this direction of travel is current and should not be put on hold. However, it is well aligned to the vision of the McClelland review and should therefore be embraced under the structures emerging from the review (see Section 7).

This Road Map does NOT imply:

- A universal interest in any individual service – however, consultation suggests that there will be early adopters and significant downstream traction for all the services identified
- A single means of provision – institutions will wish to maintain their autonomy and therefore choice will be important; furthermore shared service consortia will be formed on the basis of special interest and regional geography; however, there is a strong argument for a Scotland-wide or even a UK service in some cases, whilst there may be a self-evident vendor option in others
- A community source – sources of best value and best service provision will vary from service to service, some shared and others outsourced
- A fixed sequence – however, some services commend themselves as early targets in terms of immediate readiness, dependencies and management of risk (e.g. hosted VLE is likely to precede Student Records)
- A completed journey – however, by the end of three years, there should be widespread adoption of some services, whilst others specialized offerings may be newly available
- A comprehensive picture – the road map only contains services with strong interest in the survey and/or focus groups; services with low approval were discounted; other services will emerge during the period.

4.2 – Candidate Services

The survey and subsequent consultation generated a clear focus on 20 candidates for above campus services, which therefore form the road map. The resulting emphasis on learning and teaching and associated student facing services represents the sense of potential convergence expressed in the consultation. However, it should be recognised that a number of the candidate services (e.g. relating to collaboration, processing and storage) are of equal or even greater importance to the research agenda.

As indicated in Appendix A, there were other services that generated strong interest - notably applications such as catering, assets and estates. However, not

only did they typically score lower but also they suggested less potential synergies and represented poor strategic value when compared with services benefitting teaching, learning and research.

Whilst each of the candidate services on the Road Map might be implemented individually, there is strong consensus that the benefits potentially arising from integration, especially in the student space, represent a core objective involving major challenges as well as perhaps the biggest prize for 'Scotland plc'.

The scope of each service is a key consideration. Five major variants apply to the candidate services (see Initial Scope column):

- Managed & on demand – externally managed and extensible on demand
- Hosted but separate – a collocated but separate instance per institution
- Hosted & portable - belongs to and remains accessible to the user
- Shared service & data – benefit derived from working together
- Expertise – external or collaborative provision of knowledge services

Software (SaaS) – Sector specific

Service	Description	Initial Scope
1. Virtual Learning Environment	Blackboard and Moodle VLEs	Hosted but separate
2. Personal Portfolio	Portfolios belonging to the learner, including evidence for awarding	Hosted & portable
3. Student Records	Student registry, linked to VLE and SFC statistical returns	Hosted but separate
4. Repository - various	Institutional repository and other variants for such as learning content	Hosted but separate
5. Subscription Management	Management of scholarly subscription resources (e.g. Journals)	Shared service & data
6. Resource Discovery Layer	Search across HEI libraries, repositories, subscribed resources	Shared service & data
7. Local Library Systems	Functions to manage the local library collection, notably books	Hosted but separate

Software (Saas) – Generic applications

8. Student Email	Email address and services for clients, notably students	Managed & on demand
9. Staff Email	Email address and services for staff	Managed & on demand
10. Productivity Tools	Applications incl. word processing, spreadsheet, presentation, calendar	Managed & on demand
11. Collaboration Tools	Group applications including conferencing and application sharing	Managed & on demand

Infrastructure IaaS / PaaS

12. Network Connectivity	High performance network connectivity	Managed & on demand
13. Mass Storage	Flexible disk storage for teaching, learning and research	Managed & on demand
14. Processing Capacity	Flexible capacity to process large jobs	Managed & on demand
15. Database Platform	Flexible facility to store and manage structured data	Managed & on demand
16. Backup & Disaster Recovery	Capacity and services to secure institutional IT continuity	Hosted but separate

Knowledge (KaaS)

17. User Help Desk	Help desk to fill service gaps or replace local service	Expertise – a variety of staffing options; e.g. hosted service, central or virtual team
18. TLR Applications Support & Training	National expertise in specialist TLR applications such as Conferencing, Statistics and GIS	
19. Enterprise Applications Support & Training	Expertise in enterprise applications that are hosted and of shared interest	
20. Shared procurement	Expertise and buying power to secure best value	Expert org'n, sector / region collaboration

4.3 – Indicative Road Map

The candidate services (see Section 4.2) are positioned here on an indicative 3 years Road Map, to which caveats apply as set out in Section 4.1. Sequencing is informed by a combination of factors, including current / predicted service availability and dependencies / synergies between services.

The services are arranged vertically on the academic year 2011-12 to 2014-15 timeline to indicate timing of initial delivery. They are grouped left to right according to IaaS / PaaS (Knowledge), SaaS (Learning) and SaaS (Scholarly Resources) and colour coded according to a likely delivery mechanism (source of supply).

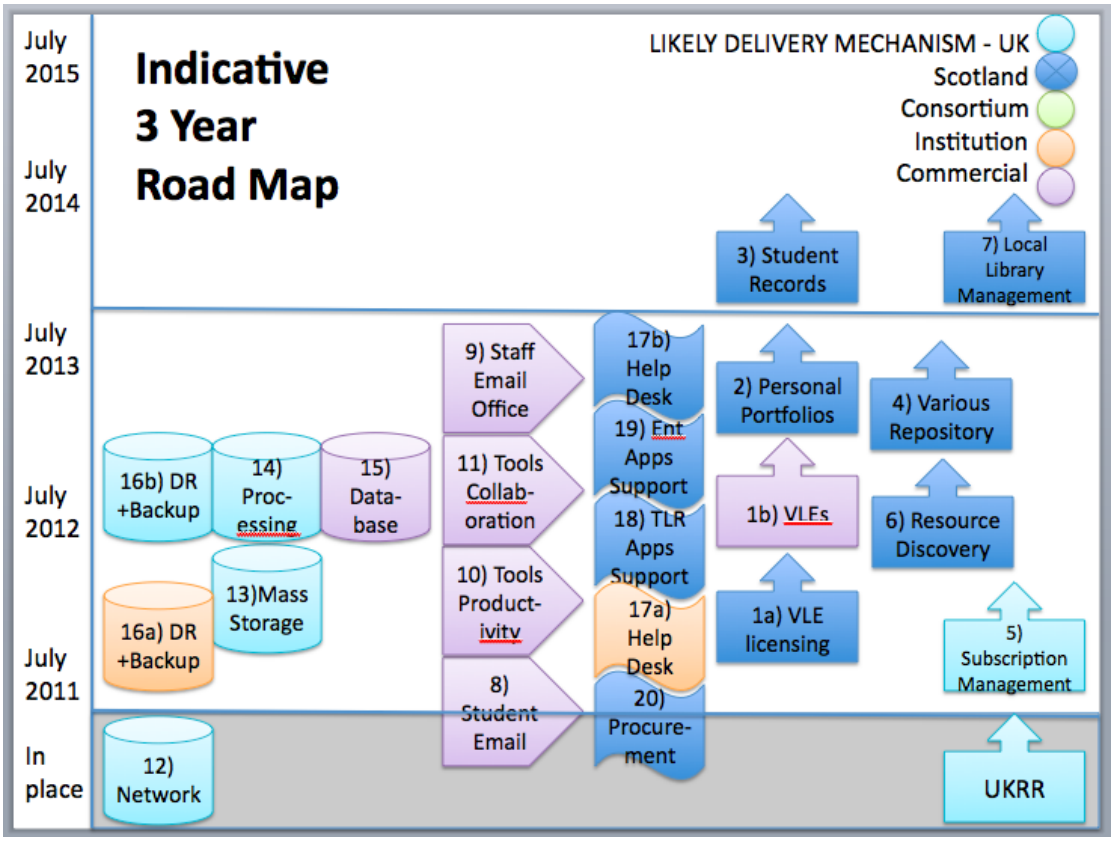


Fig 4.1 – Indicative Road Map (3 Years)

Likely (marked 'x') and feasible alternative delivery mechanisms (marked '?') are suggested in Figure 4.2 below. For example:

- Mass Storage might be expected to come from UK level JANET UK brokerage[8], but might also be delivered through a Scottish arrangement or a commercial contract

Whereas

- Shared Procurement might be expected to come from Scottish level with APUC support, but might also be delivered through UK level JANET UK brokerage or a regional / peer consortium

[8] As part of the UK Government's Universities Modernisation Fund (UMF) a brokerage is being established to facilitate efficiencies and cost savings by the deployment of shared services and Cloud Technology. This brokerage is being run by JANET (UK). The Brokerage builds on JANET (UK) core competences including procurement, security, infrastructure provision and technical expertise. The Brokerage will help define and build requirements for the education sector, build suitable terms for new services, develop the processes, procurement frameworks and environments necessary to provide technical and commercial solutions for the sector and to work effectively with the commercial sector. The brokerage will help public bodies to focus funds and share risk with a focus on flexibility, value for money and environmental impact / energy cost reduction.

Candidate Service	UK	Scotland	Consortium incl. Regional	Institution	Commercial
1. Virtual Learning Environment		?	?	?	x
2. Personal Portfolio		x	?		?
3. Student Records		x	?		?
4. Repository – various		x	?		
5. Subscription Management	x				
6. Resource Discovery Layer		x	?		?
7. Local Library Systems		x	?		?
8. Student Email					x
9. Staff Email					x
10. Productivity Tools					x
11. Collaboration Tools		?	?		x
12. Network Connectivity	x	?	?		
13. Mass Storage	x	?			?
14. Processing Capacity	x	?			?
15. Database Platform	?				x
16. Backup & Disaster Recovery	x		?	x	
17. User Help Desk		x	?	x	
18. TLR Applications Support		x	?		
19. Enterprise Applications Support		x	?		
20. Shared procurement	?	x	?		

Fig. 4.2 – Possible service governance and delivery levels

4.4 – Priorities & Synergies

Some of the candidate services on the road map are likely to have a strong catalytic effect, generating synergies that can be exploited as next stage developments.

This effect is illustrated in Fig 4.3, where mass storage, hosted VLE and subscription management are identified as key early drivers. Each of these services has early availability (2011/2012) and can be linked to a web of potential impacts beyond the service itself. The downstream sequencing takes account of likely availability as well as synergies and dependencies.

Furthermore, whilst none of these three is likely to be a Scottish shared service, they open up the downstream potential and momentum for such services, notably

- Knowledge Services – (18) TLR Applications Support & Training and (17) Help Desk
- Software applications (SaaS) – (2) Personal Portfolios, (3) Student Records
- Resource management applications (SaaS) – (4) TLR Repositories, (6) Resource Discovery and (7) Library Management

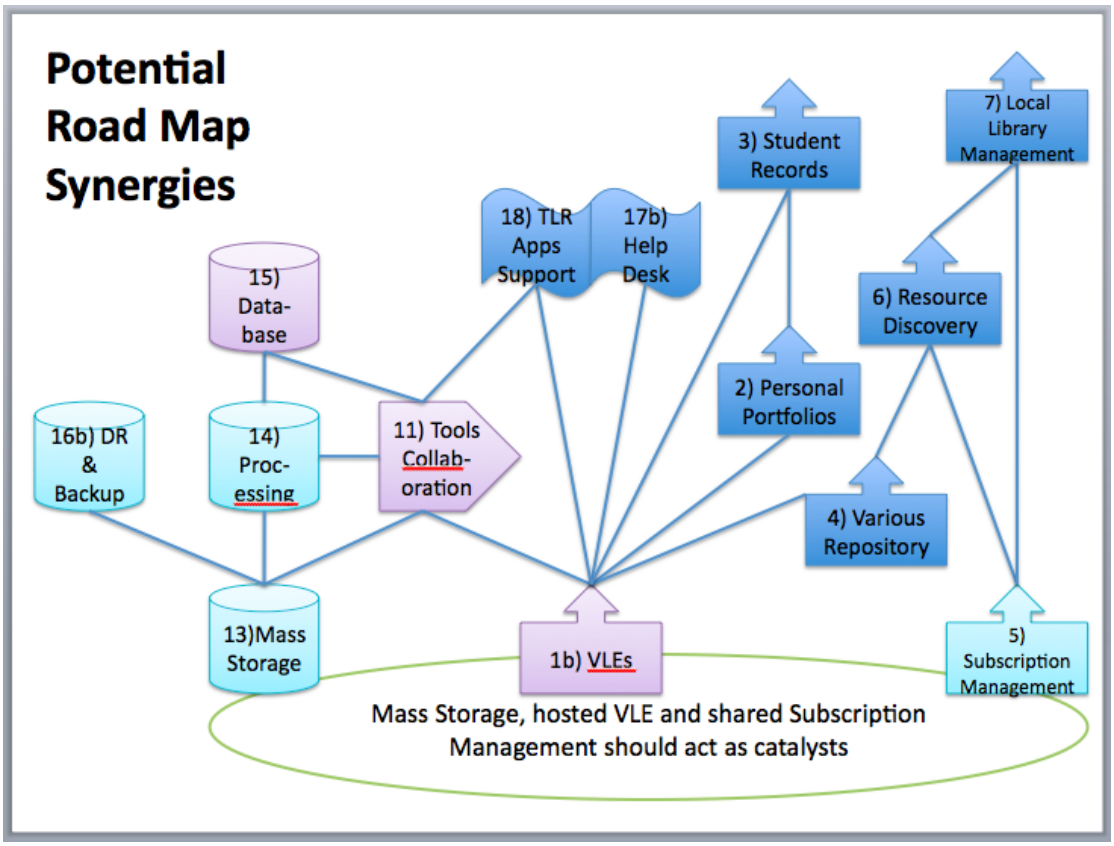


Fig 4.3 – Road Map Synergies

It is significant that this mapping of synergies highlights several of the early priority services that were identified through consultation, which are detailed in Section 5.

5 - Priority Projects

5.1 - Approach

Selection

Section 5 provides standardised descriptions of seven above campus service developments that are highlighted for priority development on the grounds of institutional appetite and their potential to act as catalysts for further synergistic advances, as evidenced during consultation and endorsed by stakeholders.

5.3 – (16) IT Continuity (DR, Back Up)	Infrastructure (IaaS)
5.4 – (11) Collaboration Tools	Platform plus (PaaS/SaaS)
5.5 - (1a) VLE Licensing	Knowledge (KaaS)
5.6 – (1b) Hosted Blackboard VLE	Software (SaaS)
5.7 – (1b) Hosted Moodle VLE	Software (SaaS)
5.8 – (3) Student Records	Software (SaaS)
5.9 – (5) Subscription Management	Software (SaaS)

With reference to the road map synergies set out in Section 4.2, it should be noted that (13) Mass Storage is not included in this list as it is assumed to be readily available to any institution or higher level service. The UMF-funded brokerage work of JANET UK is furthermore expected to enhance that position.

Using the model introduced in Section 3, the value proposition for these services is broadly characterised as follows:

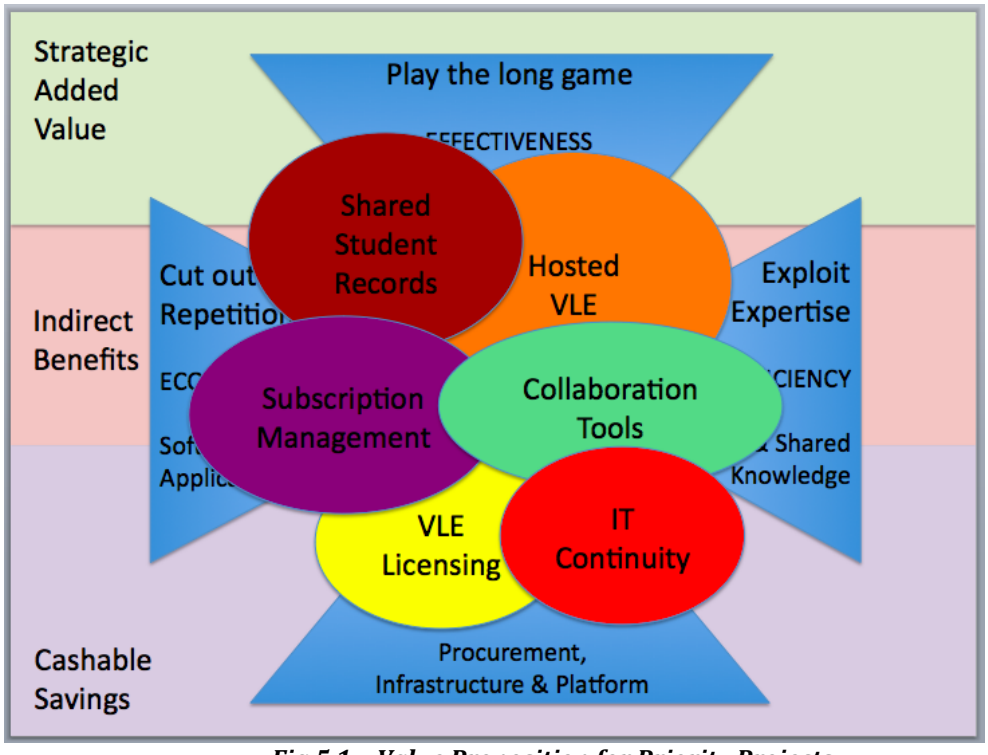


Fig 5.1 – Value Proposition for Priority Projects

Description

The descriptions the seven priority projects are intended to

- Introduce the business cases in a consistent and comparable manner
- Add substance to intent of the Road Map (Section 4)
- Provide a point of reference for institutions and consortia to develop their proposals further, looking at opportunities such as the JANET UK brokerage service and the SFC Invest to Save programme

The priority services are therefore described in a standard proforma, which forms part of the decision support 'toolkit' developed during the project (see Section 6). The documents were compiled by the Sero team, working with appropriate stakeholder groups, drawing on focus group input and JANET UK feedback (see Part C.15).

The proforma is divided in to Service Description (Part A), Core Business Case (Part B) and Enactment (Part C) as follows:

Part A - Service Description

1. Title
Title of proposed service (to use on Road Map)

2. Endorsement
Who is endorsing / proposing / supporting this? (e.g. SCURL, Scot-BUG)

3. Description
Description of the service

4. Demand
Total market and expected adoption (e.g. Number / segment of HEIs / Colleges plus any beyond education such as LAs)

5. Supply
Possible and preferred suppliers who could provide this service (e.g. Vendor, Consortium, Institution, Sector service)

Part B – Core Business Case

6. Economies
Cashable and other savings (Possible and probable)

7. Efficiencies
Service benefits (Internal and client facing)

8. Effectiveness
Impact on mission (e.g. Recruitment, student experience, research impact)

9. Inclusion of wider serices
Other services / applications that could be included or present downstream opportunities (e.g. VLE may lead to portfolios and repository services)

10. Added Value
Operational, organizational and cultural ripples / synergies (e.g. Supply side response; motivating innovation and collaboration; Scottish landscape)

Part C - Enactment

11. Timing
How soon could the service be launched? (Identify the rate-determining factors)

12. Take up profile
Predicted take up over 3 years with key factors (e.g. Cost model, Early service offer)

13. Vehicle & Governance
Preferred and possible vehicles for assuring delivery and sustainability (e.g. Existing group, NewCo, Vendor SLA)

14. Challenges
Are there other obstacles to making this happen that need to be noted?

15. Fit with JANET UK Brokerage
How does this project fit with the JANET UK Universities Modernisation Fund brokerage offer? (Completed by JANET UK).

5.2 – Highlighted Next Steps

The following requirements are highlighted as essential next steps in progressing the indicative projects set out in Sections 5.3 - 5.9 of this report, recognising that projects may be added or removed as the opportunities are established and as active dialogue develops.

In this respect, it is suggested that the act of progressing these seven projects in a partnership setting in the context of an underlying Road Map will provide essential momentum required by the community to progress from interest to intent and implementation, from recognition to reality.

These requirements should be understood in the context of the overall recommendations and mapping to the McClelland Review set out in Section 7. They are highlighted ahead of the individual business cases (Section 5.3 – 5.9) as some indication of the work to be done may assist the reader.

All indicative project cases (Sections 5.3 – 5.9)

Requirement 1 - HEIDS should work with each of the endorsing stakeholders to agree the next steps that would enable the indicative projects to be progressed with appropriate speed, transparency and rigour. These steps may involve further development of the project specification, using the tools introduced in this report (notably cost modeling and risk assessment - Section 6) and emphasising the areas highlighted in the interview report (Appendix C) including:

- Dependencies and synergies – detailing links to other shared service propositions and to campus based services
- Underlying business processes – differences across institutions
- Investment lifecycle – relative positioning of institutions in the cycle
- Operational and governance models – options specific to each service
- Financial options – clarification of mechanisms available to institutions
- Non-financial benefits – the wider business case for each service

Requirement 2 - HEIDS should work with JANET UK to establish the infrastructure, platform and software service opportunities relating to this report in respect of the brokerage service being developed under the current Universities Modernisation Fund (UMF) programme to March 2012.

IT Continuity (Section 5.3)

Requirement 3 – Involving infrastructure services of independent of sector, this area contains the widest set of implementation options. There would therefore be benefit in testing the key variants and sharing the outcomes in a short-term Scottish project, potentially working with the JANET UK brokerage service. The key options include commercial, consortium, bilateral and institution led provision covering both public and private cloud. Bearing in mind the timeline for its UMF programme, early engagement with JANET UK will be essential.

Collaboration Tools (Section 5.4)

Requirement 4 – As illustrated in the Road Map, this opportunity has synergies with shared infrastructure (storage) and applications (VLE, though also research) developments. Whilst the nature of the community requirement means that it is less tightly defined than the other indicative projects, it is nevertheless an important aspect of the ballooning IT use in teaching, learning and research across the spectrum of colleges and universities.

This might best be progressed by a group of partner institutions working with such as the JANET UK UMF programme, thus generating evidence of demand and benefit, leading to downstream shaping of a more integrated proposition.

Blackboard Licensing (Section 5.5)

Requirement 5 - Liaise with key parties within the sector (e.g. APUC, Eduserve, JANET UK, JISC) to understand the status and objectives of any relevant negotiations with Blackboard around licensing, hosting and support costs for HE and FE institutions. If negotiations are not currently underway, initiate negotiations with Blackboard to cover the options of (1) on-premises licensing, (2) Blackboard provided hosting and (3) third party hosting.

Hosted VLE (Sections 5.6 Blackboard & 5.7 Moodle)

Requirement 6 - Use the toolkit provided with this report to develop case studies of institutions currently using hosted VLE services. This should include commercial, technical and educational perspectives. Institutions known to be using hosted VLE services include:

- Manchester Metropolitan and Exeter Universities (ULCC Moodle service)
- North Glasgow College (Blackboard hosted service)

Student Records (Section 5.8)

Requirement 7 – This project is put forward as a longer-term strategic opportunity that has strong synergies with the VLE propositions (5.6 & 5.7). Unlike the VLE market, the Student Records supply side needs to address Scottish requirements and is not yet positioned with a commercial offer, though that is likely to be under consideration from such as Capita and Tribal. This project is therefore regarded as highly challenging for technical, commercial and cultural reasons as well having rich potential.

Furthermore, the perceived opportunity extends beyond the university and college sectors to the wider opportunities for Scotland to develop a lifelong learning infrastructure fitting for the 21st century global economy. This potentially involves links with the development of Glow (Education Scotland), of assessment vehicles (Scottish Qualifications Authority) and the wider skills agenda (Skills Development Scotland).

These factors commend that this opportunity requires in depth feasibility work as a matter of priority, perhaps supported by the Funding Council, working with HEIDS and Scotland's Colleges.

Subscription Resources (Section 5.9)

Requirement 8 – The Scottish Confederation of University & Research Libraries (SCURL), encompassing all 19 HEIs, has made a strategic commitment (June 2011) to the UK-wide project to develop a shared service for the management of subscription resources essential to teaching, learning and research. This will leverage UMF investment through JISC Collections. There will be cost in ensuring effective implementation across all Scottish HEIs and therefore SCURL might approach 'Invest to Save' to enable that upfront investment in 2011-12.

5.3 – IT Continuity

Part A - Service Description

1. Title
IT Continuity

2. Endorsement
Disaster recovery and IT continuity were identified within the survey[9] and in the IaaS workshops as areas with significant potential for Above Campus services.

3. Description
IT continuity can be described as the ability of an organisation to restore its information systems to operational status in the event of a data loss. Such data loss can range from the restoration of individual accounts or files as a response to deletion by an end user, to the complete recovery of a system or systems after a catastrophic event such as flood, fire or theft.

4. Demand
From the survey and workshops held, we believe that there is substantial interest in Above Campus IT continuity services. As part of their corporate governance, institutions are required to have adequate business continuity plans including IT continuity measures.

IT continuity / security and vulnerability scanning / business continuity services all feature on an institutional risk register and as such are subject to regular audit and inspection.

5. Supply
There are a number of models for the supply of such services, all clearly identified within by Wagner and Wheeler[10].

- Institutions, particularly those with multiple campus buildings can provide such services for themselves and carry the additional capital and revenue costs.
- Institutions with spare space in their data centre (e.g. St Andrews) could provide hosting facilities to other institutions.
- Commercial providers such as Sun Guard[11] offer data replication as a cloud delivered service as well as full managed hosting, colocation and business continuity management services.
- Consortia of institutions could provide secondary and peer hosting arrangements for each other.

---

[9] Provide details on the % of respondents in HE and FE that gave a strong or very strong indication that this was a service that they would be interested in.
[10] Wagner and Wheeler Above Campus shared services model (2009) http://www.educause.edu/EDUCAUSE+Review/EDUCAUSEReviewMagazineVolume44/ProvisioningAboveCampusITServi/185223
[11] Sun Guard RaaS http://www.sungard.co.uk/Pages/default.aspx

Part B – Core Business Case

This business case considers three services that are part of any IT continuity service:

1. Offsite security copies (backup).
2. Disaster Recovery (DR) as a platform service (PaaS).
3. Audit and governance knowledge services.

6. Economies

1. **Offsite security copies (backup).**
   Moving from tape to online backup would offer a reduction in the unit cost when additional factors such as backup hardware, software and hardware licences, media handling and media storage are considered.

   Services such as AmazonS3 and Microsoft Azure offer online storage for £0.09 pence per month per Gb this cost compares favourably with the full cost of a tape based system over 3 years.

   We would expect such a service to be capable of delivering at least a 20% reduction in direct costs over a 3 year period with additional cost savings and efficiency gains achieved through more reliable processes and reduction in staff time used.

2. **Disaster Recovery (DR) as a platform service**
   Depending on the model used, many disaster recovery platforms consist of duplicate hardware sat within an alternative data centre, refreshed periodically with core data. Such a service effectively doubles the capital cost of a service and while such services can be used as test and training environments, this is not considered best practice from an IT continuity purpose.

   DR platforms need to be capable of handling the same maximum load provided by the production system if they are to provide a similar service.

   Hosting DR systems on external 'elastic' platforms such as those provided by RightScale[12], AmazonEC2[13] or Rackspace[14] managed private clouds or alternatively internally with partners using virtualised servers [15] enables disaster recovery platforms to be built that can run on single processors while dormant and elastically expanded in the event of a disaster.

[12] RightScale is a service provider that specialises in IaaS/PaaS http://www.rightscale.com/
[13] Amazon elastic computing http://aws.amazon.com/ec2/
[14] Rackspace Managed private clouds capable of providing a rapidly scalable hosting provision ideal for DR http://www.rackspace.com/managed_hosting/private_cloud/index.php
[15] Virtualised computing – Hosting Virtual servers on a physical platform to allow processing and storage resource to be shared http://en.wikipedia.org/wiki/Virtualization

We would confidently expect there to be a reduction in cost of at least 40% in the capital and revenue costs[16] in the provision of a disaster recovery platform. This is achievable over a 3 year period.

3. **Audit and governance knowledge services.**
Data security and governance is increasingly of high concern for all organisations. The management of this risk is typically achieved through institutions risk and audit mechanisms.

While there is not currently a requirement for institutions to achieve ISO 27001[17] certification in information and security standards, weaknesses in data management can result in severe reputational damage.

Few institutions can afford their own internal CISP[18] certified professional to oversee all aspects of their systems security, instead they rely on external contractors and their auditors to provide such services.

In England we have seen the creation of an organisation from within the sector to provide such services ESISS http://www.esiss.ac.uk/ based at Nottingham Trent University.

We would expect that contracting such services as a sector has the potential to reduce the cost by at least 25%.

7. Efficiencies

1. **Offsite security copies (backup)**

- Data recovery services are significantly improved. For example, the service could be designed so that users can go online to recover their own files (removing one source of Helpdesk calls)
- With data backup to disk rather than tape, files are accessed directly rather than sequentially, this combined with no tape handling ensures that file restoration is faster.
- The ability to automatically populate DR platforms with data derived from disk backups ensures coherence between systems and enables automated test restores to be performed. Improved recovery times are an additional benefit.
- If desired version control can be implemented as part of the backup regime allowing clients to restore to previous versions of a file or document or system image.

2. **Disaster Recovery (DR) as a platform service**

- IT continuity levels are significantly improved.

[16] This site providers quanticatin of the savings delivered from moving a telecom service to the cloud http://www.abacusgroup.com/Abacus-Cloud-Telecom-Clouds-Quantitative-Savings
[17] ISO 27001 the international standard for an Information Security Management System (ISMS) in the UK this is also known as BS7799 http://www.itgovernance.co.uk/iso27001.aspx
[18] CISP – a Certified Information System Security Professional http://www.cissp.com/

- Correctly architected, such services provide a standby platform populated with data that is available within minutes of any disaster.
- The ability for such systems to scale elastically enables institutions to mitigate the risk that their services reach an unforeseen performance or capacity barrier that effectively prevents a service from being delivered.
- Additional test and training platforms can be constructed rapidly when needed then discarded reducing the cost and speed of delivering new versions of a service.

3. **Audit and governance knowledge services**

- Such a service run on behalf of the sector would be able to share best practice across institutions.
- A central pool of expertise capable of keeping abreast of developments in this rapidly changing area would be available as a sector resource.
- Institutional and sector risk management would be improved, data and services would be safer and typically have increased availability.
- Risk management and mitigation would be more pro-active.

8. Effectiveness

We can anticipate that the sector will increase its dependency on IT systems for operational management and the delivery of educational services. Students and staff will increasingly interact with the organisation through IT systems. Ensuring that these services are robust, secure and are highly available will become a critical success factor.

We can expect the public and regulators to become increasingly sensitive to the mismanagement of data. The reputational damage associated with a data loss or security incident can have financial consequences. The provision of audit and governance services centrally procured will facilitate the adoption of best practice.

9. Inclusion of wider services

Using cloud services for the provision of DR services could act as a way for the sector to familiarise itself with the operational, management and architectural characteristics of 'cloud services'. IT continuity systems architected as Above Campus services are effectively sector wide. Shared underlying data architecture would support the creation of additional high level services such as HR, Finance and Student Record Systems.

10. Added Value

IT continuity is often seen as a separate and additional cost in the provision of services. There is an argument that such services if architected correctly provide their own disaster recovery. IT services load balanced across three sites with any one site capable of handling 50% of the capacity is an example of architecture that is becoming popular.

The adoption of such services if contracted as a sector and delivered through existing partners would deliver best practice across institutions of all sizes. Such platform services also represent a cross-sector opportunity, regardless of

organisation type, though the availability of high speed broadband will be a key consideration.

Part C - Enactment

11. Timing

We believe that there is an appetite to run a requirements and feasibility exercise to articulate such a platform service project starting in the Autumn 2011 with a pilot exercise in the spring 2012.

12. Take up profile

Based on the survey and workshops, we expect that some or all of the elements in this business case would be adopted by over 80% of the sector by 2014. During the first two years of operation some institutions will be in a position to lead the way on account of their immediate local priorities and resource levels.

13. Vehicle & Governance

An appropriate body to offer guidance on the provision of such services would seem an appropriate mechanism. A national user group with institutional and audit representation would help to ensure adoption and knowledge transfer.

14. Challenges

Such a service requires a critical mass in order to be cost effective; as a result there will be a need for leadership and engagement from business managers as well as technical staff. IT continuity is frequently perceived as a technical rather than a business issue, for such a service to achieve its potential a change in perception needs to occur. Cross-sector engagement may help in this respect.

15. Fit with JANET UK Brokerage

In early requirements work the Brokerage has identified IT Continuity and Disaster Recovery as a common requirement across the education sector and beyond. This infrastructure level project is a potential early project for the Brokerage as a hosted solution, which has the potential to deliver service improvements and cost savings as well achieving objectives with respect to Business continuity/DR.

This area is also highly scale dependent with greater potential benefits with aggregated scale. Such a project will carry technical, legal / risk, operations / service, and business model questions. The Brokerage would have a role in understanding and addressing issues in each area for the benefit of the sector.

5.4 - Collaboration Tools

Part A - Service Description

1. Title
Collaboration Tools

2. Endorsement
The survey identified a widespread interest in tools and services for online collaboration. Workshop participants indicated that a strategic approach to the provision and management of collaboration tools has potential as an Above Campus service.

3. Description
The term "Collaboration Tools" refers to software applications commonly used to support communication and collaboration amongst and between staff and students, within and across institutions and including industrial partners.

Such tools include:

- Email
- Shared calendaring;
- Shared documents and document storage;
- Communications tools such as instant messaging, Voice Over IP, (VOIP); video conferencing, Twitter and Facebook;
- Conferencing and bulletin boards such as like Ning or Elgg;
- Shared and secure file management such as Sharepoint / Google Docs, Sites and Office365;
- Content Management systems such as Drupal, Joomla and Wordpress;

Most institutions are already using many of the services listed above; however, with the exception of campus services such as email and calendaring, such services are often procured outside the formal IT services remit involving ad hoc arrangements which are fragile, insecure, unsupported and inefficient in terms of setup and reuse.

4. Demand
From the workshop it was clear that there is increasing demand for such services and that there is currently duplication of effort in many institutions. Core collaboration functionality provided through platforms such as Google docs or Office 365[19] is likely to become a standard in many institutions that would benefit from a sector wide implantation plan.

A wider range of collaboration tools such as Drupal, Joomula, Wordpress , Ning and Elgg are currently procured in a diverse manner that ranges from hosting by departments on internal servers, through to ISP hosting arrangements that vary in quality and scale. Not all workshop delegates were aware of common Above Campus service offers.

[19] Office 365 will in June 2011 replace the live@edu service.

5. Supply

Hosting of the newer cloud based collaboration offers of Google Apps and Office365, is part of the standard offer. A value added Above Campus service offer supporting such services would focus on transition, implementation, governance and knowledge services, effectively providing Knowledge as a Service (KaaS). Such a service could also provide expertise on other cloud collaboration services such as Twitter, Facebook, Flicker, Youtube.

In addition to the increasing range of cloud services there is scope to provide an above campus service to provide the more individual service platforms such as Ning, Elgg, Drupal, Joomula and wordpress for example. Hosting could be provided by an institution with expertise and experience in supporting such applications. An alternative arrangement could be provided through a commercial provider, and would be attractive when offered to the sector or consortium of institutions.

Part B – Core Business Case

6. Economies

Probable savings from the collective provision of collaboration tools include:

Element	Rationale
Servers and Storage (CapEx)	Platform efficiencies available by designing an infrastructure to support multiple institutions will reduce the total number of servers and SAN systems required. Service funded out of revenue.
Rack, Energy & Cooling costs (OpEx)	Fewer servers will mean that the overall total cost of rack space, electricity and overall energy consumption will be lower.
Application support staff (OpEx)	Application updates and upgrades provided by the service provider, reducing the requirement for specialist Moodle skills.
Development, Test environment and DR system provision (CapEx)	Across the sector, there will be a reduction in the number of support and DR facilities environments needed.
Application support staff (OpEx)	A reduction in support, development and testing costs. Application updates and upgrades provided by the service provider.
Replacing technical activity with configuration skills (OpEx)	Cloud or dedicated hosted provision of tools significantly reduces the technical maintenance activity, replacing it with configuration activity and monitoring

Possible savings from this service might include:

- Reduction in procurement costs;
- Common deployment and configuration practices;
- Common API's and data integration methods reducing integration costs;
- Sector provision of development and configuration skills;
- Reduction in governance costs including security, vulnerability and audit as a result of fewer systems to manage.

The term collaboration tools covers a wide range of applications and systems, many of which provider similar functionality. The provision of a defined set of such tools as a hosted offer will reduce risk and enable best practice to be exploited.

7. Efficiencies

The adoption of the larger collaboration toolsets, such as Google Apps and live@edu, have delivered improvements in effectiveness and efficiency within the sector, documented in case studies. Such studies often point to the need for a coordinated approach with attention to data migration and implantation issues, effectively knowledge based services.

The provision of the wider set of collaboration tools as a sector initiative under formal service management has the potential to deliver similar improvements. The delivery of these services on a platform as a service (PaaS) infrastructure would deliver efficiencies through:

- Centralised maintenance and patching;
- A reduction in the cost of hardware and hosting costs;
- A reduction in governance costs;
- A reduction in the cost of provision of a DR platform;
- A highly available service conforming to a robust SLA;
- 24x7 operations and support and extended hours Helpdesk;
- Maintenance and upgrades done on a published schedule (preferably one agreed with the user panel) and performed out of peak hours;
- Standardised systems interfaces for integration and a set of 'best-practice' reports and templates.

8. Effectiveness

The provision of collaboration tools from an Above Campus supplier would reduce the risk profile common in services procured in an ad-hoc manner[20] with increased safeguarding of data.

Collaboration tools are associated with user-generated content. Such services frequently require timely moderation, especially when provided for undergraduates. A centralised function could provide such a service.

The management of user identity and integration with other campus systems centred on directory services and identity management services is a common source of help desk activity. The provision of a common Above Campus collaborative tool set linked with institutional directory services and conforming to existing standards has the potential to reduce this common issue and improve the user experience.

In addition to the items above there are the usual additional benefits and efficiencies for subscribing institutions:

- Training teaching staff in the best-practice use of the system;
- Developing content;
- Customising the user interface to best meet student and institutional needs; and

[20] It was noted in the workshops that such services rarely have disaster recovery arrangements other than periodic backups.

- Using the reporting interface to analyse usage of the system to identify priorities to promote uptake and share best practice;
- The inclusion of modular functionality released by third parties under an open source licence.

9. Inclusion of wider services

Email, calendaring, messaging, secure hosting of digital assets and blogging are common components from which digital educational services are constructed, ensuring that such foundation services are robust and stable enables their integration with:

- Directory services;
- Learning and research management platforms;
- Reference management systems;
- Publishing and repository systems;
- e-portfolio systems;
- Summative and formative assessment services.

A mature and common set of collaboration tools form the foundation from which innovative educational offers can be constructed. A set of common tools with strong service management standards is required to ensure such offers are sustainable.

10. Added Value

There is significant opportunity for value added services associated with collaboration tools. Examples include:

- Sharing of best practice in configuration and use across the sector;
- An increased focus and sharing of content between institutions using the same collaborative ecosystem;
- Collaboration in staff development in the use of the tools;
- Value to institutional administration and management processes;
- The consequent potential to develop bespoke functionality[21]

To date the sector has experienced considerable levels of rework as applications and services with similar or the same functionality are developed and then allowed to atrophy. A sector wide co-ordinated approach to the provision of such tools will be necessary if lasting value is to be derived.

Part C - Enactment

11. Timing

Institutions wishing to adopt one of the larger corporate services offerings from Google or Microsoft should consider adoption or migration within the next academic year (2011-12). Engagement as a sector is likely to persuade suppliers to offer preferential service offers and ensure that the Scottish sector has a significant voice in the development of such services.

[21] The temptation to develop bespoke functionality should be approached with caution due to its impact on upgrade cycles and the maintenance load required. However sector specific APIs and integration functionality would have a reduced cost when jointly procured.

12. Take up profile

Institutions are already using the live@edu platform. This service is due to be replaced with Office 365 in summer 2011. Institutions will be expected to migrate or consider alternatives. It is expected that the majority of institutions will adopt one of these platforms over the next 3years. Such a consortia would be well placed to procure or host additional collaboration services.

13. Vehicle & Governance

While the vehicle will depend on the hosting organisation, a collective acting to identify and disseminate service governance and best practice with representation from end users, service providers and institutions will be beneficial.

14. Challenges

There will be an argument that such a shared service constrains innovation, perhaps from advanced segments of the research community. The Sector should be robust in requiring high quality sustainable services that are easy to replicate and integrate.

15. Fit with JANET UK Brokerage

The elements of an initial collaboration platform overlap discussions that are underway with respect to email and application provision, particularly with respect to major providers. These discussions seek to address major issues preventing take-up of such services, namely legal clarification, contract issues, service concerns, technical provision and suitable, sustainable business models. The Brokerage is able to add weight to these negotiations through aggregating the requirements of the sector and this would form a natural extension. The core business case also identifies the savings from shared or centralised infrastructure provision. This aligns with potential Brokerage initiatives to enable the use of supplier or centralised provision, as well as the reuse of existing institutional provision. The potential for PaaS is demonstrated in the Efficiencies section and is directly in scope for the Brokerage.

Whilst suppliers are keen to push this area, this is unlikely to be an early project for the Brokerage unless a substantial need is demonstrated within HE/FE or additional resources are acquired.

5.5 - Blackboard VLE Licensing

Part A - Service Description

1. Title
Blackboard VLE Licensing

2. Endorsement
The opportunity for a consortium of HE and FE institutions to come together and negotiate a reduced licence fee for Blackboard software was identified by the workshop discussions. This outline business case has been developed in consultation with Scot-BUG (the Scottish Blackboard User Group, comprising both HE and FE institutions). Colleges were not consulted in detail, though it is noted that half the college users (7/14) are linked to the UHI Blackboard system.

3. Description
This document provides the outline business case for creating a consortium of institutions in order to negotiate a reduced licence fee for Blackboard software. The consortium would ideally be supported by the Janet UK brokerage and / or APUC in order to provide support and expertise during the negotiations.

4. Demand
Current usage of VLEs by Scottish HEIs and Colleges is understood to be:

Platform	HEIs	Share	Colleges	Share	All	Share
Blackboard	7	37%	14	33%	21	34%
WebCT Campus	4	21%			4	7%
WebCT Vista	2	10%			2	3%
Moodle	6	32%	24	57%	30	49%
Other			4	10%	4	7%
	19		42		61	

It should be noted that WebCT is now owned by Blackboard and that Blackboard are encouraging WebCT users to migrate to the latest version of Blackboard. The risk of having these users choose to migrate to Moodle is a powerful argument as to why Blackboard should offer a reduced licence fee for at least these users.

Blackboard and related systems are therefore used by 44% of the HEIs and Colleges in Scotland.

5. Supply
Ideally the consortium would comprise a number of institutions with a clear commitment to stay with or migrate to Blackboard subject to satisfactory commercial terms being negotiated.

Negotiations would necessarily be directly with Blackboard. A first step should be to understand the status of any early stage discussions at other levels, perhaps by Janet UK or Eduserv.

Part B – Core Business Case

6. Economies

The economies would clearly relate to reduce licencing and support costs for the Blackboard software. It is important that any savings:

- Benefit both large and small institutions (in both HE and FE);
- Benefit existing Blackboard users as well as those migrating from other platforms;
- Compare like with like and do not enforce unnecessary supplementary licensing.

7. Efficiencies

Additional benefits and efficiencies could be realised through this activity:

- It would provide an incentive for institutions to upgrade to the latest version of the Blackboard software and/or optionally take additional modules and thus benefit from the improved functionality;
- Involving Scot-BUG could provide additional impetus to the user group, which might be extended to include college users;
- It could encourage further collaboration and sharing of best-practice between institutions.

8. Effectiveness

Use of the latest Blackboard software and (possibly) additional software modules would provide richer functionality and a more modern user interface – for example, enabling access from handheld or mobile devices. This would provide an improved student experience and potentially better outcomes for students and increased recruitment.

9. Inclusion of wider services

Blackboard Learn has several modules – Course Delivery (the starting point), Content Management, Community and Outcomes. Whilst it is unlikely that every institution would want all of the modules, they should at the least be available as options under the licensing agreement for those institutions that do want them.

Other Blackboard platforms that could be made available include:

- Collaborate – Virtual classroom, messaging and conferencing;
- Connect – Alerting, text / email messaging of announcements etc;
- Transact – Smartcard support and integration with access control, print management and other services;
- Analytics – Data warehousing and integration with student record systems for data analysis and information presentation;
- Mobile – Support for handheld and mobile devices.

10. Added Value

This could serve as a benchmark demonstrating the capability and benefits of Scottish HE and FE institutions to act in unison for common interest. If successful, a similar model could be applied to other services.

Part C - Enactment

11. Timing

Given that there are few external factors associated with this prospect, it could be initiated immediately aiming to conclude negotiations within a few months. APUC (Advanced Procurement for Universities and Colleges) and the JANET UK brokerage have offered to provide support for any procurement activities.

The key steps are likely to be:

- Identification of institutions willing to be consortium members and gaining commitment subject to satisfactory terms. Clearly if this was a UK-wide consortium, leverage with Blackboard would be maximised, though timing may be an issue;
- Refinement of the business case
    - Agreement on the required outcomes from the negotiations (e.g. modules to be included; duration of agreement);
    - Rationale / argumentation to be put to Blackboard;
    - Commitments that could be made to Blackboard (in return for concessions on licence fee)
- Agreement of procurement / negotiation process

12. Take up profile

Existing Blackboard users would wish to move to the new licence agreement immediately. WebCT and Vista users would migrate at the point at which they upgrade their VLE system, at latest during summer 2012. The deal would ideally be open to newcomers.

13. Vehicle & Governance

Consideration must be given to the nature of the agreement with Blackboard. At its simplest, it could be a promotional offer made by Blackboard with no reciprocal commitments made by institutions. Whilst commercially this is simple, it will not necessarily lead to the lowest possible pricing from Blackboard (because of the absence of reciprocal commitments). APUC and Janet UK should be sources of advice as to the most appropriate vehicle.

14. Challenges

The key challenges and risks that should be noted are:

- Gaining agreement across institutions on the negotiating parameters:
    - What modules should be mandatory and what optional?
    - What level of commitment can be made to Blackboard?
    - What level of pricing is / is not acceptable?
- Relationship with this deal and any potential hosted service (see 5.6), either supplied by Blackboard or otherwise;
- Ensuring sufficient flexibility for those who do not want additional software and services;
- Exit terms, ensuring that value is balanced with the downside of lock-in
- Options for newcomers;
- Getting signoff across institutions for any agreement that is reached.

15. Fit with JANET UK Brokerage

The JANET Brokerage will have a core focus on requirements in Teaching & Learning and Research. This includes Virtual Learning Environments and Research Data Management. From several different directions the need to look at the aggregation of different aspects of VLE provision has been flagged to the brokerage. This includes Licensing, Managed Hosting, storage costs, etc. As a result the Brokerage is at an advanced state of negotiation with the major UK commercial VLE supplier and is also in discussion with organisations that host open source VLEs such as Moodle.

5.6 - Blackboard VLE Hosting

Part A - Service Description

1. Title
Blackboard VLE Hosting

2. Endorsement
A hosted VLE service was identified by the initial interviews and was ratified in the workshop discussions where it was agreed to be one of the most promising Above Campus services. This outline business case has been developed in consultation with Scot-BUG (the Scottish Blackboard User Group).

3. Description
This document provides the outline business case for the Software as a Service (SaaS) provision of the Blackboard Learn Virtual Learning Environment (VLE). HE and FE institutions would subscribe to the service and access it over their broadband (JANET) connections. If successful, the service could be expanded to include other Blackboard modules (e.g. Mobile, Collaborate).

4. Demand
Current usage of VLEs by Scottish HEIs and Colleges is understood to be:

Platform	HEIs	Share	Colleges	Share	All	Share
Blackboard	7	37%	14	33%	21	34%
WebCT Campus	4	21%			4	7%
WebCT Vista	2	10%			2	3%
Moodle	6	32%	24	57%	30	49%
Other			4	10%	4	7%
	19		42		61	

It should be noted that WebCT is now owned by Blackboard and that Blackboard are encouraging WebCT users to migrate to the latest version of Blackboard. Blackboard and related systems are therefore used by 44% of the HEIs and Colleges in Scotland. The same service should also be attractive to HE and FE institutions from across the UK.

5. Supply
It should be noted that a hosted service is already available from Blackboard. Not only does this demonstrate the feasibility of providing a hosted Blackboard service, but through negotiation with Blackboard may prove to be the most cost effective way to provide the Service. We understand that North Glasgow College is in the process of migrating to the hosted Blackboard service.

Alternatively hosting could be provided by

- An institution with expertise and experience in managing and supporting a large-scale Blackboard system. Given that Blackboard support Windows Server, Red Hat Linux and Sun Solaris Operating Systems, it is highly likely that an institution will already have the required technical skills.

The most significant challenge is likely to be in providing 24/7 support against a Service Level Agreement (SLA).

- A commercial provider may be interested in providing such a service.

Part B – Core Business Case

6. Economies

Probable savings from this service, regardless of provider, include:

Element	Rationale
Servers and Storage (CapEx)	Platform efficiencies available by designing an infrastructure to support multiple institutions will reduce the total number of servers and SAN systems required.
Rack, Energy & Cooling costs (OpEx)	Fewer servers will mean that the overall total cost of rack space, electricity and overall energy consumption will be lower.
Systems Management & Support Staff (OpEx)	Systems monitoring, Operating System updates and patches will be provided by the service provider.
Application support staff (OpEx)	Blackboard Application updates and upgrades will be provided by the service provider – this reduces the requirement for specialist Blackboard skills within the IT Services team.
Development, Test environment and DR system provision (CapEx)	Across the sector, there will be a reduction in the number of support and DR facilities environments needed.

Possible savings from this service might include:

- Reduced Blackboard licensing costs (as a result of consortium / bulk purchase of licences from Blackboard);
- Reduced database licensing costs;
- Reduction in governance costs, with fewer systems to audit and to perform vulnerability (penetration) testing on;
- Reduction in training costs with the availability of shared online and physical training facilities.
- With institutions increasingly collaborating with overseas partners and supporting overseas students, the potential cost of 24 x 7 support will become a factor.

The template cost model introduced in Section 6 will help institutions quantify the potential savings.

7. Efficiencies

Irrespective of hosting organisation, a professional will deliver 'good practice' service levels against a published SLA. This can provide additional benefits and efficiencies for subscribing institutions:

- 24x7 operations and extended hours Helpdesk support; as a minimum this would cover service availability but could also be extended to user

support (with institutions increasingly collaborating with overseas partners, 24x7 support is an increasing requirement);
- Maintenance and upgrades done on a published schedule (preferably one agreed with the user panel) and performed out of peak hours;
- High service availability (the target for a commercial provider would typically be 99.9%);
- Standardised interfaces for systems integration to allow integration with leading Student Record Systems and other key applications;
- A 'best-practice' set of reports and templates to provide information on system usage.

8. Effectiveness

Delivery of the VLE as a service will mean that institutions can focus on the use rather than the operation of the VLE. With a robust, reliable platform available for them, they will be able to concentrate on:

- Training teaching staff in the best-practice use of the system;
- Developing content and activities;
- Customising the user interface to best meet student and institutional needs;
- Using the reporting interface to analyse usage of the system to identify priorities to promote uptake and share best practice.

All of the above will result in an improved student experience and potentially better outcomes for students and increased recruitment.

9. Inclusion of wider services

Blackboard Learn has several modules – Course Delivery (the starting point), Content Management, Community and Outcomes. Whilst it is unlikely that every institution would want all of the modules, they should at the least be available as options for those institutions that do want them.

Other Blackboard platforms that could be made available, as options, include:

- Collaborate – Virtual classroom, messaging and conferencing;
- Connect – Alerting, text / email messaging of announcements etc;
- Transact – Smartcard support and integration with access control, print management and other services;
- Analytics – Data warehousing and integration with student record systems for data analysis and information presentation;
- Mobile – Support for handheld and mobile devices.

In addition to the live environment, development and test/training environments could also be provided – potentially on a 'pay as you go' basis.

Additionally, the service could grow to include other, non-Blackboard related services such as ePortfolios and Student Records (see 5.8).

10. Added Value

There is significant opportunity to build on a shared VLE service, as illustrated in Section 4.4. It is suggested that this could provide the foundation for

developments of national significance across the wider teaching and learning ecology. Specific examples include:

- Greater collaboration between institutions as working on common platform, which could include staff development or joint development of application extensions;
- Greater collaboration between support teams within each institution to provide materials and training programmes to grow engagement of academics with learning environment;
- Increased influence on Blackboard, such as prioritising fixes and enhancements;
- Possible collaboration on a shared ePortfolio installation, potentially easing the transition from colleges to universities to ongoing CPD;
- Sharing resources across institutions especially colleges which cover national SQA awards, which could be based on common Content Management System or shared storage platform. This may also tie in with Open Educational Resources (OER) initiatives;
- Sharing best practice on how to use or to create content;
- Strengthening links between institutions already collaborating.

Part C - Enactment

11. Timing

An outline of the major activities required to set up a hosted VLE service is set out in Section 11 of the Blackboard VLE hosting paper.

Migration to a new VLE system (or VLE provider) is a significant undertaking for any institution and can only realistically be undertaken during the summer break. Also, given the need for the service to demonstrate its reliability and robustness, it is probably most realistic to set a target of having a pilot service with a small cross-section of institutions (e.g. 6) from the summer 2012, with full service availability from summer 2013.

The time required to develop the service depends significantly upon the hosting provider. Should an institution (or other sector entity) wish to act as a hosted service provider, the key steps (and hence the critical path) to implementation of the service are likely to be:

1. Confirm viability of Sector Provider as opposed to Commercial Provider.
    - Provider identification
        - Contact leading Blackboard users to explore interest/gain commitment to become service provider;
        - Open discussions with JISC to identify alternative hosting providers.
    - Refinement of business case
        - Clarify functional and non-functional requirements
        - Develop operational cost model and hence indicative pricing;
        - Identify start up costs.
    - Market testing – get expressions of interest from HE and FE institutions (at the indicative pricing);

- Identify funding sources (especially to cover start up costs)

2. Project Start Up & Commercial agreements.
   - Develop full project plan;
   - Establish project governance (inc. user panel);
   - Negotiations with Blackboard and data centre provider;
   - Identification of technical and other staff for project team.

3. Implementation of Service.
   - Procurement of servers and hardware;
   - Systems architecture and service design;
   - Installation of software and creation of template sites;
   - Internal testing

4. Pilot Service.
   - Testing with 2 or 3 early adopter institutions;
   - Go Live & service launch

5. Institution Implementation
   - Integration with user provision and authentication systems;
   - Creation of course structure
   - Population of content
   - Training of staff

Having established the service, institutions would be expected to follow the appropriate procurement process prior to signing up for the service. APUC (Advanced Procurement for Universities and Colleges) have offered to provide support for any procurement activities.

12. Take up profile

Initial discussions have identified several institutions that have expressed interest in this service. This offer is most likely to appeal to smaller institutions, and to institutions that need to migrate to a new VLE system (e.g. current WebCT users). The key uptake factors will be:

- Price;
- Service offering – SLA and functionality offered;
- Credibility of organisation supplying hosted service.

13. Vehicle & Governance

The vehicle required will depend on the hosting provider. However, service governance is likely to benefit from the role of a separate entity (which might be HEIDS appropriately constituted and linked to ScotBUG). Regardless of provider a clear SLA and governance model (including user panel) should be implemented.

14. Challenges

The key challenges and risks that should be noted are:

- Insufficient institutions taking up the service to make it viable, though the Blackboard option addresses that issue;

- The service provider will need to demonstrate that they can provide a service to commercial levels of availability, performance and security in order to build trust in the service;
- Institutions may feel their autonomy and competitive advantage will be eroded/compromised;
- Risk of increasing prices once the service in place;
- Maintaining compliance with EU procurement regulations;
- The current version of the Blackboard software (Learn 9.1) is not designed in a way where one instance can be shared by multiple institutions; this may add to costs if multiple instances require their own building blocks, language packs, etc
- A hosted service will necessarily mean that institutions have less control over the timing of upgrades and patches and also the functionality available; some may perceive this outweighs the potential benefits;
- The hosted service will need to integrate with other IT systems within each institution (e.g. Student Records, Assessment Management, etc), which may need to be developed on an institution by institution basis;
- Institutions will need to have a clear exit strategy for any hosted service.

Proactive governance and steering mechanisms will help to mitigate these risks by improving feedback and communication with the service provider and giving institutions greater leverage than they could achieve individually. The models developed by Community Source foundations such as Kuali and Sakai may help in this respect.

15. Fit with JANET UK brokerage

The Brokerage has been in discussions / negotiations directly with organisations, both commercial and public who provide Virtual Learning Environments as managed hosted services. It is clear that there are good aggregation opportunities, with issues such as governance and storage pricing models needing to be resolved. It is worth noting that there is precedent for a multi-institution model with the Bloomsbury group of universities in London in respect of a commercially hosted VLE.

The core business case for a hosted VLE identifies the savings from shared or centralised infrastructure provision, which aligns with Brokerage initiatives to enable the use of supplier or centralised provision. Separately the Brokerage will be looking at shared DR solutions, which will also provide potential benefits to VLE solutions and services (see 5.3 above).

5.7 - Moodle VLE Hosting

Part A - Service Description

1. Title
Moodle VLE Hosting

2. Endorsement
A hosted VLE service was identified by the initial interviews and was ratified in the workshop discussions where it was agreed to be one of the most promising Above Campus services. This outline business case has been discussed with JISC RSC Scotland South & West and with colleagues from Strathclyde University and the University of Glasgow.

3. Description
This document provides the outline business case for the Software as a Service (SaaS) provision of the Moodle Virtual Learning Environment (VLE). HE and FE institutions would subscribe to the service and access it over their JANET connections. In order to improve the value to institutions, the service could be expanded to include other related applications (for example, Mahara ePortfolio).

4. Demand
Current usage of VLEs by Scottish HEIs and Colleges is understood to be:

Platform	HEIs	Share	Colleges	Share	All	Share
Blackboard	7	37%	14	33%	21	34%
WebCT Campus	4	21%			4	7%
WebCT Vista	2	10%			2	3%
Moodle	6	32%	24	57%	30	49%
Other			4	10%	4	7%
	19		42		61	

Moodle is therefore used by 30 institutions, 49% of the HEIs and Colleges in Scotland. Should the service prove to be of high quality, with clear benefits and attractive pricing, it will also be of interest to HE and FE institutions from across the UK.

5. Supply
Hosting could be provided by an institution with expertise and experience in supporting a large-scale Moodle system. Alternatively, a commercial provider might provide such a service. The most significant challenge is likely to be in providing 24/7 support against a Service Level Agreement (SLA).

It should be noted that hosted services are already available from several providers including the University of London Computer Centre[22] (ULCC) and Moodle Rooms. The ULCC service, in particular, is an exemplar as to what could

[22] http://www.ulcc.ac.uk/services/e-learning/overview.html

be achieved within the UK sector and also offers a currently available migration route for institutions that wish to move to a hosted service.

Part B – Core Business Case

6. Economies

Probable savings from this service include:

Element	Rationale
Servers and Storage (CapEx)	Platform efficiencies available by designing an infrastructure to support multiple institutions will reduce the total number of servers and SAN systems required.
Rack, Energy & Cooling costs (OpEx)	Fewer servers will mean that the overall total cost of rack space, electricity and overall energy consumption will be lower.
Systems Management & Support Staff (OpEx)	Systems monitoring, operating system updates and patches provided by the service provider.
Application support staff (OpEx)	Application updates and upgrades provided by the service provider, reducing the requirement for specialist Moodle skills within the IT Services team.
Development, Test environments and DR platforms (CapEx)	Across the sector, there will be a reduction in the number of support and DR platforms needed.

Possible savings from this service might include:

- Reduced database licensing costs (depending on platform chosen);
- Reduction in governance costs, with fewer systems to audit and to perform vulnerability (penetration) testing on;
- Reduction in training costs with the availability of shared online and physical training facilities.
- With institutions increasingly collaborating with overseas partners and supporting overseas students, the potential cost of 24 x 7 support will become a factor.

The template cost model introduced in Section 6 may help institutions quantify the potential savings.

7. Efficiencies

Irrespective of hosting organisation, a professional will deliver 'good practice' service levels against a published SLA. This can provide additional benefits and efficiencies for subscribing institutions:

- 24x7 operations and extended hours Helpdesk support; as a minimum this would cover service availability but could also be extended to user support (with institutions increasingly collaborating with overseas partners, 24x7 support is an increasing requirement);
- Maintenance and upgrades done on a published schedule (preferably one agreed with the user panel) and performed out of peak hours;

- High service availability (the target for a commercial provider would typically be 99.9%);
- Standardised interfaces for systems integration to allow integration with leading Student Record Systems and other key applications;
- A 'best-practice' set of reports and templates to provide information on system usage.

8. Effectiveness

Delivery of the VLE as a service will mean that institutions can focus on the use rather than the operation of the VLE. With a robust, reliable platform available for them, they will be able to concentrate on:

- Training teaching staff in the best-practice use of the system;
- Developing content and activities;
- Customising the user interface to best meet student and institutional needs;
- Using the reporting interface to analyse usage of the system to identify priorities to promote uptake and share best practice.

All of the above will result in an improved student experience and potentially better outcomes for students and increased recruitment.

9. Inclusion of wider services

In addition to the live environment, development and test/training environments could also be provided – potentially on a 'pay as you go' basis.

Additionally, the service could grow to include related services such as ePortfolios and Student Records (see 5.8).

10. Added Value

There is significant opportunity to build on a shared VLE service, as illustrated in Section 4.4. It is suggested that this could provide the foundation for developments of national significance across the wider teaching and learning ecology. Specific examples include:

- Greater collaboration between institutions as working on common platform, which could include staff development or joint development of application extensions;
- Greater collaboration between support teams within each institution to provide materials and training programmes to grow engagement of academics with learning environment;
- Increased influence in the global Moodle community, such as prioritising fixes and enhancements;
- Possible collaboration on a shared ePortfolio installation, potentially easing the transition from colleges to universities to ongoing CPD;
- Sharing resources across institutions especially colleges which cover national SQA awards, which could be based on common Content Management System or shared storage platform. This may also tie in with Open Educational Resources (OER) initiatives;
- Sharing best practice training material on how to use or how to create content;

- Strengthening links between institutions already collaborating.

Part C - Enactment

11. Timing

An outline of the major activities required to set up a hosted VLE service is set out in Section 11 of the Blackboard VLE hosting paper. Whilst the open-source nature of Moodle removes the requirement for licence negotiations with the application vendor, the other steps are substantially the same and so are not repeated here.

Migration to a new VLE system (or VLE provider) is a significant undertaking for any institution and can only realistically be undertaken during the summer break. Also, given the need for the service to demonstrate its reliability and robustness, it is probably most realistic to set a target of having a pilot service with a small cross-section of institutions (e.g. 6) from the summer 2012, with full service availability from summer 2013.

The time required to develop the service depends significantly upon the hosting provider. Should an institution (or other sector entity) wish to act as a hosted service provider, the key steps (and hence the critical path) to implementation of the service are likely to be:

1. Review provider options.
- Provider identification
    - Contact leading Moodle users to explore interest/gain commitment to become service provider;
    - Identify and review alternative hosting providers.
- Refinement of business case
    - Clarify functional and non-functional requirements
    - Develop operational cost model and hence indicative pricing;
    - Identify start up costs.
- Market testing – get expressions of interest from HE and FE institutions (at the indicative pricing);
- Identify funding sources (especially to cover start up costs)

2. Project Start Up & Commercial agreements.
    - Develop full project plan;
    - Establish project governance (inc. user panel);
    - Negotiations with Blackboard and data centre provider;
    - Identification of technical and other staff for project team.

3. Implementation of Service.
    - Procurement of servers and hardware;
    - Systems architecture and service design;
    - Installation of software and creation of template sites;
    - Internal testing

4. Pilot Service.

- Testing with 2 or 3 early adopter institutions;
- Go Live & service launch

5. Institution Implementation
   - Integration with user provision and authentication systems;
   - Creation of course structure
   - Population of content
   - Training of staff

Having established the service, institutions would be expected to follow the appropriate procurement process prior to signing up for the service. APUC (Advanced Procurement for Universities and Colleges) have offered to provide support for any procurement activities.

12. Take up profile

Initial discussions have identified several institutions that have expressed interest in this service. This offer is most likely to appeal to smaller institutions, and to institutions that need to migrate to a new VLE system. The key uptake factors will be:

- Price;
- Service offering – SLA and functionality offered;
- Credibility of organisation supplying hosted service.

13. Vehicle & Governance

The vehicle required will depend on the hosting provider. However, service governance is likely to benefit from the role of a separate entity (which might be HEIDS appropriately constituted and linked to SMUG). Regardless of provider a clear SLA and governance model (including user panel) should be implemented.

14. Challenges

The key challenges and risks that should be noted are:

- Insufficient institutions taking up the service to make it viable, though use of existing services will address that issue;
- The service provider will need to demonstrate that they can provide a service to commercial levels of availability, performance and security in order to build trust in the service;
- Institutions may feel their autonomy and competitive advantage will be eroded/compromised;
- Risk of increasing prices once the service in place;
- Maintaining compliance with EU procurement regulations;
- The current version of Moodle may not be designed in a way where one instance can be shared by multiple institutions; this may add to costs if multiple instances require their own building blocks, language packs, etc
- A hosted service will necessarily mean that institutions have less control over the timing of upgrades and patches and also the functionality available; some may perceive this outweighs the potential benefits;
- The hosted service will need to integrate with other IT systems within each institution (e.g. Student Records, Assessment Management, etc), which may need to be developed on an institution by institution basis;

- Institutions will need to have a clear exit strategy for any hosted service.

Proactive governance and steering mechanisms will help to mitigate these risks by improving feedback and communication with the service provider and giving institutions greater leverage than they could achieve individually. The models developed by Community Source foundations such as Kuali and Sakai may help in this respect.

15. Fit with JANET UK brokerage

The Brokerage has been in discussions / negotiations directly with organisations, both commercial and public who provide Virtual Learning Environments as managed hosted services. It is clear that there are good aggregation opportunities, with issues such as governance and storage pricing models needing to be resolved. It is worth noting that there is precedent for a multi-institution model with the Bloomsbury group of universities in London in respect of a commercially hosted VLE.

There have been several calls from institutions of varying sizes for the provision of a hosted Moodle solution. There are potential benefits, not from direct licensing, but from improved support and technical expertise, patching and development. There are new potential models, particularly through aggregation of a support function that may generate efficiencies and service improvements for the sector. The Brokerage has had exploratory discussions with providers including the University of London Computer Centre (ULCC) and it is clear that there are potential benefits to aggregating requirements; this would involve exploring additional benefits beyond standard provision and then working with a near sector partner such as ULCC to reach a sustainable solution.

The core business case for a hosted VLE identifies the savings from shared or centralised infrastructure provision, which aligns with Brokerage initiatives to enable the use of supplier or centralised provision. Separately the Brokerage will be looking at shared DR solutions, which will also provide potential benefits to VLE solutions and services (see 5.3 above).

5.8 - Student Record System

Part A – Service Description

1. Title
Shared Student Record System (SRS)

2. Endorsement
The survey highlighted strong interest in a shared SRS service amongst those open to VLE opportunities. Members of the focus groups identified this initiative as something that they considered worthy of investigation as a high priority on account of the inevitable lead-time for such a core application. SFC staff interviewed stated that a sector wide SRS was something that they would aspire to, whilst expressing reservations about practicalities and adoption.

3. Description
This document provides an outline business case for the provision of a shared SRS for use across the HE and FE institutions with two models described. The first model envisages a consortium of institutions procuring a single student record system capable of providing a multi-tenanted[23] service for each of the participating institutions. A more radical approach envisages a single above campus service for the whole of the Scottish higher and further education system, maintained by the Scottish Funding Council (SFC).

4. Demand
Student Record Systems capable of producing statistical and funding returns are a mandatory requirement for institutions in receipt of funding from the SFC. Therefore there is the opportunity for institutions to procure such systems as a consortium, or for the provision of a national system. Both of these models have the potential to deliver significant efficiency and effectiveness gains. Such a service would obviate the need for institutions to provide proscribed data returns allowing the funding council to access data directly and provide near real time financial and sector monitoring. A more centrally managed service would also be capable of supporting such as EMA awards and partner initiatives from the skills sector.

5. Supply
Student Record Systems are in use within the sector and are currently provided by two organisations, Tribal and Capita with a small number of institutions using systems from other providers or internally developed systems. We would therefore expect a commercial provider to be interested in providing a service to either a consortium of institutions wishing to collectively procure such a service or to the sector as a whole.

Hosting the production platform and DR service could be provided by:

- Institutions with hosting capability;

[23] A multi-tenanted service is the provision of a single software application capable of supporting multiple organisations as opposed to a multi instance hosting where each organisation has their own instance, thought capable of being hosted on common hardware.

- Independent data centres;
- Vendor provided hosting arrangements.

One alternative to the existing vendors would be to develop a SRS based on commercial customer relationship management solutions (CRM). Such systems come with significant levels of functionality and workflow capability already in place and are designed to support web delivered multi-channel business processes.

Part B – Core Business Case

6. Economies

Probable savings from the collective provision of such a service include:

Element	Rational
Remove the need for submission of data returns across the sector (OpEx)	The production and processing of data returns by institutions would not be required as the SFC would have access to data entered into a central system, (though still QA by institutions).
Remove the need for audit and reconciliation between data returns and MIS systems (OpEx)	While not removing the need for data audit entirely there would be a significant reduction in the need for reconciliation, with much audit work capable of being performed nationally.
A regional or sector wide service (CapEx and OpEx)	Such a service would replace multiple discrete systems, replicated in each institution. Nationally there are some 60 contracts in place.
A single annual upgrade to statutory returns (OpEx)	A single system upgrade to statutory returns would replace every institution having to perform an upgrade and test cycle.
A centralised hosting arrangement (CapEx)	A reduction in capital equipment and hosting costs.
A single central sector licence (OpEx)	A reduction in licence and maintenance costs.
Application support staff (OpEx)	A reduction in support, development and testing costs. Application updates and upgrades provided by the service provider.

Possible savings from this service might include:

- Reduction in data entry costs[24];
- Reduction in training costs;
- Reduction in governance costs including security, vulnerability and audit with fewer systems to manage.

The size of the saving derived would depend on the number of institutions collaborating. A minimum of at least five institutions collaborating might

[24] If elements of the service were public facing such a system would offer the possibility of direct enrolment and data management by the student

anticipate a saving of at least 50% while at the same time increasing availability and quality of service.

7. Efficiencies

In the model where a consortium of organisations collaborate in the provision of an Student Record System, we would expect the following efficiencies:

- A single upgrade cycle, to develop, test and deploy upgrades;
- Reduced hardware and hosting costs associated with a single platform;
- Reduced governance costs for a single infrastructure and service;
- A reduction in the cost of provision of a DR platform;
- A single service and support desk ;
- A highly available service conforming to a robust SLA.

A national service in addition to the efficiencies described above has the potential to transform the management and data landscape through:

- No further need for local creation, management and submission of data returns;
- National data standards derived as a result of a national system;
- A national student record system capable of integration with other national systems.
- Monthly monitoring of data to provide the opportunity to adjust resource profiles in year (quarterly) against target driven initiatives.

8. Effectiveness

An appropriate service management contract would deliver a highly available, reliable and secure service. In addition a service should deliver:

- Standard interfaces with open specifications allowing the market to develop standard APIs to local and generic services e-portfolios;
- Increased local capacity to focus on the use of data;
- Increased consistency and quality of data as a result of a common same data capture and reporting mechanism;

In addition to the above a national service could be expected to deliver:

- Replacing the effort associated with processing and validation of standard data returns with analysis;
- High quality market intelligence available in near real time rather than after statutory returns are submitted;
- The provision of a national student centred view of their data facilitating transfer between institutions;
- For colleges and for employers, a system supportive of the Scottish curriculum and facilitating cross-institutional delivery models.

9. Inclusion of wider services

Student record systems that work either regionally or nationally have the potential to sit at the centre of data services. Based on the experience of such as the English Ufi network, such a system would provide regional or national insight and intelligence, available to stakeholders and providers on a weekly basis rather than quarterly or annually. This has potential to integrate with regional or national systems and services such as:

- Portable e-Portfolios;
- Regional or national assessment;
- Labour market intelligence, careers and alumni;
- Libraries, archives and repositories.

10. Added Value

The provision of a student record system hosted by a collection of institutions or one single Scottish system that allowed institutions to retain control of their own data entry and MIS functions, while at the same time allowing data and analysis at a national level has the potential to deliver significant additional value.

A shared service across a number of institutions would benefit from:

- Reduced costs of maintenance, upgrades, hosting, development;
- Reduced license and hosting costs;
- Reduced cost of governance through a single DR platform and vulnerability (penetration) testing;
- Common data entry procedures.
- A common approach to the provision of annual returns with a single interpretation that would deliver efficiency gains.

A national above campus Student Record System would:

- Provide improvement in the currency of data - weekly not annually;
- Remove the need for any separate data returns – data would be extracted directly from each institutions data set – permission to use could be controlled through the use of flags;
- Provide the core for a national data system that integrated with and added value for citizens, employers, careers, and social planning.

Part C – Enactment

This outline presents two models for the provision of student record systems delivered as an Above Campus service. It is clear that the appetite for data from stakeholders and funding agencies shows no sign of reducing. Consequently we believe that a national approach to the capture and provision of these data makes the proposed Above Campus service a strong prospect.

11. Timing

Institutions will have existing contractual arrangements. In addition the criticality of such systems to the funding and management of the sector would support a cautious approach. The management of the migration to any such system should take place over three years with the following activity timeline:

- Year 1 - Feasibility, requirements capture, and procurement;
- Year 2 - Construction, testing and pilot with early adopters;
- Year 3 – Consortium or national rollout.

The combination of critical complexity and value added opportunity within and beyond Further and Higher Education therefore demand an extended timeline and therefore immediate exploration.

12. Take up profile

The workshops have identified a number of institutions that expressed an interest in collaborating in the provision of a shared student record service. Such an offer is likely to appeal especially to smaller institutions where the cost of hosting and managing a full MIS is significant. The key factors that we anticipate will affect adoption will be:

- Price;
- The degree of autonomy institutions retain in the provision of data;
- Service offering - SLA and functionality offered;
- The credibility of organisation supplying the hosted service.

13. Vehicle & Governance

If provided as a national service the governance would be integral to the provision of the platform and service. Alternatively, a consortium providing such a service could either contractually procure such a service from a vendor as a complete service offer, or form a legal entity to offer the service to the group.

14. Challenges

The key challenges and risk that should be noted are:

- Student record systems are core to the operational and financial management of institutions, as such participating organisations will need to have high levels of confidence in the quality of service provision;
- Current service offers are not engineered to be multi-tenanted and there may be resistance from suppliers to creating such a model;
- A hosted service will necessarily mean that institutions have less control over the timing of upgrades and patches and also the functionality ;
- Existing systems are likely to be integrated into a wide range of internal services within an institution, these interfaces will need to be re-developed in many cases.

The creation of an effective user group with representation from senior stakeholders from funding bodies, institutions and suppliers would be critical for such an initiative to succeed. Models and lessons may be drawn from the US-based community efforts of the Kuali Foundation and its Kuali Student offering.

15. Fit with JANET UK brokerage

The JANET UK Brokerage will be looking at establishing Infrastructure as a Service (IaaS) and Software as a Service (SaaS). Either or a combination are applicable to the delivery of student records systems and other administration applications as services over the network. The JANET brokerage is focused on Infrastructure aspects including DR provision, security, etc. It is noted that a related HEFCE sponsored UMF project (SSPS) is looking to focus on the licensing, procurement and related aspects of administrative systems for Further and Higher Education.

5.9 – Subscription Resource Management

Part A - Service Description

1. Title
Subscription Resource Management

2. Endorsement
SCURL – the Scottish Confederation of University & Research Libraries – has endorsed this opportunity, on the basis of the paper 'Proposed Subscription Resource Management Shared Service' (June 2011). All 19 HEIs are members, along with major public and national services. See http://scurl.ac.uk/about.html.

The organisation originated in 1977 as a Scottish Working Group on Cooperation in Acquisitions. The SCURL name was adopted in 1992 as the remit widened. The members' track record in shared services goes back to SCOLCAP, the Scottish Libraries Cooperative Automation Project (1980) and is most recently highlighted in SHEDL, the e-journals consortial purchasing scheme in collaboration with JISC Collections. See http://scurl.ac.uk/projects.html and http://scurl.ac.uk/WG/SHEDL/index.html.

3. Description
This proposal is a natural extension of the opportunities created by the successful SHEDL above campus initiative and thus builds on existing work, partnership process and service take up.

The 2009 SCONUL Shared Services study for HEFCE[25] articulated a vision for service improvement with associated cost savings across three library 'domains' (e-Resource Licensing & Management, Discovery to Delivery and the Local Library Management). It made a case for initial prioritization of developments in the ERM domain, identifying the opportunity to leverage the expertise and efficiencies offered by a trusted service provider alongside shared community resources. The SCONUL proposal, with support from Edinburgh and Stirling, combined the domain specific service gains with the broader value proposition of shared services, leading to inclusion in the 2011-12 HEFCE UMF programme.

The proposed service will provide above campus and shared management of electronic and subscribed resources, based on the requirement documented by SCONUL[26]. This service will

- Encompass all subscribed publications including print journal holdings, database subscriptions, subscribed e-books and electronic journals including open access materials
- Combine community sourced intelligence alongside authoritative records
- Provide consortium functionality and services, involving a platform for a mix of private and shared data, including 'above campus' agreements and negotiated acquisitions

[25] http://helibtech.com/file/view/091204+SCONUL+Shared+Service+-+for+distribution.pdf
[26] http://sconulerm.jiscinvolve.org

4. Demand

All 19 Scottish HEIs will benefit from the proposed service and therefore SCURL proposes to facilitate a community project leading to 100% adoption, subject to the final costs and benefits.

5. Supply

SCURL will address its members' service objectives by playing a leading and focused role in the UK-wide initiative, initially funded through the UMF to March 2012.

Part B – Core Business Case

6. Economies

This will enable institutions to achieve cashable savings through

- Discontinuing local systems software and associated management costs for ERM systems and Knowledge Bases
- Informing licensing deals with usage data and other indicators
- Reducing staffing allocated to ERM, licensing, data management and associated support tasks, with opportunities for re-focusing

7. Efficiencies

This will create opportunity to

- Enter data once for many, reflecting the common licensing strategies already in place
- Migrate away from the LMS as the place of record for subscription resources

8. Effectiveness

The mission of university libraries to serve teaching, learning and research will benefit in terms of

- Access - exposure of services via machine accessible interfaces as well as potential for a common discovery interface
- Timeliness – Better data, available quicker, with clear sourcing alternatives
- Support - Provision of an expert support service for the data, the platform, the process and the user

9. Inclusion of wider services

This may lead downstream to

- A shared Scottish discovery platform, leveraging more accurate, up to date information
- Support for acquisitions linked to institutional budget and finance systems
- Coverage of equivalent processes for licensed resources that are not 'subscribed', such as e-books
- A single place to manage and access archived journal and other content no longer provided by the publisher

10. Added Value

This initiative is expected to have operational and cultural ripples beyond the immediate systems benefits. This will be a breakthrough step in eroding the footprint of traditional print driven management systems. It should create opportunity to refocus resources on user services. It may enable provision to embrace wider audiences, such as SMEs and alumni, through licensing deals based on better management processes.

Part C - Enactment

11. Timing

SCURL members propose to be in the first wave of UK HEIs adopting the UMF resource management service, starting spring 2012. It is intended that data preparation will start ahead of that date.

12. Take up profile

All Scottish HEIs should have joined the service by summer 2014, during the first two years of operation. Some institutions will be in a position to lead the way, on account of their immediate local priorities and resource levels, and they should be supported by a community effort to gather common data.

13. Vehicle & Governance

SCURL expects to work with the vehicle adopted for the UK-wide service, which will be managed in the development phase by JISC Collections. As SCURL has a successful track record of partnering with JC, no particular issues are anticipated.

14. Challenges

HEIs will have to work hard to ensure that the shared service gains early critical mass, which will require a concerted data entry effort (albeit in some respects shared) that has never been applied to local ERM implementation. The shared licensing agreements already in place will certainly ease this process.

15. Fit with JANET UK brokerage

It is not clear at this point exactly where the JANET Brokerage can add value in this area; however once a project has been defined a discussion would be welcomed by the Brokerage to clarify if there are possible synergies.

6 – Institutional Decision Making

6.1 - Whole Business Assessment

The idea of a national road map for above campus IT services (Section 4) needs to be complemented by the development of institutional road maps.

Generally such thinking should take place within the standard institutional cycle using mandated processes and documentation. However, it is suggested that shared services present challenges of particular and immediate strategic significance that merit focused consideration.

This section therefore provides tools and signposts in 5 areas to assist in this context:

- Project business case template (6.2)
- Project Cost model (6.3)
- Institutional diagnostic (6.3)
- Implementation & Risk checklist (6.4)
- Environmental Assessment (6.5)

6.2 – Project Business Case

Section 5 of this report is based on a standardised expression of the business case for an individual shared services project. A template is set out in Section 5.2, which is then used to illustrate 7 cases in Sections 5.3 - 5.9.

Alternative formats could be proposed to serve this purpose, the importance being in a succinct high-level expression of the proposition that can be completed for a local or a shared case. It does not contain sensitive financial or risk information (see supporting tools below) and therefore can be used with any stakeholders – internal, partners, suppliers – to scope a requirement.

The formats used to capture business cases for the JISC Open Bibliographic Data Guide (http://obd.jisc.ac.uk) and for the SCONUL ERM service (http://sconulerm.jiscinvolve.ac.uk) may also be of interest.

6.3 – Financial Modelling

Spreadsheet templates have been developed[27] to support two levels of modelling – for the detailed breakdown of an individual project (e.g. hosted service for VLE) and for the summary information for all the projects under consideration within an institution.

[27] www.heids.ac.uk/reports/

The institutional diagnostic model is drawn directly from the work of SUFDG (the Scottish Universities Finance Directors Group). It is designed to assist decision-making through consistent collation of cost benefit data and resulting appraisal for the portfolio of shared service projects under consideration within an institution. The rows can therefore be populated for any identified project.

Having established a wider benefits case and differentiation assessment, six high level criteria are headlined by SUFDG in for appraisal of any shared services option:

- Degree of current integration
- Complexity of project
- Migration potential
- Time to delivery
- Cost to achieve
- Cash saving

The individual project template uses a five years view in order to capture medium term impacts on the cost base, the impact of update cycles and depreciation. Other assumptions are set out in the worksheet.

The model captures internal and external costs (expressed in terms of IT service requirements) for the current and proposed service (e.g. shared service or outsourced models). It can be used to compare / benchmark any pair of alternatives at institution or at consortium (e.g. peer, regional, national) level.

The key tips in any shared service business modelling are:

- Iterate to get best results, ideally involving feedback from your internal team – the process assists in identifying assumptions to be challenged, elements that may be missing and likelihood of achievable savings
- Complete all the relevant rows for a particular project, whether substantive savings are indentified or not (e.g. in cases of sunk costs and virtualisation)
- Define and if necessary update the scope of your project (perhaps using the business case template – see 6.2) and your assumptions as they evolve

Testing by two HEIDS members generated the following guidance to users of this or alternative models:

- Costs can be a high level apportionment or calculated in detail for any component (e.g. the cost of institutional data centre service for an individual application such as the VLE)
- Fractional costs are challenging to disaggregate but should nevertheless be considered
- Consider systems integration carefully, bearing in mind it will not necessarily get harder

- Whilst virtualisation is an almost universal internal strategy that makes individual service calculations even trickier, it is not reason to abandon the modelling

The cost categories used in the template are

1.0 Hosting: Annual cost of hosting if not spilt out in 1.1 to 1.4

1.1 Bandwidth: Annual cost of bandwidth.
1.2 Hosting active equipment: Annual cost of active equipment to include firewalls, routers, switches, data racks and AC if appropriate.
1.3 Building + maintenance + staff: Annual cost of the floor space and staff to service, provide security access control, etc. Note this charge is for servicing the facility not the application.
1.4 Power: Annual cost of power associated with hosting if separately chargeable.

2.0 Hardware: Value of the hardware for all platforms used to provide the service if not split out in 2.1 to 2.5

2.1 Production platform: Value of the hardware used to run the core production system
2.2 Test platform(s): Value of the hardware used to test and development systems
2.3 Disaster Recovery platform(s): Value of the hardware used to test and development systems
2.4 Backup media and consumables: Cost of media (tape, disk, DVD's) used to take security copies of the application
2.5 Licensing - Operating System: Annual cost of Operating System licences including support costs

3.0 Licence Costs – Platform: Annual cost of licence and software to support the service (e.g. SQL/Oracle database licences) including annual support costs where applicable

4.0 Licence costs - Application: Use this row if there is no breakdown between initial and upgrade licence costs in 4.1 & 4.2

4.1 Initial Application licensing: Annual cost of application licence for all platforms (production, test, development and development)
4.2 Upgrade Application licensing: In some instances there is a charge for moving from one major version of an application to the next

5.0 Maintenance releases: Cost of an average maintenance release to include the cost of upgrades, staff time testing and deployment

6.0 Major releases: Cost of an average major release to include the cost of upgrades, staff time, testing and deployment

7.0 Staff: Annual cost of staff used to support, configure, test, audit and run the service if not split out in 7.1 to 7.8

7.1 Support staff: Annual cost of staff attributed to providing help desk, configuration and management of the service
7.2 Database staff: Annual cost of staff attributed to providing database support and management
7.3 Infrastructure staff: Annual cost of staff attributed to providing help desk, configuration and management of the service
7.4 Security staff: Annual cost of staff providing security support
7.5 Application staff: Annual cost of staff that managed, develop and operate the application that underpins the service
7.6 Service management staff: Annual cost of staff that provide service management function (change management, configuration management, incident and problem management, commercial etc.)
7.7 Audit and Governance staff: Annual cost of activity that covers audit and governance
7.8 Other staff: Any other staff costs not covered in 7.1-7.7

8.0 System integration: Cost of maintaining interfaces between this and other applications (API's XML feeds etc.)

9.0 Training: Training budget for application users associated with a particular service (NOT end user training)

10.0 VAT: calculation of the VAT on VAT-able services (only charged on services purchased externally for the sake of this model).

6.4 – Implementation & Risk Checklist

Perhaps on account of the terminology and the variety of delivery models, there remains uncertainty about the key considerations (decision points, risks) to be taken in to account by institutions in evaluating and implementing above campus IT services. Whilst not exhaustive, the model of the considerations and the actors set out by JANET UK in introducing the UMF brokerage scheme (May 2011) is therefore useful.

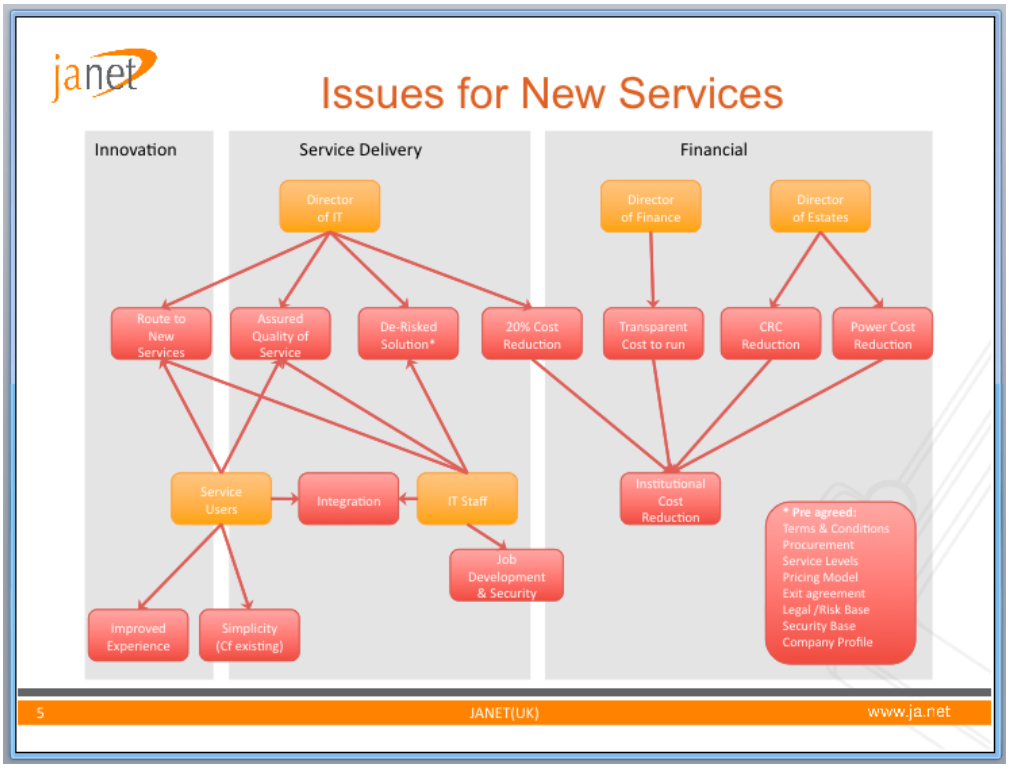


Fig 6.1 – Institutional Considerations (JANET UK)

Expanding on this model, a high-level implementation and risk checklist is provided in Appendix D. This may be useful as an aide memoire, bearing in mind that implementing a shared service (from procurement through testing to launch) will be based on standard corporate processes and established IT service management considerations.

6.5 Environmental Assessment

Institutions will also take account of the long term contribution of above campus services to a low carbon economy, by reducing their own energy consumption, by facilitating migration to environmentally advanced data centres and by contributing to the service models that impact such as travel to work and to study.

It should be recognised that shared services are just one aspect of a web of opportunity to combine energy and financial efficiencies, ranging from virtualisation of servers within the institution and to ICT enabled remote working and collaboration.

Key resources of specific relevance to Higher Education are available at

- The Carbon Trust - http://www.carbontrust.co.uk/cut-carbon-reduce-costs/public-sector/higher-education/pages/higher-education.aspx
- JISC Green IT Programe - http://www.jisc.ac.uk/whatwedo/topics/greenict.aspx

Section 7 – Concluding Position and Recommendations

7.1 - Alignment with the McClelland Review

The HEIDS study has taken place during the same period in which John McClelland CBE has undertaken his Review of ICT Infrastructure in the Public Sector in Scotland. The McClelland review considers public sector as a whole, within which Further & Higher Education (FHE) is identified as a key segment. The report sets out key strategic principles (Section 12) and makes a series of recommendations (Section 14) intended to underpin a five years transformational programme.

The recommendations and Road Map described in this report align with the McClelland proposed strategic priorities and contribute towards the implementation of the McClelland Review (MR) recommendations, and its proposed enabling structures, as cross-referenced in the following table.

MR Ref	McClelland Review Recommendation Extracts	HEIDS study cross-reference
14.1.1	A new **five year ICT strategy** for the FHE sector should be developed to move the model from local self-sufficiency to sharing.	The three years road map is based on catalytic opportunities that are aligned to the MR principles and should therefore provide a valuable feed in to the overall FHE sector five years strategy. [Section 4]
14.2.2	FHE should have a **group or board** responsible for developing, overseeing and implementing the ICT strategy … These structures will require technical support and should lean on existing mechanisms and groups.	This report has identified the need for sector level leadership. Whilst realizing current opportunities in FHE require urgent leadership, any short term mechanisms should transfer to the MR structures. [Section 5.2]
14.3.1	Scotland should embark upon **a major programme to transform** how it progresses ICT at a local, regional, subsector and national level towards the vision described in this report and in line with the strategies recommended.	Transformational opportunities have been identified in this report through the survey, Road Map consultation and indicative project definition [Sections 4 & 5].
14.3.2	Given the need to build upon exemplars and existing sunk investments the transition will have a strong theme of **convergence and connecting** infrastructures rather than building everything new.	The proposed Road Map and indicative projects incorporate these principles. For example, the proposals for Student Records and VLE will test different approaches to convergence from existing infrastructure and will form centres of connecting other related applications [Sections

		5.6-5.8].
14.4.1	Each part of the public sector should agree on **where services are best provided from**. Some will come from within individual organisations, some will be provided at a sector level or regionally within a sector. Others could be provided regionally across sectors and finally there will be services provided nationally.	The Road Map specifically identifies a range of levels at which each service could be provided [Section 4.2-4.3].
14.4.3	Sectors should operate their own minimum number of data centre services either at a central level or regionally or a hybrid of both. Cross-sector sharing may be appropriate in some parts of the country. This approach should incorporate aggressive pursuit of internal and external **"Cloud Computing"** concepts.	The HEIDS study and the supporting Desk Research report emphasise the breakthrough opportunities offered by public and private cloud provision and highlight the potential of the JANET UK brokerage [Sections 2 & 5].
14.4.6	At all levels **outsourcing and industry partnerships** should be evaluated to take advantage of industry experience, rely on their capital investments and optimise cost.	The indicative projects proposed for VLE and Student Records services will test these opportunities [Sections 5.6-5.8]
14.4.9	Where a concentrated number of common applications or capabilities prevail then an approach of **connecting the "islands of excellence"** should be pursued so that there is a minimum number of hosting and support activities within each sector and minimal if any local development.	The knowledge services proposed in this report are focused on leveraging islands of excellence to deliver specialist advice, support and training across FHE [Section 4].
14.5.1	There should be executive and technical professional leadership of the **"go to market"** approach. This mode should be supported by the established centres of procurement expertise.	In endorsing indicative projects, stakeholder groups (such as ScotBUG and SCURL) have explicitly recognised this requirement [Section 5].
14.5.4	The activity of procurement is incomplete without being extended to include both the commissioning of ICT and ongoing contract management. A special focus on this should be developed sector by sector so that staff can be trained and critical resources concentrated and shared.	This report recognises that transformation must be enabled by specialist knowledge and training, ranging from business case development to above-campus service management [Section 4].

7.2 - Overall HEIDS Recommendations

Bearing in mind both the subsidiarity of this report to the overarching direction recommended by McClelland and also that timing and continuity are of the essence for some of the early opportunities on the road map, we recommend that HEIDS:

1 – Works with FHE stakeholders to ensure that coordination and management oversight is in place to progress quickly immediate opportunities, such as those as set out in Section 5.

2 – Maintains a dialogue with the Funding Council to ensure appropriate and timely transition to the national and sector governance mechanisms and planning processes instigated in response to the McClelland Review.

3 – Works together with partners such as Scotland's Colleges and SUFDG, using the tools linked to this report to assist institutions in developing their understanding of the business case, costing and decision making processes necessary to evaluate above campus IT opportunities.

4 – Supports interested entities (such as ScotBUG and SCURL) and consortia of interested institutions in refining the indicative project business cases outlined in this report, taking account of mechanisms such as SFC Invest to Save funding and the JANET UK brokerage service.

5 – Reviews the relationship between the HEIDS mission and the Further Education colleges, including the potential for providing a sector wide membership service.

In addition to these five driving recommendations, this report identifies detailed next steps to progress the seven immediate opportunities, summarised in Section 5.2.

7.3 Conclusion

This study has established the feasibility of a collaborative approach by Scottish higher and further education institutions to a phased adoption of Above-Campus IT Services.

A range of possibilities associated with Collaborative Above-Campus IT Services and their potential benefits has been identified and a framework is proposed for the SFC or institutions to take action and allocate appropriate investments and resources.

Seven opportunities, some for early wins others with a focus on longer term gains, have been identified, situated in a coherent Road Map and proposals are made for progressing these.

Appendices

Appendix A – Survey Report

Appendix B – Focus Groups Report

Appendix C – Interviews Report

Appendix D – Implementation & Risk Checklist

Appendix A – Survey Report

Introduction

The Above Campus IT Services online survey was conducted in February and March 2011. The survey was principally addressed to managers responsible for IT in Scottish universities and colleges, who were encouraged to engage other senior management colleagues.

A total of 54 responses were received from 40 institutions, including all 19 HEIs and 22 out of Scotland's 42 colleges. Around 40% of responses were from IT managers with the remaining 60% from other senior management roles. The HEIDS Steering Group was encouraged with the interest in the above campus services agenda represented by this level of response.

This appendix focuses on the positioning questions (e.g. appetite, governance, priorities, risk) and the key analyses that enabled the Steering Group to focus the subsequent focus group and interview activity (see Appendices B & C). The anonymised survey data set can be mined to inform an even wider set of questions and is therefore made available for further analysis.

Notes on analysis

Throughout this analysis, whenever 'institutions' are referenced as opposed to 'respondents', the count takes just one response from each institution, selecting other respondents over IT managers in order to downgrade opinions driven from the 'IT business' interest.

Responses to sections C, D and H3 of the survey were scored on a 4-point scale from 1 [Not a priority/not important/not a risk] to 4 [High]. Responses to section G of the survey were scored on a 5-point scale from 1 [Non-starter] to 5 [Already outsourced/shared].

Appetite (Fig. A.1)

The respondents indicated strong interest in progressing the Above Campus IT Services agenda.

As illustrated below, 62% of the HEIs were open to involvement in the immediate term and 59% were interested in shaping the agenda, with only one respondent expressing no interest in the short or medium term. Whilst only half of the college respondents were open to immediate involvement, 36% identified their interest as shapers. Furthermore it should be noted that a number of colleges already engaged with above campus services were unable to respond in the survey timeframe.

However, there was general agreement that business case is the key pre-requisite for any service partnership.

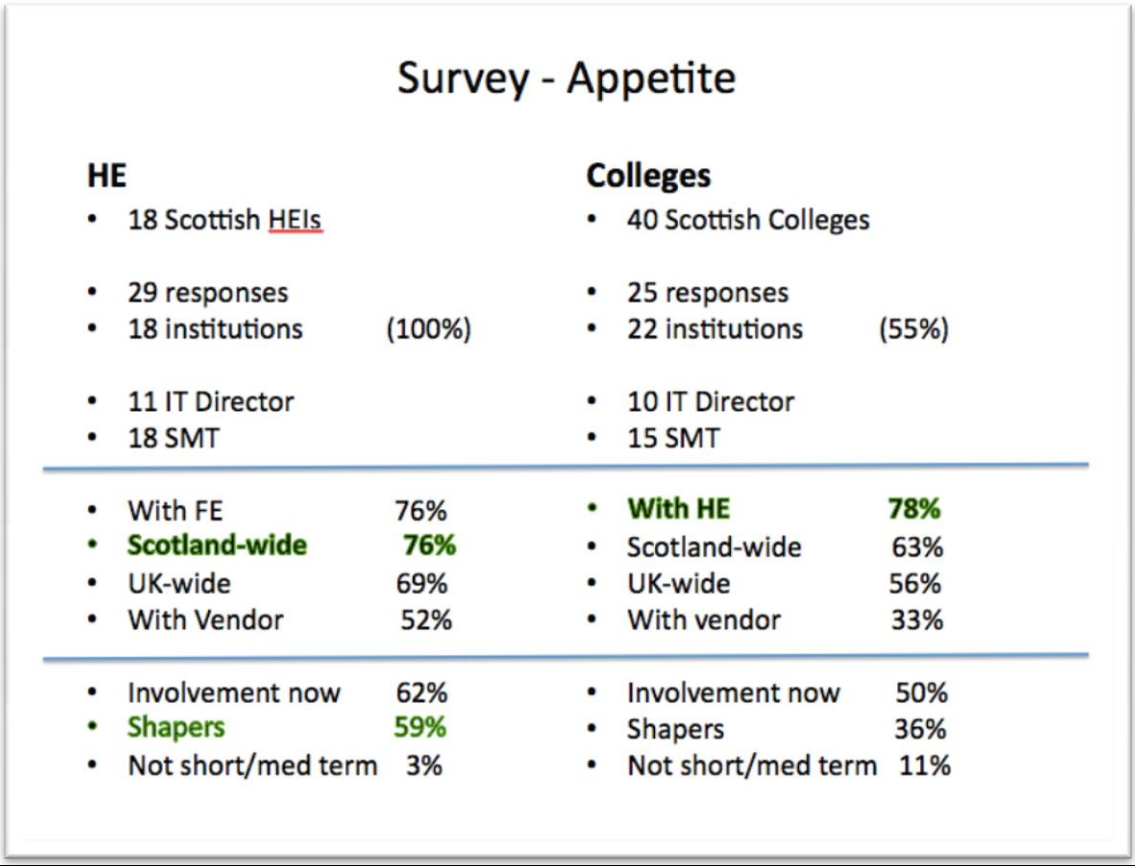


Fig. A.1 – Appetite

Governance & Vehicles (Fig. A.1, A.2)

Over 75% of respondents were open to forming partnerships across the college and university sectors, with less confidence in vendor partnerships (52% in HE, 33% in FE). The strong preference was for governance through a sector agency. HEIs demonstrated greater confidence in large partnerships (Scottish or UK wide).

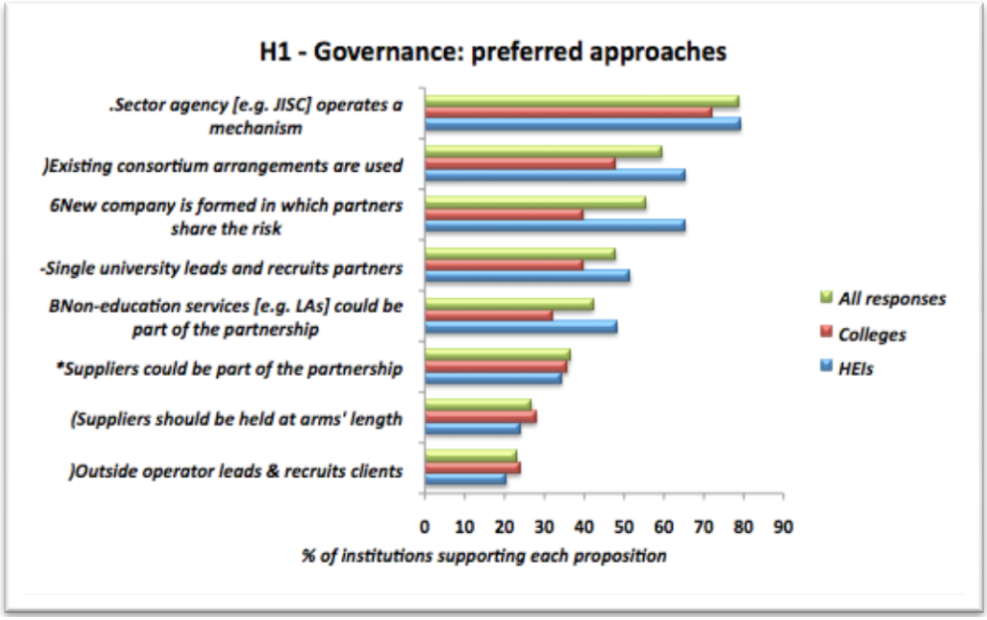
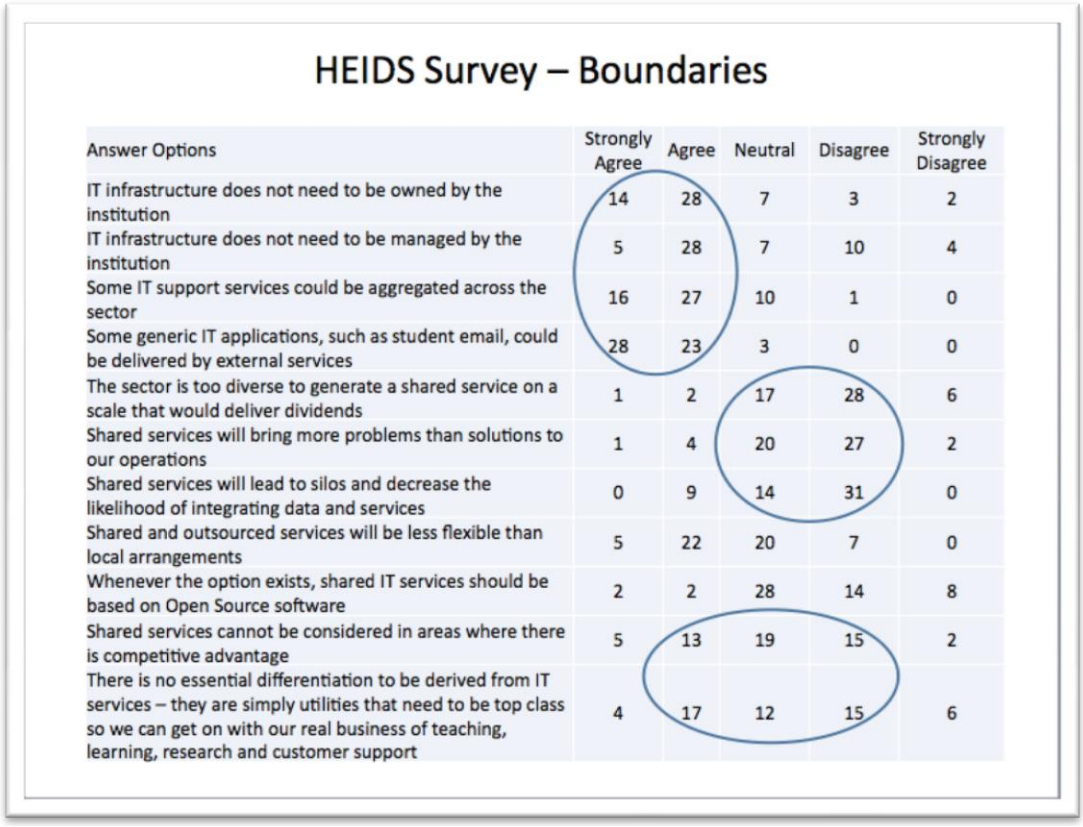


Fig. A.2 – Governance & Vehicles

Boundaries (Fig. A.3)

Responses to eleven boundary questions indicated widespread recognition of opportunities for reconfiguring ownership, management and support of IT services and for the delivery of some software applications as above campus services.



HEIDS Survey – Boundaries

Answer Options	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
IT infrastructure does not need to be owned by the institution	14	28	7	3	2
IT infrastructure does not need to be managed by the institution	5	28	7	10	4
Some IT support services could be aggregated across the sector	16	27	10	1	0
Some generic IT applications, such as student email, could be delivered by external services	28	23	3	0	0
The sector is too diverse to generate a shared service on a scale that would deliver dividends	1	2	17	28	6
Shared services will bring more problems than solutions to our operations	1	4	20	27	2
Shared services will lead to silos and decrease the likelihood of integrating data and services	0	9	14	31	0
Shared and outsourced services will be less flexible than local arrangements	5	22	20	7	0
Whenever the option exists, shared IT services should be based on Open Source software	2	2	28	14	8
Shared services cannot be considered in areas where there is competitive advantage	5	13	19	15	2
There is no essential differentiation to be derived from IT services – they are simply utilities that need to be top class so we can get on with our real business of teaching, learning, research and customer support	4	17	12	15	6

Fig. A.3 – Boundaries

Priorities (Fig. A.4)

Improvement of quality to users and of value, alongside reduction of overall and notably non-staff costs were reported as the highest immediate priorities. These priorities were held in common across colleges and universities.

Whilst the longer term priorities remained broadly the same, the improvement of services for collaborative research and teaching rose up the ladder for universities.

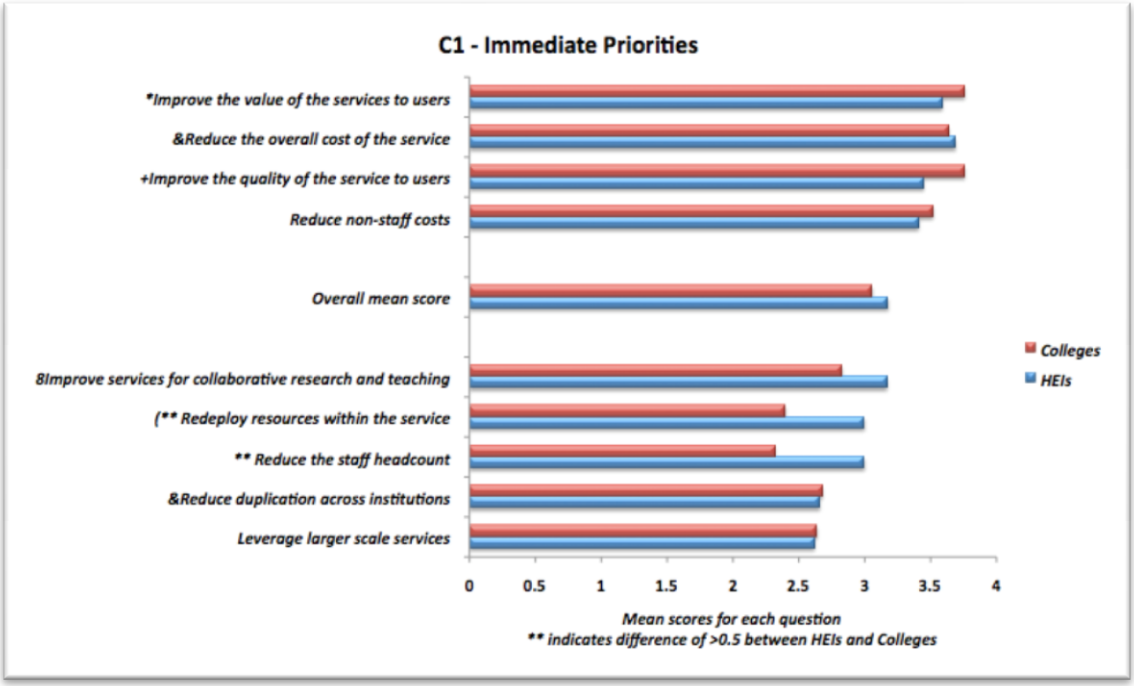


Fig. A.4 – Immediate Priorities

Risk (Fig. A.5)

The operational risks of disruption and systems integration with the associated opportunity costs were scored most highly. However the partnership challenges of sustained commitment and scale and the financial issues of evidence and control were not far behind.

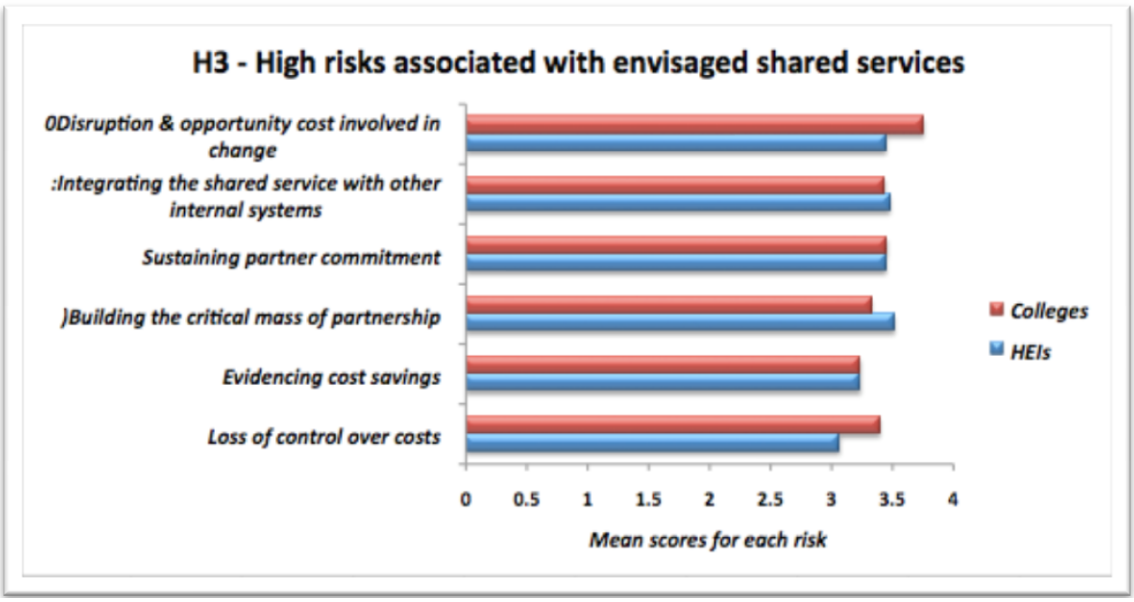


Fig. A.5 – Highest Risks

Differences between college and HEI responses (Fig. A.6)

In order to offer a more complete picture, scores are shown separately for HEIs and colleges in several illustrations.

The following table summarises the small number of 'considerable [mean score difference of >0.4] and 'substantial' [mean score difference of >0.5] sector divergences.

Section	No. of Questions	Substantial difference	Considerable difference	Total Combined
C – Priorities	18	3	1	4
D – Benefits	17	0	0	0
G – Applications	35	3	4	7
H – Risks	13	1	1	2
Totals	83	7	6	13

This indicates that there were very few questions where the mean HEI and college responses diverged either 'considerably' or 'substantially' [13 out of 83, or 15%] and all of these may be readily explained by the different natures of the institutions. Further analysis of survey results and subsequent feedback through focus groups and interviews indicates that more significant (but not total) differences may be found between the largest HEIs and the other institutions.

The areas of 'substantial difference' are detailed in Fig. A.6:

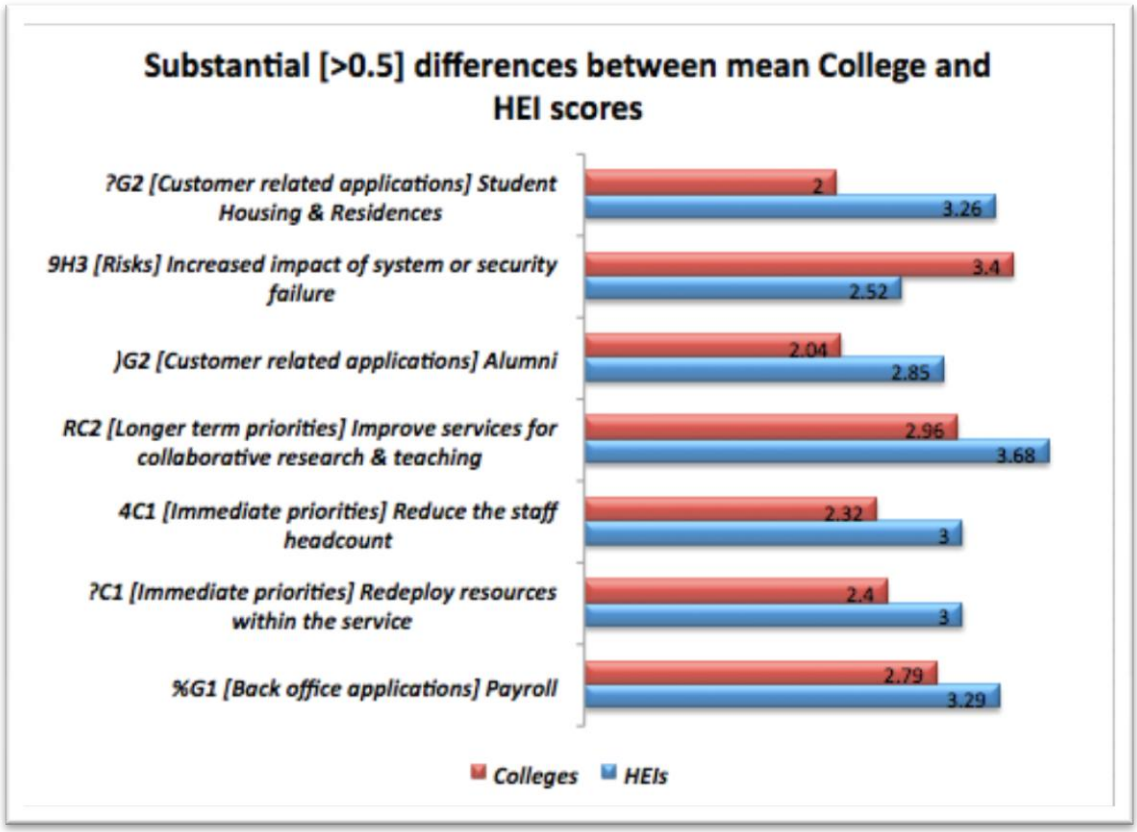


Fig. A.6 – Substantial differences between College & HEI Responses

Candidate Applications (Fig. A.7 to A.10)

Section G of the survey tested approval of a range of software applications typically used in universities and colleges, which are presented here in four groups:

- Core User Tools – as used for teaching, learning, research and for admin
- Teaching Learning & Research – including VLE, library, repository
- Customer Related – from student records to payment cards and help desk
- Back Office – from catering to financials

Approval was scored on the following five point scale, therefore making 5.0 the highest possible score in the charts (representing an application for which all respondents have already established an above campus service), with anything averaging above 3.0 of great interest:

1. Non-starter
2. Neutral
3. Interesting possibility
4. Currently under consideration
5. Already an outsourced or shared service (i.e. above campus)

Core user tools received high approval, notably email, conferencing and widely used office tools. The complex position of authentication was recognized, with its mix of distributed yet locally mediated services.

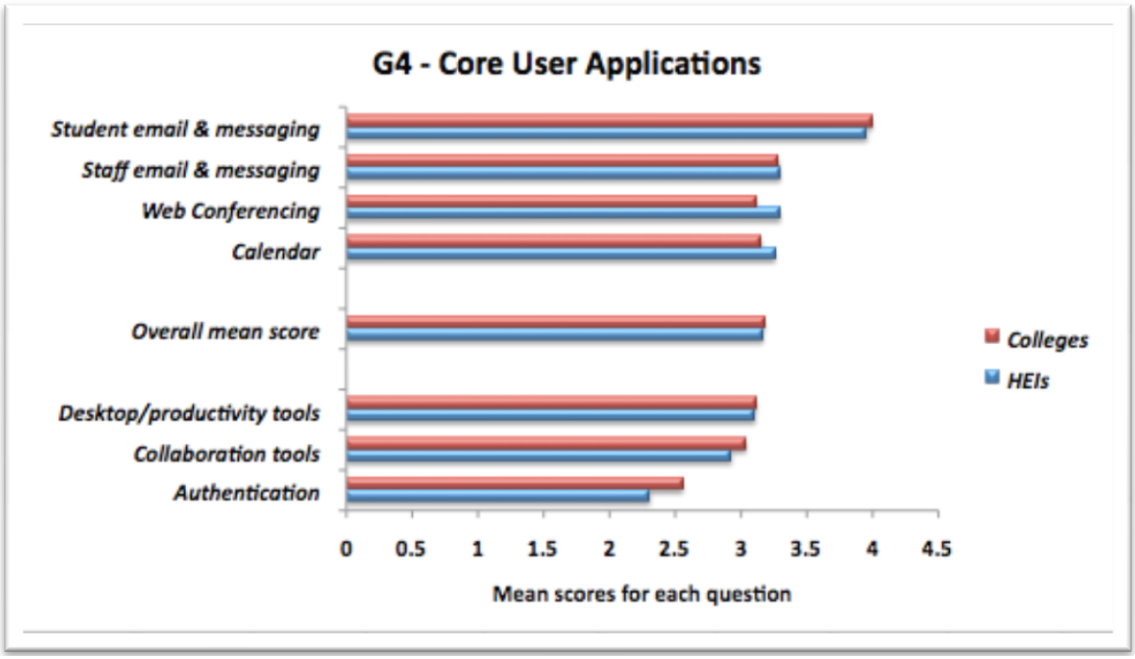


Fig. A.7 – Core User Tools

Applications to support **teaching and learning** were seen as strong candidates for above campus services.

The management of research and student placements, which raise issues of differentiation, were not as widely approved, though such concerns could be addressed through service design.

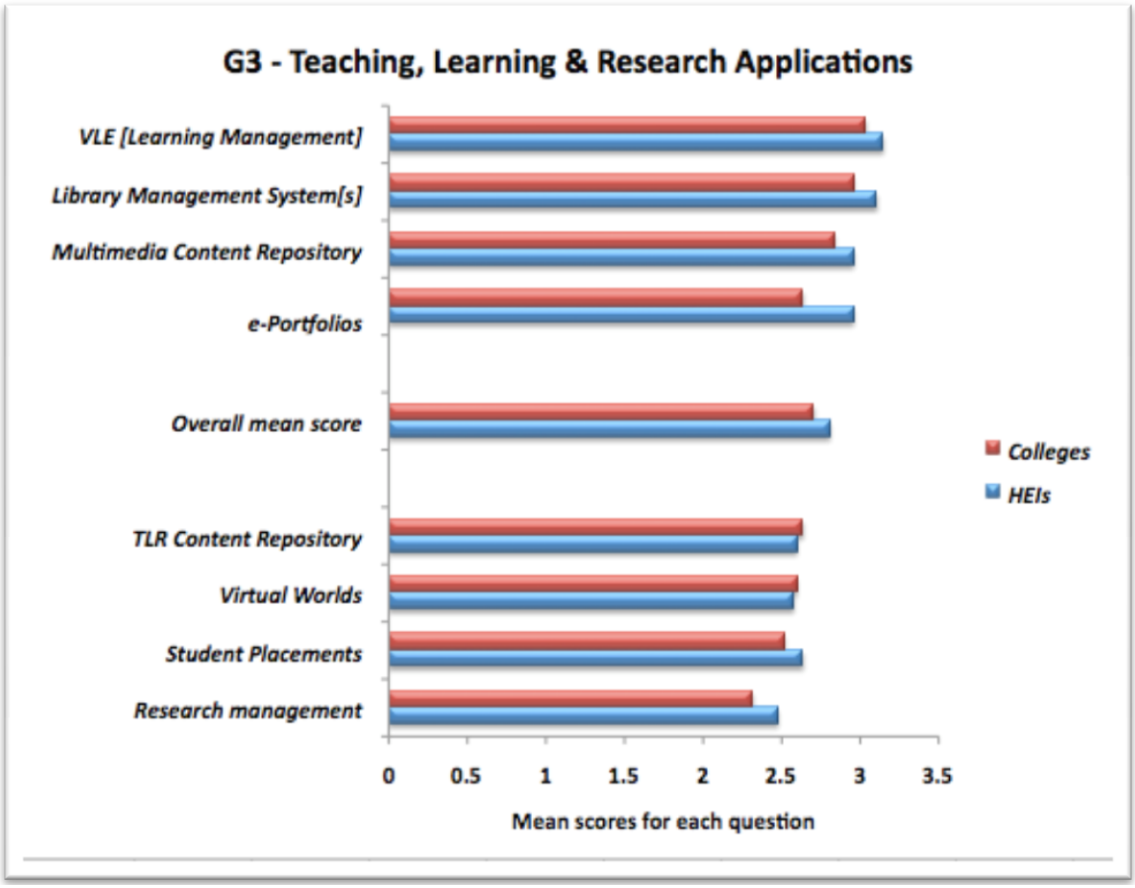


Fig. A.8 – Teaching Learning & Research Applications

A number of **customer related applications** were seen as good candidates, though sensitive applications such as Alumni and Fund Raising were addressed with more caution. The shared interest in applications and registry across collage and HE responses is noted.

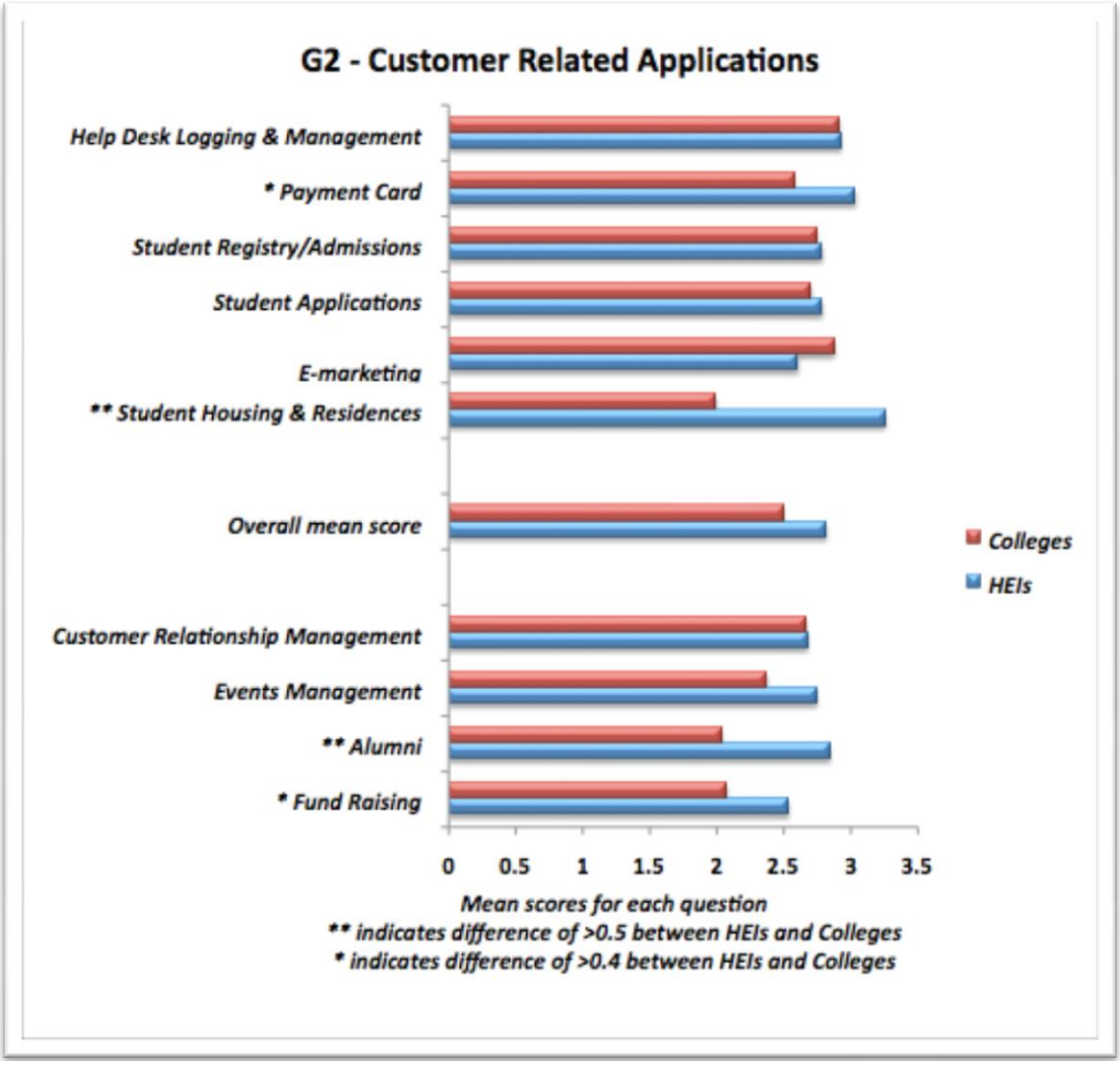


Fig. A.9 – Customer Related Applications

There was particular approval of **back office applications** that are not specific to college and university sectors – such as catering and payroll – that are typically available as outsourced services from established suppliers.

Respondents were significantly less open to options in sensitive areas, notably financials. Overall colleges were more cautious that HEIs about the prospects for back office SaaS solutions.

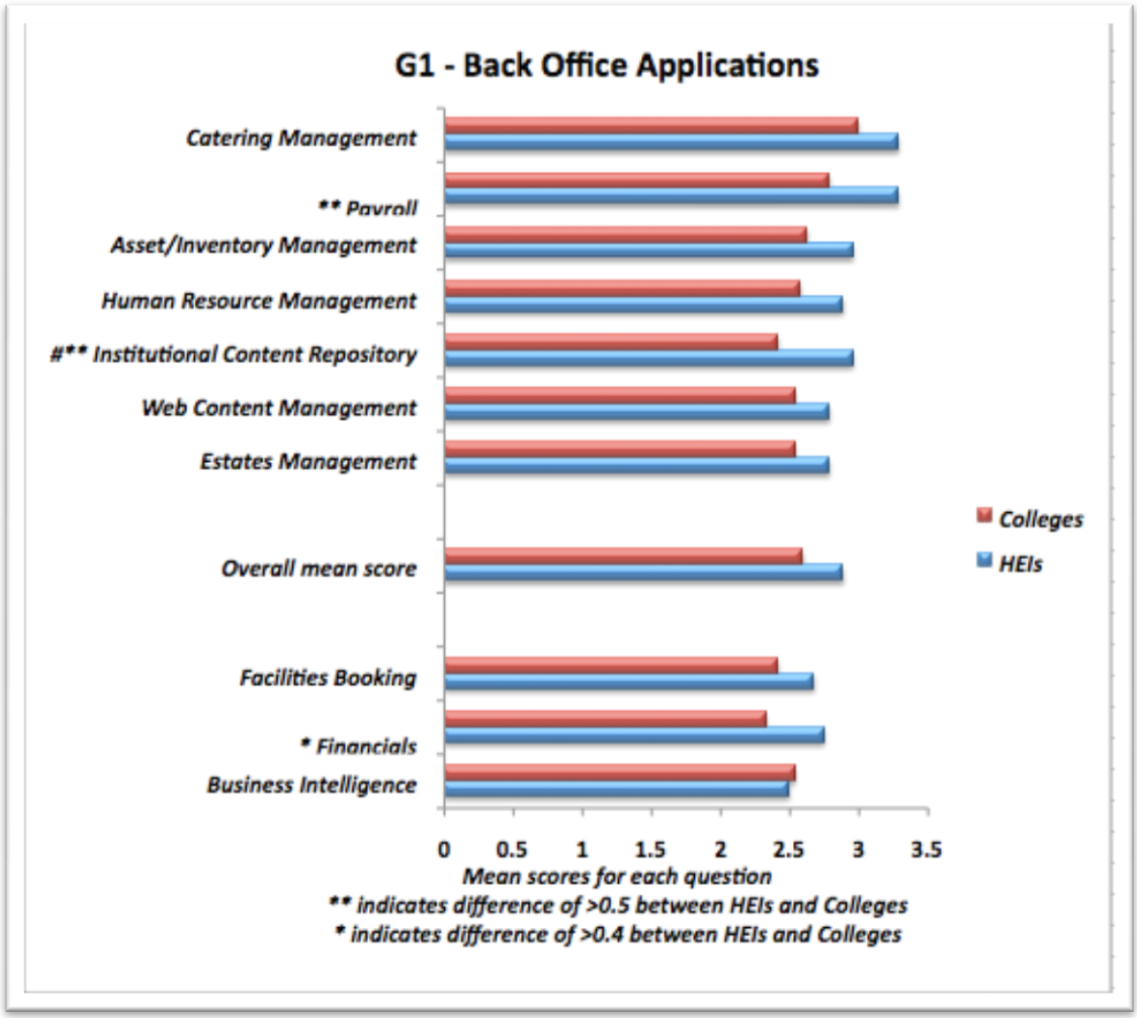


Fig. A.10 – Back Office Applications

Critical Mass

The survey responses highlighted three areas of above campus IT services with potential for critical mass of interest, and much in common between the HEI and college positions. These were further investigated through focus groups.

- **Teaching and learning applications and productivity tools** (including email and calendar) represented the strongest area of interest in shared Software as a Service. Highlighted applications included VLE, Portfolios and associated student records, library and repository management systems. Whilst other applications such as catering, payroll and personnel also scored highly, the student facing area has potential for wider ranging business process impact.

- **Shared infrastructure** was highlighted with reference to large scale data storage capacity (notably for multimedia and other research data) and associated collaboration and also provision of business critical IT services (ranging from backup to disaster recovery). 'Business continuity' was the strongest single category, with 5 out of 6 respondents assigning a 'high' rating.

- **'Knowledge as a Service'** may be the most pertinent label for the third area, including shared expertise in emerging and commonly used TLR tools, help desk operations, database administration, training and procurement. These areas of expert support have common threads as well as synergies with the identified opportunities for SaaS and shared infrastructure.

VLE cluster (Fig. A.11 to A.16)

The remaining sections explore the synergies between those three areas in terms of the cross-cutting interest from respondents.

The group of 31 institutions (77% of 40 responding) which showed potential interest in an above campus VLE are taken as the core group for this cross-tabular analysis, having scored the above campus VLE prospect (Question G3a) as

- 4 – Interesting possibility - coloured yellow
- 5 – Currently under consideration - coloured green
- 6 - Already an outsourced or shared service – coloured blue

These colour codes are used through the comparative tables that follow, in which institutions are consistently listed in the same descending order based on their overall approval of above campus applications.

Fig. A.11 compares interest of that group in an above campus VLE (column G3a) with their interest in **other teaching and learning applications**.

Interest in SaaS for Teaching & Learning Applications

Filter from 40 key respondents

Selection of 31 scoring VLE (G3a) @ 4+

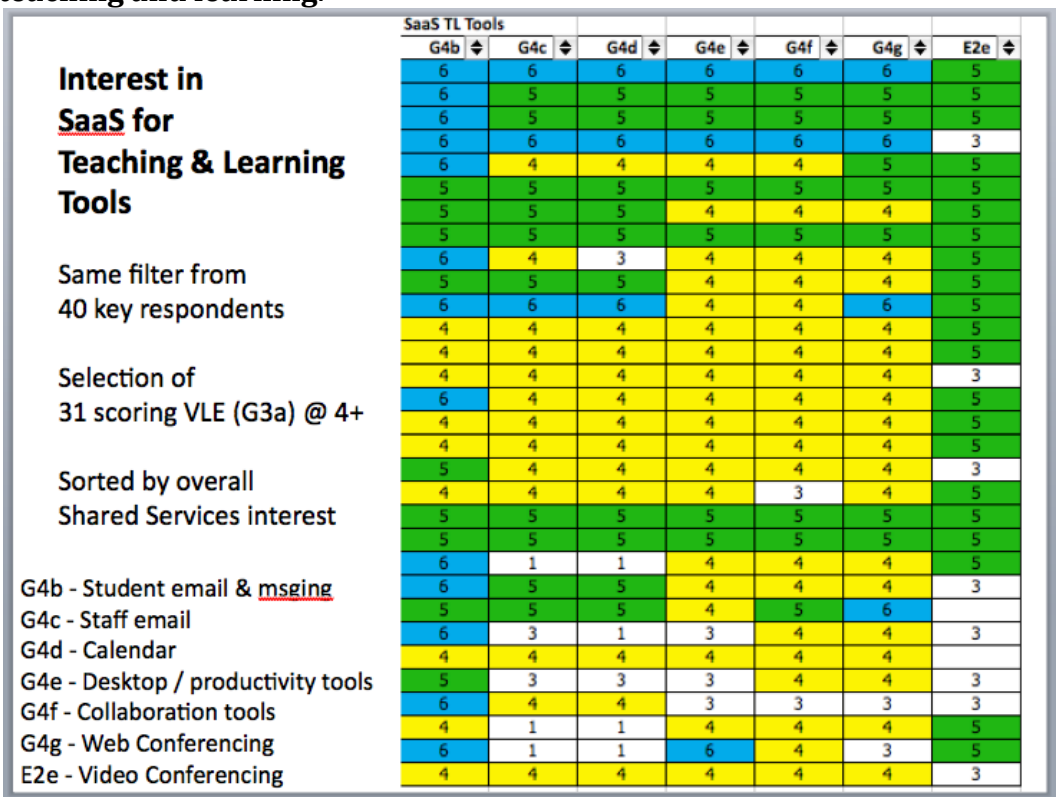
Sorted by overall Shared Services interest

G3a – VLE
G3c - Library Management
G3d – TLR Repository
G3e – Multimedia Repository
G1i – Institutional Repository
G2e - Help Desk Management
G2g - Student Registry

SaaS TL Apps						
G3a	G3c	G3d	G3e	G1i	G2e	G2g
6	6	3	6	4	6	6
5	6	5	5	5	6	5
5	5	5	5	5	5	5
6	6	4	4	3	6	5
5	4	3	3	4	4	4
4	3	4	4	5	5	4
5	4	4	4	5	4	4
4	4	4	4	5	4	4
5	5	3	4	5	3	4
6	4	3	3	5	3	4
6	6	1	1	1	6	6
4	3	4	4	4	4	4
4	4	4	4	4	6	1
4	4	4	4	4	4	4
5	4	4	4	4	4	4
4	4	4	4	4	3	3
4	4	6	6	3	1	1
4	6	3	3	4	4	4
4	4	4	4	4	4	4
4	4	4	4	3	4	4
6	3	3	3	4	4	3
6	4	4	4	4	4	3
4	6	5	4	4	4	4
4	4	4	4	3	6	1
4	4	4	4	4	1	3
4	4	4	4	4	4	4
4	4	3	4	4	1	4
4	4	4	4	6	4	4
4	4	4	4	1	3	3
6	1	1	4	1	6	6
4	1	3	3	1	3	4

Fig. A.11 – VLE interest linked to other TLR applications

Fig. A.12 compares interest of that group in an above campus VLE (column G3a) with their interest in single user and collaborative **tools typically used in teaching and learning**.

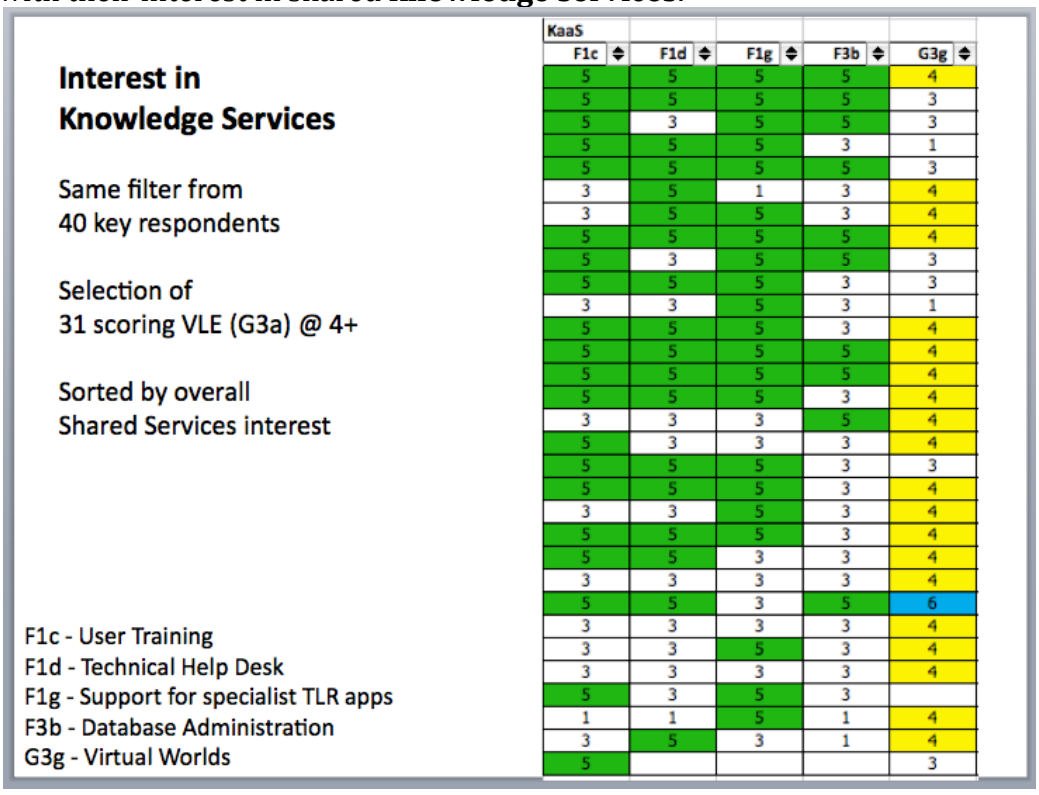


SaaS TL Tools

G4b	G4c	G4d	G4e	G4f	G4g	E2e
6	6	6	6	6	6	5
6	5	5	5	5	5	5
6	5	5	5	5	5	5
6	6	6	6	6	6	3
6	4	4	4	4	5	5
5	5	5	5	5	5	5
5	5	5	4	4	4	5
5	5	5	5	5	5	5
6	4	3	4	4	4	5
5	5	5	4	4	4	5
6	6	6	4	4	6	5
4	4	4	4	4	4	5
4	4	4	4	4	4	5
4	4	4	4	4	4	3
6	4	4	4	4	4	5
4	4	4	4	4	4	5
4	4	4	4	4	4	5
5	4	4	4	4	4	3
4	4	4	4	3	4	5
5	5	5	5	5	5	5
5	5	5	5	5	5	5
6	1	1	4	4	4	5
6	5	5	4	4	4	3
5	5	5	4	5	6	
6	3	1	3	4	4	3
4	4	4	4	4	4	
5	3	3	3	4	4	3
6	4	4	3	3	3	3
4	1	1	4	4	4	5
6	1	1	6	4	3	5
4	4	4	4	4	4	3

Fig. A.12 – VLE interest linked to user tools

Fig. A.13 compares interest of that group in an above campus VLE (column G3a) with their interest in shared **knowledge services**.

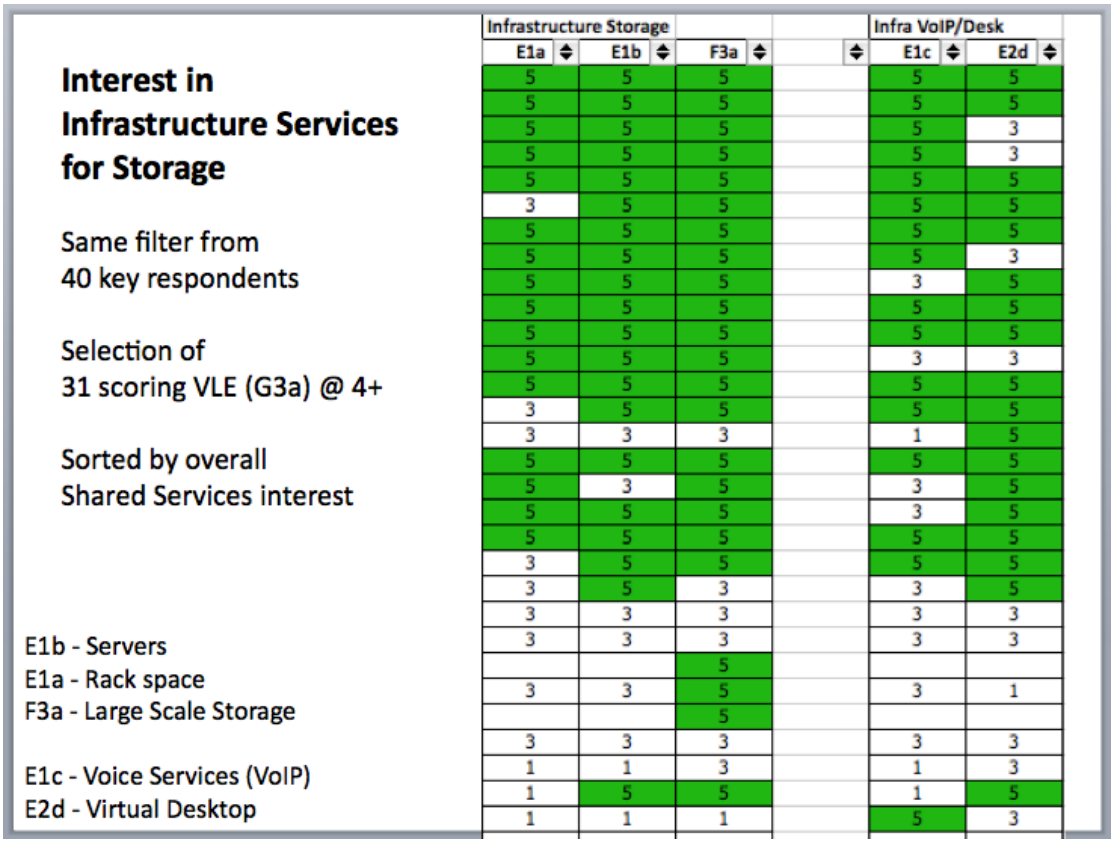


KaaS

F1c	F1d	F1g	F3b	G3g
5	5	5	5	4
5	5	5	5	3
5	3	5	5	3
5	5	5	3	1
5	5	5	5	3
3	5	1	3	4
3	5	5	3	4
5	5	5	5	4
5	3	5	5	3
5	5	5	3	3
3	3	5	3	1
5	5	5	3	4
5	5	5	5	4
5	5	5	5	4
5	5	5	3	4
3	3	3	5	4
5	3	3	3	4
5	5	5	3	3
5	5	5	3	4
3	3	5	3	4
5	5	5	3	4
5	5	3	3	4
3	3	3	3	4
5	5	3	5	6
3	3	3	3	4
3	3	5	3	4
3	3	3	3	4
5	3	5	3	
1	1	5	1	4
3	5	3	1	4
5				3

Fig. A.13 – VLE interest linked to knowledge services

Fig. A.14 compares interest of that group in an above campus VLE (column G3a) with their interest in **storage and other infrastructure services**. Note that the options to score as <4 – Interesting possibility> or <6 – Already above campus> were not offered for infrastructure services.



Interest in Infrastructure Services for Storage

Same filter from 40 key respondents

Selection of 31 scoring VLE (G3a) @ 4+

Sorted by overall Shared Services interest

E1b - Servers
E1a - Rack space
F3a - Large Scale Storage

E1c - Voice Services (VoIP)
E2d - Virtual Desktop

Infrastructure Storage				Infra VoIP/Desk	
E1a	E1b	F3a		E1c	E2d
5	5	5		5	5
5	5	5		5	5
5	5	5		5	3
5	5	5		5	3
5	5	5		5	5
3	5	5		5	5
5	5	5		5	5
5	5	5		5	3
5	5	5		3	5
5	5	5		5	5
5	5	5		5	5
5	5	5		3	3
5	5	5		5	5
3	5	5		5	5
3	3	3		1	5
5	5	5		5	5
5	3	5		3	5
5	5	5		3	5
5	5	5		5	5
3	5	5		5	5
3	5	3		3	5
3	3	3		3	3
3	3	3		3	3
		5			
3	3	5		3	1
		5			
3	3	3		3	3
1	1	3		1	3
1	5	5		1	5
1	1	1		5	3

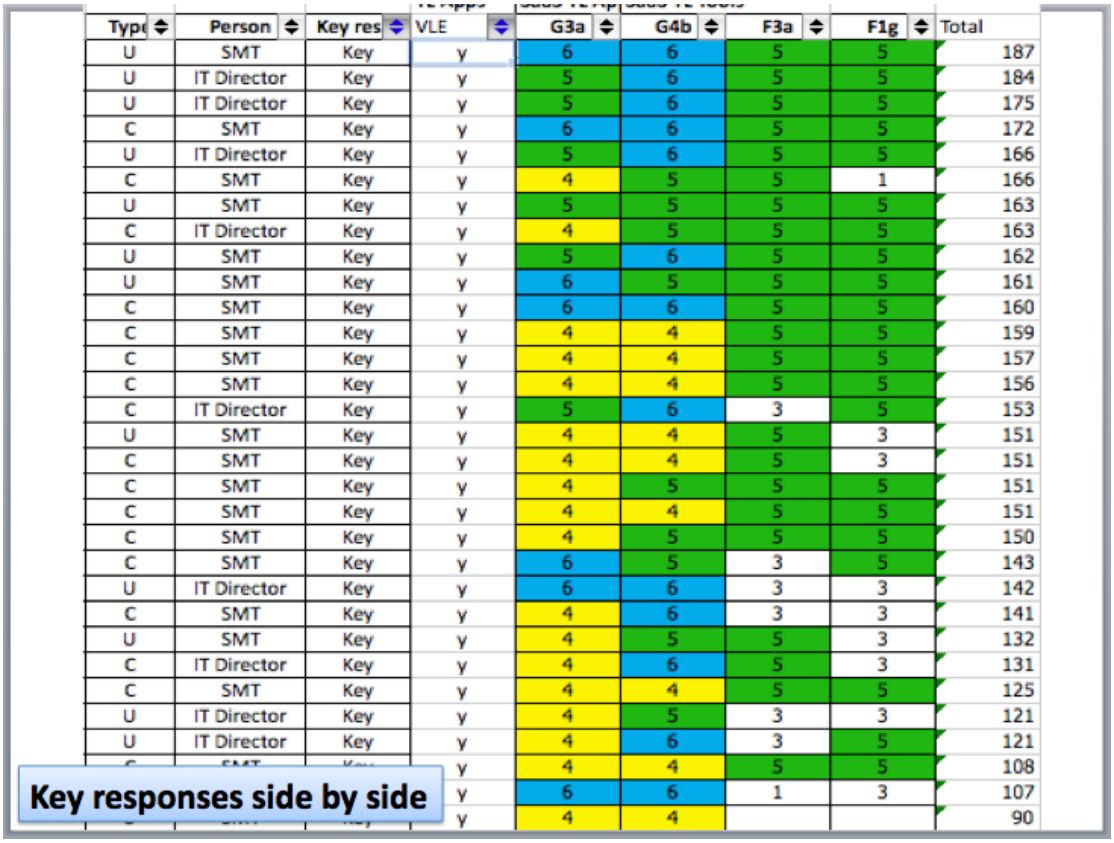
Fig. A.14 – VLE interest linked to storage and other infrastructure services

Fig. A.15 takes just one highly approved column from each of the above areas to provide an indication of a group of other services that would most readily be adopted early in a road map that includes an above campus VLE (G3a):

- G4b – Student email & messaging (from Fig. A.13)
- F3a – Large scale storage (from Fig. A.14)
- F1g – Support for specialist TLR applications (from Fig. A.13)

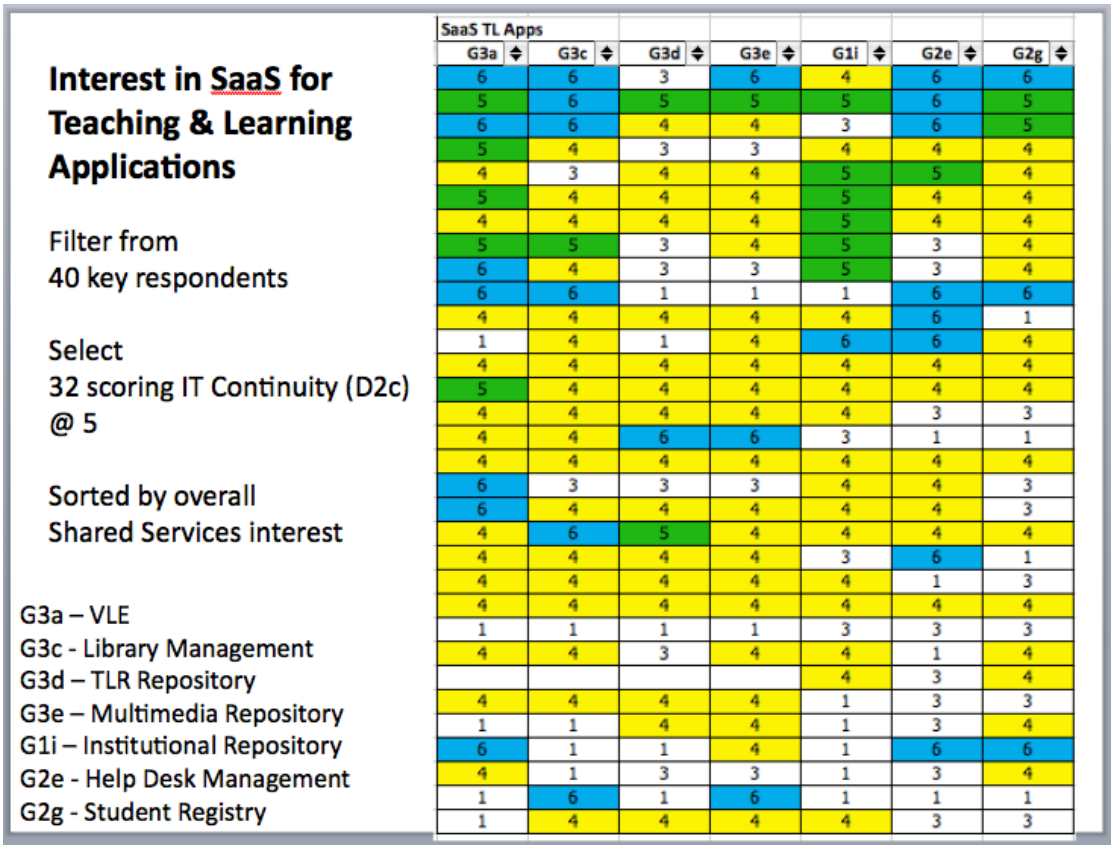
Finally, we consider the cross-fertilisation of above campus service opportunities from the perspective of a different group – selecting the 32 institutions that scored **IT Continuity** as a strong prospect.

Fig. A.16 compares interest of that group strongly interested in above campus IT Continuity (column G3a) with their interest in **teaching and learning applications**. All but the last quartile (23 institutions out of 32) demonstrate significant interest in above campus possibilities across the TLR applications space and particularly in VLE, Institutional Repository and Help Desk.



Type	Person	Key res	VLE	G3a	G4b	F3a	F1g	Total
U	SMT	Key	y	6	6	5	5	187
U	IT Director	Key	y	5	6	5	5	184
U	IT Director	Key	y	5	6	5	5	175
C	SMT	Key	y	6	6	5	5	172
U	IT Director	Key	y	5	6	5	5	166
C	SMT	Key	y	4	5	5	1	166
U	SMT	Key	y	5	5	5	5	163
C	IT Director	Key	y	4	5	5	5	163
U	SMT	Key	y	5	6	5	5	162
U	SMT	Key	y	6	5	5	5	161
C	SMT	Key	y	6	6	5	5	160
C	SMT	Key	y	4	4	5	5	159
C	SMT	Key	y	4	4	5	5	157
C	SMT	Key	y	4	4	5	5	156
C	IT Director	Key	y	5	6	3	5	153
U	SMT	Key	y	4	4	5	3	151
C	SMT	Key	y	4	4	5	3	151
C	SMT	Key	y	4	5	5	5	151
C	SMT	Key	y	4	4	5	5	151
C	SMT	Key	y	4	5	5	5	150
C	SMT	Key	y	6	5	3	5	143
U	IT Director	Key	y	6	6	3	3	142
C	SMT	Key	y	4	6	3	3	141
U	SMT	Key	y	4	5	5	3	132
C	IT Director	Key	y	4	6	5	3	131
C	SMT	Key	y	4	4	5	5	125
U	IT Director	Key	y	4	5	3	3	121
U	IT Director	Key	y	4	6	3	5	121
			y	4	4	5	5	108
			y	6	6	1	3	107
			y	4	4			90

Fig. A.15 – VLE interest linked to key areas of interest



SaaS TL Apps						
G3a	G3c	G3d	G3e	G1i	G2e	G2g
6	6	3	6	4	6	6
5	6	5	5	5	6	5
6	6	4	4	3	6	5
5	4	3	3	4	4	4
4	3	4	4	5	5	4
5	4	4	4	5	4	4
4	4	4	4	5	4	4
5	5	3	4	5	3	4
6	4	3	3	5	3	4
6	6	1	1	1	6	6
4	4	4	4	4	6	1
1	4	1	4	6	6	4
4	4	4	4	4	4	4
5	4	4	4	4	4	4
4	4	4	4	4	3	3
4	4	6	6	3	1	1
4	4	4	4	4	4	4
6	3	3	3	4	4	3
6	4	4	4	4	4	3
4	6	5	4	4	4	4
4	4	4	4	3	6	1
4	4	4	4	4	1	3
4	4	4	4	4	4	4
1	1	1	1	3	3	3
4	4	3	4	4	1	4
				4	3	4
4	4	4	4	1	3	3
1	1	4	4	1	3	4
6	1	1	4	1	6	6
4	1	3	3	1	3	4
1	6	1	6	1	1	1
1	4	4	4	4	3	3

Fig. A.16 – IT Continuity interest linked to TLR applications

Appendix B – Focus Groups Report

B1 - Overview

The Steering Group regarded these shared interests identified in the survey as strong candidates for further elaboration. Therefore respondents and / or relevant colleagues were invited to attend focus groups in Glasgow and Edinburgh in early May to explore two emerging themes in more detail ahead of developing a first cut 'road map':

- **Focus Group 1** - Software as a Service (SaaS) - focusing on opportunities relating to teaching and learning applications and associated tools

- **Focus Group 2** - Shared Infrastructure – focusing on shared requirements for large scale storage and for IT / business continuity

Each focus group also considered opportunities for knowledge sharing, in relation to such as procurement, specialized applications, service desk and training, which have synergies with both themes. A further focus group was held at the end of June to consider any issues that could be specific to the FE college sector.

A total of 21 institutions (12 HEIs and 9 Colleges) engaged in the Focus Groups. The Focus Groups confirmed and added considerable detail to the broad themes identified through the survey, enabling the consultants to draft a sector road map. Particular emphasis was placed on:

- Potential for working with the two **VLE communities** (Blackboard, Moodle) in parallel whilst encompassing shared goals beyond VLE – the consultants are to present to ScotBUG;
- Opportunity to cohere **the group of 'learner facing' applications**, notably including Student Records and the possibility of links with Glow, in the medium term road map;
- Importance of working with JANET UK to understand whether IaaS and associated **collaboration platform** ideas could be tested within its UMF service development programme.

B2 - Participants

The participants represented a good balance of large and small universities as well as representation from the college sector.

SaaS / KaaS	**IaaS / KaaS**
Edinburgh 4th May, 2011	***Edinburgh 5th May, 2011***
G Dougan – Scotland's Colleges	L Dawson – Edinburgh's Telford College
B Haig – SAC	G Dougan – Scotland's Colleges
T MacMaster – Carnegie College	T MacMaster – Carnegie College
S McDonald – Heriot Watt	R McIntyre – SAC
M Toole – Stirling University	F Muir – Queen Margaret University

	M Oduyemi – Abertay University
	A Williamson – Jewel & Esk College
Glasgow 11th May, 2011	***Glasgow 12th May, 2011***
J Brown – Dumfries & Galloway College	D Beards – Scottish Funding Council
J Currall – Glasgow University	S Brough – Strathclyde University
P Falconer – Elmwood College	R Gilmour – Glasgow University
A Hughes – University of the Highlands & Islands	A Hughes – University of the Highlands & Islands
D Dyet – Reid Kerr College	F Greig – Abertay University
T Mortimer – Dundee University	G Johnson – Reid Kerr College
M Oduyemi – Abertay University	D Phillips – Aberdeen University
D Phillips – Aberdeen University	MToole – Stirling University
F Ross - RSAMD	F Ross – RSAMD
West Lothian (FE colleges) 24th June, 2011	
D Cooper – Langside College	L Dawson – Edinburgh's Telford College
S Renton – Cardonald College	S Williams – West Lothian College
J Wilson – Carnegie College	R Wilson – Carnegie College
F Nelson – JANET Scotland	A van Gelder – APUC
G Dougan – Scotland's Colleges	

B3 - Motivations and Measures

Focus group participants were invited to discuss in groups a set of motivations that might be recognised as driving the shared service agenda. It was generally agreed that these ought to be expressed at a reasonably strategic level. While there was not complete agreement across the groups, the set of relevant motivations given below is derived from the work of the groups. There was agreement that the adoption of shared services would not be motivated by the release of staff or of physical space or to provide differentiation of service from other institutions. For some participants only the first two from the following list were of importance to their institution.

Rank 1
Quality of Service
Cost Savings

Rank 2
Continuity & Resilience of service
Management of Risk
Access to skills that are up-to-date
Capacity to innovate

Rank 3
Things that would not have been possible otherwise
Environmental objectives
Empowering users to make choices

Fig B.1 - Motivations for Shared Services (Ranked)

Similarly, participants considered typical measures that might be used to measure success or progress towards targets in implementing shared services. With a key motivator being cost savings it is no surprise that this was also seen as a measure of success, with the focus being on transferring expenditure from capital into revenue.

There were a wide range of views about using student progress data as a measure, with some suggesting that it was impossible to establish a causal link between this and shared services. However a few also wanted to use both student retention and student progress as measures.

All were agreed that student and staff satisfaction surveys were important, along with help desk and usage statistics, while other suggested measures such as space freed and staff re-deployed were not important.

Rank 1
Revenue savings
Total Cost of Ownership (TCO)
Satisfaction indicators
Help Desk indicators

Rank 2
Service usage levels
Technical performance indicators
Student retention and achievement*

Rank 3
Carbon emissions
Audit compliance

Fig B.2 - Measures of success/progress (Ranked)
****No consistent agreement on this measure***

B4 - Barriers, synergies and opportunities

Participants in the workshop were tasked with selecting one or two candidates for shared services and considering what the opportunities might be to enable them to occur.

Software (SaaS) & Knowledge KaaS

For SaaS the test cases selected by participants were: VLE; Support; Multimedia Repository; Library Management System; Student Registry; Collaboration Tools.

Discussions focused around possible barriers to implementing a shared service, and the identification of any synergies with other service offerings that might help make the case for a particular service. Based on their shared knowledge, each discussion group proposed one or more ways of providing their chosen service.

Typical barriers: Groups of users with vested interest in status quo (eg University Registry staff); perception that 'our institution is different'; unnecessary diversity of business processes; reluctance to yield control of an aspect of institutional life; existing (satisfactory) solution; too many links to other system components so that change would bring major disturbance to these connected systems.

Typical synergies: Opportunity taken to revise the student record and harmonise FE/HE reporting requirements to SFC and others; stimulate use of Open Educational Resources through shared VLE provision; improve joint course provision and enhance transfer of student achievement records through shared VLE provision; release of staff to provide better support elsewhere; improved management of educational resources leading to wider availability and use.

In the conversations around possible solutions/implementations it became clear that the design of any shared service could not be "one size fits all". A service with a selection of service options and levels of engagement would bring the most advantage to the sector. An example of this is the VLE where some institutions may have a strong requirement for an associated personal portfolio and an assessment system while others would not. The following are suggested options from the SaaS workshops.

VLE
Each groups that considered a VLE as a possible shared service proposed there should be two service offerings – the Blackboard vendor offering and the Moodle platform. Those institutions that currently use Blackboard would benefit by leveraging a better offering and service, while the Moodle community would benefit through access to each other's technical and pedagogical expertise. This latter might be provided through a consortium arrangement, while the former may involve a shared procurement.

Collaboration Tools (Web Conferencing)
Participants noted that their current local approaches are ad-hoc rather than strategic. Solutions would include: a support and advisory service across the sectors; procurement consortia; purchasing a hosted solution. These tools ought to be linked closely to the VLE so might be jointly considered with the above.

User Support/Help Desk
One solution is to access the Helpdesk offerings available to the HE sector (such a NorMAN, UniDesk). For smaller institutions and FE colleges, where the pressures from the user community is for a level of service beyond what the institution can afford, there were no obvious available options. A consortium arrangement that provided access to partners' expertise and skills would seem appropriate, along with an extended hours helpdesk (might only work for common applications eg use of Internet, e-mail, Office).

Multimedia Repository
One solution is to allow academics to upload materials to Web 2.0 services such as YouTube and iTunesU, recognising that this raises issues of IP and copyright.

The other is to purchase a storage management solution (such as Server Intellect). In the first case the IT support team will have to advise academics on issues of upload/download/linking , while in the second they will have to support the implementation of a storage management solution). Neither of these are a 'shared solution' although the first is 'Above Campus'

Student Record System (FE)
CAPITA and Tribal identified as the suppliers of Student Record Systems (SRS) to FE colleges – all with individual contracts, a reliance on supplier consultancy for support and requiring in-house expertise. A consortium arrangement would allow colleges to share expertise and experiences, define sector-wide requirements, and combine to procure a commercial offering. There is a high level of interest among colleges in joint action in relation to SRS.

Student Record System (SFC)
Many participants expressed a hope that the SFC would take the opportunity afforded by the HEIDS study to address long-standing issues of inconsistencies in reporting and look to a SRS that encompassed the FE and HE experiences of a student (or even wider than simply FE or HE). This would require initiative on the part of the SFC, supported by the FE and HE institutions.

Infrastructure (Iaas, PaaS) & Knowledge (Kaas)

For IaaS the test cases selected by participants were: storage; co-location of infrastructure; collaboration infrastructure; backup; disaster recovery; virtual desktop; pay on demand processing; and learning materials repository.

It was recognised that the network is the fundamental component in the infrastructure, and needs to be reliable, resilient and capable of sustaining the high volumes necessary for off-site backup and repositories. FE colleges expressed a particular anxiety about resilience. While it was assumed that such a network was already provided, there was recognition that developments in the public sector networks and the Scottish schools broadband network (GLOW) might introduce alternative options in the future. Although the list of barriers identified by the groups appears considerable, there was general optimism across the groups that workable solutions could be found.

Typical barriers: 'Sunk costs' for many institutions (at different points in lifecycle); further up-front investment required before savings can be realised; rights management; resistance to change; differing business processes; reduction in autonomy for institutions/users; concerns over resilience; negotiating SLAs; risk to institutional data; versioning and licence issues; location of data (especially research data).

Typical synergies: Sharing 'best practice' in infrastructure architecting; improved resilience and availability for applications; mitigation of risk to business continuity; reduction in energy and space costs (including carbon emissions); adoption of standard procedures resulting in reduction in administration and

audit; simplification and rationalisation of applications; improved flexibility in matching provision to demand; improved speed of provisioning.

The workshops established that most institutions have been considering how their mass storage needs might be met, usually through a mix of on-site and off-site provision. There were examples of inter-institution collaborations (mutual hosting of backup or sharing server rooms) as well as use of commercial storage providers (e.g. private cloud). In some cases sunk costs were substantial and these institutions were therefore interested in sharing their capacity with smaller institutions and FE colleges. The options suggested were:

Storage
The groups considered a number of possible solutions, such as an institution taking rack space in a managed environment (commercial). The preference however would be to work with other institutions – either taking rack space in a server room in another institution or sharing virtual machines. At this stage there appears to be some reticence in moving towards a cloud-based solution (either private or public), although the emergence of the JISC CloudSpace provision is a further factor to be considered. The availability of UMF funding for this JISC solution may well prove attractive.

Co-location of infrastructure
As hinted above this would involve institutions coming to a reciprocal agreement for space in each other's data centres. The intention would be to extend this to the actual sharing of server infrastructure (through virtualisation).

Backup/Disaster Recovery
For smaller institutions this was a crucial provision. There was a general view that institutions were not doing it as efficiently and robustly as they might, with some having insufficient provision. The main solution suggested was for consortium arrangements to share knowledge and experience of what could be done at a local level (clustering, virtualisation, automatic failovers, load balancing) and combined procurement of other components of a solution from a commercial provider. A further solution was offered by a large HEI with a live/live configuration with capacity that could be shared.

B5 - Next steps

Finally, participants were asked to rank a set of proposed candidates for shared services. While individual rankings reflected current institutional positions there were common elements given a high ranking, as summarised below:

Rank	***SaaS / KaaS***	***IaaS / KaaS***
1	VLE	Network Connectivity
2	Support Desk (24/7)	Storage
3	Library Management System	Disaster Recovery
4	Content repository	Shared Procurement
5	Staff e-mail	Virtual Desktops
6	Student Records / Registry	User Training

Fig B.3 – Suggested Candidate Services (Ranked)

Appendix C - Interviews Report

Participants

Name	Institution
Phase 1 - March	
L Creanor	Glasgow Caledonian University
S Watt	St Andrew's University
J Heyward	University of Edinburgh
A McCreath	Robert Gordon University
P Deans	Napier College
A Hughes	University of the Highlands & Islands
G Dougan	Scotland's Colleges
S Jennings	Universities Scotland
Phase 2 - June	
L McDonald	Adam Smith College
F Ross	RSAMD
R Parsons	University of Dundee
G Johnson	Reid Kerr College
M Turpie	Abertay University
S McDonald	University of Glasgow
B Mullins	University of West of Scotland
S Marsden	University of Edinburgh
J Currall	University of Glasgow
P McNaull	SUFDG / Heriot Watt University
F Carmichael & M Clarke	JISC RSC SW Scotland
J Duffy & G McBride	Scottish Funding Council
D Perry	JANET UK
J Wilson	Scottish Qualification Authority

Themes

Stakeholder interviews were carried out at two phases of the study. The initial interviews (8 in total) were to establish the extent to which the sectors were already engaged with shared services, their appetite for further progress and the likely barriers. The second set of interviews (14 in total) were to gauge stakeholder responses to an initial set of candidates for shared services and explore possible timings and likely vehicles for their development and delivery.

The Phase 1 interviews established a strong level of support for the exploration of Above Campus IT services and a confirmation that key decision makers were fully aware of the economic and political drivers for their continued engagement in such considerations. All contributors had prior experience of one or more

shared services in their institution and valued the improvements that they had brought. In some cases the shared service was the only route through which the institution could afford to provide a service, or provided it at a level that could not otherwise be reached.

The Phase 2 interviews provided an opportunity for individuals to identify the opportunities in which they would have the greatest level of interest. Not surprisingly, the prospect of a shared VLE was of interest to all, along with a refreshed student record system (SRS). These are further commented on below. Surprisingly, while most admitted that sharing knowledge was desirable and would have a low entry cost, only a few included this in their 'top 3' choice. Similarly, a reliable and superfast network is absolutely essential to both HE and FE sectors but was only mentioned by a few (perhaps recognising that a 'solution' already exists). There was general agreement that improved access to mass storage with backup and recovery would be desirable across the sector. These were broadly in line with the interests expressed in the stakeholder interviews in Phase 1.

Both phases indicated that careful consideration should be given to establishing the scope of any proposed service(s). It was not obvious to most that the default should be Scotland-wide (in spite of the overall compactness of the sectors and the good relationships that existed among and between them). The expressed preference was for initiatives at regional or even local level – starting small and perhaps eventually growing to a national provision. The expression "working with like-minded people" was used often to support such a view. There were few examples of collaborations across sectors (such as universities and NHS) for a variety of reasons – operational and financial.

Issues to be addressed

Most respondents agreed that the overview of candidate services provided by a roadmap was of value in understanding the range of such services, so long as the timescales in such a roadmap were only intended to be indicative.

A number of key factors and concerns were emphasized in interviews, providing a valuable checklist for any subsequent service design and development. Whilst a number of these are covered in the indicative project proforma used in Section 5, it is essential that they should be explicitly taken in to account at the next stage.

Key Factors

- **Dependencies and synergies** need to be signaled; the services on the road map should not be seen as individual elements to be 'picked off', when in reality there is a significant amount of inter-connectedness among infrastructure, software and knowledge services.

- **Underlying business processes** will differ from one institution to another - a roadmap might serve to obscure this potential barrier to progress towards aggregation or sharing.

- **Investment lifecycle** will be a key factor for institutions at different points in the lifecycle of their current systems and services. Some were mid-way through a multi-year service contract (e.g. for backup and disaster recovery) while others had recently incurred large sunk costs in procuring and implementing a new of refreshed application. Some institutions indicated that they might nonetheless have an interest in the specification and development of a particular shared service, for consideration when the time was right. In a few cases others indicated that they would not have an interest in participating in areas where they had made recent investment.

Clarity required for each candidate service

- **Operational and governance models** that might be employed to agree and establish a shared service.

- **Bureaucratic systems** must be avoided, potentially swallowing up potential savings.

- **Financial options** available to institutions; for example, VAT requirements and how 'in kind' contributions might be accepted within a partnership.

- **Consideration of risk** will be essential when developing models and proposals. Whilst these concerns tended to be raised by the larger universities, risks relating to such as quality of services, loss of management control and ownership of data should be concerns for all.

- There was concern on the part of some larger institutions that cashable cost savings would be achieved, making it even more important to identify the **non-financial benefits** that might arise from shared services.

Priority Services

The Phase 2 interviews provided an opportunity for individuals to identify the opportunities in which they would have the greatest level of interest. Not surprisingly, the prospect of a shared VLE was of general interest, along with a refreshed Student Record System (SRS).

VLE

There was a commonly held belief that a VLE (and associated learning support tools) could provide the best opportunity for a shared service (7 of the 8 respondents said so). However, some concern was also expressed that the realisation of gains would depend on the engagement and adoption of these tools by academic staff. In some institutions it would appear that there is still some way to go in achieving the change of culture necessary for widespread use of a VLE and its tools in teaching and learning. The caveat was however flagged that

care should be taken to avoid 'specification bloat' by including too many of the features demanded by individual institutions.

A VLE is a good example of an application that has strong linkages to other systems (such as the SRS for student and class data, the personal portfolio system, mass storage for archiving etc). College respondents also noted that all colleges largely draw their provision from the same SQA course catalogue, making the case for a shared VLE a compelling one.

Student Records

All respondents agreed that the notion of a shared SRS held attractions for them, excepting one institution that has recently implemented a new SRS. All similarly agreed that this would be possibly the most challenging project, both in terms of complexity and timescale, but one that could yield considerable benefits. There were, however, marked differences in appetite to take such a project forward between the smaller HEIs and FE colleges and the larger universities. The former were of the view that this should be on the roadmap for the sector.

FE colleges in particular noted that they all individually dealt with issues of updating, module implementation and adjusting reporting to meet changing data requirements from the many government bodies – and all required to have staff with relevant expertise in their SRS.

Sharing Knowledge

Most recognized that sharing knowledge was desirable and would have a low entry cost.

There was almost unanimous view from the smaller institutions and FE colleges that their IT support teams were not large enough to have expertise across all of the systems and applications that users do or might demand. The level of interest in shared services in the area of specialist systems and applications is therefore very high, especially if the service allowed them to cope with peaks in demand (such as when carrying out major upgrades) or to deal with emergencies (such as system failures).

Infrastructure Services

There was general agreement that improved access to mass storage with backup and recovery would be desirable across the sector.

Acknowledging that a reliable superfast network was required to underpin much of the work of institutions, and in particular to support the transfer of information for mass storage purposes, some expressed concerns that insufficient consideration was being given to wider Scottish Government initiatives. The Scottish Government through its Digital Strategy is committed to more widespread digital participation, increased IT skills in the workforce and the development of Scotland's Public Sector Network (PSN). Any future

development of network provision for Scotland's universities and colleges must to take account of these wider initiatives.

Sector differences

The survey outcomes confirmed that there was an appetite by decision makers in both HE institutions and FE colleges for cross-sector arrangements in shared services. The Phase 1 interviews confirmed that such arrangements were already in existence, usually local in nature. The survey and interviews also showed both sectors sharing the same view of the set of opportunities to be taken forward.

However, in a few areas there were differences of view. The colleges have a much greater interest in SRS than the larger HE institutions, but less interest in Library Management Systems or research repositories. They are much less sensitive about the location of mass storage than universities, where (for example) research contracts demand on-site storage of data. Importantly, FE colleges seemed to be less anxious about the level of risk posed by any changes to services or any threat to competitiveness. FE colleges and smaller HE institutions were the most likely to benefit from sharing knowledge as a service, with their smaller staff teams often spread thinly over the expertise required to implement and maintain services.

Appendix D – Implementation & Risk Checklist

Appendix D provides a checklist of issues to be addressed in planning and implementation, which will also assist in identifying risk.

Whilst such processes will be standard within the institution and well defined in relation to the IT service, there will be considerations that are specific to or elevated by the nature of a shared services trajectory. This checklist is therefore designed as an aide memoire to help managers and planning teams ask (typically iteratively) the necessary questions in a timely and comprehensive manner.

Implementation Issues

This list organises 40 examples of planning and implementation issues for above campus services across 5 main and 20 sub-categories. It builds on the issues highlighted by JANET UK in presentation of the UMF brokerage project (2011). We suggest institutions should add their own questions under the proposed categories.

Category	Example Issues
A – Technology	
1 – Stability	Rapidly changing technologies – safe to adopt?
	Rapidly changing technologies – life expectancy of current?
2 – Standards	Availability of technology standards
	Applicability of established standards used below campus
B – Suppliers	
3 – Churn	Position of vendors of existing services
	Life expectancy of current solutions
4 – Leverage	Access to suppliers of new services
	Mutual benefit in adopting new services
5 – Business model	Supplier model for achieving profitability
	Scale of adoption required by supplier
6 – Migration	Potential for lock in
	Pros and cons of early adoption
C - Business Case	
7 - Cost impact	Possibility of raising costs
	Accounting for sunk investments
8 – Demand level	Quantifying demand for new approaches
	Possibility of driving users to undercover alternatives
9 - Cost model	Lack of Total Cost of Ownership (TCO) benchmark
	Period applied to Return On Investment (ROI)
10 – Synergies	Reliance on downstream value added benefits
	Complexities introduced in to cost benefit analysis

D – Service model	
11- Stability	Rapidly changing institutional business models
	External demands on the model from such as funders
12 – Clarity	Lack of clear fit with supplier / product offerings
	Cut across internal business structures
13 – Licensing	Inappropriate license models
	Incomplete understanding of critical terms & conditions
14 – Service level	Inappropriate service levels
	Incomplete understanding of critical terms & conditions
15 – Rights	Lack of clarity of legal position re- data
	Lack of clarity of legal position re- processing

E – Operational	
16 – Migration	Initial data transfer critical path and bottlenecks
	Annual implementation window
17 – Integration	Data integration challenges
	Suitability of below campus integration approaches
18 - Local roles	Definition of required local roles
	Terms of employment and related considerations
19 – Expertise	Lack of expertise to evaluate to new models
	Lack of expertise to migrate to new models
20 - Skills pool	Deskilling existing workforce
	New skills required by existing workforce

Risks

There is a danger of elevating every implementation consideration (e.g. the list of 40 above) to a position in the risk register. The result would likely be a form of 'snow blindness', leading to the categorisation of above campus services as 'too difficult'.

It will therefore be beneficial to synchronise the two mechanisms so that only real risks graduate from the issues checklist to a project or programme risk register.

Furthermore, in the real world of shared services planning and implementation of IT services, the risks graduating from the issues above will be joined by everyday business considerations such as key staff availability, timing of legal processes and more.