

Using Open Source Software in Schools

This information sheet identifies the key findings of Becta's recent work exploring how a small sample of schools implemented open source software solutions. The sheet also identifies any benefits and issues that LEAs and schools need to be aware of when considering open source software.

Introduction

What is open source software?

Open source software (or OSS) is:

"Non-proprietary software for which the underlying programming code is provided and may be modified to more closely fit users' needs. It is usually very low cost or free and does not incur the payment of licensing fees."¹

Why look at the cost of open source software in schools?

UK Government studies have suggested that the use of OSS within the UK public sector can provide a viable and credible alternative

to proprietary software, and could potentially lead to significant cost savings. The aim of the Becta project was to see if these findings applied to the schools sector. The project, which was funded by the DFES, worked with a sample of schools to explore how OSS is being used, the relative costs compared with those in non-OSS schools, and how OSS can be implemented successfully.

Examples of selected case studies are shown overleaf and are described in detail in the Becta publication "Open source software in schools: a case study report".

A full report on the relative costs of OSS schools and approaches to OSS implementation by schools is given in the Becta publication "Open source software in schools: a study of the spectrum of use and related ICT infrastructure costs" [<http://www.becta.org.uk/publications>].



¹ There are many types of Open Source Software, mainly differing in the licensing term under which altered copies of the source code may be redistributed. The Linux operating system is an example of open source software.

² StarOffice is not 'open source' in the true sense of the definition, but it is considered part of this category as it is an inexpensive alternative, and has a number of open source components.

How is open source software used in schools?

The project schools demonstrated that OSS may be used for:

- **Server operating systems**

Some schools have client-server networks with Linux servers. Secondary schools with larger networks also use Microsoft and Novell servers for specialist software such as management information systems (MIS) or anti-virus software.

- **Computer operating systems**

The schools use Linux, Windows, or a mix of the two as the operating systems on their computers. Some schools use dual-boot computers with both operating systems. Dual-boot computers allow the user to choose which operating system to run, according to the functionality required and the applications available.

- **Applications – in the classroom and for administration**

Several schools installed StarOffice² or OpenOffice on all or most of their computers. Some even offer both. However, Microsoft Office was also installed on the majority of computers in all schools. A range of other OSS was installed throughout the schools, the most popular being IrfanView, Crocodile Clips, the Gimp, Audacity and Mozilla.

There are varying costs and benefits associated with each type of use described above. In most cases the schools in the Becta OSS project employed a mixture of OSS and proprietary software. In the case study examples, the numbers of open source server and computer operating systems and OSS applications are expressed as a percentage of the total.

Reasons for moving to open source software

Cost savings

Several schools said that the main driver for introducing OSS was the potential cost savings. One particular area identified was the use of open source operating systems and thin-client networks to extend the life of old computers.

Flexibility

Other reasons for introducing OSS were its transparency, flexibility and the educational value of providing pupils with a broader experience of operating systems and software.

Culture

A 'champion' or enthusiast of OSS was often responsible for introducing these solutions to the school. This person often provides the software support or is confident contracting out for the necessary skills. In these circumstances, other staff may not need any in-depth knowledge or awareness of the distinction between the proprietary and the OSS solutions they are using.

Reliability and security

The 'champions' introduced OSS because they believed the systems to be more stable and more secure than proprietary solutions. The opinions of users in the schools confirmed these perceptions.

Medium-sized rural secondary school Case study 5

	% use
Server	100%
Computer	20%
StarOffice	100%
OpenOffice	10%

- "The head teacher believes that the ICT manager's maverick style and drive has been a crucial part of the school's success."
- "Financial savings on software expenditure impact indirectly on teaching and learning by enabling spending on other things such as hardware and technical support."
- "There are some compatibility issues, but the disadvantages are outweighed by the benefits. Initially the technician needed to spend a lot of time on building the system and so was not sufficiently available for real-time general support. This is no longer a problem."

Small rural primary school Case study 1

	% use
Server	100%
Computer	100%
StarOffice	100%
OpenOffice	0%

- "The head teacher is delighted with the ICT provision the school has now, and goes so far as to attribute the success with regard to ICT of its most recent Ofsted inspection to Linux."
- "OSS has saved the school money, which has been used to pay for a part-time ICT teaching assistant who teaches ICT to pupils, so the use of OSS is indirectly raising standards."
- "OSS seems more reliable and the school has excellent support from people with superb OSS expertise."

What do teachers, pupils and parents think?

Teachers

Teachers in all schools seemed positive about using OSS on the computers. The general view was that OSS applications (mainly OpenOffice and StarOffice) were easy to use, and some felt they were more reliable.

Pupils

Overall, pupils in all schools liked using OSS and found it reliable, although an issue stated by some was lack of familiarity, as they were used to non-OSS equivalents, and had to learn to use two different types of application.

Parents

One school offered parents the opportunity to use OSS by attending sessions working alongside pupils. A CD with the OSS was available to parents for a nominal fee. This has led to a number of parents using OSS at home and enrolling in evening classes.

Are there any disadvantages?

Overall, the main disadvantages of OSS were:

- lack of compatibility with some curriculum software
- inability to read files created in other applications
- lack of familiarity among teachers and pupils, and resistance to its use.

How were costs measured and compared?

The Becta model for total cost of ownership (TCO) of ICT infrastructure in schools was used as a basis for the study. The model also included a staff survey that recorded how much time users reported they were taking to support the systems themselves, and generated information on potential hidden costs. This survey also provided information about the satisfaction with and reliability of schools' ICT services and facilities, including training opportunities. Cost data for a three-year period was collected under the following headings in all schools:

- hardware
- software
- network
- consumables
- training
- formal support (both internally funded and bought in)
- user self-support (ie the equivalent cost of personal time spent on support or technical self-help).

The resulting profiles for all 15 schools were compared with 33 schools using proprietary software over the same period. We have used the average annual cost per PC as the most meaningful figure, because several costs (eg consumables, software, peripherals and support) are closely related to the number of PCs.

Large urban secondary school Case study 7

	% use
Server	70%
Computer	0%
StarOffice	0%
OpenOffice	100%

- "The head of ICT advises that the whole school worries about cost, but since OSS has been introduced, the senior management team is now much more comfortable with value for money than it was in the past."
- "The network manager feels that the transparency of OSS is more important than the cost saving, because he is able to adapt it to meet the school's needs."

Costs per PC

We found that the costs per PC were usually lower for the OSS schools at both primary and secondary levels (Figure 1). However, the potential cost savings depend on the precise way in which a school deploys OSS solutions. For instance, there were cost implications for having dual-platform computers where two operating systems were installed on a single computer so that users could select either an open source operating system or Windows. This solution gave users the opportunity to try new facilities, but providing both operating systems reduced the overall cost savings.

The introduction of OSS into a school environment needs to be carefully planned in order to enjoy the potential cost savings while still providing appropriate support and ongoing maintenance.

Technical support costs

The study revealed that support costs were considerably different between schools using OSS. As support needs are closely related to the specific OSS implementation chosen by a school, the most cost-effective support levels and the kind of support required will vary accordingly.

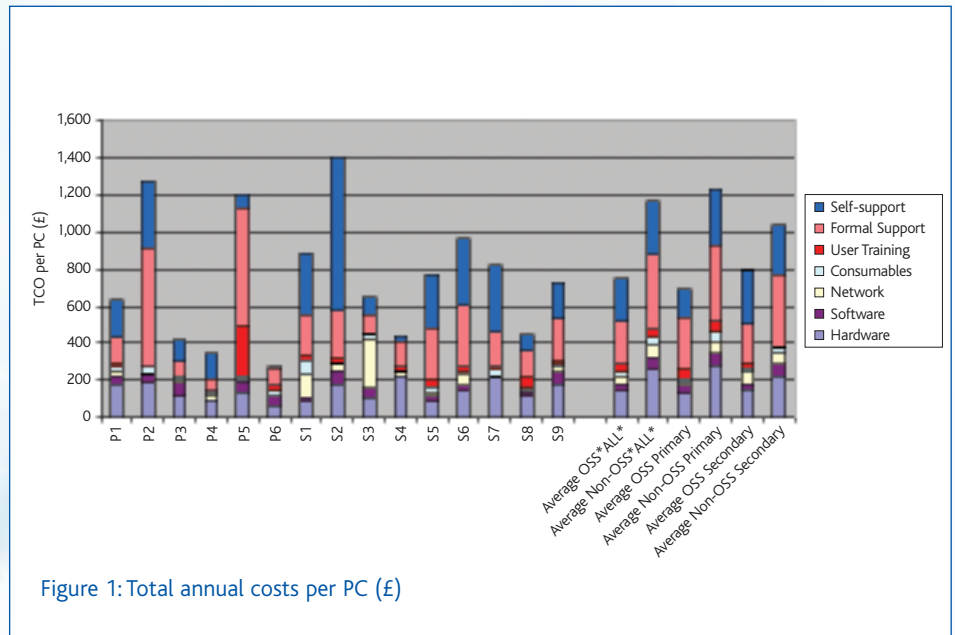


Figure 1: Total annual costs per PC (£)

The support possible for OSS in schools is significantly affected by local factors including the presence of a 'champion', funding, senior management team buy-in and receptive stakeholders.

Some OSS schools have shared knowledge and skills with each other, creating a support network and a reduction in overall cost. This was demonstrated by a cluster of four schools in our study where one secondary school using OSS provided free technical support to three feeder primaries.

Summary of findings

Cost

- Our study indicates that OSS solutions can be implemented successfully and with obvious cost benefits as a networking solution.
- A strategic approach to financial planning in which any savings are allocated to best meet the wider educational aims of the school is important.
- The use of dual-platform computers, which contain open source and proprietary operating systems, can help solve interoperability problems for administration, management and some curriculum applications. However, this solution may reduce the overall cost benefit as it requires proprietary licences. Maintaining a proportion of dual-platform computers is one way to achieve the benefits and save on licensing costs.
- Some schools found that OSS worked with lower-specification hardware, allowing them to extend the life of existing hardware and realise savings from new hardware purchases of a reduced specification, with no impact on performance.
- The use of alternative productivity software, eg OpenOffice/StarOffice, instead of proprietary solutions saved licence costs.
- OSS solutions for servers can also offer cost

savings to schools and were viewed as easy to use and more reliable. Schools with multiple servers can trial OSS as a phased introduction on one or more servers before deciding upon full implementation.

- Schools need to take account of the costs of user training for OSS in the same way they would for proprietary solutions. The study highlighted that spending on training across OSS and non-OSS schools was generally low.

Technical support

- Schools implemented support solutions according to their individual circumstances, demonstrating a wide spectrum of commitment to using OSS.
- Technical support skills tended to pre-exist in schools using OSS, or develop as a result of schools working together. Schools using OSS must be aware that their champion may leave, and should explore how they would replace those skills. For all schools, the support process needs to be a formalised series of repeatable processes, eg the Framework for ICT Technical Support (FITS). See 'Further information'.

Introducing open source software

Schools reported that they had introduced OSS because:

- they liked its transparency and flexibility, which made it possible to alter the software according to their needs
- there was an educational value to providing pupils with a broader experience of operating systems and software
- it was a way to achieve value for money and to extend the ICT network and facilities
- they had access to appropriate knowledge, skills and experience to support an OSS implementation.

Challenges/issues to explore

- Some users were unfamiliar with OSS applications and their use in education and administration environments. Open-source-only computers were therefore seen as a potential obstacle which users need to overcome.
- The real or perceived lack of curriculum software has been identified as an obstacle to a more general introduction of OSS applications and content-specific software for classroom use.
- Senior staff and administrators were less receptive to the use of OSS for administration and management purposes, due to lack of compatibility and interoperability with existing packages.
- The introduction of OSS is something that would need careful strategic planning and discussion within the school.

Next steps

The case studies highlighted some interesting aspects of using OSS in schools. Further discussion of these points can help schools make informed decisions if they are considering introducing OSS solutions.

Think about how open source software could save your school money

Could OSS help you extend the life of older equipment?

Could OSS reduce your software licensing costs for:

- servers?
- desktop computers?
- classroom or office software?

Consider the wider educational value

Would OSS give your pupils a wider experience of different operating systems?

Have you considered a mixed solution?

Few schools have a completely open source network. Most have a mixture of open source operating systems and software alongside proprietary software such as that provided by Microsoft.

Can you provide support and training?

There may be initial resistance to OSS when it is first introduced. Do you think you can provide appropriate support and training to make this kind of change?

Further information

Becta information

'Becta's view: Strategic financial planning for ICT' <http://www.becta.org.uk/publications>

Framework for ICT technical support (FITS) <http://www.becta.org.uk/fits>

'Open source software in schools: A case study report' <http://www.becta.org.uk/publications>

'Open source software in schools: A study of the spectrum of use and related ICT infrastructure costs' <http://www.becta.org.uk/publications>

Press release: Increased choice and value for money for schools procuring ICT products and services http://www.becta.org.uk/corporate/press_out.cfm?id=3451

Total cost of ownership model and example data (Username: ExampleSecondary and Password: ExampleSecondary16): <http://tco.ngfl.gov.uk>

Other resources

Moyle, K. (2004) 'What place does open source software have in Australian and New Zealand schools' and jurisdictions' ICT portfolios?' http://www.e-learning.sa.edu.au/elearning/files/links/Total_Cost_of_Ownership_an.pdf

Office of Government Commerce (2004) 'Open source software trials in government: Final report' http://www.ogc.gov.uk/embedded_object.asp?docid=1002366

Schoolforge – initiative to support school use of open source software <http://www.schoolforge.org.uk>

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