



Investigation into the use of Microsoft SharePoint in Higher Education Institutions

Final Report

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Project websites

Northumbria University: http://www.northumbria.ac.uk/sharepoint_study

Eduserv: <http://www.eduserv.org.uk/research/studies/SharePoint2009>

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Executive Summary

The vast majority of UK HEIs are now making some use of SharePoint 2007.

SharePoint's rapid rise in this sector can be attributed to several factors:

- The ease with which SharePoint can be procured: none of the HEIs in this study went to competitive tender to procure SharePoint as it is included in their Campus Agreement with Microsoft
- Its provision of a wide variety of functionality including: content management for intranets and websites; collaboration sites for workgroups; workflow capability; and portal capability with single sign on and the ability to provide personalised content
- The gap in the HE information environment: most HEIs have had content management systems in place for their teaching and learning functions (in the form of a Virtual Learning Environment - VLE) but did not have any such systems in place for their administrative functions, service functions or research work
- Its devolution of a lot of power to local users: this suits the federal culture of HEIs, where there is a greater degree of autonomy in faculties and departments than in the divisions of organisations in other sectors.

Two distinct types of SharePoint implementation were discerned:

- Organic SharePoint implementations: implementations which have started small and evolved over time without a pre-existing strategy or plan. Such implementations have typically centred on the provision of collaborative SharePoint team sites to work groups. The strength of these implementations is that they involve the provision of SharePoint team sites to teams and groups that have expressed a need or desire for them, so user uptake is relatively high. The main challenge with organic implementations is how to enable them to be scaled up. How does the institution ensure that it has the right infrastructure, support and governance in place to manage SharePoint, once adoption has grown to the extent that it has been adopted by a significant portion of the HEI and it has become a critical system for many parts of the institution?
- Corporate SharePoint implementations: implementations setting out to achieve specific objectives, such as the deployment of SharePoint to manage an intranet, to manage an external website, or to provide a portal with a single-sign-on facility to other information systems within the HEI. Such implementations typically also involve, or envisage, the implementation of collaborative team sites. Such implementations have the advantage that a corporate scale infrastructure and governance arrangements can be put in place from the start. The main challenge is that these implementations involve ambitious goals and HEIs are often embarking on them without prior experience of SharePoint.

The implementations observed in this study have one or more of the following drivers:

- to improve document management: SharePoint document libraries can be deployed with version control, check in and check out, and metadata capture
- to support collaboration with external partners: if an organisation has an external connector licence they can add external people to their Active Directory, or equivalent identity management system, and allow site owners to provide them with access to particular SharePoint sites
- to improve cross-school/departmental working: site owners can allow access to sites to colleagues anywhere within the institution without having to go through an IT administrator
- to enable staff and students to find colleagues with similar interests: in SharePoint 2007 My Sites can make a profile of an individual available for the rest of the organisation to view or

search on, though the take up of My Sites amongst staff and students has been relatively low

- to improve an intranet or external website: SharePoint is more frequently used for intranets rather than the management of external websites. Customisation is required if an HEI wants a website in SharePoint 2007 to meet Web standards, including accessibility standards. Customisation is also required if an organisation wants to apply its branding to SharePoint sites
- to target information (typically through an intranet) to particular audiences
- to improve and automate cross-institution processes: though the institutions in the study have not found Infopath electronic forms easy to get set up and working
- to provide a personalised portal where staff and students can log-in to one place and access all the different systems of the HEI: SharePoint has a single sign on facility, although the HEI needs to write some custom code to get it to work
- to bring together and manage data from different information systems around the organisation: for example, in order to pull data from student databases and finance databases and display and manipulate it in the SharePoint environment.

This study of implementations in the UK Higher Education sector has identified the following critical success factors for SharePoint implementations:

- identify what customisation is required and manage those customisations: any significant alterations to SharePoint 2007 require programming in C# and .NET; some HEIs have these skills in house, but many do not. Customisations, if not managed properly, can complicate the ongoing maintenance and upgrade paths for SharePoint installations
- find a way of managing the provision of new collaborative team sites: HEIs need to decide their criteria for who can set up a team site, what they can use it for, how they go about getting one and where it sits within the overall URL structure
- identify a clear focus for the implementation: SharePoint is capable of being put to many different uses so there is a need for an organisation to focus on what it implements in what time frame
- provide enough training and advice to enable people to make use of the system: this is a particular challenge for organic implementations, where the HEI does not know in advance who is going to be invited to collaborate to one or more team sites, or who will want to be a site owner of a team site
- define the boundary between SharePoint and other systems: SharePoint has functionality that will duplicate other information systems already in place in the HEI, for example the VLE, and there is a need to provide clarity on the scope of SharePoint to minimise resulting disruption
- put adequate governance arrangements in place: SharePoint has the capacity to sprawl and grow very quickly. There is a need to plan for the following factors: How will the technical infrastructure for SharePoint scale? How will the information architecture for SharePoint scale? How will the support for users scale?

Microsoft is promoting SharePoint as a VLE. However most HEIs already have a VLE in place, Moodle and Blackboard being the market leaders, and during the course of this research only two HEIs were found who were using SharePoint as an institutional VLE. The effort required to adapt SharePoint to the role of a VLE, in comparison to choosing a specialist VLE system, is the main disincentive to deploying SharePoint as a VLE. Despite not being frequently deployed as an institutional VLE, SharePoint is being used in teaching and learning, particularly for functions which are not easily fulfilled by the VLE, for example: group collaborative work, ad-hoc non-repeated courses, and work that cuts across several or many different courses.

There is plenty of scope for SharePoint to be used to support research groups in HEIs. The market for systems to support research is much less defined, homogenous and mature than the market for

VLEs. Several HEIs are using SharePoint to support collaborative research work with colleagues from other institutions. However, SharePoint will face strong competition from open source systems in that space.

There was some evidence of anti-Microsoft feeling in some academic circles, some IT circles and from some learning technologists. However, this feeling is not universal in any of these groups, and is not strong enough to have deterred any HEI from implementing SharePoint, and is not shared by staff in administration or support services. Nevertheless, given the rapid increase in take up of the product, together with Microsoft's existing dominance of HEIs' e-mail provision, operating system and word processing/spreadsheet software, there are real issues to face about the implications of the sector's reliance on one company.

This research was conducted in the summer and autumn of 2009. Many of the implementations seen were relatively recent. The coming year or two is likely to see significant development in the SharePoint space. The average size of implementations will get larger as recent implementations mature. SharePoint is unlikely to take much market share from the established VLEs, but we will increasingly see VLEs competing for the attention of academic staff and students with both SharePoint on one hand and web applications such as Facebook on the other. In the collaboration space SharePoint is likely to face its stiffest competition from Google Apps, rather than established ECM vendors.

SharePoint 2010 will become available in the first half of 2010. Generally, we have seen lacklustre implementation and take up of My Sites in SharePoint 2007, and it will be interesting to see what difference the significant improvements in the social computing facilities of My Site in SharePoint 2010 will make. We think, and hope, that 2010 will see the formation of one or more HEI SharePoint user groups, to enable colleagues within the sector to share knowledge and experience, to act as a voice for the sector vis-a-vis Microsoft, and to explore the implications of the rise of SharePoint for the sector.

Contents

	Page
Executive summary	i
1 About the research project	1
2 Explaining the rapid growth of SharePoint 2007 within the UK Higher Education sector	2
2.1 SharePoint is easier to procure than most of its Enterprise Content Management system competitors	2
2.2 SharePoint 2007 is versatile	2
2.3 SharePoint 2007 devolves power to teams and end-users	2
2.4 SharePoint 2007 is a platform with a large ecosystem around it	3
2.5 A gap in the Higher Education information landscape for SharePoint 2007	3
3 The procurement of SharePoint by HEIs	4
4 Implementation approaches	6
4.1 Organic approaches to the implementation of SharePoint	6
4.2 Corporate approaches to the implementation of SharePoint	8
5 Drivers behind SharePoint implementations	9
5.1 Improving document management	9
5.2 Supporting cross-faculty working and cross-departmental working	10
5.3 Supporting collaboration with external partners	11
5.4 Enabling staff and students to find colleagues with similar interests	11
5.5 Improving intranets and/or external websites	13
5.6 Targeting information to particular audiences	13
5.7 Automating cross-institution processes	14
5.8 Providing a personalised portal for students and staff	14
5.9 Bringing together data kept on different systems in the University	15
6 Critical success factors for SharePoint implementations	17
6.1 Managing customisations	17
6.2 Managing the provision of new collaboration sites	18
6.3 Identifying a clear focus for the implementation	19
6.4 Providing training, advice and support	19
6.5 Clarifying the distinction between SharePoint and other systems in use within the HEI	20
6.6 Putting appropriate governance arrangements in place	21
7 SharePoint and teaching and learning	23
7.1 SharePoint's competitive battle with the specialist Virtual Learning Environment (VLE) providers	23
7.2 Uses of SharePoint in teaching and learning	24
7.3 Criticism of SharePoint and the concept of the VLE by learning technologists	26
8 SharePoint and research	28
8.1 Uses of SharePoint to support research projects	28
8.2 Using SharePoint to manage information needed for the Research Excellence Framework	29
8.3 SharePoint and the management of research outputs	29

9	Barriers to adopting SharePoint in Higher Education	30
10	Perceptions of Microsoft and SharePoint within Higher Education	31
10.1	Administrative/academic views	31
10.2	Anti-Microsoft feeling	31
10.3	Higher Education and Microsoft	32
11	The future of SharePoint in the UK Higher Education sector	33
12	References	35
	Glossary of SharePoint and other key terms	37
	Appendices	39
Appendix 1	Literature review	
Appendix 2	Report of telephone survey	
Appendix 3	Report of online survey	
Appendix 4	Report on community consultation	

1. About the Research Project

Interest in Microsoft SharePoint solutions is growing within the UK education and wider public sector. This study into the use of Microsoft SharePoint by Higher Education Institutions (HEIs) was funded by Eduserv, under their Research Programme, for two reasons:

- to improve HEIs' understanding about the level and nature of interest in SharePoint and whether it is justified in terms of accepted good practice
- to enhance Eduserv's understanding about the uptake and usage of SharePoint solutions in the UK HE community and influence their 2-3 year plans for service provision in line with their charitable mission.

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The work was undertaken by Northumbria University using a team of internal and external staff. The study's methodology comprised:

- an initial review of selected current literature on SharePoint in the HE sector: searches were conducted in information and education databases, on the websites of HEIs and on the web using Google. The review was largely confined to the UK HEI sector, although some examples from overseas were included. (See Appendix 1 – Literature Review.)
- a telephone survey of a purposively selected sample of UK HEI IT Directors/Managers: 40 HEIs were interviewed between August and October 2009; this represented approximately 25% of the UK HEI population and reasonably matched the population in terms of type of organisation and geographical location. (See Appendix 2 – Report of the Telephone Survey.)
- an online survey targeted at IT Directors and SharePoint Project Managers: informed by the telephone this survey, conducted in the last two weeks of October 2009, obtained further information on the scale and nature of HEI SharePoint use. 51 responses were received from 47 different HEIs. (See Appendix 3 – Report of the Online Survey.)
- an online community consultation with stakeholders in HEIs via a blog: the aim was to enable professional groups, institutions, vendors and individuals with an interest in SharePoint in the UK HE sector to express their views on its impact and on what the sector needs to do to maximise the opportunities it offers and to minimise any risks. The consultation was widely publicised and open from 21 October to 9 November 2009; seven responses were received. (See Appendix 4 – Report of the Community Consultation.)
- detailed case studies of the use and potential future use of SharePoint in three HEIs: face-to-face interviews were held with small numbers of staff in different roles.
- holding an event, 'Use of Microsoft SharePoint in UK Higher Education Institutions' in London on 25 November 2009. The presentations comprised interim findings from the project and case studies from a number of HEIs who had experience of implementing SharePoint.
<http://www.eduserv.org.uk/events/sharepoint-for-he>

2. Explaining the Rapid Growth of SharePoint 2007 within the UK Higher Education Sector

The study revealed that most UK HEIs are using SharePoint to some extent. In the telephone survey of 40 UK HEIs, 78% said that they were making some use of SharePoint (see Appendix 1). A further 47 UK HEIs completed an online survey and 61% said that they were making some use of SharePoint (see Appendix 2). Dominic Watts, UK HE Business Manager at Microsoft, estimates that 80% of UK HEIs are using SharePoint in some shape or form (*Personal communication, 11 September 2009*).

SharePoint's rise is all the more remarkable given the relative lack of success of other Enterprise Content Management Systems (ECM) in HE. Whereas the other big vendors of proprietary ECM systems (IBM, Oracle, Open Text, EMC etc.) all have HE customers, none of them has established any dominance in the sector. The vast majority of HEIs were not using a proprietary ECM system before SharePoint 2007 came along.

The reasons for the rapid rise of SharePoint 2007 in the UK HEI can be ascribed to several factors, discussed below.

2.1 SharePoint is easier to procure than most of its Enterprise Content Management system competitors

The vast majority of the institutions who participated in this study procured SharePoint by virtue of their Campus Agreement with Microsoft. (See Section 3.) The campus agreement is a vehicle used by many UK HEIs to purchase software from Microsoft including the Windows operating system, the Office productivity suite, and the Exchange e-mail server. HEIs are able to simply add licences to SharePoint 2007 onto that annual agreement. This campus agreement enables HEIs to obtain SharePoint without the need for competitive tender. In the 40 HEIs that participated in the telephone survey not a single one said that their purchase of SharePoint licences came after a competitive tender exercise: no HEI did ask a range of vendors to respond to a requirements document. Two other HEIs undertook some form of competitive tendering process for associated systems (email, student portal), and one of these is also considering competitive tendering for consultancy to develop their SharePoint implementation further.

2.2. SharePoint 2007 is versatile

Microsoft calls SharePoint the 'Swiss army knife' of information management systems. It can be used to run an institution's website and intranet. It can provide collaboration and document management facilities for work groups. It can be used as a portal providing a single point of access for staff and students to other information systems provided by the institution. It has workflow and electronic form capabilities. The other ECM vendors provide a similar range of functionality. The difference with SharePoint 2007 is that it comes as a 'job lot'; once licences to SharePoint 2007 have been bought the web content management, collaboration, document management, portal and workflow capabilities are included. Most of the other ECM vendors sell these capabilities separately. For example, if an organization purchases IBM Websphere as its portal, it would still need to buy their FileNet system if it needed a document management system.

2.3 SharePoint 2007 devolves power to teams and end-users

A strength of other ECM vendors is that their systems tend to be stronger than SharePoint on governance, administration and compliance. For example, the ECM suites from the other main vendors have at their heart an electronic records management system that enables an institution to hold and maintain a corporate fileplan and corporate retention and access rules. Ironically,

SharePoint's relative weakness in governance terms turns into a strength in the higher education sphere.

To take full advantage of the governance functionality offered by other ECMs an organization needs a corporate implementation and strong corporate governance rules, and hence these systems have done best in environments with strong corporate cultures, such as regulated industries and Central Government Departments. HEIs tend to be more federal in nature, with faculties expecting some degree of flexibility and independence. Corporate roll out of an ECM, especially for document management and collaboration, would risk alienating faculties and hence failing to achieve a satisfactory rate of user adoption.

SharePoint devolves considerable power to local teams, and can be deployed without a corporate roll out.

2.4 SharePoint 2007 is a platform with a large ecosystem around it

The rapid growth of SharePoint across all market sectors (not just HE) has seen a large ecosystem grow around the product. SharePoint 2007 can be extended either by writing custom code, or by integrating third party products.

There are a great many system vendors who are either adapting their own systems so that they can work in the SharePoint environment, or writing applications specifically to plug gaps in SharePoint functionality.

The huge growth of SharePoint has added to the pool of individuals and companies who can programme in C# and .NET (the languages used to develop in SharePoint), meaning that it is generally easier to find people experienced in working with SharePoint than it is to find people experienced in customizing the offerings of the other proprietary ECM systems. Having said that, some HEIs did report difficulty finding SharePoint skills. One said "the demand for experts exceeds the supply of experts". Another said "there is a lack of expertise in the market place at a price that HEIs can afford".

2.5 A gap in the Higher Education information landscape for SharePoint 2007

Most HEIs have implemented Virtual Learning Environments (VLEs) to manage content generated by their teaching and learning function. However, most had not implemented equivalent systems to manage content generated by their service departments, their administrative functions and their research function. Kingston University said that one of their motivations for implementing SharePoint 2003 was that "they had established systems for teaching and learning, and now needed to do the same for the corporate areas".

3. The Procurement of SharePoint by HEIs

Most of the HEIs surveyed had procured SharePoint licences through their Microsoft Campus Agreement. The Microsoft Campus Agreement allows an HEI to:

- choose which Microsoft software (both client and server software) it wishes to use
- designate how many users, devices or servers it wishes to be able to use or run that software.

Microsoft prices the campus agreement according to the numbers of users/servers/devices that will use or run the chosen software. Most HEIs in the study have included the Client Access Licences (CALs) for SharePoint 2007 in their campus agreement.

This should not be taken to imply that SharePoint 2007 is free for universities. The CAL licences staff and students to use SharePoint, but in most cases HEIs still need to pay for:

- server licences to run SharePoint on each server that they wish to deploy it on
- server hardware
- an external connector licence if the institution is allowing external people to access or contribute to their SharePoint implementation (for example if they wanted to use SharePoint as an extranet or for managing their external facing web site)
- licences for MS SQL server (the database that stores all content created in SharePoint)
- development time for any customisation that the HEI requires
- project management costs
- configuration costs
- training costs.

One HEI said: "It is free to buy licences, but SharePoint 2007 is not free to deploy". They cited the need to get in expert help for the technical configuration, and the need for a high investment in training.

The complexity of the initial configuration of SharePoint 2007 was a point made by several HEIs. Many brought in external consultants to help with this.

One HEI said of SharePoint 2007:

too much functionality available out of the box. The product scope is so vast that delivery is difficult to focus. The requirement for governance generated by large functional scope was too big an overhead for the university to cover. It required complex development/configuration to reduce product scope.

Another said that SharePoint was "complicated, particularly for configuration". Another said "technology requires a lot of resourcing to be implemented seriously".

Nevertheless SharePoint is still perceived as being a low cost solution in comparison to other proprietary ECM vendors. One HEI said:

We went to tender and shortlisted several large ECM vendors including Microsoft and Oracle. Had two days of demonstrations and interviews with vendors. But the prices the vendors were charging for ECM were far too expensive for us. We couldn't justify the expense.

We already had a campus agreement with Microsoft that included SharePoint. SharePoint met most of our intranet needs and a lot of our ECM needs. It was

a no-brainer to choose it because it was so much cheaper. We had to buy new hardware (but we would have had to do that whichever system we chose) but the only extra software licences we had to buy on top of the campus agreement were a couple of server licences which cost comfortably less than £1,000.

Another HEI said:

We got SharePoint by default. When we knew that we wanted a portal we started a tender process. We didn't get what we wanted out of it, so it was decided that, given that we already had SharePoint licences, we would use those.

The University of the West of England (UWE) reported that:

SharePoint has always been part of our Microsoft Campus agreement. We did have to buy an external connector licence for about £7,000 to enable us to set up extranet sites that external users can access.

4. Implementation Approaches

Two broad types of approach to implementing SharePoint within UK HEIs were observed in the study, which can be characterised as the organic approach and the corporate approach. The organic approach typically revolves around the provision of collaborative team sites for local work groups. The corporate approach typically has the use of SharePoint as an intranet and/or a portal at the heart of it, though most of these projects also involve (or envisage) the provision of collaborative team sites for local work groups.

4.1 Organic approaches to the implementation of SharePoint

With organic approaches a part of the organisation starts using or providing SharePoint team sites and the implementation grows organically over a period of time.

Imperial College London and UWE started their implementations with IT staff using SharePoint team sites for their own work. Use then grew as those groups started offering team sites as a collaborative tool to the rest of the organisation.

One HEI in the study said that one department had implemented SharePoint for its work. The implementation grew as the staff within that department invited colleagues in other departments to collaborate in their team sites. Now the HEI is embarking on a corporate implementation of SharePoint.

The main strength of the organic approach is that because it is focused on providing sites where teams need and want them there is generally high user acceptance and adoption. One HEI shared that:

there is no centralised approach. The freedom of choice allows user groups or faculties to opt out.

Organic implementations work best where there is a group responsible for the provision of SharePoint team sites that can:

- advise those requesting a SharePoint team site as to whether or not a team site is appropriate to their needs
- advise those requesting a SharePoint team site as to what features would be useful to them. SharePoint has an enormous range of functionality and work groups need some support in making judgements on what to include or leave out of their SharePoint team site.

One HEI reported a 'hands off' approach to implementing SharePoint team sites:

We set up a team site for any school/dept that wants one and for what they want; it is not centrally controlled beyond set up and technical maintenance. Schools/departments are given admin rights and manage own sites, they can request support as needed.

The main challenge for the organic approach is the issue of scalability. If a small team who become very familiar with SharePoint is providing advice and tailoring SharePoint team sites, then as SharePoint use grows they face challenges of:

- how to support existing users of the system
- how to respond to increasing requests for new sites as word of mouth creates increasing demand
- putting in place governance arrangements and defining lines of responsibility

- scaling up the server farm and ensuring that back up and recovery arrangements are in place.

Both Imperial College London and UWE report that their implementations grew organically to a point where the institutions have now recognised that SharePoint has become a critical system, and needs to be treated as a corporate system.

Imperial College has tried to tackle the challenges of scale by working with the ICT service desk to enable them to support users reporting problems and issues, and by implementing governance policies and procedures that were not needed when the implementation was small. It intends to develop template team sites, so that where there is a frequently encountered business need (for example a committee) a site is ready to deploy, equipped with web parts relevant and useful for that work.

UWE described their SharePoint implementation as follows:

Most of our SharePoint work has been done without a formal strategy. We have been using SharePoint for a long time, we were using it before SharePoint 2003. We started off just setting up team sites for ourselves. Then people got to hear about it, and it grew on an ad-hoc basis. As people came to us with problems, we would build them something in SharePoint if we thought SharePoint would help.

Our approach has always been to use SharePoint as a platform, rather than as a finished product. If people have a business need we will think through that need with them, and try to use SharePoint to create a solution to their need. If it can't do it out of the box we will do a bit of custom development work ourselves, or get a consultant in to help.

Our approach of sitting down with people and giving a tailored solution to their needs (rather than just a generic, template SharePoint team site) has worked well. SharePoint works well when people have a specific problem they need to address, and when the SharePoint solution is tailored to address that need.

As well as building the solution we provide ongoing support, people don't have to go through the help desk, they can come to us.

We are conscious that our approach [of tailoring sites to the needs of particular teams] is not easy to scale. We are trying to build a community of SharePoint champions around UWE. We have set up a user group, have regular meetings, and plan to use the group to develop a governance framework for the SharePoint implementation. (Gilbert, 2009).

Another HEI described their approach:

Teams ask web services for solutions. If SharePoint can be used to provide them with a solution then we will use it as part of the solution. No formal strategy. SharePoint is one of the technologies we can use to enhance a service for students and staff.

4.2 Corporate approaches to the implementation of SharePoint

Institutions taking a corporate approach choose to implement SharePoint for a specific purpose or purposes. It is a corporate project, with a high profile in the institution and dedicated corporate resources.

Examples of such projects include:

- Coventry University's implementation of SharePoint 2007 as a staff and student portal
- Kingston University's implementation of SharePoint 2003 as an intranet, an extranet with partner institutions, and its provision of a collaborative team site to every department and faculty
- Cranfield University's use of SharePoint to replace its intranet
- Napier University's use of SharePoint to manage its intranet, its externally facing website, and to provide team collaboration sites
- Glasgow University's implementation of SharePoint as a personalised portal for staff and students
- Oxford University's roll-out of SharePoint collaboration sites for research groups, committees and societies.

The corporate approach starts with bigger ambitions and more resources than the organic approach. With this approach HEIs are able to begin with the infrastructure and support arrangements that they need to sustain the implementation on an institution-wide scale.

Corporate approaches to SharePoint are more likely to need customisation than organic approaches to SharePoint, because they are more likely to involve either:

- external websites or intranet that usually require SharePoint sites to be rebranded to reflect the look of the corporate brand

or

- a portal which requires customisation to allow SharePoint to interact with third party systems.

or

- electronic forms and workflows that may go beyond the out of the box capabilities of SharePoint 2007.

The main challenge with the corporate approach is that institutions that have no prior experience with SharePoint are launching on very ambitious projects. SharePoint 2007 is not an easy product to install and configure, and the learning curve is very steep.

One HEI that implemented SharePoint to manage its intranet shared that:

No one in the institution had any skills in relation to SharePoint. I did my SharePoint training a week or two before implementation. When I look back on the sites and pages I created earlier this year I think there is so much more I could have done. It is hard to help content authors when you are scratching around with it to learn it yourself.

Our lack of knowledge meant that when a user asked us a question 'does SharePoint do this?' we were reliant on Microsoft's marketing material to give an answer, rather than us being aware of the limitations.

5. Drivers Behind SharePoint Implementations

SharePoint is a system with a wide variety of functionality that can be put to a wide variety of different uses. The SharePoint implementations explored in this study vary widely in their scale and scope. However, it is possible to identify a relatively small list of drivers behind the implementation of SharePoint within HE. All of the implementations examined in this study had one or more of the following drivers:

- to improve document management
- to improve cross-school/departmental working
- to support collaboration with external partners
- to enable staff and students to find colleagues with similar interests
- to improve an intranet or external website
- to target information to particular audiences
- to improve and automate cross institution processes
- to provide a personalised portal where staff and students can log-on in one place and access all the different systems of the university
- to bring together and manage data from different information systems around the organisation.

An analysis of the drivers cited by respondents to the telephone survey is included in Appendix 2 of this report (Report on telephone survey. See Section 4.2.) The two main drivers cited by respondents were 'collaboration' and 'improving services, systems and management'. In this section 'collaboration' is broken down into 'document management', 'cross-school/departmental collaboration' and 'collaboration with colleagues outside the institution'. 'Improving services, systems and processes' is broken down into 'providing a personalised portal for staff and students' and 'improving and automating cross institution processes'.

Five institutions in the telephone survey cited records management as the purpose for using SharePoint: 2 live implementations, 1 pilot, 1 planned and 1 being considered. So generally, there is little evidence of organisations applying records management measures with SharePoint. Two institutions mentioned that they may consider procuring 3rd party systems to improve records management in SharePoint. One HEI mentioned that it had advised one department to use SharePoint document libraries rather than shared drives for their important documents because of the possibility of applying version control in SharePoint.

5.1 Improving document management

SharePoint document libraries can be deployed in any type of SharePoint site, including SharePoint My Sites, team sites and publishing sites. However, it is in team sites that document libraries are most frequently encountered.

In SharePoint 2007 document libraries can be set up to have folder structures, columns of metadata can be defined for documents, and version control and check in/check out can be enabled.

Basic workflows can be set up around documents. Imperial College reported that some researchers wanting to publish papers use a SharePoint workflow to set colleagues a task with a deadline to comment on the paper. The advantage of this is that SharePoint will send out reminders to those who have not submitted their comments.

One HEI reported that:

The initial thing that everyone really likes and has made biggest impact is document collaboration. We were having a lot of problems with documents being e-mailed around and people having the wrong version of documents.

However, another reported that it preferred Google Docs for working on documents

Difficult to do collaborative working on documents in SharePoint, because you have to check them in and out. So we use Google docs for that and put documents in SharePoint when they are finished.

5.2 Supporting cross-faculty working and cross-departmental working

In SharePoint 2007 the control of access permissions is very granular. Local site owners can set permissions on who has the rights to design the site, contribute to the site and access the site. Access permissions can be set at a still finer level: permissions can be set on individual web parts (such as a document library) or individual entries within a web part.

This means site owners can provide colleagues from other faculties and departments with access to their site, without going through IT administrators.

One HEI reported as a key benefit of its SharePoint implementation:

The ability for teams to determine who should access their team site, without having to go through an IT person. It is easy for a site owner to give access to documents and reports to people elsewhere in the University. It is also easy for them to see who can access the site and who has what permissions to contribute to the site a site.

UWE said that the institution first saw the value of its SharePoint implementation when it went through a big restructuring exercise.

When the university went through a big restructuring SharePoint was invaluable. The S: drive (shared network drive) was organized according to the old structure. People were finding that they had joined a merged department, and had no place on the shared drive to share with their new colleagues. We were able to set the new teams up with SharePoint team sites, and they were able to keep on working.

UWE also used SharePoint team sites to help with the management of its student residences. Running a residence involves people from different disciplines working together to maintain the building and provide services. The different disciplines belonged to different departments and hence were mapped to different shared drives. Prior to SharePoint they had no common place to share information with each other. UWE said:

Our student village is staffed 24 hours. They used to have to have three meetings a day, so that staff were aware of issues from the previous shift. They tried keeping paper logs but it didn't work. We set them up a SharePoint team site, and now they use a discussion list to record any incidents (light bulb needs replacing etc.). If a serious issue arises we have set up an electronic form for them in InfoPath and they just fire it up in the SharePoint team site and set the process going.

5.3 Supporting collaboration with external partners

SharePoint is typically used in conjunction with Microsoft's Active Directory (although it can also be used with other identity management applications). An HEI can add people from outside the institution to its Active Directory. If the HEI has purchased an external connector licence (not typically included in a Microsoft Campus Agreement) then any local SharePoint team site owner can provide those external people who are listed on the institution's Active Directory with permissions to read or contribute to their site.

Cranfield University said:

We undertake large scale collaborative projects with industry partners. These partners put considerable sums of money into such projects. The University wants to enable the partners to be intimately involved in running the projects. The ability to set up extranet sites where external partners can access and collaborate on documents relating to the project via SharePoint document libraries is a considerable benefit for both the University and our partners.

The fact that the extranets are in SharePoint is advantageous because the IT departments in the various industrial partners are usually familiar with it, trust it and are prepared to allow their staff to access it. It is possible that if Cranfield was using an open source system, or a system specific to higher education, then this might be viewed with more suspicion by IT departments in our corporate partners.

Vanilla extranet sites can be set up quite easily; bespoke work is not required. Once a collaboration site is set up the business can manage their extranet without relying on ICT.

UWE reported that:

One quarter to a half of the sites we create involve collaboration with an external organization.

We have a research group in the arts, who are not part of the University, and who aren't on our network. We were able to set up a SharePoint site for them and give them access to it, and they were able to collaborate with the people they worked with in the University.

We did a big project with a local College to reorganize their IT infrastructure. We were able to set up a team site and give their staff and ours access to it so both parties could see the documents, and maintain issue logs.

5.4 Enabling staff and students to find colleagues with similar interests

Several HEIs said they deployed SharePoint My Sites in order to provide a 'people finder' for their institution.

My Sites in SharePoint 2007 provide an individual member of staff or student with two pages:

- a 'My Profile' page which enables an individual to display information about themselves for the rest of the organisation to see
- a 'My Home' page which provides an individual with a private space with which they can store and work on documents, store links and subscriptions to resources elsewhere within the SharePoint implementation (and/or to external resources).

Cranfield University reported that when it asked students and staff what they wanted from their SharePoint implementation one of the things that users requested was the ability to see which other members of the campus shared the same research interest as them.

My Sites in SharePoint 2007 have had mixed success. The main problem is a lack of take up by students and staff. One HEI shared that:

people like the idea of being able to search for colleague's skills, but lots of people aren't prepared to put in the time to update their own skills.

The lack of take up is partly due to competition from other forums on which people can maintain a profile. For example, students or staff could maintain profiles on free web hosted applications such as Facebook, LinkedIn, WordPress or Blogger. The advantage of the web hosted applications is that staff and students are then able to make themselves visible and contactable to people outside the institution, whereas SharePoint 2007 My Sites only provide visibility to colleagues within the same institution.

My Sites in SharePoint 2007 lack some of the functionality that web hosted social computing applications possess. For example, there is no facility in SharePoint My Sites for people to provide the status updates that make FaceBook, LinkedIn and Twitter such lively places.

Several HEIs that said that they have provided staff and/or students with My Sites but have not actively promoted them. One HEI said: "We implemented SharePoint although we didn't put much resources or publicity to it."

Cranfield University School of Management reported:

My Sites have been provided to students but are not heavily used. The School has not promoted My Sites. My Sites in SharePoint 2007 are out of date in comparison with free Web 2.0 applications such as Facebook and LinkedIn.

Imperial College has approximately 20,000 staff and students; almost 1 in 10 (2,000) have set up their My Sites.

UWE report that:

Not many students use SharePoint. All of them have a log on and the ability to create a My Site if they want to. But we haven't publicised it. Around 2,000 students have set up a My Site.

One solution to the problem of low take up of SharePoint 2007 My Sites is to pull in data from other systems, for example from the organisation's Active Directory or equivalent identity management system. One HEI said:

For My Sites we tried to pull as much information as possible from existing databases. We could do that with contact details, but we couldn't do it for people's place in the organisational hierarchy because we had no reliable data source for who each individual's line manager is.

Cranfield University found it had to do a lot of work to the data held on colleagues in Active Directory before it could pull the data into SharePoint My Site profiles. Fields such as office locations and telephone numbers were rarely filled in on Active Directory prior to the introduction of SharePoint. This was largely because those fields were never used or searched on. Now that the information on Active Directory can be exploited in the SharePoint environment it has given the University a reason to enhance and clean up that data.

Coventry University found that they were able to pull in information not just from the Active Directory but also from the Human Resource system to provide some standard, basic information for the My Site profile (Yeadon, 2009).

5.5 Improving intranets and/or external websites

Just as SharePoint 2007 provides team sites for collaboration and My Sites for personal profiles, so it provides publishing sites to enable an organisation to use cascading style sheets (CSS), and templates to manage content for an intranet site or an external web site.

SharePoint 2007 has some weaknesses as a content management system:

- out-of-the-box it does not offer compliance with web standards, including accessibility standards. One institution that considered using SharePoint for its intranet expressed anger that SharePoint 2007 requires customisation to produce sites that meet accessibility standards. They told us “you shouldn’t sell a product into higher education that doesn’t produce accessible code”
- to reproduce an organisation’s branding on a website in SharePoint 2007 usually requires customisation.

UWE report that:

One problem is the complexity of branding. It is a non-trivial exercise to brand sites. We have two levels of branding. With publishing sites (used for the top levels of faculties’ site collections) we set up branding as a SharePoint ‘feature’ that we deploy. With team sites we have branding as a ‘theme.’ Theming only goes so far: you can apply it to a SharePoint page but you can’t apply it to items on a page like a list or a library.

Another HEI successfully used SharePoint to manage their external web site but reported:

web content management functionality [in SharePoint 2007] is not great and branding and look and feel required heavy customisation. Limited availability of web experienced consultants, and small budget has made progress slow.

SharePoint is not a big player in terms of the numbers of HEIs that are using it to manage its external website. Recent Eduserv funded research into web content management systems did not mention SharePoint (Social Issues Research Centre, 2009). Most of the HEIs we spoke to that were using SharePoint for their intranet or for internal collaboration were using a different system for their web content management system.

Nevertheless the Head of Communications at one HEI in the study declared themselves delighted with the results of moving their external website over to SharePoint 2007, and HEIs such as Napier University, Leeds Trinity University College and the University of Gloucestershire, are using SharePoint 2007 to run their externally facing websites.

5.6 Targeting information to particular audiences

One participating HEI said that one of its main drivers for implementing SharePoint for managing its intranet was to be able to target news to particular internal audiences. It wanted to detect what campus the person accessing the intranet belonged to, and whether they were staff or student. This would enable them to filter out news about, for example, building work affecting another campus.

Cranfield University reported:

We are making use of the ‘audiences’ function in SharePoint, to allow one SharePoint URL to present different information to different people depending on the audience they belong to. The need to define audiences has revealed fundamental differences in the way that different parts of the University define particular groups. For example, there was no agreement on what constituted

a 'researcher'. Some parts of the University viewed PhD students as researchers, others did not. Some parts of the University regarded research assistants (RAs) as researchers, others did not. A common definition of what constituted a 'researcher' had to be agreed before 'researchers' could be implemented as an 'audience'.

Sometimes a School will request that information about their School-specific policies, procedures or services is displayed more prominently than information about equivalent University-wide policies, procedures or services. Sometimes they ask for their staff and students to be directed to a SharePoint page that does not display any information about the equivalent service provided by the central service department. Although audiences can be used for this purpose we have found that the audience is not a universal panacea, and cannot 'paper over cracks' in business processes between different areas. There is a management overhead to setting up audiences and sustaining it as a particular page changes over time. If a colleague searches for information rather than navigates to it then the search results that are returned are not filtered by audience.

5.7 Automating cross institution processes

SharePoint 2007 comes with the ability to deploy workflows on documents in document libraries, on items in lists. It also has the ability to institute workflows on electronic forms (the electronic forms being generated in a separate Microsoft application called Infopath).

Imperial College reports some usage of the workflow capabilities by staff, in particular by academic staff setting up workflows to manage the process of inviting colleagues to comment on papers that they intend to publish. By setting up a workflow SharePoint can issue the reminders rather than the author having to chase.

Cranfield University said that one of the main benefits it was looking for from implementing SharePoint was to be able to set up a facility for processes such as claiming travel expenses to be done online rather than on paper. However, it reported that it found setting up the Infopath forms and the workflow to be far more complex than anticipated:

We are trying to use InfoPath electronic forms, but are finding it technically quite hairy. In theory it is advantageous for us to use it. But it is not as easy as it should be. We've found it very difficult to get a travel and subsistence form working properly. Infopath seems unnecessarily complex just to make a form available.

UWE has been able to get Infopath electronic forms running with workflows, but reports that it procured a third party product to help, and that it took a year and a half of struggle before getting the measure of it.

5.8 Providing a personalised portal for students and staff

The desire to provide a personalised portal for students and staff is partly a recognition of the problems caused by the existence of many different information systems within an HEI. Students and staff may be asked to interact with several of the following: the VLE, library system, institutional repository, student records system, human resource system, finance system, document management or collaboration system, content management system.

SharePoint 2007 provides a single sign on facility (SSO). SSO is a facility which, at least in theory, enables students and/or staff to sign on once and then access the various different systems

provided by their institution without having to log in separately to each system. The ambition to have SSO is closely connected to the issue of identity management in the institution.

The ability to provide students with a single sign on facility and a personalised portal is seen by some Universities as something that could help student retention.

Glasgow University is instituting SharePoint as their student portal, with the main driver being to improve services for students. It aims to provide

a student portal enabling them to collect their own information (i.e. email, files) together; It will also provide web parts linking to university systems allowing students to access the student records system, library services, printing services, and learning materials on the VLE. Vision is to have a feature rich communication and collaborative environment. SharePoint is part of a jigsaw, fits with OCS [a Microsoft communication tool which includes instant messaging], presence technology, wikis, blogs etc. (Montgomery and Farrow, 2009)

However, Glasgow University is not using the single sign on facility in SharePoint 2007. They report that the single sign on facility in SharePoint 2007 is not a fully functioning out-of-the-box single sign on facility. Instead it provides a place for an institution to write and deploy its own code to act as a single sign on facility. Rather than write its own code, Glasgow decided to develop, with external consultants, a single sign on web application and web part to integrate with their existing identity management tool to manage the authentication of students and staff. Having logged onto SharePoint a member of staff or student will be able to click on a dedicated link from their My Site which takes them to the third party product which will authenticate them with other systems in the University.

One HEI in the study is using SharePoint as a portal, but has a different system to manage its website content and its intranet content:

Until now we had one big website, without a separate intranet.

We are now splitting it into an external website for the outside world, and a portal [intranet] for staff and students. We have set up SharePoint to hold the high level portal pages and to be the point of single sign on to take students and staff into the applications that they need. SharePoint also handles the personalisation to change the portal according to the role and preferences of individual users.

Lower level portal pages are being kept in the web content management system, but being redone so that they look like portal pages. It is a pain having the higher-level pages in SharePoint and the lower level pages in another content management system. We hope to get a content management system that will manage both web and portal content, with SharePoint holding the higher-level portal pages and handling the single sign on and personalisation."

5.9 Bringing together data kept on different systems in the University

The existence of many different systems within a single HEI means that data on matters of interest to the institution (data about staff, about students, about research publications etc.) is scattered across different systems.

SharePoint 2007 offers, through its business data catalogue, the opportunity to bring data from other information systems into the SharePoint environment (without coding but using XML) where it can be manipulated and used.

One example of the use of this is for providing an institution of a view of how it is performing against a range of indicators, where data is drawn from a variety of different systems.

Certain features of SharePoint are likely to lend themselves to use in this capacity: the fact that it is a general system that the University can allow everyone on campus access to; that it crosses the boundary between academic and administrative functions; and that in SharePoint lists you have Excel style functionality plus the ability to set fine grained access permissions on the list itself and items within it.

Several HEIs expressed an intention to use SharePoint for integrating and managing data.

Cranfield University said that:

Longer term we will look to use BDC (business data catalogue) to integrate data systems from our student database (SITS) and financial database (Agresso).

One HEI reported that they were:

Currently working on a business intelligence dashboard. We are setting up SQL Server integration services to extract data from many different systems and pull it into a data warehouse. We will use SQL Server reporting services to allow us to define reports that can be viewed through SharePoint.

Previously administrators would collate data from many Excel spreadsheets, a process that is time consuming error prone, insecure and difficult to control. We will be able to use SharePoint security model to define who sees the reports, which means we won't have to e-mail them around. Some of the reports are business sensitive.

Another HEI reported:

We have used SharePoint to integrate with some back end systems. Asset management has a bespoke system for managing energy consumption in SQL that doesn't have a good web front end. They want the rest of the university to be aware of how much energy they are using. We have set up a front end in SharePoint for users to access that information. We have used SQL reporting services to integrate with the SQL database.

6. Critical Success Factors for SharePoint Implementations

Any institution implementing SharePoint needs to ensure the following things are right in order to sustain their implementation:

- identify what customisation needs doing and managing those customisations and any external parties
- find a way of managing the provision of new collaborative team site
- identify a clear focus for the implementation
- provide enough training, advice and support to enable people to make use of the system
- clarify the relationship between SharePoint and other systems in the institution
- put adequate governance arrangements in place.

6.1 Managing customisations

Although SharePoint contains an enormous range of functionality, there are occasions, particularly in ambitious corporate implementations, where an institution needs to customise SharePoint to achieve a particular purpose. Customising SharePoint is something many SharePoint experts advise should only be done as a last resort, as it complicates the maintenance and upgrade of a SharePoint implementation.

The types of reasons for customising SharePoint 2007 include: rebranding SharePoint sites to reflect the look and feel of an institution's brand; altering sites to meet accessibility standards; and integrating SharePoint with other systems in the institution.

Managing customisation often involves the use of external developers, particularly where institutions do not have in house skills in the programming languages needed to develop in the SharePoint environment (C# and .NET).

Kingston University was one of the earliest UK HEIs to adopt SharePoint corporately. It implemented SharePoint 2003 in 2004. Due to weaknesses in SharePoint 2003, Kingston had to undertake extensive customisation. Most of the customisations were done by a third party. This made it heavily dependent on the third party, because only the third party understood how the customisations were written. Whenever a new service pack was released it had to check each customisation to see how it was affected by the upgrade, and the customisation had to be rewritten if it was broken by the service pack.

One drawback to customisation is the impact that it has on the ongoing maintenance and upgrades to the SharePoint implementation.

At the time of writing Kingston University had not yet been able to migrate from SharePoint 2003 to SharePoint 2007. Microsoft radically changed the architecture of SharePoint between the 2003 and 2007 versions. There is no migration path for many of their customisations so for customisations which are popular with colleagues and not present in SharePoint 2007 functionality the University is considering how to reproduce them in SharePoint 2007. In a sense Kingston is a victim of its own success: the growth of the SharePoint platform means that it has a large amount of content and it has become critical to some areas of the University. For this reason the University is taking a very gradual approach to upgrading to 2007. The upgrade will take place over a two year period, with Departments and faculties gradually being moved over to SharePoint 2007. The University will run both 2003 and 2007 in parallel for a considerable period of time.

Cranfield University reported that:

The University traditionally developed web applications in Java, on top of Unix machines running Linux and Apache. This creates some challenges. SharePoint 2007 can be customised on two different levels.

Minor changes can be done through SharePoint designer, and this can be done in-house by one of the development team.

Radical changes, requiring changes to the code, need to be done by people with .NET skills or Visual Basic skills. The University does not possess these skills in-house and in situations where radical change is asked for or required the University is dependent on external consultants.

The development team does not hold SharePoint in particularly high regard as a development platform, and would be reluctant to switch their development effort away from Java towards developing in SharePoint.

Another HEI reported that:

It is important to use external consultants in the right way. We chose the company that convinced us that they would work alongside us, so that our staff learned skills from them and understood what they did. We only call them in when we don't know how to do something. And they have largely been as good as their word, they have worked alongside us.

6.2 Managing the provision of new collaboration sites

Managing SharePoint team collaboration sites is a different proposition from overhauling an intranet site. A typical intranet can be architected and designed as a whole, intranet content is relatively static (although most organisations are making efforts to inject more movement into their intranets), and the rate of growth of intranet content is incremental.

In contrast, team collaboration sites can potentially be created for a vast array of different groups, at different times and for different purposes. Sites may be needed by ad-hoc teams as well as by long standing committees and organisational units. They may be used for long running projects as well as for fleeting or aborted work items. The rate of growth of team sites may grow exponentially given the potential for team site owners to create sub-sites under any team site that they create.

The big design question that each institution implementing SharePoint must answer is: who can have a team site, for what purpose, and how do they get one?

Kingston University took a big bang approach and set up each school and department with a collaborative team site that was available to them from the go-live date of the system. The advantage of this approach was that every area of the organisation had a team site already set up without having to ask for one. However, Kingston says that if it could start over again it would not do it that way. The structure has made it difficult to set up cross-organisational team sites. Anyone wanting a team site for a cross organisational work group has to ask the site owner for their faculty/departmental site to set up a new sub-site. The difficulties of this are exacerbated by the fact that Kingston is using SharePoint 2003. In SharePoint 2003 permissions for a sub-site are automatically inherited from a parent site. In such a situation the site owner would have to manually remove all persons from the faculty/department that they did not want to access the site, and add in any people from other departments/faculties that they did want to access the site.

Another HEI that used the organisational structure for team sites said:

We have site collections for each school and then it is self managed below that, within guidelines. We have made clear through training and in resources what the rules were for self management.

Oxford University has defined what it wants team sites to be used for. It will be focusing the provision of team sites on research groups, clubs and societies and committees. By focusing the scope of team sites it is able to reduce the risk of SharePoint sprawl, and able to design template team sites for those purposes, containing the web parts and layout most likely to be of use to people in those situations.

Many institutions have put a process in place so that when teams want a new team site they need to apply for one. This enables the team supporting or advocating the SharePoint implementation to check that a SharePoint team site is an appropriate tool for that group, and to provide them with support and advice.

6.3 Identifying a clear focus for the implementation

The fact that SharePoint can be put to so many uses means that there is a need to focus a SharePoint implementation, particularly a corporate SharePoint implementation. This is to avoid an implementation over-stretching itself.

One administrator of a SharePoint implementation at an HEI said:

The biggest problem is feature creep. As soon as people realise what SharePoint can do, and that you can automate stuff that they do manually, they want to do lots of things. Biggest challenge is cutting it back to the essentials so that it doesn't hold back the implementation.

I took on too much at the start and now have a huge backload. You see SharePoint and think 'wow, this can do so much'. But don't take on too much. Talk to stakeholders and establish what are the top priorities and do them before them before anything else. One of our priorities was an online holiday form. Make sure that priorities are agreed by management and are based on a good business justification. Need understanding from IT infrastructure people.

6.4 Providing training, advice and support

Training is a critical challenge for both corporate approaches and organic approaches to rolling out SharePoint.

Imperial College defines two classes of users:

- End users – people who use SharePoint team sites for collaboration and for uploading and working on documents. They seem to pick up SharePoint relatively quickly
- Power users – they set their sites up, set the permissions on sites, and add web parts to sites. SharePoint has a wide range of functionality, and power users have a great deal of choice. The flip side is that SharePoint does require significant input and time from power users to make it work.

One challenge with the organic approach to implementing SharePoint is that the institution does not know in advance who will even have access to a team site, or who will become a power user setting up and administering a team site. The emphasis switches away from providing training at

the initial go-live point of the system, towards providing support and advice at the point at which a particular work group or team decides it wants to have its first team site

Imperial College shared that:

We have a specialist role dedicated to advising colleagues on the use of collaborative technology. If colleagues need advice on whether to use SharePoint, or if colleagues think they would like to use SharePoint but don't quite know what for or how, then the service desk will refer them to [her].

Lots of people have heard of SharePoint. Sometimes colleagues come to [Her] and say they would like to start using SharePoint but don't know what for. It is hard to explain to people what SharePoint is because it can be made to do virtually anything. [Her] approach is to ask them about their work and the areas in which they need technology to support them.

Sometimes [she] will recommend SharePoint and advise on how to use it, other times she will advise an alternative tool, or an external web hosted application. For example, if people want a wiki, then Imperial's specialist Wiki tool 'Confluence' seems to be a better wiki than SharePoint. But if people want a lot of different types of collaborative functionality, and the wiki is just one aspect of the functionality that they require, then a SharePoint team site, with a SharePoint wiki, is likely to be the better option.

UWE's approach has been to train staff on how to use their SharePoint My Site. It knows that every member of staff has a My Site available to them should they wish to use it. Furthermore, each staff member is the administrator of their My Site so has the full range of permissions to design their Site and add pages, add web parts, and set access permissions for other people.

One HEI that rolled out SharePoint as an intranet said:

Training for the first lot of content authors didn't go well. We got an external trainer in, and his training was mainly about the general features of SharePoint rather than our specific usage of SharePoint. That left the group feeling negative. We have changed our subsequent training to make it very specific to our implementation. We don't call it SharePoint training, we brand it with our name for the intranet. We use in-house trainers.

6.5 Clarifying the distinction between SharePoint and other systems in use within the HEI

One HEI expressed concern about the fact that SharePoint could, in theory, do the job of any system around the HEI that manages content or manages a process. This could potentially be disruptive, with a SharePoint implementation entering into competition with existing systems within the organisation, and causing confusion with staff about where to put content:

Universities have different systems that can be used for managing digital content: VLE, SharePoint, Institutional portal, CMS, Institutional repository. Each of these systems has a specific role to play. It starts getting dangerous when they start to replicate what each other do. There needs to be a way of transferring information from one system to another.

UWE reports that occasionally colleagues in faculties will experience confusion as to whether to upload a particular piece of information to the Blackboard VLE, to the UWE intranet, or to their faculty's SharePoint site.

Another HEI decided to restrict the scope of its SharePoint implementation in order to avoid confusion with the VLE:

We have no plans to roll out to SharePoint to our students. We have made a heavy investment in Blackboard for VLE.

6.6 Putting appropriate governance arrangements in place

One HEI in the study said:

“With regards to team collaboration sites we are concerned to avoid SharePoint sprawl. We heard a talk from another organisation who experienced an explosion of team sites as people created levels of sub-sites under the original team sites. We want to put a workflow in place so that if people want a new team site it has to be approved by IT, and if people want a new sub-site within that team site it has to be approved by the site owner. We can't do that with SharePoint out of the box. We are going to have to get a consultant in for five days to write custom code.

Imperial College reported:

We devolve the administration of collaborative team sites to colleagues in Schools or Services. ICT do not have the resources to administer the sites themselves.

With governance there is only so much the ICT department can do centrally. Once administration of sites has been delegated to local power users ICT cannot stop them creating sub-sites.

Imperial College's advice to other institutions implementing SharePoint was to think through the following questions:

- Who will look after the infrastructure?
- How will the support for users be provided?
- Can your help desk cope with supporting SharePoint users when the implementation scales up?
- If colleagues want to use visual studio to do complex workflows can ICT support them, or are they on their own?
- How many site collections will you set up? Just one? Or several?
- How is your URL structure going to work?

Cranfield University said:

*We operate a simple permissions model for our sites:
Owners (people who can redesign or reconfigure a particular site)
Members (people who can contribute to a particular site)
Visitors (people who can view the site but who cannot contribute to it).*

We encourage people to use active directory groups when defining 'Visitors' to the site, as these tend to be larger categories of people (for example an entire academic School). When defining members and owners people tend to set up bespoke groups in SharePoint as the particular combination of people they want has probably not been defined in active directory.

One HEI mentioned the need for “a controlled roll out to prevent uncontrolled growth and sprawl”; but also mentioned the tension between governance on the one hand, and growth and uptake on the other:

Rapid application development for SharePoint brings with it risk of uncontrolled growth. Mitigation of this risk may itself be a barrier to success –

difficult to balance demand versus control. The need to be very structured sometimes reduces quick win approach.

7. SharePoint and Teaching and Learning

7.1 SharePoint's competitive battle with the specialist Virtual Learning Environment providers

The vast majority of UK HEIs already have a VLE, which in effect acts as a content management system for teaching and learning content.

VLEs enable HEIs to provide students with access to learning materials, news and information relating to their courses. This typically includes course calendars, lecture notes and past exam papers.

The market for VLEs in the United Kingdom is dominated by two systems: Blackboard (a commercially licensed system) and Moodle (an open source system).

Microsoft would like SharePoint to be perceived and used as a VLE:

- In October 2008 Dominic Watts, Microsoft UK's higher education business manager, wrote a blogpost entitled '*Using SharePoint as a VLE*'. In the post Watts (2008) states that HEIs could use SharePoint as their VLE either by using out of the box functionality or by customisation.
- Microsoft released some open source code (the SharePoint Learning Kit, <http://www.codeplex.com/slk>) which extends SharePoint to provide SCORM (Sharable Content Object Reference Model) functionality. Wikipedia (2009) describes SCORM 2004 as embodying:
a complex idea called sequencing, which is a set of rules that specifies the order in which a learner may experience content objects. In simple terms, they constrain a learner to a fixed set of paths through the training material, permit the learner to "bookmark" their progress when taking breaks, and assure the acceptability of test scores achieved by the learner.
- The University of Glasgow reported that when they chose SharePoint as their Portal product, Microsoft tried very hard to persuade them to deploy it as a VLE (Montgomery and Farrow, 2009).

In terms of market share, SharePoint is a long way behind the leaders in the VLE market (Blackboard and Moodle). Only two examples of HEIs deploying SharePoint as their institutional VLE were identified during the study: the University of Plymouth and Anglia Ruskin University.

One HEI said:

We would consider SharePoint as a VLE, but the downside is that it is not a VLE out of the box.

And another said:

some departments have started to use SharePoint as a VLE but this is breaking the rules although it does lend weight to argument for using SharePoint as a VLE.

The learning technologist at Cranfield University drew comparisons between SharePoint and the market leaders VLEs:

If we deploy Blackboard it will cost us around [£ tens of thousands] in licences per year. We know what we are getting, we know there is not much flexibility or scope to customise, but we can easily set up all our courses and get the VLE up and running.

If we choose Moodle we do not have to pay a penny in licences. But it needs more customisation than Blackboard, and you need people with .PHP [a general-purpose scripting language] skills to do that. We haven't got .PHP skills in house so what we save on licences would go on buying in .PHP skills

We could set up all our courses as SharePoint team sites. But we have 2,000 courses, and to set up and administer 2,000 SharePoint team sites would be a nightmare.

Sequencing learning in SharePoint [for example to ensure that a student took a particular path through learning materials, and tackled materials in a certain order] would require customization, or the creation of workflows. SharePoint does not natively support SCORM packages, and the open source SharePoint Learning Kit that Microsoft has provided via Codeplex is not supported by Microsoft.

There is a reluctance to use SharePoint (and Microsoft products in general) in some academic quarters, and in particular in areas such as engineering, mathematics and computing, where they prefer to use open source software.

Providing grade book functionality in SharePoint would require customization.”

A Learning Technologist at another HEI reported:

Our VLE is now more than just Blackboard. It consists of ELG open source social networking environment, Wordpress blog environment, Desktop video environment, MediaWiki. Wimba has audio tools, podcasting, audio and video classroom environment, with whiteboard and two-way video environment.

Almost all modules and courses represented in the VLE. It would be hard to see any functionality that we could meaningfully shift to SharePoint.”

7.2 Uses of SharePoint in teaching and learning

Although SharePoint is rarely being used as an institutional VLE, this does not mean that it is not being used in teaching and learning. It is generally being used for specific purposes for which the institutional VLE, with its rigid structure, is unsuited.

For example, Cranfield University's School of Management reports:

We develop custom MBA courses for external clients. We use SharePoint to provide each client with a customised learning environment, tailored to their needs, and accessible through the client's website. This is a very specific need that the University's Virtual Learning Environment (Blackboard) would not have been suited for – partly because Blackboard is less easy to customise, and partly because Blackboard's licensing arrangements would require an extra payment each time we provided a portal for a different organisation.

We customise the portals we set up for our clients so that they are as close as possible in look and feel to the client's own website.

Each portal has a home page and learning materials arranged into the different modules of the course. The students like the fact that they can access the learning materials via a SharePoint calendar. They click on a day where they have a lecture and see links to all the relevant material for that

day. They can synchronise the course calendar from SharePoint with their Outlook. Students are also given team sites to collaborate with their peer group through the course and these are heavily used.

In response to a blogpost in the context of this study (Lappin, 2009) on 'SharePoint vs Blackboard and Moodle: The battle for the VLE market in UK HE', Sonja Eisenbeiss of the University of Essex told us:

We are using both SharePoint and Moodle in our Department and we seem to fall into two groups of teachers/researchers: Moodle is used by those who teach standard modules and find it convenient. SharePoint is used for those who want more flexibility, more collaborativeness, and the possibility to have different levels of user permissions and contributions. Those of us who prefer SharePoint are typically colleagues who are organising research groups or teach one-off tutorials etc. (Eisenbeiss, 2009)

Imperial College use Blackboard for their virtual learning environment and SharePoint for collaboration. They told us:

If students are doing a group project, or want to do a group presentation then SharePoint provides them with better functionality, though students do have an alternative in the form of Google Docs.

UWE runs a graduate development programme (GDP) to provide students with generic skills for study and life. The programme cuts across the different faculties of the University, so the rigid course structure of Blackboard cannot accommodate the documents generated by the programme. UWE designed a custom form within SharePoint for colleagues from anywhere in UWE to upload a GDP document, describe it and index it. They also set up a faceted search for people to be able to search the GDP documents.

UWE also adapted SharePoint team sites for use in an exercise for their law students:

Recently there has been some take up from the academic side for teaching purposes. In the law facility one element of teaching is a simulation of what it is like to be in a law firm working on cases. In the past these exercises would be paper based. They were extremely paper intensive, and unpopular with students.

We created a solution for them with SharePoint team sites. If the case involved two different law firms each representing a different client, then we would set up one team site for each law firm. We would allocate students to the different law firms. We linked e-mail accounts to the team site so that the two law firms could communicate with each other. We even put a voice mail facility into the team sites so that voice messages could be recorded and left.

The students loved it. They accessed the law firm sites through the Blackboard Virtual Learning Environment, and this enabled us to monitor the hits on the site. The Blackboard site for a law degree course module typically gets around 200-300 hits over the whole course. With the first legal practice simulations in SharePoint we got 4,000 hits in the first fortnight, even though it was a non-assessed piece of work. The statistics showed that students were often accessing it between midnight and two in the morning. With the second simulation we got 14,000 hits from students.

Tutors were able to access the sites of both law firms involved in each case, and can look at the activity logs in the sites to follow through the interactions between the firms.

7.3 Criticism of SharePoint and the concept of the VLE by learning technologists

Learning technologists are an influential group in relation to the use of applications to support teaching and learning in HE. Some learning technologists have been very critical of SharePoint.

George Siemens is a theorist on learning, and author of the influential article 'Connectivism: A Learning Theory for the Digital Age' (Siemens, 2004). In September 2009 he wrote on his elearnspace blog:

I'm a bit negative on Microsoft these days. I'm teaching a course using SharePoint (an Old English term meaning "hell"). It's horrendous. Please, if you like the people or customers you work with, never, ever, make them use SharePoint. Microsoft understands systems/process. But not end users. (Siemens, 2009)

Those learning technologists that are critical of SharePoint also tend to be critical of the whole concept of the VLE. Critics of the VLE say that they are more about managing the institution's content, rather than about helping students to learn. One source of criticism is that a VLE is owned by the University and only accessible to the student whilst they are studying at the institution. Another is that the VLE is bounded by the institution, and does not generate opportunities for the learner to connect with others outside the institution. Some learning technologists have proposed the concept of a Personal Learning Environment (PLE) which enables students to record their learning in a space that they can access after they have left the institution, and which enables them to collaborate with people at any institution or outside of the world of Higher Education.

At the 2009 Conference of the Association of Learning Technologists (ALT –C) there was a vigorous debate on the topic 'The VLE dead'. The panel included two people from the University of Plymouth, who are using SharePoint as their VLE (Steve Wheeler and Nick Sharratt). Nick and Steve were on opposite sides of the debate. The speakers' positions prior to that debate were as follows:

The first panel member, Steve Wheeler, will argue that many VLEs are not fit for purpose, and masquerade as solutions for the management of online learning. Some are little more than glorified e-mail systems. He will argue that VLEs provide a negative experience for learners.

The second member of the panel, Graham Attwell, believes that the VLE is dead and that the Personal Learning Environment (PLE) is the solution to the needs of diverse learners. PLEs provide opportunities for learners, offering users the ability to develop their own spaces in which to reflect on their learning.

The third panel member, James Clay, however, believes that the VLE is not yet dead as a concept, but can be the starting point of a journey for many learners. Creating an online environment involving multiple tools that provides for an enhanced experience for learners can involve a VLE as a hub or centre.

The fourth panel member, Nick Sharratt, argues for the concept of the institutional VLE as essentially sound. VLEs provide a stable, reliable, self-contained and safe environment in which all teaching and learning activities can be conducted. It provides the best environment for the variety of learners within institutions. (ALT-C, 2009)

Steve Wheeler works in the Faculty of Education at the University of Plymouth. He is responsible for convening the University's e-learning research network and co-ordinating technology mediated

learning for the Faculty of Education. He posted the following about SharePoint, Blackboard and Moodle on his blog in July 2008:

I am against the sterile, meaningless Managed Learning Environments (read BlackBoard, SharePoint and yes, even Moodle) that universities and colleges push which are purpose built to maintain strict control. They constrain the use of materials, and ensure that only bona fide students are allowed in. The students don't like them, and only use them because they have to. Anything an MLE can do, the social web can do just as well, if not better.... oh, and did I mention, usually for free. (Wheeler, 2008)

In November 2008 Neil Witt, Technical Director of HELP CETL, and also based at the University of Plymouth wrote on his blog:

I work for an institution that has that well known Enterprise level Document Management Platform, SharePoint, as its VLE. Does it work, well – not at the moment. Will it address our Teaching and Learning needs? Doubtful. At this institution, as with many others, there are small groups, sometimes a lone voice, some sparks of inspiration who have been doing elearning for many years. They use free hosting, flickr, youtube, open source, anything they can get their hands on for delivering what they want to deliver to their students. It's done from a sense of frustration trying to escape from the corporate one size fits all solution. They recognise that there isn't 'a solution', there are many solutions out there so why not choose the one, two or many that address the needs of the learner rather than the monolithic structure that's managed and controlled but empty, unused and probably unusable. (Witt, 2008)

8. SharePoint and Research

There are various reasons why the market for systems to support the research activities of HEIs is nowhere near as large, as homogenous or as mature as the market for systems (VLEs) to support teaching and learning in HEIs:

- The market for systems to support research is smaller than the market for VLEs. Schools and the further education sector are in the market for VLEs as well as Higher Education. Virtually every HEI does a huge amount of teaching and learning, whereas a significant proportion of HEIs do relatively little research.
- The demands of a HEI in relation to research are many and various; so various that it is hard to conceive of them being provided by one package in the way that Blackboard (say) provides a one-size-fits-all VLE. Requirements include:
 - collaboration facilities for project teams to share news, documentation and data with each other
 - data management facilities to manage research data
 - project management functionality to manage research projects
 - research management systems to manage bids for funding
 - management of the publication record of staff to support reporting against the Research Excellence Framework (<http://www.hefce.ac.uk/Research/ref/>)
- The nature of research projects is much more diverse than the nature of taught courses. A taught course in the sciences can use the same VLE as a taught course in the humanities. However, a scientific research project is likely to need a very different set of information management tools than a research project in the humanities. A large scale research project will need a different set of information management tools than a small scale research project.

There is no dominant provider of research support systems within higher education. However, there is a considerable amount of work being done with the sector on defining and providing 'Virtual Research Environments'. JISC has a Virtual Research Environment programme (<http://www.jisc.ac.uk/whatwedo/programmes/vre.aspx>) with several funding projects, most of which involve the use of open source systems, such as Sakai; only one of those projects involves the use of SharePoint.

8.1 Uses of SharePoint to support research projects

The largest scale attempt to use SharePoint to support research projects is coming from the University of Oxford (Oxford University Computing Services, 2009), which is attempting to define a template SharePoint team site for research projects, and make that available to research teams within the University.

Several HEIs have used SharePoint to support research projects that involve external partners. (See Section 5.3 above).

Imperial College reported that many research teams use the calendar web part within SharePoint team sites to control the booking in and out of laboratory equipment.

8.2 Using SharePoint to manage information needed for the Research Excellence Framework

Cranfield University reported:

We are gathering their requirements for a CRIS (Current Research Information System) that will help us assess ourselves under the Research Excellence Framework (REF).

We originally thought of using SharePoint My Sites to help each academic build their individual publications record. Our development team produced a prototype solution in SharePoint but we found that it was clunky and did not compare with specialist research management systems that are claiming to be 'REF ready'. We intend to look for an off-the-shelf package that can manage publications, research contracts and automatically generate academic CVs.

8.3 SharePoint and the management of research outputs

Most HEIs maintain an institutional repository to retain a record of their research outputs. However, the study did not identify any institutions using SharePoint as an institutional repository.

Chris Awre at the University of Hull is conducting a JISC funded project called the Content Lifecycle Integration Framework (CLIF) project (<http://www.jisc.ac.uk/whatwedo/programmes/inf11/sue2/clif.aspx>) looking at how to make it easy for someone to transfer content from a system they are working in, into the institutional repository. Hull is using SharePoint as one of the examples of systems that HEIs would like to link to the institutional repository.

9. Barriers to Adopting SharePoint in Higher Education

One HEI reported on the doubts it had about the feasibility of deploying SharePoint across the whole of the organisation:

We have used SharePoint in two, relatively small areas. Both areas have found it useful, but they have expressed concerns about whether their approach to implementing SharePoint could scale across the University. For example both areas were able to come up with their own policies for how they would govern SharePoint. But if we spread it out to other areas we would no longer be able to let each area decide on its own policies and governance, we would have to think about consistency across the whole system.

We may end up deploying SharePoint wider. We are looking at the experience of the departments that have used it so far and will be making recommendations to the University on SharePoint. At the moment we don't have the necessary infrastructure. SharePoint is a platform. It needs configuring. You don't get much benefit from just using it out of box. It requires a large amount of time to configure and that poses resource issues. We don't know how we would manage to resource a big SharePoint roll out.

Our infrastructure for the management of identity is not easily adapted to SharePoint. If we were to implement SharePoint we would have to set up accounts for people within SharePoint and that would create more duplication.

We need to be specific about what we would like to do with SharePoint and what we don't want to do to avoid mission creep. About to initiate a project to look at how the University can use SharePoint. We will work with the pilot department and unit to capture lessons learned from the pilots.

SharePoint is a platform, not easy to use straight out of the box, need to think of what you want to use it for. A lot of people don't understand that. Dilemma is people will look at what SharePoint says it can do and then think that it they ought to try and use all of those functions.

Another HEI shared that it had abandoned plans to implement SharePoint because the: *concepts and features seemed like a good fit but we just couldn't make it work and it looked like it wouldn't be cost effective either internally or using external resource.*

The problems identified by that HEI included:

- SharePoint 2007 is complicated, particularly for configuration
- We expected SharePoint to be a simple to use tool – but it proved otherwise
- too much functionality available out of the box and required complex development/configuration to reduce product scope
- the requirement for governance generated by large functional scope was too big an overhead for the university to cover.

10 Perceptions of Microsoft and SharePoint Within Higher Education

10.1 Administrative/academic views

In theory SharePoint is uniquely placed to become an information system that crosses the divide and spans both administrative and academic functions of an HEI. In practice SharePoint has been stronger within the administrative functions than academic functions.

UWE described a contrasting rate of adoption between the academic and administrative sides of the institution:

Most of the early take up was from administrative departments. But recently we have had take up from academic departments too.

In service departments such as IT services, Estate Services, House Services, there was quite rapid adoption. SharePoint enabled them to do lots of administrative tasks better.

In the academic side initially it was mainly used for organizing committees, such as award boards. SharePoint enabled them to keep track of minutes, decisions and agendas.

And another participating HEI said that “SharePoint is perceived by academics as a corporate system.”

10.2 Anti-Microsoft feeling

There is evidence of some anti-Microsoft feeling in some quarters, namely from some academics, from some IT professionals, and from some learning technologists. However, no evidence was found of this feeling adversely affecting the plans that HEIs have for SharePoint.

One HEI reported that “academics naturally dislike Microsoft but this hasn't been a barrier as such as users are already familiar post introduction of Outlook.” Another said “some research staff don't like Microsoft”. One person (working in an IT role) said that in their HEI there was “some anti-Microsoft feeling from some of the more nerdy academics but feeling was generally positive”.

Another person at a different HEI said that there is:

some resistance within IT because some people don't like Microsoft products. Some techie IT people would rather do something on their 'Sun Java portal' or whatever, and we might see something if we waited 10 years! There is an element of Microsoft bashing.

However, another HEI said that:

A lot academic and research staff are asking for SharePoint without knowing we are about to deploy it. They are asking because people they're working with [at other institutions] use it.

10.3 Higher Education and Microsoft

Some people reported a desire for a vehicle to share information about SharePoint with colleagues at other institutions:

There is a great push from Microsoft to get into Higher Education. It worries me that we as a sector will never get a say in what goes into future versions of SharePoint. Microsoft isn't consulting enough. They don't consult on any of their products. If there are a lot of users in Higher Education it would be good to have a higher education pressure group to try and exert some influence over the product.

It would be great to have the opportunity to meet with other people in Higher Education; there is a lot that could be shared including code. London SharePoint Group meets every three months but it is cross-sectoral.

11. The Future of SharePoint in the UK Higher Education Sector

This research was conducted in the summer and autumn of 2009. Looking ahead to 2010 and beyond the following trends can be anticipated:

- **Beginnings of the adoption of SharePoint 2010**

SharePoint 2010 will become available in the first half of 2010. Most HEIs will wait until a service pack has been issued before they think about upgrading to it, so it will be 2011 before SharePoint 2010 starts to have an impact. SharePoint 2010 will bring improvements to the social computing functionality of My Sites, with Facebook/Twitter style status updates, and with tagging and bookmarking. My Sites are significant in an HE context because they are the part of SharePoint that HEIs consider providing to students as well as staff. We have hitherto seen lacklustre take up of My Sites in HE. Some HEIs implementing SharePoint 2007 have decided not to roll out My Sites at all, others have only provided them to staff, others have made them available to staff and students but decided not to actively promote them. We are likely to see increasing provision and take up of My Sites from those HEIs that move to SharePoint 2010.

- **Fuzzy boundary between SharePoint implementations and Virtual Learning Environments**

There is no prospect, in the near future, of SharePoint challenging Blackboard's leadership in the market for institutional VLEs for teaching and learning. Most HEIs now have both an institutional VLE, and a SharePoint implementation. Institutional VLEs are accustomed to battling against web hosted applications such as Facebook for the attention of staff and students. They now also face competition internally from SharePoint. Currently SharePoint seems to be being used at the margins of teaching and learning, filling in for areas where VLEs are weaker. HEIs have reported SharePoint's use for one-off courses and small scale courses; for pieces of work requiring students to collaborate in groups, and for work that cannot fit within the confines of one course. Schools or faculties that do not like their institution's proprietary VLE have long been able to use an open source VLE (such as Moodle) and build their own VLE in that. Now some schools are using SharePoint and building a school specific VLE in SharePoint. However, SharePoint has a long way to go before it is anything more than marginal to teaching and learning.

- **Increase in average size of SharePoint implementations**

At the point of time in which the research was conducted (summer and autumn of 2009) many of the implementations examined were at an early stage. The boom in SharePoint came in 2008 and 2009, as HEIs started to pick up on SharePoint 2007. We will see the maturation of many implementations which are currently less than a year old. This is likely to bring with it some governance challenges (for example 'SharePoint sprawl') which are not apparent when implementations are smaller. It will also increase the percentage of staff and students in HE familiar with SharePoint as a working environment. One HEI reported that some of their academics, unaware that the University was about to deploy SharePoint, have been asking for SharePoint because they have been working with colleagues at other institutions who are using it.

- **Competition from Google Apps for the collaboration space**

SharePoint seems to have competed successfully against other proprietary ECM vendors in the collaboration space (though it faces strong competition from both proprietary and open source systems in the web content management space and the portal space). It seems that the most likely form of new competition in the collaboration space will come in the shape of Google Apps which offers significantly less functionality, but operates on a web hosted subscription model which may appeal to HEIs that want to avoid the

complexities of the configuration and management of SharePoint.

- **Formation of at least one Higher Education SharePoint User Group**

It is surprising that there is a lack of Higher Education SharePoint user groups. There are two JISCmail groups (SharePoint-Scotland and YH-SharePoint) but traffic on these two lists is low. The formation of one or more active SharePoint user groups would seem to be essential given the high level of take up in the sector, the complexity of the product, the customisation and configuration challenges it poses, and the range of uses to which it can be put. Such a user group or groups could, support the sharing of knowledge across the sector, provide the sector with a voice in relation to both Microsoft and to vendors within the ecosystem around SharePoint, enable the sector to explore the implications of Microsoft's increasing dominance within higher education, as domination of the collaboration space is added to its domination of operating systems, e-mail servers, and office productivity software.

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Glossary of SharePoint and Other Key Terms

Active Directory

Active Directory is a central component of the Windows platform. It provides the ability to manage identities and relationships in network environments.

Business Data Catalogue

A feature of SharePoint 2007 that enables an organization to draw data from other systems into SharePoint for display and manipulation within SharePoint.

C# and .NET

C# is a programming language developed by Microsoft to work within their .NET software framework. The .NET framework provides an environment to build, deploy and run web services and web applications.

InfoPath (full name Microsoft Office InfoPath)

InfoPath is an application used to develop electronic data entry forms. The forms are XML based and can be connected to back end information systems. An organization can use InfoPath to design and develop an electronic form, and then deploy the forms within SharePoint.

My Sites

My Sites provide an individual with their own personal SharePoint site. By default a My Site contains two pages:

- a personal page (My Home) – this part of the My Site is private to the individual. It allows individuals to manage their own documents, tasks etc, and to manage their subscriptions to information from elsewhere in SharePoint. An individual can allow selected colleagues to view particular parts of their private page, for example to collaborate on an individual document, or even to share an entire document library
- a public page (My Profile) – this part of the My Site is accessible to everyone. It enables individuals to describe themselves, and to provide such information as they wish to make generally available to colleagues, for example contact details, skills and experience, role and job title. Individuals may also use it to maintain a blog accessible by the rest of the institution.

Some of the HEIs that have implemented SharePoint have chosen to roll out My Sites to staff and students. Other HEIs have either not implemented My Sites at all or restricted them to staff.

Publishing sites

Publishing sites enable SharePoint to be used to power an organisation's external website, and/or its intranet. A separate (but free) Microsoft application called SharePoint designer can be used to create page layouts to be used as the templates for intranet and/or website pages.

Team sites

SharePoint Team sites enable groups of colleagues to capture, develop and share documents and information. Many HEIs have implemented SharePoint as a replacement for, or supplement to, shared network drives. Compared with shared drives, team sites are:

- more flexible – site owners can determine who within the HEI can have access to the team site, and what they can do within the site, without having to refer to an IT administrator

- more powerful in terms of the collaboration functionality that they provide, including discussion boards, task lists, shared calendars, and document management features such as version control and metadata.

The flip side of this increased flexibility and power is that team sites are more complex for individuals and teams to learn and to administer than shared drives.

Web parts

SharePoint enables site owners to utilise a wide variety of collaborative tools within the three types of site described above. These tools take the form of web parts which can be placed on a page within the site. SharePoint provides a wide variety of web parts including:

- libraries for the storage of resources (i.e. document libraries, picture libraries, slide libraries, form libraries). Document libraries are the most common; they can be used to store documents, capture metadata about documents and to impose version control on documents
- lists for the storage and display of data. Lists take many different forms, including calendars, contact lists, discussion boards, task lists, and announcements.

In addition to the default library and list web parts provided by SharePoint, organisations are able to define their own web parts, to perform specific functions required by the organisation. Once a web part is defined for one SharePoint site the code can be saved and then uploaded and redeployed elsewhere. A saved web part could be deployed by the same organisation elsewhere in their SharePoint implementation or by another organisation in an entirely different SharePoint implementation.

Appendices

Appendix 1 Literature review

See separate file: SharePoint Study - Appendix 1 Literature Review.pdf

Appendix 2 Report of telephone survey

See separate file: SharePoint Study - Appendix 2 telephone survey report.pdf

Appendix 3 Report of online survey

See separate file: SharePoint Study - Appendix 3 online survey report.pdf

Appendix 4 Report on community consultation

See separate file: SharePoint Study - Appendix 4 community consultation report.pdf