# OSS Watch

## OSS Watch Survey 2006: Report

*July 2006*

OSS Watch is pleased to announce that it has recently concluded its 2006 survey of UK Higher Education and Further Education institutions.

During October 2003, OSS Watch conducted a study of UK Higher Education (HE) and Further Education (FE) institutions, looking at their attitudes and policies towards open source software (OSS). The purpose of the study was to influence OSS Watch's plan for 2004 and 2005, and to provide a sound basis for understanding and addressing the needs of educational stakeholders in their use of open source software.

The main part of the 2003 study was a survey which investigated the current state of participation in free and open source software both in terms of projects developing such software and institutional deployment of such software.

When the 2003 study was conceived, it was envisaged that, if OSS Watch were to continue beyond pilot status, this survey would need to be repeated in 2006 in order to measure the growth of open source software in UK HE and FE institutions.

## 1 Executive summary

### 1.1 The OSS Watch 2006 Survey

During February and March 2006, OSS Watch conducted a survey[1] of UK Higher Education (HE) and Further Education (FE) institutions, looking at their attitudes and policies towards open source software (OSS). This was in many ways a repeat of a similar exercise that OSS Watch performed in October 2003.

Improvements in the way in which the 2006 survey was performed resulted in two main benefits:

- By sending the survey's URL to the ICT director of the institution, the survey was more likely to have been completed by the person who is most able to provide answers about ICT for the whole institution.

- The survey was completed by more people: in 2003, responses (from those replying on behalf on their institution) were obtained from only 6% of UK HE and FE institutions; in 2006, a reply from 18% of institutions was obtained.

Whenever possible, comparisons have been made with the results of the 2003 survey. However caution has to be adopted in doing this since the roles and responsibilities of those who answered the 2003 survey are not equivalent.

### 1.2 Key findings

**Institutional policies** Although only 25% of institutions mention OSS in an institutional policy, in practice 77% of institutions consider OSS when procuring software.

**Contributing to OSS** 16% of institutions do not know if their staff submit patches or code to OSS projects. Of those institutions where the ICT manager does know, 86% do not submit whereas 14% do. For those that submit patches or code, the regulations concerning this were varied:

- 7 respondents said it is the working practice of staff to supply patches;
- 6 respondents said that they do not know what the regulations are in regard to supplying patches;
- 5 respondents said that staff are supplying patches in their own time;
- 1 respondent said that this is specified in the employees's contract.

**Use of the Moodle VLE** 56% of FEs use Moodle as a Virtual Learning Environment.

**Content Management Systems** There is no commonly accepted software for Content Management Systems (CMSs): the range of software being used for a CMS is wider than for other applications. In all, 69 institutions answered the CMS question giving 29 different answers.

**Software for wikis and blogs** Although recently there has been a lot of discussion about the use of wikis and blogs, of the 23 institutions that answered the question about wikis, half of them said that their institution did not use wikis. Similar figures also apply for blogs.

**Software mix on servers** Most institutions (69%) have deployed and will continue to deploy OSS on their servers. Generally, the software on servers is a mix of OSS and proprietary software (PS). The use of OSS is most common for database servers (used by 62% of institutions), web servers (59%) and operating systems (56%).

**Reasons for choosing software on servers** When choosing PS for servers, the responses show that there is no one reason or a combination of reasons that leads to doing this. However, the reasons for using OSS are specific: saving on total costs of ownership, lower likelihood of getting locked in to a solution from a specific vendor, and better interoperability with other products.

**Support of OSS** Most institutions that use OSS on their servers rely on in-house support for the OSS.

**Software mix on desktops** In contrast to servers, the use of OSS on desktops is far less common. 47% of institutions indicated that, on desktops, they have not used OSS in the past and will not use it in the future. However, it is increasingly common to use both OSS and PS on desktops (42% do this).

**Commonly deployed desktop software** Microsoft Office and Internet Explorer are deployed by all institutions on most desktops. Other commonly deployed applications are Microsoft Outlook (82%) and Mozilla/Firefox (68%). The latter's use is now considerably higher than in 2003.

**Reasons for choosing software on desktops** The responses indicate that, saving on the total cost of ownership is, for desktops as for servers, the most important reason to use OSS on desktops. This was also indicated as the most important reason in the 2003 survey. Being locked in was not mentioned as an issue in 2003, but in 2006 the majority (73%) indicated that they chose OSS for that reason either on their desktops or on their servers or on both. Ideology is not an important factor for respondents, although a third of them indicated that it played a role.

## 1.3   Conclusion

A positive picture of the use of OSS emerges in both HEs and FEs. Although there are considerable differences between the two types of institutions, in general OSS is used more often than in 2003 and institutions have higher levels of skills and experience of OSS compared to 2003. This survey shows that it is likely that, in the future, use of OSS will continue and expand alongside the use of PS.

## 2   Introduction

OSS Watch is a JISC advisory service that provides unbiased advice and guidance about free and open source software for UK higher and further education. It was created in 2003, and one of its first tasks (in October 2003) was to conduct a study of UK Higher Education (HE) and Further Education (FE) institutions, looking at their attitudes and policies towards open source software (OSS). The purpose of this work was to influence OSS Watch's plan for 2004 and 2005, and to provide a sound basis for understanding and addressing the needs of educational stakeholders in their use of open source software.

The main part of the 2003 study was a survey of ICT managers within HE and FE institutions. The survey investigated the current state of participation in free and open source software both in terms of projects developing such software and institutional deployment of such software[2].

When the 2003 study was conceived it was envisaged that if the OSS Watch pilot service were to continue beyond pilot status then the survey would need to be repeated in 2006 in order to measure the growth of open source software in UK institutions.

OSS Watch is pleased to announce that it has recently concluded its 2006 survey.

This report gives details of the findings of the 2006 survey and compares the results wherever possible with those of the 2003 survey. The following three goals were identified as the most important for the 2006 survey:

- to produce an up-to-date picture of the deployment of OSS in HEs and FEs

- to draw comparisons with the results of the previous survey

- to scope areas for future work by OSS Watch

## 3   Methodology

In the 2003 survey there was some confusion regarding who in the institution should complete the survey. For the 2006 survey, only ICT managers were asked to complete the survey. It was made available on one of OSS Watch's web pages.

### 3.1   Questionnaire

The questionnaire[3] for the 2006 survey was partly derived from the questionnaire used for the 2003 survey and from a questionnaire constructed for the FLOSSWorld project[4] which ran in parallel to but was independent of this survey.

The questionnaire consisted of 45 questions organised into five topics:

1) Characteristics of the institution and the respondent

2) ICT policy regarding software and its deployment

3) Skills and awareness of ICT personnel in relation to software

4) Deployment of software on servers

5) Deployment of software on desktops

### 3.2   Response rate

One of the problems with the 2003 survey was its low response rate: of the 672 institutions contacted, only 63 replied. Of these 63 respondents, 22 answered for their department and only 41 answered for the whole institution (HE n=14; FE n=27). This is a response rate of 6%, which is very low.

It was important to improve the response rate for this survey since the suspicion was that only those institutions in which there was a higher interest in OSS would have replied, skewing the results. For the 2006 survey a list was composed containing the names of the individuals most likely to be in charge of ICT at each institution. These individuals, covering 637 institutions, were contacted in the first round by post. This letter contained the URL of the web page containing the questionnaire. The letter was followed up by an email that was sent to two mailing lists. The respondents were asked to answer the questions on behalf of the whole institution and not just for the department they worked in. Further emails were sent two and three weeks later. This time individual messages were sent to those people who had not yet completed the survey.

This exercise resulted in an improved response rate of 18% (114 institutions), three times higher than the response rate in 2003. This is thought to have improved the validity of the conclusions compared with the 2003 survey.

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[2]For more information about the OSS Watch 2003 Survey, see `http://www.oss-watch.ac.uk/studies/scoping/`

[3]See appendix A for the full questionnaire.

[4]We are extremely grateful to members of the FLOSSWorld project consortium (`http://www.flossworld.org/`) for giving us access to their questions and for allowing the questions to be used in the questionnaire for OSS Watch Survey 2006.

The response to the survey and interest in it was encouraging. The number of respondents who were willing to be contacted for a follow up survey (based on Q43) was high for this type of survey: 41% of those institutions that completed the survey were willing to be contacted again and 78 out of the 103 (76%) who participated were interested in receiving the report.

The fieldwork for the 2006 survey was conducted during February and March 2006.

## 4 Findings

This section describes the results of the 2006 survey. Whenever possible, comparisons have been made with the results of the 2003 survey. However, caution has to be adopted in doing this since the roles and responsibilities of those who answered the 2003 survey are not equivalent (see *Methodology*).

### 4.1 Characteristics of the institution and the respondent

#### 4.1.1 Characteristics of the institution

The average number of staff and students was calculated for those institutions that completed the entire survey.[5] Since only the total number of students over all institutions was given in 2003, and the questions were formulated differently, it is not possible to directly compare the average number of students and staff between the surveys.

The findings of the 2006 survey showed that the differences between HEs and FEs in the average number of students (see table 1) is not significant, but that the difference in the average number of staff is. Only two FEs answered that they had postgraduate students, which may account for the difference between HEs and FEs not being significant, even though the actual size difference is quite large.

Table 1: Average number of students and staff by type of institution (Q3, Q4, Q5 and Q6)

| Type of institution | Undergraduate students | Postgraduate students | All students | Teaching staff | Non-teaching staff |
|---|---|---|---|---|---|
| **Higher education** | 8703 | 2971 | 10952 | 1001** | 1002** |
| **Further education** | 5986 | 290 | 5430 | 297** | 236** |
| **Total average** | 7055 | 2757 | 7749 | 550 | 517 |

** Differences between HEs and FEs significant at p<.01
*Note*. The average number of students and staff is calculated only for those institutions who gave an answer >0 for these questions.

#### 4.1.2 Characteristics of the respondent

As can be inferred from table 2, the most common responsibilities of those individuals who answered the survey are software procurement/purchasing, and the development or overseeing of institutional ICT policies. Fewer than half of the respondents had any of the technical skills that were inquired about in the survey.

Table 2: Type of responsibilities and skills of those individuals who completed the survey (Q7 and Q8)

| | | HE | FE | All |
|---|---|---|---|---|
| **Administrative responsibilities** | Software procurement/purchasing | 91% | 95% | 94% |
| | Developing institutional ICT policies | 91% | 94% | 93% |
| | Overseeing implementation of ICT policies | 91% | 90% | 91% |
| | Developing/administering institutional ICT budgets | 83% | 81% | 82% |
| | Designing/approving software licensing agreements | 71% | 75% | 73% |
| | Approving software development in house | 83%** | 48%** | 60% |
| | Developing ICT training | 46% | 44% | 45% |
| **Technical skills** | Software development | 40% | 46% | 44% |
| | Web design | 31% | 41% | 38% |
| | ICT/Software training/teaching | 40% | 52% | 48% |

** Difference between HE and FE significant at p<.01
*Note*. Those who did not complete the survey but answered this question are included in this and other tables unless otherwise indicated.

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[5]After controlling for missing data and erroneous completion of the 2006 survey, 91 UK institutions submitted surveys that could be fully analysed for the purposes of this survey. See appendix B for a full list of the questions and the number of responses to each question.

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The only significant difference between the respondents from HEs and those from FEs was the administrative responsibility of approving software developed in-house. It seems that, in general, the respondents in this survey had a mainly administrative role and were not so much involved in the technical side of ICT policies and development. In terms of technical skills these findings largely echo the responses to the 2003 survey. However, in terms of administrative responsibilities there seems to be a larger number of respondents responsible for policy and procurement (in 2003 only 22% were involved in licensing agreements and 79% in procurement). This is probably because this time the survey was aimed at, and reached, the ICT directors of institutions.

## 4.2   ICT Policy regarding software and its deployment

### 4.2.1   ICT policy

Two questions were asked in relation to policy; first if the institution had an ICT policy and second if any policy in the institution mentioned software.

As table 3 indicates, 93% of the institutions have a stated ICT policy and 80% have a policy (not necessarily ICT related) that mentions software. Of those institutions that indicate that a policy (ICT or other) mentions software, the majority (80%) say that this is an ICT policy and a minority (20%) say that a different type of policy mentions software.

Table 3:  The type of ICT policy/strategy in the institution (Q9 and Q10)

|  | **HE** | **FE** | **All** |
|---|---|---|---|
| Institution has a stated ICT policy/strategy | 88% | 95% | 93% |
| Institution has a policy/strategy that mentions software | 79% | 81% | 80% |
| ICT policy/strategy mentions software | 78%[a] | 81%[a] | 80%[a] |
| Another policy/strategy mentions software | 22%[a] | 19%[a] | 20%[a] |

[a] Percentage of those who answered that the institution has a policy that mentions software (answers 1 and 2 in Q10).

Figure 1 shows whether OSS is explicitly considered as an option in institutional policies, and whether its use is encouraged.

Figure 1: Is OSS mentioned as an option when procuring software in policy/strategy? (Q11)
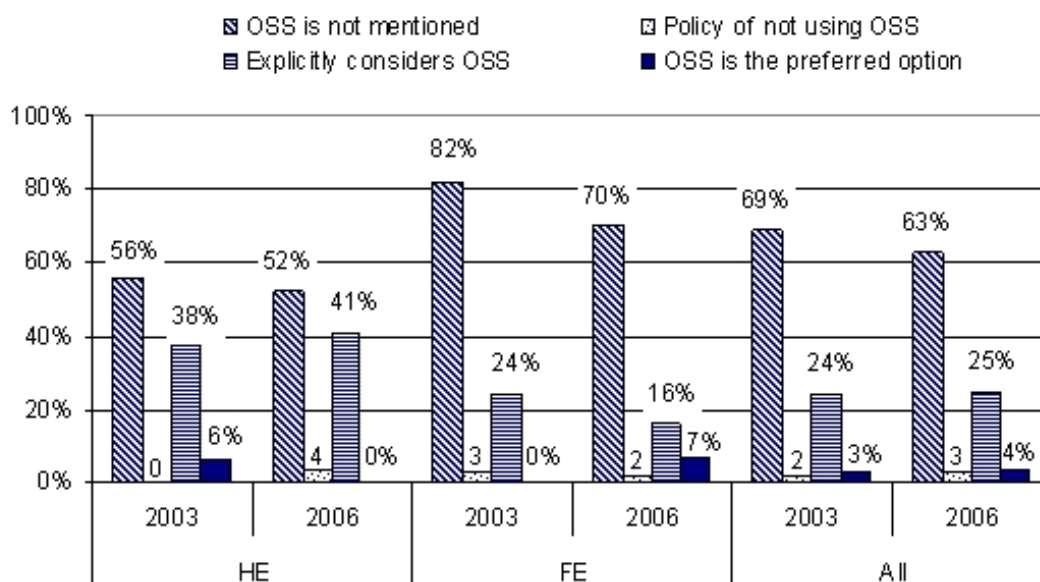


In 2006, for both types of institutions, it is most common that OSS is not mentioned at all (HE=52% and FE=70%). In 2003 there were no HEs that said they had a policy of not using OSS; in 2006 this figure has risen to 4%. Within FEs there was almost no difference between 2003 (3%) and 2006 (2%) in the percentage of institutions that have a policy of not using OSS.

In 2006, OSS is explicitly considered as an option more often in HEs (41%) than in FEs (16%). Some HEs indicated in 2003 that OSS was not only considered as an option but that it was also the preferred option (6%). This is no longer the case (0%), although the reverse happened for FE (0% in 2003, 7% in 2006).

### 4.2.2 Practice

However, policy might not always be a good reflection of what actually happens in practice, as is shown in figure 2.

Figure 2: Policy and practice of using OSS (Q11 and Q12)
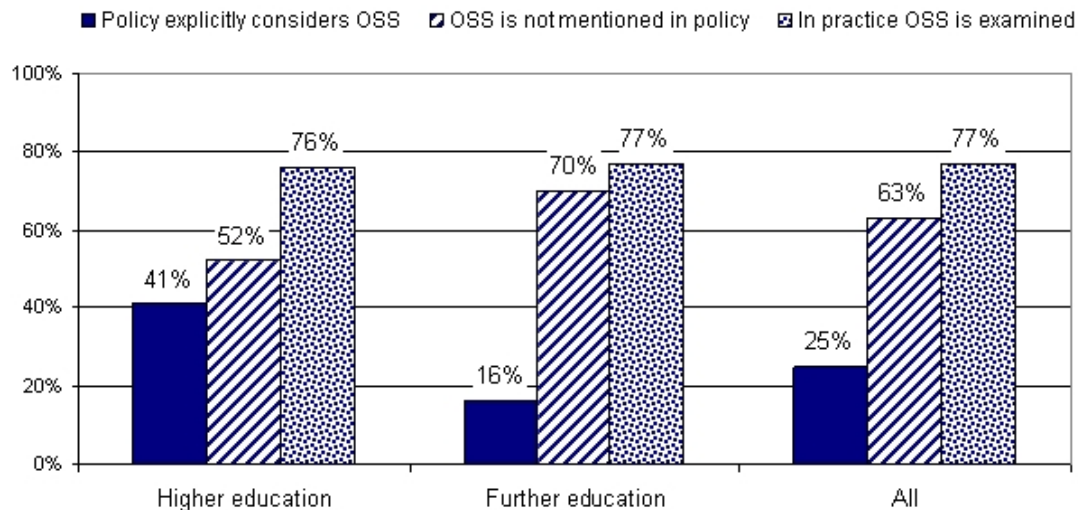


While in 2006 only 25% of policies in HEs and FEs explicitly mention OSS as an option and 63% of the policies do not mention it at all, in practice 77% of the institutions examine OSS as an option. This difference is particularly striking in FEs, where only 16% of policies consider OSS explicitly as an option but 77% examine it in practice.

In general a combination of OSS and proprietary software (PS) is preferred for an institution, as table 4 shows.

Table 4:  In the long run, what do you think is better for your institution's computer systems? (Q13)

|                                                   | HE  | FE  | All |
|---------------------------------------------------|-----|-----|-----|
| It's better to use OSS only                       | 0%  | 0%  | 0%  |
| It's better to use proprietary software only      | 15% | 13% | 14% |
| It's better to use some OSS and some proprietary  | 85% | 77% | 80% |
| Don't know                                        | 0%  | 10% | 6%  |

*Note*. Those who did not complete the survey but answered this question are included. Private and other institutions are excluded.

## 4.3    Skills and awareness of ICT personnel in relation to software

One indicator of the skill that staff have with regard to developing OSS is whether staff submit patches or other code to OSS projects.

Table 5 shows that the number of institutions in which staff submit patches is very small (N=11, 14%) and that often ICT managers do not know whether or not staff submit patches (N=15, 16%).

Table 5:   Staff contribution to OSS (Q14)

|  | HE | FE | All |
|---|---|---|---|
| Staff submit patches or other code to OSS projects [a] | 6 (22%) | 5 (9%) | 11 (14%) |
| Staff do not submit patches to OSS projects [a] | 21 (78%) | 49 (91%) | 70 (86%) |
| Does not know if staff submit patches | 7 (21%) | 8 (13%) | 15 (16%) |

[a] Percentage of those who know whether or not staff submit patches.
*Note*. The number of institutions is indicated followed by percentage of the total number of institutions in brackets.

Table 6 indicates the knowledge (by ICT managers) of the regulations regarding the submission of patches or other code to OSS projects.

Table 6:   What are the regulations for staff submitting patches or other code to OSS projects? (Q15)

|  | HE | FE | All |
|---|---|---|---|
| It is specified in their employment contract | 0% | 1 (10%) | 1 (5%) |
| It is the working practice | 4 (44%) | 3 (30%) | 7 (37%) |
| They do this in their own time | 1 (11%) | 4 (40%) | 5 (26%) |
| Don't know | 4 (44%) | 2 (20%) | 6 (32%) |

*Note*. The number of institutions is indicated followed by percentage of the total number of institutions in brackets.

For those that do submit patches it is often a working practice rather than part of the person's contract of employment. Again a considerable number of ICT managers (32%) are not aware how the submission of patches is regulated, even where they earlier indicated that they assumed staff do submit patches.

Table 7 indicates that frequently there are only a few members of staff that are aware of OSS.

Table 7:   What best describes the awareness of OSS by staff of your institution's ICT services? (Q16)

|  | HE | FE | All |
|---|---|---|---|
| There are no staff in the institution's ICT services with any awareness of OSS | 3% | 0% | 1% |
| A few staff have basic awareness, but the majority have no awareness of OSS | 27% | 55% | 45% |
| All staff have basic awareness | 3% | 5% | 4% |
| A few staff have extensive awareness and the majority basic or no awareness | 39% | 32% | 35% |
| A significant number of staff have extensive awareness and a minority have basic or no awareness | 27% | 6% | 14% |
| All staff have extensive OSS awareness | 0% | 2% | 1% |
| Average on scale from 1 (low) through 6 (high) | 3.61* | 2.95* | 3.18 |

\* Difference between HE and FE statistically significant at $p < .05$

Staff in HEs have a higher level of awareness than those in FEs. It seems that in general there are a few 'experts' within an institution, but the majority are not aware of (45%) or only have basic awareness of OSS (35%). The difference between HEs (3.61) and FEs (2.95) in terms of the level of awareness is statistically significant.

Table 8 shows that the same pattern (where HEs score higher than FEs) appears when looking at the level of experience in actually deploying OSS.

Table 8:  What experience of deploying OSS do the staff of your institution's ICT services have? (Q17)

|  | HE | FE | All |
|---|---|---|---|
| There are no staff in the institution's ICT services that have deployed OSS | 9% | 3% | 5% |
| A few staff have basic experience of deploying OSS, but the majority have no experiences | 30% | 65% | 53% |
| All staff have basic experience of deploying OSS | 0% | 2% | 1% |
| A few staff have extensive experience and the majority have basic or no experiences | 48% | 29% | 36% |
| A significant number of staff have extensive experience and a minority have basic or no experiences | 9% | 2% | 4% |
| All staff have extensive experience in deploying OSS | 3% | 0% | 1% |
| Average on scale from 1 (low) through 6 (high) | 3.24** | 2.61** | 2.83 |

** Difference between HE and FE statistically significant at $p<.01$

In both HEs and FEs there are very few staff with no experience and again, as was the case with awareness, it seems that in most institutions there are a few experts while the rest are unskilled (53%) or only have basic experience (36%).

The responses to Q16 and Q17 show that skill and awareness levels are not evenly distributed between ICT staff members in these institutions (see tables 7 and 8). Although the questions were phrased differently in 2003, there is enough similarity in the responses that the following conclusion can be drawn: while awareness levels were similar in 2003 and 2006, skill or experience levels are higher in 2006.

## 4.4   Deployment of OSS and Proprietary Software

In 2003 the questions relating to the deployment of OSS were phrased differently, and no distinction was made between the deployment of OSS on servers and desktops. In 2003, 86% of HEs and 72% of FEs deployed OSS. In the 2006 survey the deployment of OSS is without a doubt higher since all institutions indicated that OSS is deployed on desktops and a high percentage indicated that it is used on servers for a number of different applications.

In the 2006 survey, the use of OSS was examined separately for servers and desktops.

## 4.5   Deployment of software on servers

To understand whether there are intrinsic differences between HEs and FEs in terms of their deployment of OSS on servers, it is important first to understand whether there are differences in the number of servers that these institutions maintain.

Figure 3: What is the approximate number of servers used at your institution? (Q18)
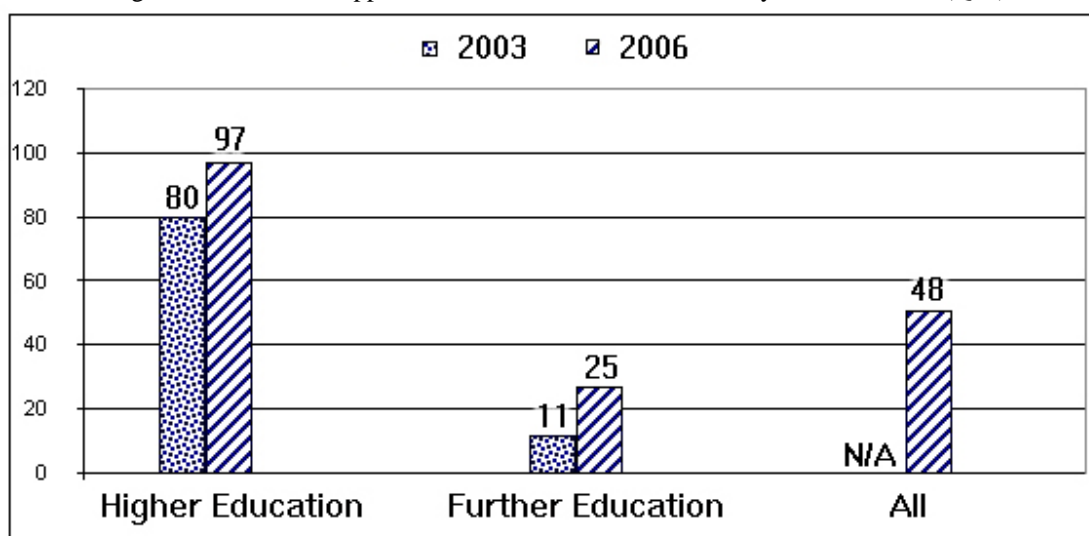


From figure 3 it is clear that HEs have a larger number of servers than FEs. In fact they have almost four times as many. Both in HEs and in FEs the number of servers has gone up from 2003.

Looking back at the difference in student numbers (10952 vs 5430), the difference between HEs and FEs may be accounted by the greater number of students (and thus users) at HEs. Indeed, there is a high correlation (r=.74, p<.01) and probably a strong relationship between the number of students and the number of servers. The relationship between the number of students and the number of servers is stronger in HEs (r=.87) than in FEs (r=.42).

Table 9 shows that most institutions (69%) have deployed, and will continue to deploy, OSS on their servers. There are very few who have tried OSS but do not wish to continue doing so (2%). Some have not used it in the past and will not do so in the future (18%), while another 11% have not used it in the past but intend to do so in the future.

Table 9: Which of the following applies best to your deployment of software on servers? (Q19)

|  | **HE** | **FE** | **All** |
| --- | --- | --- | --- |
| The institution has deployed only proprietary software and will continue to do so in the future | 13% | 21% | 18% |
| The institution deployed OSS in the past and will only deploy proprietary software in the future | 3% | 2% | 2% |
| The institution does not deploy OSS now but will do so in the future | 10% | 11% | 11% |
| The institution has deployed and will deploy some OSS on its servers | 74% | 66% | 69% |

Table 10 shows the future intentions of those who have used only PS on their servers in the past.

Table 10:  Future intentions of those who have used only PS on their servers in the past (Based on Q19)

|  | **HE** | **FE** | **All** |
| --- | --- | --- | --- |
| Have used only PS in the past | 7 (23%) | 20 (32%) | 27 (29%) |
| No future intention of using OSS [a] | 4 (57%) | 13 (65%) | 17 (63%) |
| Intends to use OSS in the future [a] | 3 (43%) | 7 (35%) | 10 (37%) |

[a] Percentage of those who only used PS in the past
*Note*. The number of institutions is indicated followed by percentage of the total number of institutions in brackets.

Of the 27 (29%) institutions that have not used OSS in the past, 10 (37%) intend to use it in the future. The proportion of HEs who have not previously used OSS but intend to do so in the future is marginally higher than the proportion of FEs (43% compared with 35%).

Those institutions that use OSS on their servers almost invariably use it in combination with proprietary components (see table 11). Only 3% of FEs (2 institutions) say they only use OSS. Even where institutions used OSS in the past but do not intend to do so in the future (see table 10) it is likely that the OSS that was used in the past is still running on these servers and will continue to do so: whilst these institutions do not intend to add more OSS in the future they have not removed the OSS that they have already deployed.

Table 11: Use of software on servers (Q19 and Q20)

|  | **HE** | **FE** | **All** |
| --- | --- | --- | --- |
| The institution uses only proprietary components | 19% | 24% | 23% |
| The institution's servers use only OSS components | 0% | 3% | 2% |
| The institution's servers use some proprietary and some OSS | 81% | 73% | 75% |

### 4.5.1  Use of OSS for specific applications on servers

Table 12 shows that, on servers, the use of OSS is most common for *database* servers, followed by *web servers* and *operating systems*. The least common use is for *mail software* and *Virtual Learning Environments* (VLEs). In general, PS is used more frequently than OSS with the exception of VLEs in FEs.

Table 12:  The use of OSS and PS on servers (Q21 to Q25)

|  | HE | FE | All |
|---|---|---|---|
| OSS operating systems | 60% | 54% | 56% |
| PS operating systems | 74%** | 97%** | 89% |
| OSS mail software | 40%** | 14%** | 23% |
| PS mail software | 100% | 100% | 100% |
| OSS web server software | 57% | 60% | 59% |
| PS web server software | 71% | 84% | 80% |
| OSS database servers | 54% | 67% | 62% |
| PS database servers | 100% | 100% | 100% |
| OSS VLEs | 11%** | 56%** | 40% |
| PS VLEs | 40% | 25% | 31% |

** Difference between HEs and FEs significant at p<.01

These findings are displayed visually in figure 4.

Figure 4: Use of OSS for different server applications (Q21 to Q25)
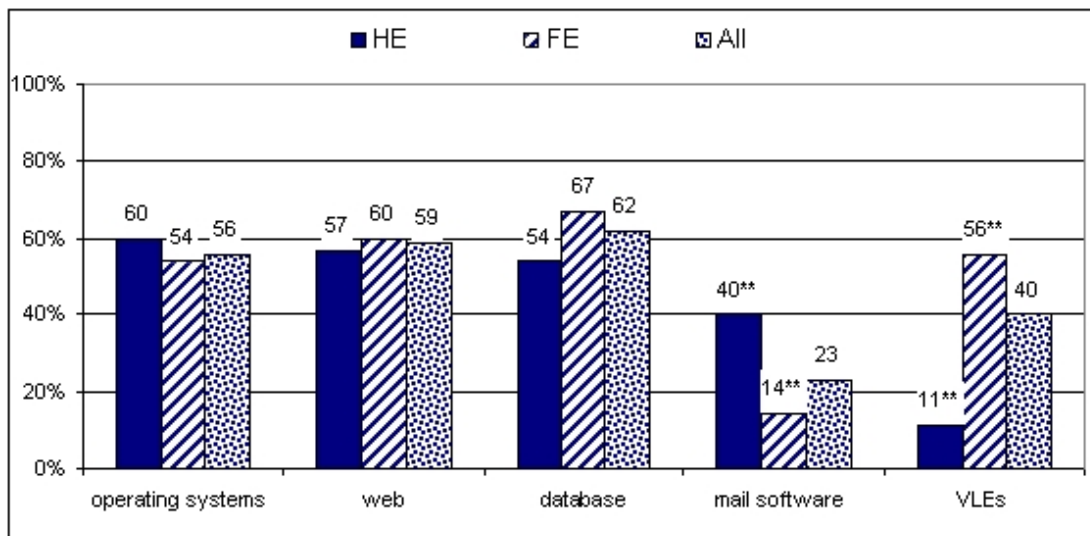


** Difference between HEs and FEs significant at p<.01

The difference between HEs and FEs is significant with regards to the use of open source mail software, which HEs use more commonly than FEs. In the case of VLE software this is reversed, FEs using OSS VLEs significantly more than HEs. This is particularly important given that HEs are generally more likely to use OSS than FEs. It is one of the few instances in which FEs are more likely to prefer an OSS alternative.

Figure 5 shows that the use of proprietary software on servers is widespread across most applications. As has already been mentioned, it is only in VLEs that OSS can claim an overall lead over proprietary alternatives. Figure 5 also shows that FEs tend to rely more on proprietary operating systems than HEs.

Figure 5: Use of PS for different server applications (Q21 to Q25)
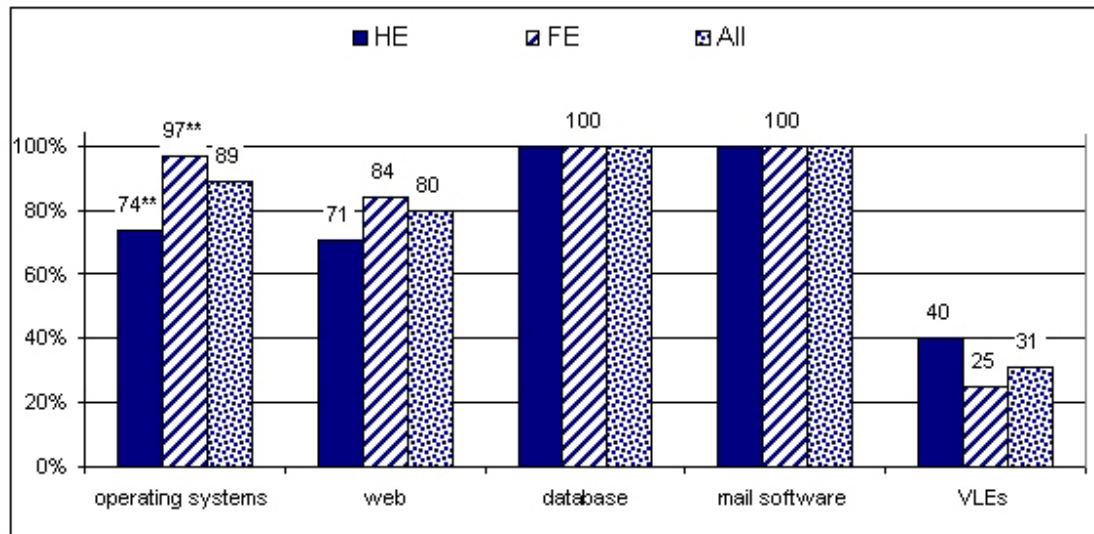


** Difference between HEs and FEs significant at p<.01

Table 13 indicates the software that is most often used for each application. It also indicates whether on the whole OSS, PS or OSS and PS is used for this application.

Table 13:  Software used on servers for different types of applications (Q21 to Q25)

|  |  | HE | FE | All | % only OSS | % OSS and PS | % only PS |
|---|---|---|---|---|---|---|---|
| **Operating systems** | Windows Server 2003 | 74% | 94% | 87% | 0% | 56% | 32% |
|  | Windows NT or earlier | 20% | 24% | 22% |  |  |  |
|  | Linux | 60% | 54% | 56% |  |  |  |
|  | Solaris | 49%** | 8%** | 22% |  |  |  |
|  | Mac OS X | 23% | 24% | 23% |  |  |  |
|  | Mac OS | 9% | 10% | 9% |  |  |  |
| **Mail software** | Exchange | 43% | 67% | 58% | 0% | 23% | 77% |
|  | Novell | 17% | 14% | 15% |  |  |  |
|  | Exim | 29% | 0% | 10% |  |  |  |
|  | Sendmail | 20% | 10% | 13% |  |  |  |
| **Web server** | Microsoft IIS | 71% | 84% | 80% | 9% | 50% | 31% |
|  | Apache web server | 51% | 57% | 55% |  |  |  |
|  | Apache Tomcat server | 54% | 32% | 40% |  |  |  |
| **Database servers** | Microsoft SQL Server | 66% | 87% | 80% | 0% | 62% | 36% |
|  | MySQL | 49% | 67% | 60% |  |  |  |
|  | PostgreSQL | 14% | 5% | 8% |  |  |  |
|  | Oracle | 46% | 52% | 50% |  |  |  |
| **VLE** | Moodle | 9%** | 56%** | 39% | 33% | 7% | 25% |
|  | Blackboard | 17% | 21% | 19% |  |  |  |
|  | WebCT | 20% | 3% | 9% |  |  |  |

** Difference between HEs and FEs significant at p<.01
*Note*. This table lists only the most common responses. The full set of results is listed in appendix C.

For questions Q21 to Q25 there were almost no applications for which only OSS was used; the exceptions were *web server software* and *VLEs*. For all other applications both OSS and PS were used by the same institution.

There was a significant difference between HEs and FEs with regard to the operating systems used on servers. Solaris was mentioned significantly more by HEs than FEs. Also, as has already been mentioned, FEs are more likely than HEs to use Microsoft Windows.

In HEs, use of OSS (Sendmail and/or Exim) for mail software (40%) is similar to the usage of Microsoft Exchange (43%), whereas in FEs open source mail software is not used much in comparison to Microsoft Exchange (10% against 67%).

An unexpected finding was that Microsoft IIS is mentioned extensively for *web servers* (80%), whilst internationally the Apache web server dominates[6] . Similarly surprising is that Apache Tomcat is used to the same extent (54%) as the Apache web server (51%) in HEs, although in FEs the more common pattern appears, in which the Apache web server (57%) is used more than Tomcat (32%).

There are fewer institutions that use OSS for *databases* (62% use MySQL and/or PostgreSQL) than use Microsoft SQL Server (80%). This difference is larger for FEs (difference=20%) than for HEs (difference=12%).

The overall difference in the use of OSS between HEs and FEs for *VLE* applications (see table 12), can be attributed to the Moodle VLE being used far more frequently in FEs than in HEs.

For a number of applications, it was not clear (when designing the survey) which software would be most commonly used. Therefore an open-ended question (see figure 6 and table 14) was used, allowing respondents to indicate which piece(s) of software they used. Most mentioned only one OSS or PS application, and there were no instances in which both OSS and PS were used within the same institution for the same application.

Figure 6: Use of OSS for server applications (Q26)
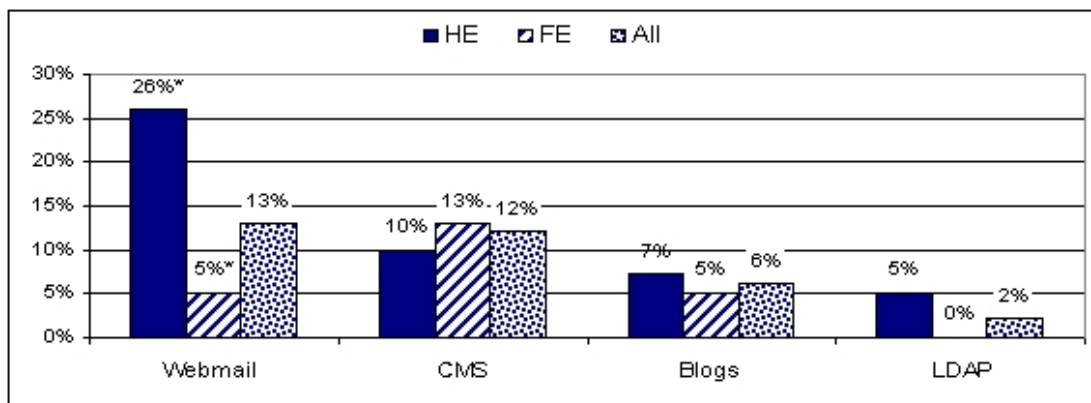


* Difference between HEs and FEs significant at p<.05
*Note*. The percentages in the figure indicate the percentage of institutions that uses OSS and not PS for this application

Table 14:  What software if any does your institution use in the following areas? (Q26)

|  |  | HE | FE | All | % only OSS | % only PS |
|---|---|---|---|---|---|---|
| **LDAP** | Microsoft | 23% | 26% | 27% |  |  |
|  | Novell | 29% | 15% | 20% |  |  |
|  | Sun | 6% | 0% | 2% | 2% | 98% |
|  | Open LDAP | 3% | 0% | 1% |  |  |
|  | No answer | 37% | 52% | 47% |  |  |
| **Web mail** | Outlook | 31% | 40% | 39% |  |  |
|  | Novell | 17% | 12% | 14% | 14% | 86% |
|  | IMP/Horde | 11% | 1% | 5% |  |  |
|  | No answer | 23% | 25% | 27% |  |  |
| **Calendar/diary server** | Microsoft | 37% | 43% | 43% |  |  |
|  | Novell | 9% | 12% | 11% | 0% | 100% |
|  | Oracle | 6% | 0% | 2% |  |  |
|  | No answer | 34% | 29% | 33% |  |  |
| **Content Management System** | Microsoft | 9% | 7% | 8% |  |  |
|  | Moodle | 0% | 6% | 4% |  |  |
|  | In house | 0% | 4% | 3% | 11% | 89% |
|  | Other | 17% | 10% | 13% |  |  |
|  | No answer | 34% | 24% | 30% |  |  |

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[6]For details of the Web Server Survey conducted each month by Netcraft, go to `http://news.netcraft.com/`

What software if any does your institution use in the following areas? (Q26) (cont.)

| | | HE | FE | All | % only OSS | % only PS |
|---|---|---|---|---|---|---|
| | MediaWiki | 6% | 6% | 6% | | |
| | Moodle | 0% | 6% | 4% | | |
| **Wiki** | DocuWiki | 3% | 0% | 1% | 100% | 0% |
| | None | 14% | 9% | 11% | | |
| | No answer | 74% | 75% | 77% | | |
| | Moodle | 0% | 4% | 3% | | |
| | In house | 0% | 3% | 2% | | |
| **Blog** | Community server | 0% | 1% | 1% | 7% | 93% |
| | None | 14% | 10% | 12% | | |
| | No answer | 77% | 75% | 78% | | |

*Note*. These questions did not have closed answers: the respondents were asked to list the components that they used. Percentages are on the basis of the whole sample (n=103).

For this question, *all* the responses for Wiki software were OSS, whereas only PS were named for calendar/diary server software.

HEs are more likely than FEs to use OSS for *webmail* (26% vs 5%). For all other types of applications, the differences between the use of OSS in HEs and FEs are not significant. *LDAP*, *blogs* and *calendar servers* are the applications for which OSS is least frequently used.

Table 14 also shows that there is no commonly accepted software for Content Management Systems (CMS). Indeed, the range of software being used for a CMS is wider than for other applications. In all, 69 institutions answered the question about CMS, and they gave 29 different answers. The most used CMS was Microsoft's, but even this was used in only 8% (i.e., 6) of those institutions that answered this question. Whilst FEs mention that they use Moodle as a CMS, it is not mentioned by HEs at all, reflecting the same practice as with VLEs.

Wikis and blogs may be much hyped in the press, but of the 23 institutions (23%) that answered the question about wikis, 48% said their institution did not use them, and of the 22 that answered the question about blogs, 55% indicated that they did not use such software. It can perhaps be assumed that those who gave no answer to these questions also did not use these applications, which would increase these percentages.

### 4.5.2   Reasons for using or excluding software on servers

Respondents were asked to give their reasons for using PS and OSS, and for excluding OSS from servers. Table 15 reveals the reasons given for using proprietary software.

Table 15: Reasons for using PS (Q27)

| | HE | FE | All |
|---|---|---|---|
| Expert support | 96% | 83% | 87% |
| Performance of the software | 96% | 83% | 87% |
| Needed specialised software | 78% | 75% | 76% |
| Low staff support costs | 75% | 69% | 71% |
| No in house expertise on OSS | 41% | 71% | 61% |
| Personnel preferences | 62% | 66% | 65% |
| Software was already in use, there were no switching costs | 57% | 57% | 57% |
| Low additional upgrade costs | 41% | 56% | 51% |
| Consultancy support was already in place | 42% | 50% | 48% |

*Note*. Percentages are those institutions who said it was a reason or a very important reason

A wide range of reasons was given for the use of PS, and eight out of the nine reasons were indicated as playing a role in decision-making by more than half of the institutions. The most often mentioned reasons were expert support (87%) and performance (87%). The only reason that was mentioned by less than half of the respondents was that consultancy support already existed (48%). Low additional upgrade costs (51%) were also considered less relevant than the other reasons given. The conclusion is that there is no one reason, nor a simple combination of reasons, that determines the choice of proprietary software.

The respondents were also asked to indicate whether each of the suggested reasons was 'not a reason', 'a reason', or 'an important reason' in making the decision to choose PS, by scoring each option from one to three (see table 16).

Table 16: How important were the following reasons for using PS on your servers? (Q27)

|  | HE | FE | All |
| --- | --- | --- | --- |
| Expert support | 2.6 | 2.3 | 2.4 |
| Performance of the software | 2.5 | 2.2 | 2.3 |
| Needed specialised software | 2.3 | 2.2 | 2.2 |
| Low staff support costs | 2.0 | 2.0 | 2.0 |
| No in house expertise on OSS | 1.6 | 2.0 | 1.9 |
| Personnel preferences | 1.7 | 1.9 | 1.8 |
| Software was already in use, there were no switching costs | 1.8 | 1.8 | 1.8 |
| Low additional upgrade costs | 1.6 | 1.7 | 1.7 |
| Consultancy support was already in place | 1.7 | 1.6 | 1.6 |

*Note*. Scores based on the average importance on the scale from 1 through 3, where 1 means that it is not a reason and 3 that it is an important reason.

The reasons, ranked according to importance, order themselves in the same way as was observed in table 15 (where they were ranked more simply according to whether they constituted a reason or not). Expert support and performance were not only *mentioned* by most institutions; they were also the most *important* reason for choosing this type of software. Comments made in the "other" category for this question related to there being a requirement in the industry to use the same software that is used in the 'outside' world.

Those respondents who said that their institution used OSS were also asked to indicate the reasons for using this type of software. The results are given in table 17.

Table 17: Reasons for using OSS on servers (Q28)

|  | HE | FE | All |
| --- | --- | --- | --- |
| Saving on total cost of ownership | 68% | 77% | 74% |
| Lower likelihood of getting 'locked in' by a software provider | 45% | 73% | 63% |
| Better interoperability with other products | 57% | 60% | 59% |
| The possibility of migrating data across systems | 48% | 54% | 52% |
| Able to modify source for specific reason | 57% | 44% | 48% |
| Needed custom made software | 57% | 38% | 44% |
| The possibility of migrating data from existing systems | 33% | 44% | 40% |
| Better response with bug fixes and/or support | 19% | 40% | 33% |
| For ideological reasons | 24% | 38% | 33% |

*Note*. Percentages are those institutions who said it was a reason or a very important reason

The responses indicate that the decision to use OSS is mainly based on the total costs of ownership (74%), followed by avoiding the problem of being locked in (63%), and better operability with other products (59%). Given that five of the nine reasons were infrequently mentioned (i.e., by less than half of the institutions), the reasons for using OSS are more specific and concentrated than those for choosing PS.

Table 18 shows, that, when ranking these reasons according to importance, the difference between HEs and FEs becomes clear. The prevention of 'getting locked in' is more important to FEs (average=2.1) than HEs (average=1.5). All other reasons are equally important in both types of institutions.

Table 18: How important were the following reasons for using OSS? (Q28)

|  | HE | FE | All |
|---|---|---|---|
| Saving on total cost of ownership | 1.9 | 2.0 | 2.0 |
| Lower likelihood of getting 'locked in' by a software provider | 1.5* | 2.1* | 1.9 |
| Better interoperability with other products | 1.8 | 1.9 | 1.8 |
| Able to modify source for specific reason | 1.7 | 1.6 | 1.6 |
| The possibility of migrating data across systems | 1.6 | 1.7 | 1.6 |
| Needed custom made software | 1.6 | 1.6 | 1.6 |
| The possibility of migrating data from existing systems | 1.4 | 1.5 | 1.5 |
| Better response with bug fixes and/or support | 1.2 | 1.5 | 1.4 |
| For ideological reasons | 1.2 | 1.4 | 1.3 |

\* Difference between HEs and FEs significant at $p<.05$
*Note*. Scores based on the average importance on a scale from 1 through 3, where 1 means that this is not a reason and 3 that it is a very important reason.

Ideology and the need for a better response were the least important and the least mentioned. In fact one respondent felt quite strongly about the 'misuse' of ideological reasons for selecting software. This person added a specific comment that argued that ideology would be the poorest basis on which to decide which software to use, and that functionality and costs should be the only reasons that count. A few other comments indicated that OSS was used for teaching purposes although it was not necessarily used for any of the other reasons. Another respondent added that there were good experiences in the sector with adopting OSS and that there was better security with OSS.

The last set of questions related to the reasons for excluding OSS (see table 19). No similar question was asked for PS since no institution had explicitly indicated excluding PS.

Table 19: Reasons for excluding OSS from servers (Q29)

|  | HE | FE | All |
|---|---|---|---|
| Training needs | 82% | 77% | 79% |
| Meeting user expectations | 78% | 63% | 68% |
| Need for 3rd party support | 78% | 58% | 65% |
| No open source specialized software to satisfy our needs | 75% | 56% | 62% |
| Interoperability and migration problems | 53% | 67% | 62% |
| Migration costs | 59% | 60% | 60% |
| Time costs of identifying relevant software | 56% | 57% | 57% |
| Lack of information about experiences in other institutions | 44% | 53% | 50% |
| Nobody wanted it | 33% | 32% | 33% |
| Legal issues including licensing | 27% | 19% | 22% |

*Note*. Percentages are those institutions who said it was a reason or a very important reason

In a similar vein to the comments about the reasons for using PS, one of the most frequently mentioned reasons to exclude OSS was the perceived need for extra staff training (79%). User expectations (68%) and third party support (65%) followed closely. There was a wider variety of reasons mentioned for excluding OSS than for choosing it, and 8 of the 10 reasons were mentioned by more than half of the institutions. Legal issues (22%) or the lack of enthusiasm of staff (33%) were not frequently mentioned as reasons for excluding OSS. Fears seem to be more related to costs and lack of experience.

Respondents were once again asked to indicate how important these issues were. The responses are indicated in table 20.

Table 20: How important were the following issues in these decisions to exclude OSS? (Q29)

|  | HE | FE | All |
|---|---|---|---|
| Training needs | 2.1 | 2.3 | 2.2 |
| Meeting user expectations | 2.3 | 1.9 | 2.1 |
| Need for 3rd party support | 2.3* | 1.8* | 2.0 |
| No open source specialized software to satisfy our needs | 2.3 | 1.8 | 1.9 |
| Interoperability and migration problems | 1.7 | 1.9 | 1.8 |
| Migration costs | 1.8 | 1.7 | 1.8 |
| Time costs of identifying relevant software | 1.7 | 1.8 | 1.8 |
| Lack of information about experiences in other institutions | 1.6 | 1.8 | 1.7 |
| Nobody wanted it | 1.5 | 1.5 | 1.5 |
| Legal issues including licensing | 1.3 | 1.3 | 1.3 |

* Difference between HEs and FEs significant at p<.05

*Note*. Scores based on the average importance on a scale from 1 through 3, where 1 means that this is not a reason and 3 that it is a very important reason.

The need for third party support was more important in HEs (av=2.3) than in FEs (av=1.8). In fact, in HEs third party support (av=2.3) and meeting user expectations (av=2.3) were more important than perceived training needs.

In the comments to these questions, the lower importance of reasons indicating a lack of enthusiasm, such as 'nobody wanted it', was confirmed by those institutions who indicated that there was no decision made to actively exclude OSS. Most additional comments to this question were related to a lack of experience of staff, as one respondent put it, "outside the university sector" (i.e. outside HEs).

### 4.5.3 Institutional support for the use of OSS

This lack of experience is clearly an issue since, as table 21 shows, most of the institutions that use OSS on their servers rely on in-house support for OSS.

Table 21: If you are using OSS on your institution's servers, who supports OSS? (Q30)

|  | HE | FE | All |
|---|---|---|---|
| Some individuals have the skills to support OSS but it is not part of their job specification | 32% | 53% | 46% |
| It is part of the job specification of some individuals to support OSS | 64% | 36% | 45% |
| It is part of the job specification of all ICT staff to support OSS | 5% | 4% | 4% |
| The support of OSS is outsourced | 0% | 4% | 3% |
| Other | 0% | 2% | 1% |

In comparison to developing OSS (i.e., submitting patches, see table 5), where the ICT manager was often not aware of what was going on in practice, the support of OSS is more regulated. In HEs support of OSS is part of the job specification of some individuals (64%), whilst in FEs it is more often an informal arrangement (53%) because individuals do it even when it is not in their job specification.

## 4.6   Deployment of software on desktops

A similar set of questions as the ones asked for servers was also asked for the use of software on desktops.

As was the case with servers, HEs have significantly more resources in terms of desktops than FEs (see table 22). Again, this appears to be related to the number of students that institutions have (r=.81, p<.01). As before, this relationship is stronger for HEs (r=.90) than for FEs (r=.82) but the difference between these two types of institutions is less clear than for servers. However, the percentage of desktops that are managed directly by ICT is smaller in HEs (58%) than in FEs (100%).

Table 22: Number of desktops and their management within the institution (Q31 and Q39)

|  | HE | FE | All |
|---|---|---|---|
| Average number of desktops in use in the institution | 2724** | 914** | 1496 |
| Average number of desktops that are managed by ICT services* | 1584* | 922* | 1143 |

\* Difference between HEs and FEs is significant at p<.05
\*\* Difference between HEs and FEs is significant at p<.01

Figure 7 shows that a large majority of managed desktops run Windows (95%). There is greater use of Windows on desktops in FEs (97%) than in HEs (91%), and greater use of Macs in HEs (14% vs 5%).

Figure 7: What percentage of desktops are managed by ICT services (Q40)
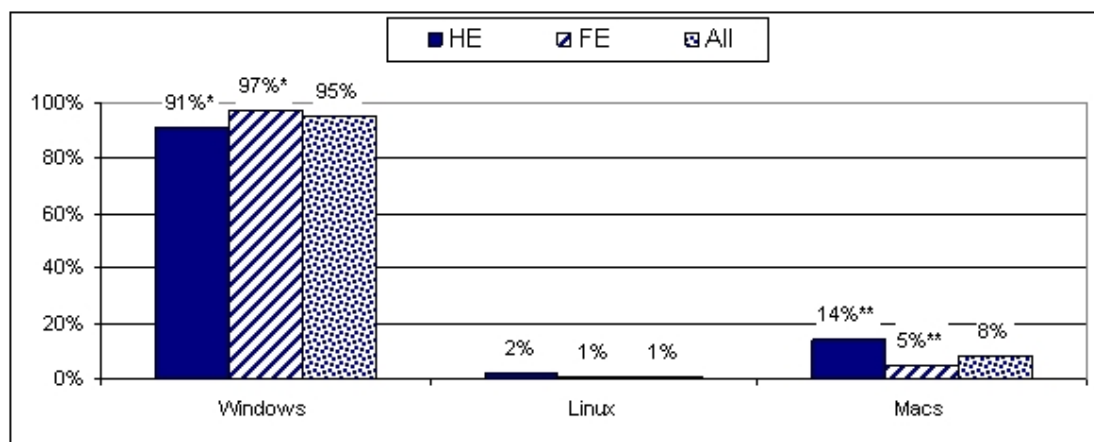


\* Difference between HEs and FEs significant at p<.05
\*\* Difference between HEs and FEs significant at p<.01

Table 23 shows that there is more flexibility in HEs than in FEs as, in the latter, the users have less choice regarding the applications that they can run on their desktops.

Table 23: Which one of the following statements is most appropriate for managed desktops? (Q41)

|  | HE | FE | All |
|---|---|---|---|
| The application set on managed desktops is frozen | 30% | 77% | 62% |
| The application set is frozen, but users can install applications after consultation with ICT | 57% | 21% | 33% |
| On managed desktops, users can install applications without permission | 10% | 2% | 4% |
| Don't know | 3% | 0% | 1% |

*Note*. The differences between HEs and FEs are significant at p<.01

The differences between the two types of institutions in the way applications on desktops are managed are significant. Looking across the institutions it appears that changing the application set is often not possible (62%). In reality this is the case only within FEs (77%) and not within HEs (30%) where users can change the application set after approval of ICT services (57%).

Institutions were also asked about the applications they deployed on their desktops. The responses are summarised in table 24.

Table 24: Which one of the following applies best to your deployment of software on desktops? (Q32)

|  | **HE** | **FE** | **All** |
|---|---|---|---|
| The institution has deployed only proprietary software and will continue to do so in the future | 40% | 51% | 47% |
| The institution deployed OSS in the past and will only deploy proprietary software in the future | 3% | 0% | 1% |
| The institution does not deploy OSS now but will do so in the future | 17% | 16% | 16% |
| The institution has deployed and will deploy some OSS on its desktops | 40% | 33% | 35% |

In contrast to servers, the use of OSS on desktops is far less common, both in the past and as predicted for the future. Almost half of the institutions (47%) indicated that they have not used OSS in the past and will not use it in the future. There have been very few bad experiences with OSS, as is evident from the number of responses by those that have used it in the past who are also likely to do so in the future (35% of the total as opposed to the 1% that plans to cease using OSS). Again, there are a fair number of institutions that show a future willingness to deploy OSS without having had the experience of using it in the past (16%). The differences between HEs and FEs in their history of OSS deployment on desktops is not significant.

Figure 8 shows the proportion of institutions deploying only PS, only OSS, and a mixture of PS and OSS on their desktops.

Figure 8: To what extent is OSS used on desktops? (Based on Q33)
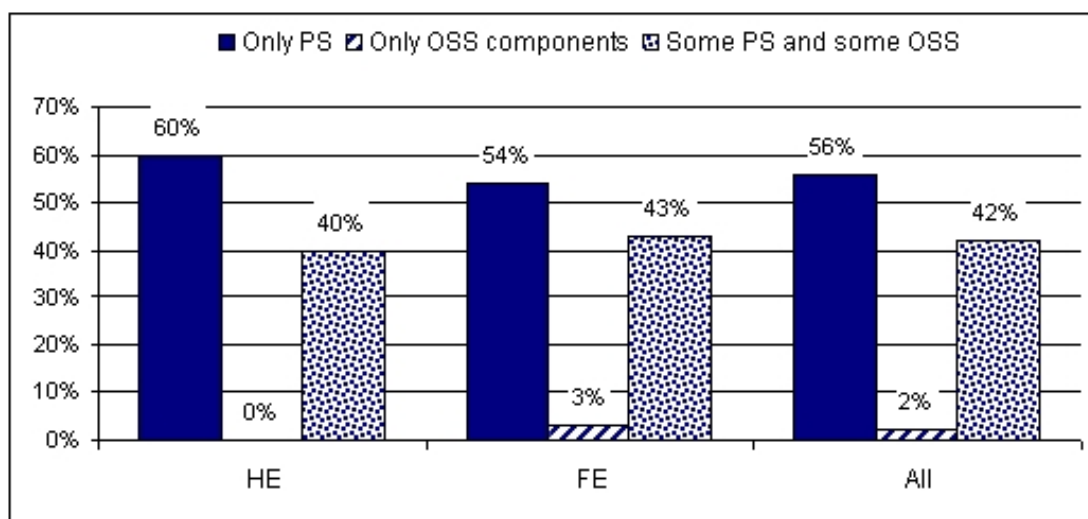


Marginally more than half of the institutions (56%) use only PS on their desktops, and it is as uncommon for institutions to use only OSS (2%) on their desktops as it is for them to use only OSS on servers (2%). Amongst HE respondents, there is not one who uses only OSS on its desktops. It is far less common to use both PS and OSS on desktops (42%) than it is on servers (75%). PS thus dominates desktop applications much more than it does server applications.

### 4.6.1   Use of software for specific applications on desktops

A list of operating systems was provided in the survey, and respondents were asked to indicate whether they were used on desktops.

Table 25 shows that the operating systems installed on desktops were mainly Windows and MacOS. The main difference between HEs and FEs was in their use of Solaris, which is only used in HEs (11%).

Table 25: Which of the following operating systems are used on your institution's desktops? (Q34)

|                       | HE      | FE     | All  |
|-----------------------|---------|--------|------|
| Windows XP            | 54%     | 65%    | 61%  |
| Windows 98 or earlier | 6%      | 8%     | 7%   |
| MacOS X               | 34%     | 37%    | 36%  |
| MacOS                 | 17%     | 17%    | 17%  |
| Linux                 | 17%     | 8%     | 11%  |
| Solaris               | 11%**   | 0%**   | 4%   |
| Free BSD              | 3%      | 0%     | 1%   |

** Difference between HEs and FEs significant at p<.01

The use of open source operating systems is not common in either type of institution, but is more common in HEs (Linux 17%). In HEs, Linux appears to have been used to about the same extent in 2003 (76%) as it was in 2006 (60% on servers and 17% on desktops). In FEs, its use seems to have been slightly less in 2003 (56%) than in 2006 (54% on servers and an additional 8% on desktops). However, since in the 2003 survey servers and desktops were grouped together, it is difficult to draw conclusions about whether this is a trend or just caused by a different way of asking the question.

Another part of the survey addressed the question of which software applications were deployed on the institution's desktop.

Table 26 shows, that in 2006, Microsoft Office and Internet Explorer are used by all institutions on desktops. Other commonly used software products are Microsoft Outlook and the Mozilla/Firefox web browser. Netscape and Thunderbird are only deployed by about one fifth of the institutions. HEs use Matlab (non OSS, 33%) and LaTeX (OSS, 20%) significantly more than FEs (8% and 5% respectively). The reason for this might be that both programs are used specifically for academic publication and analyses.

Table 26: Which of the following commonly used software are used on desktops? (Q35)

|                                  | HE   |      | FE   |      | All  |
|----------------------------------|------|------|------|------|------|
|                                  | 2003 | 2006 | 2003 | 2006 | 2006 |
| OpenOffice                       | 38%  | 23%  | 24%  | 23%  | 23%  |
| Microsoft Office                 | N/A  | 100% | N/A  | 100% | 100% |
| Mozilla/Firefox browser          | 44%  | 77%  | 32%  | 64%  | 68%  |
| Netscape browser                 | N/A  | 40%  | N/A  | 21%  | 27%  |
| Microsoft Internet Explorer      | N/A  | 100% | N/A  | 100% | 100% |
| Thunderbird                      | N/A  | 33%  | N/A  | 16%  | 22%  |
| Microsoft Outlook/ Outlook Express | N/A | 87%  | N/A  | 80%  | 82%  |
| Matlab                           | N/A  | 33%**| N/A  | 8%** | 16%  |
| Octave                           | 12%  | 0%   | 0%   | 3%   | 2%   |
| LaTeX/TeX                        | 41%  | 20%* | 3%   | 5%*  | 10%  |

* Differences in percentage between HEs and FEs significant at p<.05
** Differences in percentage between HEs and FEs significant at p<.01

OpenOffice, which seemed quite popular in 2003 amongst HEs, has dropped somewhat in popularity, from 38% to 23%, but remained about the same for FEs (23%). The use of Mozilla/Firefox (68%) is now considerably higher than in 2003, where on average 44% of the HEs deployed it and 32% of the FEs. Octave, which in 2003 was deployed only by HEs, is now used on desktops only by the FE respondents. The use of LaTeX in HEs has decreased since 2003, from 41% to 20%, but has stayed about the same in FEs.

Table 27 displays the findings of this part of the survey according to the extent of deployment, i.e., whether it is used on all desktops or only on some desktops.

Table 27: Extent to which software is used on desktops (Based on Q35)

|  | HE | FE | All |
|---|---|---|---|
| OpenOffice | 1.23 | 1.26 | 1.25 |
| Microsoft Office | 2.87* | 2.98* | 2.95 |
| Mozilla/Firefox browser | 1.77 | 1.69 | 1.71 |
| Netscape browser | 1.40 | 1.25 | 1.30 |
| Microsoft Internet Explorer | 2.67** | 2.98** | 2.88 |
| Thunderbird | 1.33 | 1.18 | 1.23 |
| Microsoft Outlook/ Outlook Express | 2.23 | 2.41 | 2.35 |
| Matlab | 1.33** | 1.08** | 1.16 |
| Octave | 1.00 | 1.03 | 1.02 |
| LaTeX/TeX | 1.20* | 1.05* | 1.10 |

* Difference in the average between HEs and FEs significant at $p < .05$
** Differences in the average between HEs and FEs significant at $p < .01$

*Note*. Scores based on the average extent of usage on a scale from 1 through 3, where 1 means that this is not used, 2 that it is used on some desktops, and 3 that it is used on all desktops.

The difference in extent of usage between HEs and FEs is significant for Office and Internet Explorer. It seems that in general FEs depend to a greater extent than HEs on PS (Microsoft) for their desktops.

Whilst 23% of both HEs and FEs have desktops installed with OpenOffice, only 3% of the FEs had it on all desktops (extent of use=1.26), whilst amongst HEs there were no institutions with OpenOffice installed on all desktops (extent of use=1.23). 87% of the HEs indicate that they use Microsoft Office on all desktops (extent of use=2.87), whereas 98% of the FEs (extent of use=2.98) say they have it on all desktops.

### 4.6.2 Reasons for using or excluding software on desktops

In contrast to the case with servers, there is no difference in the reasons given by HEs and FEs as to why they use PS or OSS on desktops, nor are there any significant differences as to why they might exclude OSS.

The same reasons are mentioned and considered important for using PS on desktops as were important on servers (see Tables 15, 16 and 28). That is, expert support and the performance of the software are mentioned most often (78% and 80% respectively) and are regarded as most important (2.13 and 2.12), whereas the lack of in-house expertise and consultancy support are least mentioned (48% and 35%) and regarded as least important (1.65 and 1.41). A range of reasons have high levels of importance and, again, there is no one reason that can be said to be the decisive factor in using PS.

Table 28: How important were the following reasons for using proprietary software? (Based on Q36)

|  | Percentage that mentions [a] | | | Average importance [b] | | |
|---|---|---|---|---|---|---|
|  | HE | FE | All | HE | FE | All |
| Expert support | 89% | 73% | 78% | 2.3 | 2.05 | 2.13 |
| Performance of the software | 90% | 75% | 80% | 2.24 | 2.05 | 2.12 |
| Needed specialised software | 72% | 68% | 70% | 2.08 | 2.07 | 2.07 |
| Low staff support costs | 68% | 75% | 73% | 1.96 | 2.02 | 2 |
| Personnel preferences | 78% | 65% | 69% | 1.96 | 1.93 | 1.94 |
| Software was already in use | 71% | 64% | 67% | 2 | 1.88 | 1.92 |
| Low additional upgrade costs | 46% | 60% | 55% | 1.57 | 1.71 | 1.66 |
| No in house expertise on OSS | 41% | 51% | 48% | 1.52 | 1.72 | 1.65 |
| Consultancy support was already in place | 24% | 39% | 35% | 1.32 | 1.45 | 1.41 |

[a] Percentages are those institutions who said it was a reason or a very important reason
[b] Scores based on the average importance on a scale from 1 through 3, where 1 means that this is not a reason and 3 that it is a very important reason.

Saving on total cost of ownership is, for desktops as for servers, the most important reason to use OSS on desktops (see Tables 17, 18 and 29). This was also indicated as the most important reason in the 2003 survey. Being locked in was not mentioned as an issue in 2003, but in 2006 the majority (73%) of the participating institutions indicated that they chose OSS for this reason either on their desktops or on their servers or on both. Ideology is not a particularly important factor (average importance=1.33) for respondents, although a third of them indicated that it does play a role (31%).

Table 29: How important were the following reasons for using OSS? (Based on Q37)

| | Percentage that mentions [a] | | | Average importance [b] | | |
|---|---|---|---|---|---|---|
| | HE | FE | All | HE | FE | All |
| Saving on total cost of ownership | 58% | 61% | 60% | 1.75 | 1.79 | 1.78 |
| Lower likelihood to be 'locked in' by a software provider | 64% | 50% | 54% | 1.64 | 1.71 | 1.69 |
| Better interoperability with other products | 64% | 43% | 49% | 1.73 | 1.54 | 1.59 |
| The possibility of migrating data across systems | 60% | 46% | 50% | 1.70 | 1.50 | 1.55 |
| Needed custom made software | 50% | 29% | 35% | 1.58 | 1.43 | 1.48 |
| The possibility of migrating data from existing systems | 55% | 36% | 41% | 1.64 | 1.39 | 1.46 |
| Better response with bug fixes and/or support | 36% | 36% | 36% | 1.45 | 1.46 | 1.46 |
| Able to modify source for specific reason | 18% | 30% | 26% | 1.18 | 1.44 | 1.37 |
| For ideological reasons | 36% | 29% | 31% | 1.36 | 1.32 | 1.33 |

[a] Percentages are those institutions who said it was a reason or a very important reason
[b] Scores based on the average importance on a scale from 1 through 3, where 1 means that this is not a reason and 3 that it is a very important reason.

Table 30 shows that the reasons given for excluding OSS from desktops are also similar to those given for servers (see table 20).

Table 30: How important were the following issues in these decisions to exclude OSS? (Q38)

| | Percentage that mentions [a] | | | Average importance [b] | | |
|---|---|---|---|---|---|---|
| | HE | FE | All | HE | FE | All |
| Training needs | 71% | 82% | 79% | 2.00 | 2.21 | 2.15 |
| Meeting user expectations | 71% | 76% | 75% | 2.07 | 2.21 | 2.17 |
| Interoperability and migration problems | 77% | 67% | 70% | 2.15 | 1.97 | 2.02 |
| Migration costs | 64% | 59% | 60% | 1.86 | 1.88 | 1.88 |
| Need for third party support | 71% | 53% | 59% | 2.00 | 1.75 | 1.83 |
| Time costs of identifying relevant software | 62% | 50% | 53% | 1.92 | 1.69 | 1.76 |
| Nobody wanted it | 38% | 55% | 50% | 1.62 | 1.74 | 1.70 |
| No open source specialized software to satisfy our needs | 58% | 39% | 44% | 2.00 | 1.58 | 1.70 |
| Lack of information about experiences in other institutions | 46% | 47% | 47% | 1.69 | 1.56 | 1.60 |
| Legal issues including licensing | 17% | 28% | 25% | 1.17 | 1.28 | 1.25 |

[a] Percentages are those institutions who said it was a reason or a very important reason
[b] Scores based on the average importance on a scale from 1 through 3, where 1 means that this is not a reason and 3 that it is a very important reason.
*Note*. There were varying numbers of respondents who gave an answer for each type of reason. Therefore the numbers differ. This is based only on respondents from HEs and FEs who gave an mark of importance to the reason and who made a decision to exclude OSS.

Training needs ranks highest in the list of reasons to exclude OSS from both servers and desktops. Similarly, user expectations are as important for desktops as they are for servers. Again legal issues is the least important and the least mentioned reason to exclude OSS. However, a lack of enthusiasm by users is considered more important to the decision to exclude OSS from desktops (1.7) than it was for servers (1.5); only 33% mentioned this as a reason for servers, whereas 50% mentioned this as a reason for desktops. On the other hand, the absence of specialised OSS software was more important on servers (62% mentioned, average importance 1.9) than it was on desktops (44% mentioned, average importance 1.7).

Training needs and user expectations, the two most important reasons for excluding OSS, were not mentioned in the 2003 survey. So it seems that new issues have come to the fore over the last three years in relation to the training and expertise needed to run OSS. The need for third party support is considered to be far more important now than it

was three years ago (37% mentioned this reason then as opposed to 59% now). This shift might indicate a change in perception as to how OSS is or should be managed: a shift from assuming that software management can or should be run from outside the institution to the perception that this needs to be done through a combination of in-house expertise and external support or training. Interoperability was an issue in 2003, and is still an issue for desktops, although not so much for servers in this survey.

## 5 Conclusions

In comparing this survey with that conducted in 2003, a generally positive picture of the use of Open Source Software (OSS) in institutions emerges. Not only is OSS used more often for more applications than in 2003, but there are also higher levels of skill and experience within institutions. A reasonable number of institutions that have not used OSS before intend to do so in the future. However, it is unlikely that OSS will come to dominate the market in the foreseeable future. Proprietary software (PS) is still used more extensively, especially in FEs, and OSS is almost invariably used in combination with PS.

Even in the 2003 survey it was clear that making the distinction between HEs and FEs is important, perhaps even more than the size of the institutions. Overall, the picture both for servers and for desktops is that HEs are better equipped both in human and in material resources than FEs, even when one takes the size of the institution into consideration. However, it is logical that the resources available to certain institutions are related to the number of staff and students or users of the software. Larger institutions have more desktops and servers and more expertise independent of what type of institution they may be.

HEs also seem to have more expertise in the deployment of OSS. Different issues obviously play a role in decisions made in different types of institutions as to whether to use OSS or PS. There was one exception to the pattern of HEs making more use of OSS than FEs, and that was the relatively extensive use of Moodle in FEs. One can only speculate as to why proprietary VLEs are used more in HEs than in FEs. Maybe HEs were earlier adopters of VLEs and are now locked in, or maybe both HEs and FEs became partially locked in but HEs have the money to afford to still be locked in.

The analysis shows that besides the differences in size and type of institutions, the distinction between servers and desktops is an important one to retain in future studies. Software use is not uniform across different areas and it is important to make this distinction within institutions as well as the distinction between different types of institutions.

Although the use of OSS differs across different applications and between servers and desktops, the reasons for using or not using OSS follow a similar pattern. The institutions build on a broader range of reasons in the use of PS than they do for the use of OSS. Specific reasons, such as training needs or the fear that OSS will not meet user expectations, play an important role in deciding to exclude OSS and use PS. Those institutions that do make a choice to use OSS often do so to save costs or to avoid being locked in by PS companies.

In general, there seems to be a fear that using OSS will require human resources and skills that institutions do not have. However those institutions that do use OSS do not indicate that they do so because they have in-house skills, instead they are using OSS for economic reasons. This is an important finding, which could give hints in terms of how to help those institutions that would like to start using OSS. This group of institutions is probably more convinced by technical support arguments or offers for training in OSS than they will be by arguments that focus on the possibilities of saving money.

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# A  Questionnaire

This appendix presents the questionnaire as used for the OSS Watch Survey 2006. As pointed out in section 3.1, some of the questions were taken from or were derived from questions of the FLOSSWorld survey. We are extremely grateful to members of the FLOSSWorld project consortium (`http://www.flossworld.org`) for giving us access to their questions and for allowing them to be used in this questionnaire.

## A.1  Introduction

Thank you for your interest in this survey. Its main aim is to look at the use of open source and proprietary software in higher and further education institutions across the UK. Although only questions marked with a * are "obligatory", the value of the survey depends upon each respondent completing the full set of questions. So please try to answer each question or sub-question. The survey contains 44 questions and should not take longer than 20 minutes to complete.

This survey asks for factual information about the use of ICT at your institution, and should be filled out by someone who is familiar with ICT across the institution. We will be providing a report on the survey which will be made public. However, any data from the survey will be anonymised in the report.

This survey is conducted by OSS Watch. OSS Watch is funded by the Joint Information Systems Committee (JISC) and is hosted by the University of Oxford as part of its Research Technologies Service. For further information about OSS Watch please visit `http://www.oss-watch.ac.uk/` or contact OSS Watch at info@oss-watch.ac.uk.

*In these questions, the term 'institution' is used for the whole institution and not just your department. Please provide answers for the whole institution, even if you have to make rough estimates. If you wish to reset a page so that none of the questions have been answered, please use the Reset button that appears at the bottom of the page.*

**If you would like to receive an electronic copy of the survey results and accompanying analysis, please enter your e-mail address in this box.**

Q1 **What is the name of your institution?***

Q2 **What is the type of your institution?***

| |
|---|
| Higher Education Institution |
| Further Education Institution |
| Other type of institution (Please specify below) |

**Other type of institution (Please specify)**

Q3 **What is the approximate number of undergraduate students at your institution?***
If you don't know, enter *??* in this box.

Q4 **What is the approximate number of post-graduate students at your institution?***
If you don't know, enter *??* in this box.

Q5 **What is the approximate number of academic and academic-related staff or teaching staff that your institution employs?***
If you don't know, enter *??* in this box.

Q6 **What is the approximate number of other staff that your institution employs?***
If you don't know, enter *??* in this box.

## A.2  Your responsibilities and your technical skills

The following questions ask about your responsibilities within the institution and your technical skills.

Q7 **Do you have any of the following responsibilities in your institution?**
**Please check as many responsibilities as apply.**

- Software procurement/purchasing

- Developing institutional ICT policies

- Overseeing implementation of ICT policies

- Developing/administrating institutional ICT budgets

- Designing/approving software licensing agreements

- Approving software development in-house

- Developing ICT training

Q8 **Are you skilled in any of the following technical activities?**
**Please check as many activities as apply.**

- Software development

- Web design

- ICT/Software training/teaching

## A.3 Management of and policy regarding ICT

What follows are questions about the management of and policy regarding ICT in your institution. Some of the questions refer to open source software (OSS) which is software released under a licence certified by the Open Source Initiative. Typical examples of OSS are Linux (e.g., Red Hat, SuSE, Debian), Apache web server, Mozilla Firefox and OpenOffice.

Q9 **Does your institution have a stated ICT policy/strategy?***

| Yes |
|---|
| No |
| I don't know |

Q10 **Does this policy or any other policy/strategy at your institution specify anything regarding software?***

| Yes, the institutional ICT policy/strategy specifically mentions software |
|---|
| Yes, another policy/strategy specifically mentions software |
| No, in our institution no policy/strategy mentions software |
| I don't know |

Q11 **If your answer to Q10 is Yes, is open source software (OSS) mentioned as an option when procuring software in this policy/strategy?**

| The Institution has a policy/strategy in which OSS is not mentioned |
|---|
| The Institution has a policy/strategy of not using OSS software |
| The Institution has a policy/strategy that explicitly considers OSS as an option |
| The Institution has a policy/strategy in which OSS is the preferred option |
| I don't know |

Q12 **In practice, is open source software (OSS) examined as an option when procuring software for your institution?***

| Yes |
|---|
| No |

Q13 **In the long run, what do you think is better for your institution's computer systems: to use proprietary software or to use OSS components?***

| To use proprietary software only |
|---|
| To use some OSS components and some proprietary components |
| To use OSS software only |
| I don't know |

Q14 **Do staff submit patches or other code to OSS projects?***

| Yes |
|---|
| No |
| I don't know |

Q15 **If your answer to Q14 is Yes, what are the regulations in relation to staff submitting patches or other code to OSS projects?**

| |
|---|
| It is specified in their employment contract that they are allowed to do this |
| It is part of the IPR policy of their department/the institution |
| It is the working practice |
| They do this in their own time, under their own responsibility |
| I don't know |

## A.4   Awareness and the level of skill in deploying OSS

The questions that follow ask about the awareness and the level of skill in deploying OSS by staff of your institution's ICT services.

Q16 **What best describes the awareness of OSS by staff of your institution's ICT services?\***

| |
|---|
| There are no staff of the institution's ICT services with any awareness of OSS |
| A few staff have basic awareness and the majority have no awareness about OSS |
| All staff have basic awareness |
| A few staff have extensive awareness and the majority have basic or no awareness |
| A significant number of staff have extensive awareness and the minority have basic or no awareness |
| All staff have extensive OSS awareness |
| None of these (Please explain below) |

**None of these (Please explain)**

Q17 **What experience of deploying OSS does the staff of your institution's ICT services have?\***

| |
|---|
| There are no staff of the institution's ICT services that have deployed OSS |
| A few staff have basic experience of deploying OSS and the majority have no experiences |
| All staff have basic experience of deploying OSS |
| A few staff have extensive experience and the majority have basic or no experiences |
| A significant number of staff have extensive experience and the minority have basic or no experiences |
| All staff have extensive experience of deploying OSS |
| None of these (Please explain below) |

**None of these (Please explain)**

## A.5   Deployment of software on your institution's servers

In what follows you are asked a few questions about the deployment of software on your institution's servers.

Q18 **What is the approximate number of servers used at your institution?\***
If you don't know, enter *??* in this box.

Q19 **Which of the following statements applies best to your institution's deployment of software on its servers?\***

| |
|---|
| On its servers, the institution has deployed only proprietary software in the past and will continue to do so in the future |
| On its servers, the institution deployed OSS in the past and will deploy only proprietary software in the future |
| On its servers, the institution does not deploy OSS now but it will deploy some OSS in the future |
| The institution deploys some OSS on its servers |

Q20 **If you are deploying OSS on your institution's servers, to what extent is OSS used?**

| |
|---|
| The institution's servers use only OSS components |
| The institution's servers use some proprietary and some OSS components |

Q21 **Which of the following operating systems are used on your institution's servers?**
**Please select as many operating systems as apply.**

- Windows Server 2003

- Windows NT or earlier

- AIX

- Free BSD

- NetBSD

- OpenBSD

- Linux (e.g., Red Hat, SuSE, Debian)

- HP-UX

- MacOS

- Mac OS X

- Open VMS

- OS/2

- Solaris

**Other operating system (Please describe)**

Q22 **Which of the following mail software are used on your institution's servers?**
**Please check as many as apply.**

- Exim

- Postfix

- Sendmail

- Exchange

**Other mail software (Please describe)**

Q23 **Which of the following web server software are used on your institution's servers?**
**Please check as many as apply.**

- Apache web server

- Apache Tomcat server

- Microsoft Internet Information Server (IIS)

**Other web server software (Please describe)**

Q24 **Which of the following database servers are used on your institution's servers?**
**Please check as many as apply.**

- MySQL

- PostgreSQL

- Microsoft SQL Server

- Oracle

**Other database server (Please describe)**

Q25 **Which of the following Virtual Learning Environments are used on your institution's servers?**
**Please check as many as apply.**

- Moodle

- Bodington

- Blackboard

- WebCT

**Other Virtual Learning Environment (Please describe)**

**Q26 What software if any does your institution use in the following areas?**

- LDAP server

- Webmail

- Calendar/diary server

- Content Management System

- Wiki

- Blog

**Q27 If you are using proprietary software on your institution's servers, how important were the following reasons for using proprietary software?**

| | |
|---|---|
| | **0** = Not a reason<br>**1** = A reason<br>**2** = Most important reason |
| Needed specialised software | 0   1   2 |
| Low additional upgrade costs | 0   1   2 |
| Low staff support costs | 0   1   2 |
| Personnel preferences | 0   1   2 |
| Performance of the software | 0   1   2 |
| Expert support | 0   1   2 |
| No in house expertise on OSS | 0   1   2 |
| Consultancy support was already in place | 0   1   2 |
| The software was donated | 0   1   2 |
| Software was already in use, there were no switching costs | 0   1   2 |

**Other reason (Please describe)**

**Q28 If you are using OSS on your institution's servers, how important were the following reasons for using OSS?**

| | |
|---|---|
| | **0** = Not a reason<br>**1** = A reason<br>**2** = Most important reason |
| Saving on total cost of ownership | 0   1   2 |
| The possibility of migrating data across systems | 0   1   2 |
| The possibility of migrating data from existing systems | 0   1   2 |
| For ideological reasons | 0   1   2 |
| Needed custom made software | 0   1   2 |
| Able to modify source for specific reason | 0   1   2 |
| Better response with bug fixes and/or support | 0   1   2 |
| Lower likelihood of getting 'locked in' by a software provider | 0   1   2 |
| Better interoperability with other products | 0   1   2 |

**Other reason (Please describe)**

**Q29 If any decisions were made to exclude OSS on your institution's servers, how important were the following issues in these decisions?**

| | 0 = Not an issue 1 = An issue 2 = Most important issue |
|---|---|
| Legal issues including licensing | 0  1  2 |
| Interoperability and migration problems | 0  1  2 |
| Migration costs | 0  1  2 |
| Time costs of identifying relevant software | 0  1  2 |
| Lack of information about experiences in other institutions | 0  1  2 |
| Need for 3rd party support | 0  1  2 |
| No open source specialized software to satisfy our needs | 0  1  2 |
| Training needs | 0  1  2 |
| Meeting user expectations | 0  1  2 |
| Nobody wanted it | 0  1  2 |

**Other issues (Please describe)**

**Q30 If you are using OSS on your institution's servers, who supports OSS?**

| |
|---|
| Some individuals have the skills to support OSS but it is not part of their job specification |
| It is part of the job specification of some individuals to support OSS |
| It is part of the job specification of all ICT staff to support OSS |
| The support of OSS is outsourced. |
| Other (Please describe below) |

**Other (Please describe)**

## A.6   Deployment of software on your institution's desktops

The following questions are about the use of software on desktops within your institution. By desktops, we mean desktop computers and workstations.

**Q31 What is the approximate number of desktops in use in your institution?\***
If you don't know, enter *??* in this box.

**Q32 Which of the following statements applies best to your institution's deployment of software on its desktops?\***

| |
|---|
| On its desktops, the institution has deployed only proprietary software in the past and will continue to do so in the future |
| On its desktops, the institution deployed OSS in the past and will deploy only proprietary software in the future |
| On its desktops, the institution does not deploy OSS now but it will do some OSS in the future |
| The institution deploys some OSS on its desktops |

**Q33 If you are deploying OSS on your institution's desktops, to what extent is OSS used?**

| |
|---|
| The institution's desktops use only OSS components |
| The institution's desktops use some proprietary and some OSS components |

**Q34 Which of the following operating systems are used on your institution's desktops?**
**Please select as many operating systems as apply.**

- Windows XP

- Windows 98 or earlier

- Free BSD

- NetBSD

- OpenBSD

- Linux (e.g., Red Hat, SuSE, Debian)

- MacOS

- MacOS X

- OS/2

- Solaris

**Other operating system (Please describe)**

Q35 **Which of the following commonly used software are used on desktops and to what extent? (Please select a button for each line of the table.)***

| | 0 = Not used 1 = Used on some desktops 2 = Used on all desktops |
|---|---|
| OpenOffice | 0   1   2 |
| Microsoft Office | 0   1   2 |
| Mozilla/Firefox browser | 0   1   2 |
| Netscape browser | 0   1   2 |
| Microsoft Internet Explorer | 0   1   2 |
| Thunderbird | 0   1   2 |
| Microsoft Outlook/ Outlook Express | 0   1   2 |
| Matlab | 0   1   2 |
| Octave | 0   1   2 |
| LaTeX/TeX | 0   1   2 |

Q36 **If you are using proprietary software on your institution's desktops, how important were the following reasons for using proprietary software?**

| | 0 = Not a reason 1 = A reason 2 = Most important reason |
|---|---|
| Needed specialised software | 0   1   2 |
| Low additional upgrade costs | 0   1   2 |
| Low staff support costs | 0   1   2 |
| Personnel preferences | 0   1   2 |
| Performance of the software | 0   1   2 |
| Expert support | 0   1   2 |
| No in house expertise on OSS | 0   1   2 |
| Consultancy support was already in place | 0   1   2 |
| The software was donated | 0   1   2 |
| Software was already in use, there are no switching costs | 0   1   2 |

**Other reason (Please describe)**

**Q37 If you are using OSS on your institution's desktops, how important were the following reasons for using OSS?**

| | 0 | 1 | 2 |
|---|---|---|---|
| **0** = Not a reason **1** = A reason **2** = Most important reason | | | |
| Saving on total cost of ownership | 0 | 1 | 2 |
| The possibility of migrating data across systems | 0 | 1 | 2 |
| The possibility of migrating data from existing systems | 0 | 1 | 2 |
| For ideological reasons | 0 | 1 | 2 |
| Needed custom made software | 0 | 1 | 2 |
| Able to modify source for specific reason | 0 | 1 | 2 |
| Better response with bug fixes and/or support | 0 | 1 | 2 |
| Lower likelihood to be 'locked in' by a software provider | 0 | 1 | 2 |
| Better interoperability with other products | 0 | 1 | 2 |

**Other reason (Please describe)**

**Q38 If any decisions were made to exclude OSS on your institution's desktops, how important were the following issues in these decisions?**

| | 0 | 1 | 2 |
|---|---|---|---|
| **0** = Not an issue **1** = An issue **2** = Most important issue | | | |
| Legal issues including licensing | 0 | 1 | 2 |
| Interoperability and migration problems | 0 | 1 | 2 |
| Migration costs | 0 | 1 | 2 |
| Time costs of identifying relevant software | 0 | 1 | 2 |
| Lack of information about experiences in other institutions | 0 | 1 | 2 |
| Need for 3rd party support | 0 | 1 | 2 |
| No open source specialized software to satisfy our needs | 0 | 1 | 2 |
| Training needs | 0 | 1 | 2 |
| Meeting user expectations | 0 | 1 | 2 |
| Nobody wanted it | 0 | 1 | 2 |

**Other issues (Please describe)**

**Q39 What is the approximate number of desktops that are managed by ICT services?\***
If you don't know, enter *??* in this box.

**Q40 What % of desktops managed by ICT services are:**

- **Windows**

- **Linux (e.g., Red Hat, SuSE, Debian)**

- **Macs**

- **Other (Please indicate)**

---

Q41 **Which of these statements is most appropriate for desktops managed by ICT services?**

| |
|---|
| The application set on managed desktops is frozen, and so users cannot install programs |
| The application set is frozen, but users can install applications after consultation with ICT services |
| On managed desktops, users can install applications without consulting anyone |
| I don't know |

## A.7 Other information

The following questions obtain the answers to some final questions.

Q42 **Is there anything you would like to add to the information that you gave in this survey and that you have not been able to express?**

Q43 **We might want to follow up on this research project. Would you be willing to be contacted for participation on further research into this subject?\***

| |
|---|
| Yes |
| No |

Q44 **If your answer to Q43 is Yes, please give your contact details.**

- **Name**

- **E-mail address**

- **Phone**

- **Work Address 1**

- **Work Address 2**

- **Work Address 3**

- **Work Address 4**

- **Work Address Postcode**

## B  Number of answers to each question

The total number of HEs was 35 and the total number of FEs was 63. The following table indicates how many HEs and FEs answered each question in the survey.

Table 31: The number of answers to each question

| | Question | # HE | # FE | # All |
|---|---|---|---|---|
| Q1 | What is the name of your institution | 35 | 63 | 98 |
| Q2 | What is the type of your institution | 35 | 63 | 98 |
| Q3 | What is the approximate number of undergraduate students at your institution | 26 | 41 | 67 |
| Q4 | What is the approximate number of post-graduate students at your institution | 24 | 42 | 66 |
| Q5 | What is the approximate number of academic and academic-related staff or teaching staff that your institution employs | 27 | 48 | 75 |
| Q6 | What is the approximate number of other staff that your institution employs | 26 | 45 | 71 |
| Q7 | Do you have any of the following responsibilities in your institution | 35 | 63 | 98 |
| Q8 | Are you skilled in any of the following technical activities | 35 | 63 | 98 |
| Q9 | Does your institution have a stated ICT policy/strategy | 33 | 61 | 94 |
| Q10 | Does this policy or any other policy/strategy at your institution specify anything regarding software | 34 | 62 | 96 |
| Q11 | Is open source software (OSS) mentioned as an option when procuring software in this policy/strategy | 27 | 44 | 71 |
| Q12 | In practice, is open source software (OSS) examined as an option when procuring software for your institution | 34 | 62 | 96 |
| Q13 | In the long run, what do you think is better for your institution's computer systems: to use proprietary software or to use OSS components | 34 | 62 | 96 |
| Q14 | Do staff submit patches or other code to OSS projects | 34 | 62 | 96 |
| Q15 | What are the regulations in relation to staff submitting patches or other code to OSS projects | 9 | 10 | 19 |
| Q16 | What best describes the awareness of OSS by staff of your institution's ICT services | 33 | 62 | 95 |
| Q17 | What experience of deploying OSS does the staff of your institution's ICT services have | 33 | 62 | 95 |
| Q18 | What is the approximate number of servers used at your institution | 28 | 60 | 88 |
| Q19 | Which of the following statements applies best to your institution's deployment of software on its servers | 31 | 62 | 93 |
| Q20 | If you are deploying OSS on your institution's servers, to what extent is OSS used | 25 | 47 | 72 |
| Q21 | Which of the following operating systems are used on your institution's servers | 35 | 63 | 98 |
| Q22 | Which of the following mail software are used on your institution's servers | 35 | 63 | 98 |
| Q23 | Which of the following web server software are used on your institution's servers | 35 | 63 | 98 |
| Q24 | Which of the following database servers are used on your institution's servers | 35 | 63 | 98 |
| Q25 | Which of the following Virtual Learning Environments are used on your institution's servers | 35 | 63 | 98 |
| Q30 | If you are using OSS on your institution's servers, who supports OSS | 22 | 45 | 67 |
| Q31 | What is the approximate number of desktops in use in your institution | 28 | 59 | 87 |
| Q32 | Which of the following statements applies best to your institution's deployment of software on its desktops | 30 | 61 | 91 |
| Q33 | If you are deploying OSS on your institution's desktops, to what extent is OSS used | 12 | 28 | 40 |
| Q34 | Which of the following operating systems are used on your institution's desktops | 35 | 63 | 98 |
| Q35 | Which of the following commonly used software are used on desktops and to what extent | 30 | 61 | 91 |
| Q39 | What is the approximate number of desktops that are managed by ICT services | 29 | 58 | 87 |
| Q41 | Which of these statements is most appropriate for desktops managed by ICT services | 30 | 61 | 91 |
| Q42 | Is there anything you would like to add to the information that you gave in this survey and that you have not been able to express | 9 | 13 | 21 |
| Q43 | Would you be willing to be contacted for participation on further research into this subject | 30 | 60 | 90 |

The following table indicates how many HEs and FEs answered questions having options which could be answered separately.

Table 32: The number of answers for questions having options

| Question | | Option | # HE | # FE | # All |
|---|---|---|---|---|---|
| Q26 | What software if any does your institution use in the following areas | LDAP | 22 | 30 | 52 |
| | | Webmail | 27 | 45 | 72 |
| | | Calendar/diary server | 23 | 43 | 66 |
| | | Content Management System | 23 | 46 | 69 |
| | | Wiki | 9 | 14 | 23 |
| | | Blog | 8 | 14 | 22 |
| Q27 | How important were the following reasons for using proprietary software | Needed specialised software | 27 | 57 | 84 |
| | | Low additional upgrade costs | 29 | 59 | 88 |
| | | Low staff support costs | 28 | 58 | 86 |
| | | Personnel preferences | 26 | 56 | 82 |
| | | Performance of the software | 28 | 59 | 87 |
| | | Expert support | 27 | 58 | 85 |
| | | No in house expertise on OSS | 27 | 58 | 85 |
| | | Consultancy support was already in place | 26 | 58 | 84 |
| | | The software was donated | 25 | 55 | 80 |
| | | Software was already in use, there were no switching costs | 28 | 58 | 86 |
| Q28 | How important were the following reasons for using OSS | Saving on total cost of ownership | 22 | 43 | 65 |
| | | The possibility of migrating data across systems | 21 | 41 | 62 |
| | | The possibility of migrating data from existing systems | 21 | 41 | 62 |
| | | For ideological reasons | 21 | 40 | 61 |
| | | Needed custom made software | 21 | 40 | 61 |
| | | Able to modify source for specific reason | 21 | 41 | 62 |
| | | Better response with bug fixes and/or support | 21 | 40 | 61 |
| | | Lower likelihood of getting 'locked in' by a software provider | 22 | 40 | 62 |
| | | Better interoperability with other products | 23 | 40 | 63 |
| Q29 | How important were the following issues in these decisions to exclude OSS | Legal issues including licensing | 15 | 36 | 51 |
| | | Interoperability and migration problems | 17 | 36 | 53 |
| | | Migration costs | 17 | 35 | 52 |
| | | Time costs of identifying relevant software | 16 | 37 | 53 |
| | | Lack of information about experiences in other institutions | 16 | 36 | 52 |
| | | Need for 3rd party support | 18 | 36 | 54 |
| | | No open source specialized software to satisfy our needs | 16 | 36 | 52 |
| | | Training needs | 17 | 39 | 56 |
| | | Meeting user expectations | 18 | 35 | 53 |
| | | Nobody wanted it | 15 | 34 | 49 |
| Q36 | How important were the following reasons for using proprietary software | Needed specialised software | 25 | 57 | 82 |
| | | Low additional upgrade costs | 28 | 55 | 83 |
| | | Low staff support costs | 28 | 57 | 85 |
| | | Personnel preferences | 27 | 57 | 84 |
| | | Performance of the software | 29 | 57 | 86 |
| | | Expert support | 27 | 56 | 83 |
| | | No in house expertise on OSS | 27 | 57 | 84 |
| | | Consultancy support was already in place | 25 | 56 | 81 |
| | | The software was donated | 24 | 53 | 77 |
| | | Software was already in use, there are no switching costs | 28 | 56 | 84 |
| Q37 | How important were the following reasons for using OSS | Saving on total cost of ownership | 12 | 28 | 40 |
| | | The possibility of migrating data across systems | 10 | 28 | 38 |
| | | The possibility of migrating data from existing systems | 11 | 28 | 39 |
| | | For ideological reasons | 11 | 28 | 39 |
| | | Needed custom made software | 12 | 28 | 40 |
| | | Able to modify source for specific reason | 11 | 27 | 38 |
| | | Better response with bug fixes and/or support | 11 | 28 | 39 |
| | | Lower likelihood to be 'locked in' by a software provider | 11 | 28 | 39 |
| | | Better interoperability with other products | 11 | 28 | 39 |

The number of answers for questions having options(cont.)

| Question | Option | # HE | # FE | # All |
|---|---|---|---|---|
| Q38 How important were the following issues in these decisions to exclude OSS | Legal issues including licensing | 12 | 32 | 44 |
| | Interoperability and migration problems | 13 | 33 | 46 |
| | Migration costs | 14 | 34 | 48 |
| | Time costs of identifying relevant software | 13 | 32 | 45 |
| | Lack of information about experiences in other institutions | 13 | 32 | 45 |
| | Need for 3rd party support | 14 | 32 | 46 |
| | No open source specialized software to satisfy our needs | 12 | 31 | 43 |
| | Training needs | 14 | 33 | 47 |
| | Meeting user expectations | 14 | 34 | 48 |
| | Nobody wanted it | 13 | 31 | 44 |
| Q40 What % of desktops managed by ICT services are: | Windows | 30 | 59 | 89 |
| | Linux (e.g., Red Hat, SuSE, Debian) | 13 | 18 | 31 |
| | Macs | 21 | 39 | 60 |
| | Other (Please indicate) | 5 | 9 | 14 |

## C   Types of software used on servers

Table 33: The types of software used on servers

|  | | HE | FE | All |
|---|---|---|---|---|
| **Operating systems** | Windows Server 2003 | 74% | 94% | 87% |
| | Linux | 60% | 54% | 56% |
| | Mac OS X | 23% | 24% | 23% |
| | Windows NT or earlier | 20% | 24% | 22% |
| | Solaris | 49% | 8% | 22% |
| | Novell Netware | 17% | 21% | 19% |
| | MacOS | 9% | 10% | 9% |
| | HP-UX | 11% | 6% | 8% |
| | Windows 2000 | 9% | 5% | 6% |
| | Open BSD | 6% | 2% | 3% |
| | AIX | 9% | 0% | 3% |
| | Free BSD | 6% | 2% | 3% |
| | Open VMS | 6% | 0% | 2% |
| | SCO Unix | 3% | 0% | 1% |
| | NetBSD | 0% | 0% | 0% |
| | OS/2 | 0% | 0% | 0% |
| **Mail software** | Exchange | 43% | 67% | 58% |
| | Novell | 17% | 14% | 15% |
| | Sendmail | 20% | 10% | 13% |
| | Exim | 29% | 0% | 10% |
| | Other | 11% | 6% | 8% |
| | Mercury | 6% | 3% | 4% |
| | Postfix | 3% | 5% | 4% |
| | Lotus | 6% | 0% | 2% |
| **Web server software** | Microsoft Internet Information Server | 71% | 84% | 80% |
| | Apache webserver | 51% | 57% | 55% |
| | Apache Tomcat server | 54% | 32% | 40% |
| **Database servers** | Microsoft SQL Server | 66% | 87% | 80% |
| | MySQL | 49% | 67% | 60% |
| | Oracle | 46% | 52% | 50% |
| | PosgreSQL | 14% | 5% | 8% |
| | Ingres | 9% | 0% | 3% |
| | Other | 0% | 2% | 1% |
| | N= | 35 | 68 | 98 |
| **VLEs** | Moodle | 9% | 56% | 39% |
| | Blackboard | 17% | 21% | 19% |
| | Other | 11% | 16% | 14% |
| | WebCT | 20% | 3% | 9% |
| | Microsoft class server | 3% | 2% | 2% |
| | None | 3% | 0% | 1% |
| | Bodington | 3% | 0% | 1% |
| **LDAP** | Microsoft | 23% | 26% | 27% |
| | Novell | 29% | 15% | 20% |
| | Sun | 6% | 0% | 2% |
| | None | 0% | 3% | 2% |
| | Open LDAP | 3% | 0% | 1% |
| | Other LDAP | 3% | 0% | 1% |
| **Web mail** | Outlook | 31% | 40% | 39% |
| | Novell | 17% | 12% | 14% |
| | Other | 11% | 9% | 10% |
| | IMP/Horde | 11% | 1% | 5% |
| | SquirrelMail | 6% | 1% | 3% |
| | None | 0% | 3% | 2% |

The types of software used on servers(cont.)

|  |  | HE | FE | All |
|---|---|---|---|---|
| **Calendar/diary server** | Microsoft | 37% | 43% | 43% |
|  | Novell | 9% | 12% | 11% |
|  | Other | 9% | 4% | 6% |
|  | None | 0% | 4% | 3% |
|  | Oracle | 6% | 0% | 2% |
|  | Meeting Maker | 6% | 0% | 2% |
|  | N= | 35 | 68 | 98 |
| **Content Management System** | Other | 17% | 10% | 13% |
|  | Microsoft | 9% | 7% | 8% |
|  | None | 9% | 6% | 7% |
|  | Moodle | 0% | 6% | 4% |
|  | In house | 0% | 4% | 3% |
|  | Shado | 6% | 0% | 2% |
|  | Plone/Zope | 6% | 0% | 2% |
|  | Polopoly | 6% | 0% | 2% |
|  | Blackboard | 3% | 0% | 1% |
|  | Mambo | 0% | 1% | 1% |
|  | JK Content | 3% | 0% | 1% |
|  | Joomla | 0% | 1% | 1% |
|  | RedDot | 3% | 0% | 1% |
|  | Open CMS | 3% | 0% | 1% |
|  | MySource | 3% | 0% | 1% |
|  | Typo3 | 0% | 1% | 1% |
| **Wiki** | None | 14% | 9% | 11% |
|  | MediaWiki | 6% | 6% | 6% |
|  | Moodle | 0% | 6% | 4% |
|  | DocoWiki | 3% | 0% | 1% |
|  | Twiki | 3% | 0% | 1% |
| **Blog** | None | 14% | 10% | 12% |
|  | Moodle | 0% | 4% | 3% |
|  | In house | 0% | 3% | 2% |
|  | Community server | 0% | 1% | 1% |
|  | .Text | 3% | 0% | 1% |
|  | Elgg | 3% | 0% | 1% |
|  | Blogger | 0% | 1% | 1% |
|  | PebblePad | 3% | 0% | 1% |
|  | N= | 35 | 68 | 98 |

## D   Suggestions for a follow up survey

This survey can be considered more successful in reaching the intended respondent group than the previous survey conducted in 2003, the response rate increased from 6% to 18% and the reaction of those who completed the survey was very positive. Confusions that existed in the previous survey about which part of the institution to answer for or what certain questions referred to seem to have been resolved in this follow up.

### D.1   Contacting respondents

The method used for contacting ICT managers in this survey was very successful and it is highly likely that with more time for the fieldwork the response rate would have been even higher. Spam emails seemed to have been very efficient and showed an immediate increase in responses.

### D.2   Measuring institution size

Table 1 gives the average number of students and staff (produced from the answers to questions Q3, Q4, Q5 and Q6). There was a problem with the responses to these questions. The number of institutions that replied to these questions is shown in Table 34.

Table 34: The number of institutions replying to questions about the size of the institution

|  | Undergraduate students | Postgraduate students | Teaching staff | Other staff |
|---|---|---|---|---|
| Answer >0 | 57 (HE=20,FE=35) | 24 (HE=20,FE=2) | 74 (HE=24,FE=47) | 71 (HE=24,FE=44) |
| Answer=0 | 6 | 39 | 0 | 0 |
| Doesn't know | 24 | 28 | 19 | 22 |
| No answer | 8 | 4 | 2 | 2 |

*Note*. The responses from private and non-UK institutions are included in this table.

It is clear that the postgraduate question is problematic for the FE institutions, but there also seemed to be a problem for those in HEs; of the 30 institutions only 20 answered this question. The questions in relation to staff were less problematic and most missing answers were caused by the person not knowing this number. It has to be noted that there was great variance in the number of students at both types of institutions.

In future research, it might be useful to look at student-staff ratios instead of the size of the institution.

Table 35 shows that the student/staff ratio is lower in HEs than in FEs, but also that there is a lot more variety between the FEs than between the HEs (based on the standard deviation). However, the difference in student-staff ratio is not significant. In future research with a hopefully higher number of institutions and a better formulation of the question about postgraduate students this indicator might be more useful.

Table 35: Student-staff ratio by type of institution

|  | Mean | N | Std. Deviation |
|---|---|---|---|
| Higher education UK | 9.3 | 20 | 5.6 |
| Further education UK | 16.8 | 29 | 18.9 |
| Total | 13.7 | 49 | 15.6 |

*Note*. Those who did not complete the survey but answered this question are included. Other and private institutions are excluded.

### D.3   Question wording recommendations

In a possible follow-up survey the questions that were left open ended in terms of applications on servers can be categorised according to the categories found in this survey, with the exception of the question on Content Management Systems.

## E   Table index

## F   Figure index

## G   Abbreviations

| | |
|---|---|
| **HE** | Higher Education institution |
| **FE** | Further Education institution |
| **OSS** | Open Source Software |
| **PS** | Proprietary Software |
| **CMS** | Content Management System |
| **VLE** | Virtual Learning Environment |