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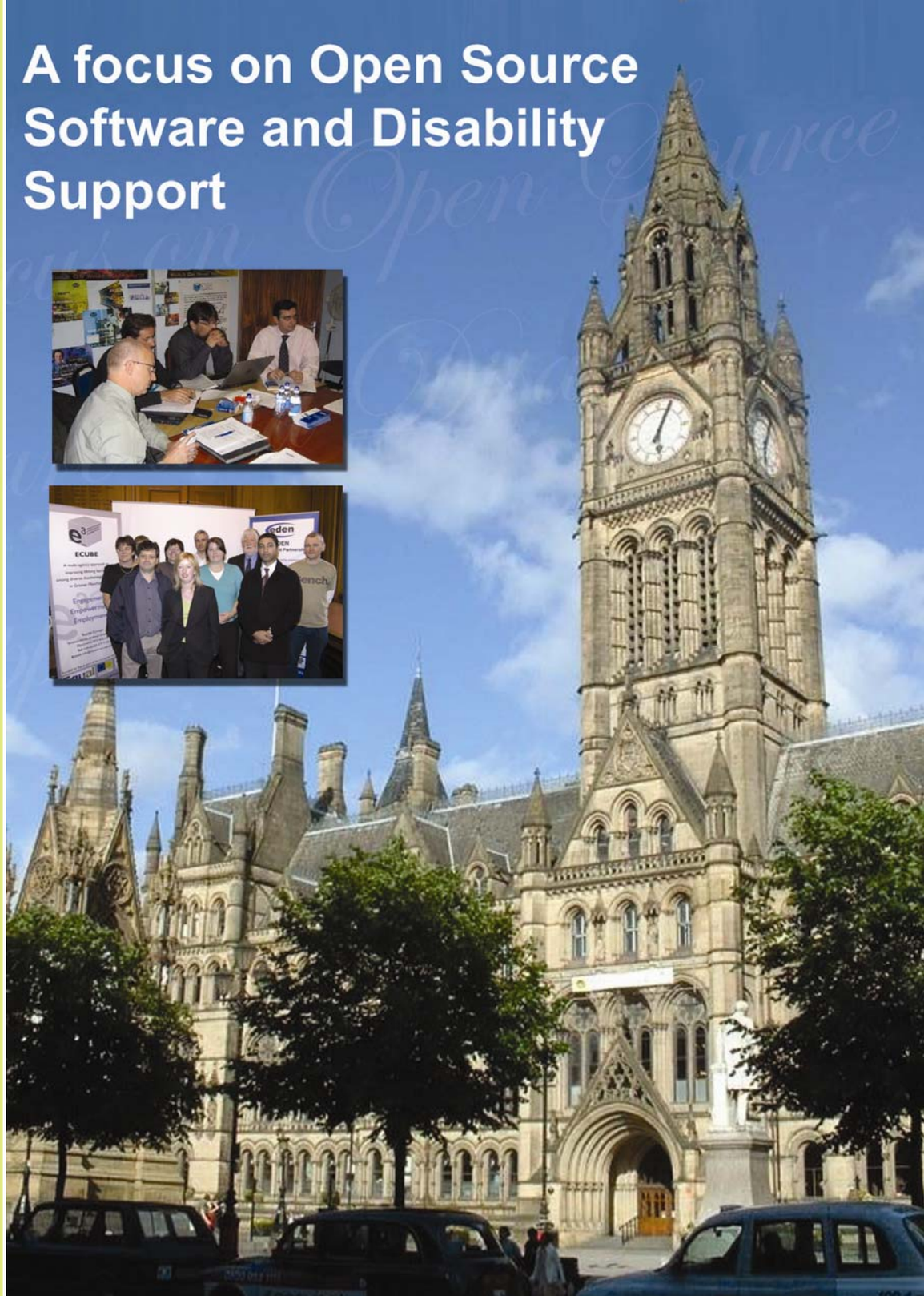
C. I. EQUAL Round II
Action 2 - T.C.A. M2E

A work group among
the partners
of the TCA "M2E":

Italy, project "The knowledge based coast";
U.K. "ECUBE";
Czech Republic "ADIP";
Hungary "Variàciòk foglalkoztatàsi rehabilitàcióra";
FR "EGALITHE"

A focus on Open Source Software and Disability Support



meet identified accessibility needs. They should also examine the current use of such functionality by users

- Organisations should include OS products when making purchasing decisions. Here it is important that both acquisition and maintenance costs are included in the cost calculation

- Organisations should consider the use of OS products at two distinct levels. Firstly they should consider options at the operations system level and secondly at the desktop application level.

- Organisations should ensure that the criteria used for decision making is appropriate to the organisations overall vision, mission and values. It will certainly be the case that cost effectiveness is an important criterion to consider. However a desire to support the Open Source philosophy may, or may not, be an appropriate criterion for decision making

These recommendations, based on the work of our study group, form a broad framework within which organisations should consider the use of Open Source software.

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Also the use of Open Office was problematic when it came to sharing files with users of Microsoft Office.

Integration – A concern is that as many organisations seek to integrate disabled people into mainstream society it is logical to develop their skills in the use of propriety software rather than OS software because that is what is used extensively.

Conclusion and recommendations

This is a complex area and drawing conclusions is difficult for a number of reasons, including the fact that support for the Open Source approach is partly based on 'ethical' grounds. In the VOSS project, for example, their project report refers to 'Strong resistance from some contracted technical support staff who saw it as a threat to their entrenched monopoly position of using Microsoft software.' giving the impression that challenging authority is as important as obtaining cost effective practical solutions.

However there are conclusions that can be drawn which would be useful to organisation that support people with disabilities when reviewing their ICT strategy. OS products are a strategic option that should be examined in detail and as such organisations such consider the following recommendations:

- Organisations should form a clear picture of the accessibility needs of users. This may be undertaken using a combination of approaches such as audit, surveys, user groups etc. Not only should organisations try to accurately assess accessibility requirement now, but they should seek to predict needs as well.

- Organisations should examine the accessibility functionality that is already available in their current systems to determine the extent to which it can

Open Source and Disability Support

Executive Summary

The ICT and disability study group, part of the M2E transnational partnership consider the potential for the use of Open source (OS) products to support disabled people with access to ICT. OS products are those that can be adapted by developers because the source code (building blocks) of the product can be accessed. This contrasts with propriety software, which, usually for commercial reasons, keeps the code private. This document sets out the groups approach, findings, discussion, conclusions and recommendations.

Colleagues form organisation in 5 EU countries supported the work, by considering experience in their own country and using as a basis for discussion and analysis with a view to developing recommendations as a framework that organisations could use when considering the use of OS products in their overall use of ICT

One of the partners, S-Comp, is a technology company and Microsoft partner and therefore could offer a strong perspective on propriety software. Also one of the partners, Manchester Community Information Network, has valuable, first hand, experience in this area. So valuable learning, discussion and analysis was developed from their experience. All partners are involved in the support of disabled people. Desk research also produced valuable information to inform the work of the study group.

The principal advantages that emerge from the work are twofold; firstly it appears that overall cost can be reduced by using OS products. Secondly the level of product flexibility offered by OS is much greater than that which can be offered by propriety software. There are caveats with both advantages but it is the study group's view that given the high quality of many OS products these are signifi-

cant advantages that can be obtained from using OS products.
The key disadvantages of using OS products are that firstly, there are relatively few applications targeted specifically at improving access for disabled people. Secondly, the OS environment is complex, and thirdly, reliability may sometimes be compromised. Lastly, organisations seeking to integrate disabled people into the community should take care that the use of OS product, which are not extensively available, does not counter to this aim.

Finally the study group developed a set of recommendations that organisations considering the use of OS products could use as a framework to guide decision making. In short organisations should form a clear picture of the accessibility need of users, review current accessibility arrangements, actively consider OS products, both at application and operating system level and finally ensure that decisions are made using robust criteria.

Introduction

Motivation to Employment (M2E) is an EQUAL transnational partnership. It is one of the many transnational partnerships formed under Action Two of the second phase of EQUAL in the period 2000 – 2007. Transnational co-operation is a principal aim of EQUAL and central to transnational co-operation is the exchange of information and experience.

The M2E transnational partnership brings together organisations from France, Italy, Hungary, the Czech Republic and the UK, that are working to support disabled people in work and in there search for work. The work of M2E was split into different strands, one of which was that of ICT and disability. The members working on this theme examined the current and potential use of Open Source (OS) software to support people with disabilities. This document is the report the work undertaken by that ICT and Disability study group of the M2E transnational group

So the aim of this study group was to assess the issues, benefits and draw-

Key advantages and disadvantages surrounding the use of Open Source ICT products.

The principal advantages that are emerging from the work include:

Cost – It is clear that at operating system level Linux is a viable alternative to Windows that can provide similar levels of reliability, flexibility and security at a much lower outlay. It is also clear that individual FOSS applications, such as Firefox can also provide similar levels of reliability etc. to Microsoft products with a much lower outlay.

Flexibility – Having the ability to adjust the code will give users much more control over the adaptability of the software than can be obtained by using the accessibility functionality available in propriety software. Mass market organisations such as Microsoft will always find it difficult to cater for the needs of disabled people who in many senses form a collection of small niche markets. The caveat here is that significant technical know-how is required to be able to adjust the code and obtain maximum flexibility.
The principal disadvantages are:

Few products – There are a limited number of OS products that are available to support disability access compared with the variety of propriety software products that exist.

Complexity of the Open Source environment – Freeware differs from Open Source software, which may differ from free software and registration formats are irregular. It is possible for an Open Source product to be adapted and then registered as propriety software and this can cause confusion.

Reliability – this may be compromised by limited development resources and in the case of applications by upgrades to the operating systems on which they run.

distributions, particularly Ubuntu, have created products that can quickly convince end users of Linux usability. However for FOSS to be able to establish itself within the sector it will need to adopt a clear strategy aimed primarily at decision makers:

Concerns about long-term technical support have to be addressed. Much of this will need to be done nationally through development of a Linux user group dedicated to the VCS, training ICT circuit riders in Linux support, a national VCS help desk and knowledge base for Linux, etc. Pressure needs to be put on technical support suppliers to force them from entrenched positions of only supporting Microsoft operating systems.

Although there are clear parallels between the ethos of the VCS and the Free Software community few VCS decision makers will decide to switch to FOSS solely on ethical or political grounds. Cost is a much more viable reason in their eyes and it is most effective when they are considering new ICT investment. Management are open to the argument that they are not doing their job properly if they are not considering the cost savings that arise from using FOSS, other things being equal. This can be taken advantage of initially through developing a number of very cost effective FOSS solutions to key needs of the sector that involve little disruption of existing work practices - use of Open Office, Firefox, Thunderbird cross platform FOSS programs, LAMP based CMS websites, Linux file server and backup systems, suitable LAMP based groupware programs running on an internal Linux server, etc.

By proving the viability, stability, security and cost effectiveness of even a relatively small initial number of FOSS solutions the conditions can be created for convincing management to seriously think about moving more widely to FOSS when it comes to times for considering major new ICT investments, such as replacing old hardware, software upgrades, etc

backs of the use of OS software to improve accessibility. This would provide a framework for organisations that support disabled people and highlight potential ICT options that had not yet been considered.

Approach

Over the period from late 2005 to early 2007 it was agreed that there would be a programme of 5 transnational meeting at which partners would gain understanding of the work of each partner organisation and the environment in which it operates. In addition to this each organisation highlight the use and experience of Open Source software that they were aware of in their own country.

This information could then be shared and a framework developed to assist disability organisations to decide on the extent to which they may incorporate OS products within their ICT strategy.

Findings and Discussion

In this section, which is the main body of the report, the nature of Open Source software will be explained and how it differs from freeware and propriety software. The adaptability of Microsoft products to support disabled people will be discussed together with the advantages and disadvantages of using OS products

These issues will be considered in light of the experience of partners and in the particular context of:

- A case study will be discussed relating to Manchester Community Information Network (MCIN), an organisation that switched to the use of Open Source software in 2005.
- The experience of ICOM, an organisation in Lyon that has developed and used an OS product to support disability access, will be described.
- A project co-ordinated by the Cambridge Independent Advice Cen-

tre (CIAC), piloting the use of OS products in voluntary sector organisations in the East of England, will be outlined.

What are the advantages of, and barriers to, using ICT for disabled people?

Before considering the issues surrounding open source it is worth highlighting the key advantages of using ICT to support disabled people, which are:

- That it provides greater access to information especially written communication
- That it gives greater autonomy for example it allows disabled people to work in their own home or to have many aspects of the home controlled by ICT (Domotics)
- Communication can be enhanced considerably by ICT

The key barriers are:

- The nature of the disability
- Other personal factors eg motivation, confidence and capacity to learn
- Knowledge and availability of specific ICT that is useful
- Cost

What is Open Source software?

This is when the source code (the language used by programmers and developers that forms the building blocks of all software products) is made available to the general public with little or no intellectual property restrictions. This allows users and organisations to develop the software product to meet their own specific needs.

So already in the context of access for disabled people one advantage can be seen in that a product with open source could be developed to meet the needs of a person with a particular disability, for example a person with low vision could

would be a waste of the money already spent. Obviously people don't change just for change sake and need good reasons to change to Linux from an environment they have already heavily invested in. Linux desktop migration is sometimes difficult when they have already heavily committed to a Microsoft server environment, particularly if they are using Exchange server.

To a certain extent these problems were compounded by the approach to the project. It was initially envisaged that 10 desktop Linux computers for testing FOSS on a stand-alone basis would be supplied. However, when the training visits to premises took place it immediately became obvious that everyone was expecting us to integrate the computers fully into existing networks and work environments. Without this they were not really prepared to test the computers properly. It was therefore necessary to carry out additional work not originally envisaged without adequate funding and resources. This meant that a compromise had to be found on how far the project could go with integrating the computers into existing network systems, this gave a false impression concerning the full capabilities of Linux.

Despite these problems, in a number of cases managers were pleased to have been made aware of FOSS as an alternative to proprietary software and said they would certainly consider its use when making new major ICT investments in future, providing the issue of good long term technical support could be overcome.

From the experiences of the overall East of England FOSS in the VCS project, not just the Linux on the desktop project, it is clear that FOSS use by the VCS can be a viable and extremely cost effective alternative to proprietary software. It could also eventually result in software solutions much better adapted to VCS use than present proprietary "off the shelf" solutions that are often aimed primarily at users in the business sector.

The rapid recent development of user friendly Graphical User Interfaces for Linux

- Open Office - FOSS equivalent to Microsoft Office
- Evolution - FOSS equivalent to Microsoft Outlook
- Firefox - FOSS equivalent to Internet Explorer
- Scribus – Desktop publishing
- Project Planner - Project management
- GnuCash – Finance

The organisations involved were invited to an initial session where they were introduced to FOSS and Ubuntu Linux. They then all received a personal training session at their own premises. After three months the organisations were invited to submit an interim assessment of their use of the computers. At the end of the project they were asked to fill in a questionnaire.

Feedback from actual users was generally very positive regarding use of the software. They found it intuitive and, with only occasional difficulties, quickly adapted to its use. Many of them seemed very surprised at this and at the range of good quality free software available. They had clearly been influenced to believe this would not be the case, but soon overcome any such prejudices.

Resistance to more general use of the software was however much stronger at managerial and decision making level. There were a number of factors involved: Strong resistance from some contracted technical support staff who saw it as a threat to their entrenched monopoly position of using Microsoft software. In at least two cases they put strong pressure on the organisations involved to switch the computers to using Microsoft, making clear that they would not supply any support for Linux and implying that there were unstated dangers to mixing its use with Windows. This raised fears with decision makers about being able to get long-term technical support for Linux.

Managerial staff often considered that they had invested so much money on technical support and solving past problems that they felt that moves to Linux

have the code adjusted so that the contrast of the display was automatically increase when using that particular product.

But one disadvantage also arises quickly, source code is a technical language so technical expertise is needed to make adjustment to the source code that support the user without damaging the functionality of the product.

Most software that is currently available to support access for disabled people is propriety software, which means that the organisation that has developed it wishes to maintain intellectual property rights and therefore keeps the source code private.

Contrast this with the Wikipedia definition of free software to understand the relationship between the two. Free software (from Wikipedia - http://www.gnu.org/philosophy/free-sw.html): is a matter of liberty, not price.
Free software is a matter of the users' freedom to run, copy, distribute, study, change and improve the software.

More precisely, it refers to four kinds of freedom, for the users of the software: The freedom to run the program, for any purpose. The freedom to study how the program works, and adapt it to your needs. The freedom to redistribute copies so you can help your neighbour. The freedom to improve the program, and release your improvements to the public, so that the whole community benefits.

Clearly access to the source code is a precondition for software to be completely free.

What flexibility exists to support disabled people in propriety software in particular that offered by Microsoft?

Microsoft’s latest operating system, Windows Vista, includes built-in accessibility

settings and programs that make it easier for computer users to see, hear, and use their computers. The accessibility settings and programs in Windows Vista are particularly helpful to people with visual difficulties, hearing loss, pain in their hands or arms, or reasoning and cognitive issues.

Major accessibility improvements in Windows Vista are the Ease of Access Center and state-of-the-art speech recognition and magnification capabilities. It provides a centralized location where you can get quick access to adjust accessibility settings and manage assistive technology programs. The Ease of Access Center can be found in the Control Panel of Windows Vista, It replaces the Accessibility Wizard and Utilities Manager in previous versions of Windows.

- Magnifier, the magnification program built into Windows Vista, enables you choose magnification levels from 2 to 16 times the original and choose to track the mouse, the keyboard, or text editing. Magnifier can be found in the Ease of Access Center.
- The newly improved Narrator text-to-speech tool, built into Windows Vista, now reads Narrator menus without leaving the active window. Individuals who use Narrator will also find a more pleasant, natural sounding voice. Narrator can be found in the Ease of Access Center.
- Windows Speech Recognition, in Windows Vista, empowers you to interact with your computer by voice, significantly reducing the use of a mouse and keyboard while maintaining or increasing your overall productivity. You can dictate documents and email, fill out forms on the Web, and command applications and the operating system by saying what you see. Right from the beginning, you are guided through an easy setup process and an interactive training application that will familiarize you with the voice commands. Whether it is starting an application, selecting a word, or correcting a sentence, you are always in control and guided toward a list of smart choices.

dual boot, emulation and virtualisation may mean that users can try out alternative operating systems whilst still having access to their favourite applications and the “safety net” of Windows.

ICOM’s work

ICOM is a computing resource centre based in Lyon that supports a wide range of people with disabilities on a daily basis. Its aim is to research and develop innovative solutions that increase the independence and inclusion of disabled people and to promote their use widely.

Amongst other things ICOM have developed a virtual keyboard called Clivicom, using open source software. This tool is specifically designed to improve the access of people with disabilities to ICT.

East of England Free and Open Source software (FOSS) in the Voluntary and Community Sector (VCS) Project

In this project 10 desktop computers using Ubuntu Linux were distributed to Voluntary and Community Organisations (VCO) in the East of England Region for testing and evaluation. The organisations were:

- Fenland CVS
- Ipswich CVS
- West Norfolk CVS
- Cambridge Independent Advice Centre
- Voluntary Action Luton
- Colchester MIND
- Crossroads, Cottenham
- Community and Voluntary Forum: Eastern Region (COVER)
- Cambridge Online
- Herts Citizens Advice

A range of suitable FOSS products were included:

ing system. Most users had a huge amount of time invested in learning Microsoft Windows and it can be difficult getting to grips with a new operating system. Switching operating systems does demand some effort and learning.

It was agreed at MCIN that, in certain conditions and situations, Open Source could be a real benefit to community groups. However it does demand a level of technical skill to get running and to offer support in the early days.
A group needs to be clear what they want and need from their computer to assess if Open Source will fit the bill.

However there are many benefits:

- It is free so costs can be reduced.
- The software is reasonably stable secure and therefore reliable
- The products were easy to use
- There are ethical advantages (for some)
- Licensing and the administration and control surrounding it is reduced

For a community group with limited resources free software is a major attraction, however one does need to take into account additional costs in terms of training, support and staff development.

Almost a year after the switch to Linux the majority of MCIN staff are still using Linux as their primary computer for doing day to day tasks such as word processing, internet, email etc. Many users do have access to a secondary Mac or PC to carry out tasks they would find harder or could take longer to complete using Linux. This does not mean that feasible alternatives do not exist but that due to limited time one might not be able to learn new skills and explore options. In this mixed environment users can pick the best tool for the job be that Linux, Mac or Windows. Those members of staff that are not using Linux are running Open Source applications such as Firefox, Thunderbird etc.

The capability of running multiple operating systems on one computer through

Find Speech Recognition in the Control Panel of Windows Vista.
Microsoft works closely with assistive technology (AT) manufacturers through the Microsoft Assistive Technology Vendor Program to ensure that AT products are ready when Windows Vista is available. Many AT products, including multiple screen readers, are available on Windows Vista.

Apple also have a strategy in this context, for example Mac OS X Tiger introduces VoiceOver, an accessibility interface that offers you magnification options, keyboard control and spoken English descriptions of what's happening on screen. If you have a visual impairment, VoiceOver enables you to work collaboratively with other Mac users or work on their computers without assistance. Apple claims it is fully integrated and extraordinarily reliable, 'VoiceOver eliminates the need for an expensive screen reader'. There is a special section in the preferences of the operating system MAC OSX for Macintosh "Universal access". It is possible to choose the special feature you need for example:

- Vision Impairment: In this section it is possible to select VoiceOver (with many options). A voice speaks when the mouse is over an icon, but it is possible to avoid the use of the mouse. Zoom (with many options) and Colours (with many options) it is possible to select black/White, negative, contrast, darkness, and so on
- Hearing Impairment – For example, flashing light can be activate instead of sound tones (bips).
- Keyboard - It is possible to have a different set up on the keyboard in order to avoid double letters and some alarms if the keyboard is used incorrectly.
  Mouse and track-pad: there are a few settings especially for the speed.

MCIN's experience in switching to Open Source

MCIN is a community development organisation based in Manchester that uses ICT. It works to enable hard-to-reach groups and local communities to access

all the benefits that ICT has to offer to increase social inclusion.

For a number of years MCIN had been promoting Open Source alternatives to community groups. It was therefore agreed that MCIN would move its desktop machines from (predominantly) Windows to Ubuntu (a version of Linux an Open Source/ free operating system) in September 2005. It was agreed that there would be a six-month trial and a review would be carried out at the end of this period. Although predominantly using Microsoft Windows staff at MCIN had been already using Open Source applications such as Thunderbird (email) and Firefox (web browser). This trial focussed on desktop machines, as all MCIN servers are running Linux.

Linux is an increasingly popular operating system (an alternative to Microsoft Windows and Apple Mac OS). There are different versions (distributions) of Linux; some are free whilst others are only available commercially. Whilst Linux has proved very popular for developers and servers it is becoming increasingly popular as a desktop operating system for end users. However switching to Linux does demand an investment in terms of time for users as they need to learn different ways of doing things and get to grips with how the system works.

Increasingly popular are Open Source applications, which will run on different operating systems yet, which are free and constantly being developed and updated. Examples include:

- Firefox - an open source web browser, developed as an alternative to Microsoft Internet Explorer.
- Thunderbird - an email programme.
- Open Office - an alternative to Microsoft's Office Suite of applications.

Users can use these applications alongside existing programmes. These are full versions with no time or functional limitations.

MCIN has eight staff and six of those people were interviewed for this survey.

(It excluded the technical/ web developer who was using Linux already as his primary tool and whose needs as a developer different to other users).
One other member of staff was unable to complete the survey due to work commitments/ deadlines.

MCIN staff have a range of abilities and capabilities. However, in an office setting computers are generally used for email, Internet access, word processing, spreadsheets, and databases. There are however times when specific applications/ skills are required eg: photo and image editing, video editing, audio editing, presentations etc.

Of the six people interviewed at the end of the trial, four people were still using Linux. Of these three people were using Linux as their primary computer (ie: to complete most day to day tasks) whilst one person was using it as their secondary computer (ie: doing most of their work on a Windows computer whilst using Linux to complete certain tasks). Of these six people none had been using Linux before switch in September 2005. All had been using version of Windows at work with five of those interviewed were using Microsoft windows as their primary operating system at home whilst one person was using Mac OS X.

At MCIN interviewees used a range of applications and this had an impact on their response to Linux. For example there was no problem using Firefox and Thunderbird as users had been using the Windows versions of these applications already. However a major issue for a couple of members of staff was compatibility and interoperability with Microsoft Office. This was especially highlighted with regard to Word documents and PowerPoint presentations. When sharing documents with the “outside world” this could be problematic. Whilst Open Office could open the files formatting might be lost and there were problems for Microsoft Office users opening documents created and saved within Open Office.

There were also questions over the level of user friendliness of the Linux operat-