

2010

中小企業資訊科技培訓計劃

T01 – Open Source Software (OSS) Fundamental for SMEs

資助機構:	主辦機構:
<p>香港特別行政區政府 政府資訊科技總監辦公室 Office of the Government Chief Information Officer The Government of the HKSAR</p>	 <p>製造業創新商會 Manufacturing Enterprise Integration and Innovation Association</p>

協辦機構:

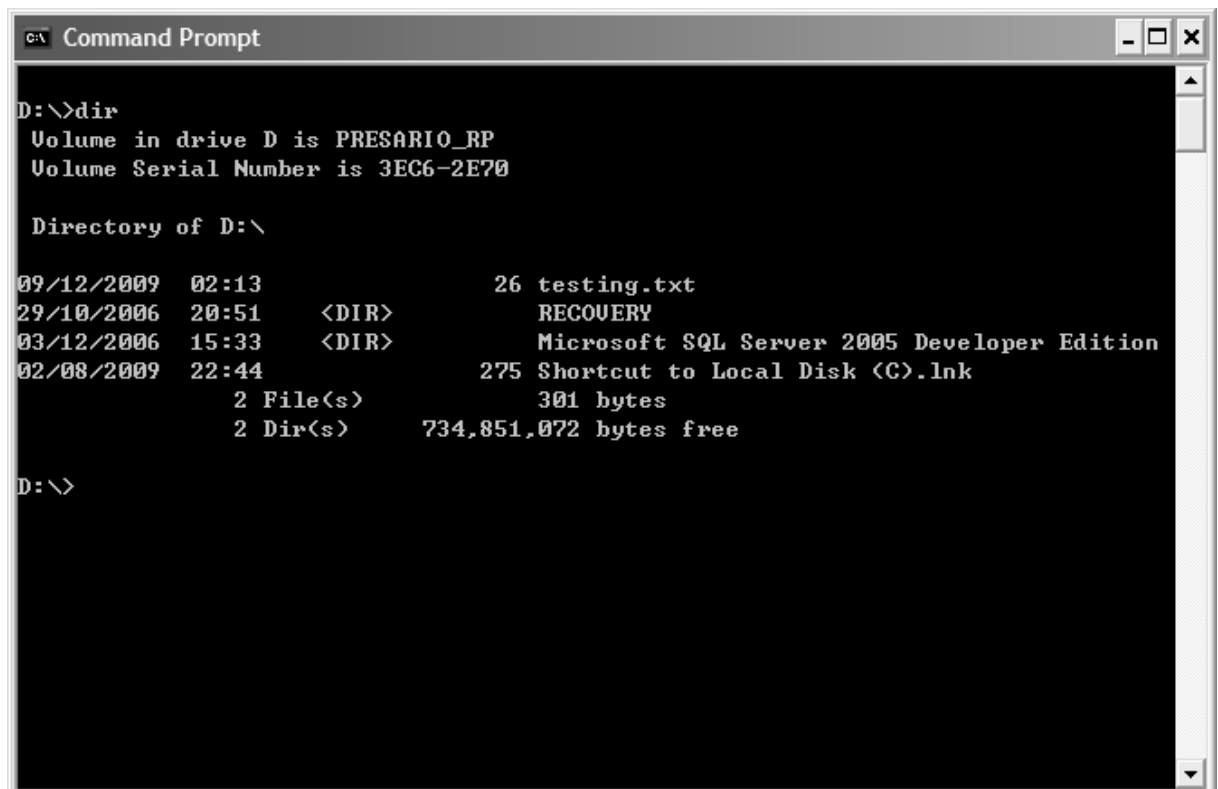


A. What is OSS?

Before study the OSS, several concepts should be understood.

I. Basic Concepts of Source Code, Program and Software

1. Software performs specific tasks for users.
2. Software (or application software) comprises a set of programs, or one single program.
3. Program consists of a set of program statements or commands which are written by human (i.e. programmer). Those commands will instruct the computer to carry out specific tasks.
4. Commands can be illustrated by DOS commands.
dir → It displays a list of files and subdirectories in a directory.



```
c:\ Command Prompt
D:\>dir
Volume in drive D is PRESARIO_RP
Volume Serial Number is 3EC6-2E70

Directory of D:\

09/12/2009  02:13                26 testing.txt
29/10/2006  20:51             <DIR>      RECOVERY
03/12/2006  15:33             <DIR>      Microsoft SQL Server 2005 Developer Edition
02/08/2009  22:44           275 Shortcut to Local Disk (C).lnk
                2 File(s)              301 bytes
                2 Dir(s)      734,851,072 bytes free

D:\>
```

copy → It copies one or more files to a specific location.

```
c:\ Command Prompt
D:\>dir
Volume in drive D is PRESARIO_RP
Volume Serial Number is 3EC6-2E70

Directory of D:\

09/12/2009  02:13                26 testing.txt
29/10/2006  20:51    <DIR>          RECOVERY
03/12/2006  15:33    <DIR>          Microsoft SQL Server 2005 Developer Edition
02/08/2009  22:44                275 Shortcut to Local Disk (C).lnk
                2 File(s)      301 bytes
                2 Dir(s)      734,851,072 bytes free

D:\>copy testing.txt testing2.txt
        1 file(s) copied.

D:\>dir
Volume in drive D is PRESARIO_RP
Volume Serial Number is 3EC6-2E70

Directory of D:\

09/12/2009  02:13                26 testing.txt
09/12/2009  02:13                26 testing2.txt
29/10/2006  20:51    <DIR>          RECOVERY
03/12/2006  15:33    <DIR>          Microsoft SQL Server 2005 Developer Edition
02/08/2009  22:44                275 Shortcut to Local Disk (C).lnk
                3 File(s)      327 bytes
                2 Dir(s)      734,846,976 bytes free

D:\>_
```

5. Since those codes (is called **source code** or **source**) are written by human, need to be translated into computer readable format. This format is called object code or executable file.
6. This translation process is called compilation or interpretation.

7. The following is a sample source code of Java.

```
/**
 * The HelloWorldApp class implements an application that
 * simply prints "Hello World!" to standard output.
 */
class HelloWorldApp {
    public static void main(String[] args) {
        System.out.println("Hello World!"); // Display the string.
    }
}
```

II. Concepts of OSS

1. OSS (Open Source Software) is software licensed with a copyright license compliant with the Open Source Definition (OSD) is upheld by the entire open source community.
2. It is distributed with its source code in human readable format (as discussed above).
3. Open and collaborative ways are the core model of OSS and it is contributed by groups of developers.

III. Background of OSS

1. In the early days of computing (approximately 1945 to 1975), computer programs were often shared among developers.
2. In those days, programs were bundled with hardware and sold without extra cost.
3. In 1984, Richard Stallman (a researcher of MIT Artificial Intelligence Lab) started the GNU project and established the Free Software Foundation (FSF) in 1985. It was a very significant milestone of OSS / FOSS (Free Open Source Software).
4. In 1991, Linus Torvalds began developing Linux which can be claimed the most well-known open source software.
5. OSS was coined in 1998 and it became popular among those who wanted to focus on the software source code being available and compliant with the OSD.
6. It is protected and promoted by the Open Source Initiative (OSI).

IV. Characteristics of OSS

1. It may not just mean access to the source code. Its distribution terms should also comply with the following:
2. Free Redistribution, the license shall not require a royalty or other fee for such sale.
3. Source Code, the program must include source code as well as must allow distribution in source code and compiled form.
4. Derived Work, the license must allow modifications and derived works, and must allow them to be distributed under the same terms as the license of the original software.
5. Integrity of Author's Source Code, if the license allows the distribution of "patch files" with the source code for the purpose of modifying the program at build time, it may restrict source-code from being distributed in modified form.
6. No Discrimination Against Persons or Groups
7. No Discrimination Against Fields of Endeavor, the license must not restrict anyone from making use of the program in a specific field of endeavor.
8. Distribution of License, the right attached to the program must apply to all to whom the program is redistributed without the need for execution of an additional license by those parties.
9. License Must Not Be Specific to a Product, the rights attached to the program must not depend on the program's being part of a particular software distribution.
10. License Must Not Restrict Other Software, it must not place restrictions on other software that is distributed along with the licensed software.
11. License Must Be Technology-Neutral, no provision of the license may be predicated on any individual technology or style of interface.

V. Difference between FOSS and OSS

In fact, the difference between them is ambiguous or even no difference.

OSS (Open Source Software) can be interpreted that source code of software is available to the public; while the "Free" of FOSS (Free Open Source Software) has two meanings, namely, free of charge (or gratis) and freedom to, practically, "free" here means freedom not free of cost.

1. FOSS can be divided into two categories, namely, free software and open source software. Sometimes they are treated as one single software type or their features are common and interchangeable.

2. Free Software is a matter of liberty, not price. It concerns about the freedom.
 - ◆ Freedom to run / use / execute the software;
 - ◆ Freedom to study how the programs (software) works by accessing to the source code;
 - ◆ Freedom to redistribute copies;
 - ◆ Freedom to improve / enhance the software (programs) and release the improvements to the public.
3. We can also check out the concepts of "Free Speech" and "Free Beer" on this difference between FOSS and OSS.
 - ✓ "Free Speech" means freedom as in the ability to do whatever you want. Free software is free as in speech. The source code can be studied, modified, shared and executed. It does not necessarily mean that the application costs nothing in terms of money.
 - ✓ "Free Beer" means the application doesn't cost anything in terms of money. It does not mean that you have any rights to the source code, modification, or sharing the application. Just means you don't have to spend any money on it.

B. Current status of OSS

Even though the OSS has emerged for several decades, it is still being developed and growing. The OSS model is the alternative for commercial software applications. Since the OSS appeared, there are many alternatives in the market for most of the commercial software packages. For example, Dia is an OSS package and it can replace Microsoft Visio. It is a software package to create many different kinds of diagrams and charts, like flow charts and network diagrams, and etc.

I. Popular OSS Products

The section below lists some of the most popular or well-known OSS products (with brief description) in the market.

1. Linux is the most famous OSS product.
 - ✓ Its kernel is an operating system kernel used by a family of Unix-like operating systems. It may be also called "baby Unix".
 - ✓ It is designed to provide personal computer users a free or very low-cost operating system comparable to traditional and usually more expensive UNIX systems.
 - ✓ It has a reputation as a very efficient and fast-performing system.
 - ✓ Its kernel can be applied for "Super Computer" Architecture.

2. Mozilla Firefox is an alternative of MS Internet Explorer, and it should be the second large market player in web browser sector.
 - ✓ The source code can be found from the link below:
https://developer.mozilla.org/En/Developer_Guide/Source_Code
 - ✓ It is mainly written in C/C++ (one of programming languages) with other web development tools and languages (like JavaScript and XUL – XML User Interface Language).
 - ✓ It claims itself faster, safer and smarter than the most popular one.
3. OpenOffice.org is the leading open-source office software suite for word processing, spreadsheets, presentations, graphics, databases.
 - ✓ It can be downloaded and used completely free of charge.
 - ✓ OpenOffice.org Base enables users to handle database data.
 - ✓ OpenOffice.org Draw is for graphics manipulation.
 - ✓ OpenOffice.org Writer is a fully equipped word processor.
 - ✓ OpenOffice.org Calc is a powerful spreadsheet software.
 - ✓ OpenOffice.org Impress can create multimedia presentations.
4. In the Internet world, there are three major players, namely, Apache Tomcat, PHP and MySQL. A full function web or e-Commerce site can be built with them.
 - ✓ Apache Tomcat is a web server (or called HTTP server) which allows web pages (contents) stored and executed.
 - ✓ PHP is a widely-used general-purpose scripting language that is especially suited for Web development and can be embedded into HTML.
 - ✓ MySQL is the world's most popular open source DataBase Management System mainly for web-base applications.
5. Songbird is a free and open source software audio player and web browser.
6. The last example is Gimp. It is probably the oldest and most well-known open source graphic application.
 - ✓ The main features include powerful painting tool, layers and channels support, plug-in architecture and scripting engine.

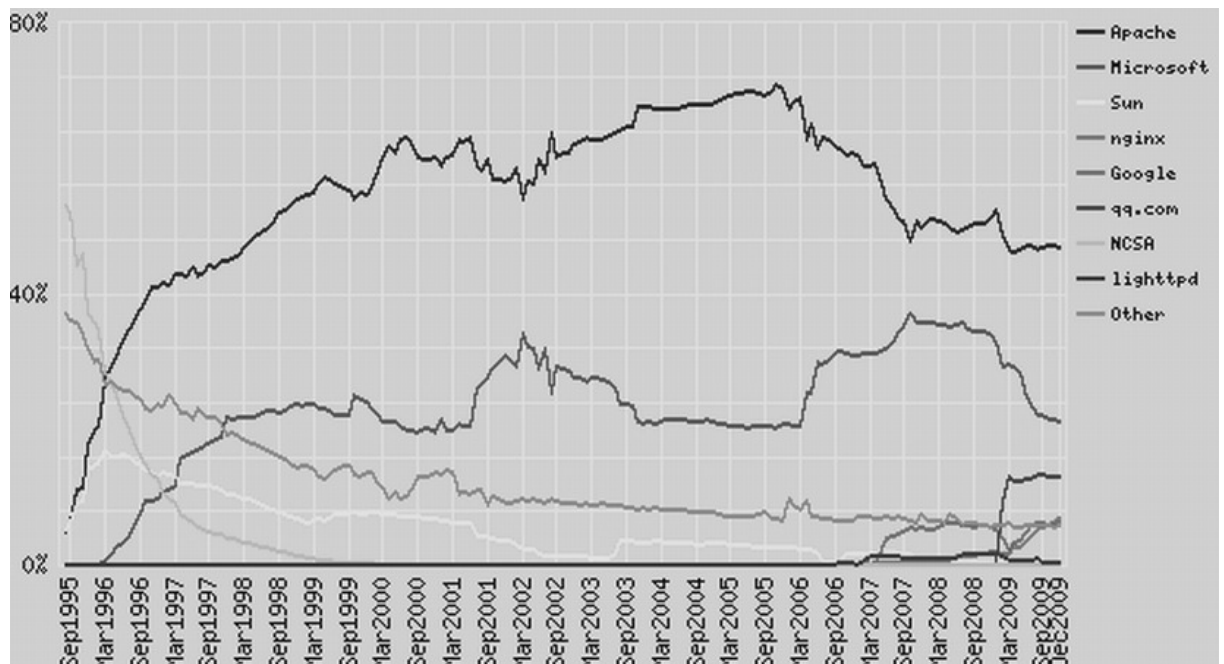
II. Market Information

Since there are a lot of OSS products in the market, some are very well-known while some are not. For those small or not well-known OSS packages, it is too difficult to research the penetration of market.

On the other hand, its market share can be hinted by checking some statistic data of several well-known OSS products. Since research bodies apply distinct sample size or characteristics, methodologies and technologies, different results are expected as below.

1. Apache

- ✓ It should be most popular web server in the market. According the latest figures by Netcraft, Apache dominates this market sector, around 50% of market share.
- ✓ In 2007 April, Netcraft's survey published polled 113,658,468 web, and found that Apache had 58.86% of the market while Microsoft (IIS, Internet Information Services) had 31.13%.



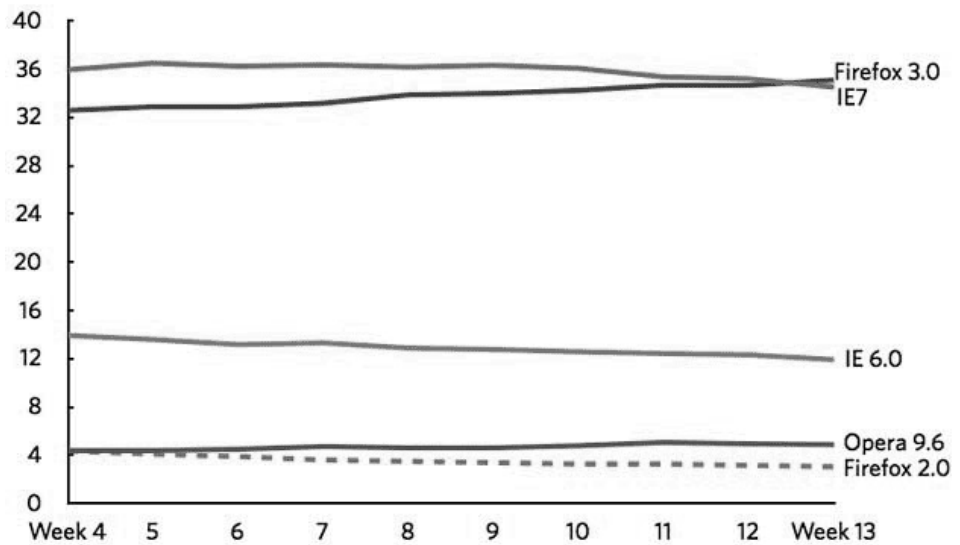
2. Firefox

- ✓ According to different statistical data, Firefox is the main competitor to IE even though there are differences among those statistical sources.
- ✓ In other words, the browser market is almost shared by Firefox and IE.

Browser Statistics Month by Month

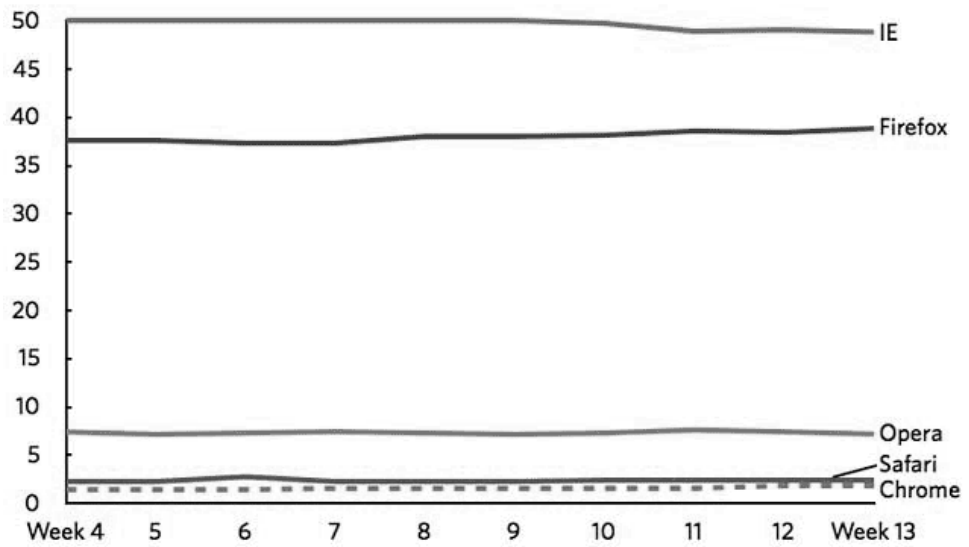
2009	IE8	IE7	IE6	Firefox	Chrome	Safari	Opera
November	13.30%	13.30%	11.10%	47.00%	8.50%	3.80%	2.30%
October	12.80%	14.10%	10.60%	47.50%	8.00%	3.80%	2.30%
September	12.20%	15.30%	12.10%	46.60%	7.10%	3.60%	2.20%
August	10.60%	15.10%	13.60%	47.40%	7.00%	3.30%	2.10%
July	9.10%	15.90%	14.40%	47.90%	6.50%	3.30%	2.10%
June	7.10%	18.70%	14.90%	47.30%	6.00%	3.10%	2.10%
May	5.20%	21.30%	14.50%	47.70%	5.50%	3.00%	2.20%
April	3.50%	23.20%	15.40%	47.10%	4.90%	3.00%	2.20%
March	1.40%	24.90%	17.00%	46.50%	4.20%	3.10%	2.30%
February	0.80%	25.40%	17.40%	46.40%	4.00%	3.00%	2.20%
January	0.60%	25.70%	18.50%	45.50%	3.90%	3.00%	2.30%

Top 5 browsers in use in Europe by version: week 4-13, 2009 Percent



Top 5 browsers in use in Europe: week 4-13, 2009

Percent



ars

W3Counter - Global Web Stats - Windows Internet Explorer

http://www.w3counter.com/globalstats.php

W3Counter - Global Web Stats

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Global Web Stats View archived reports: | November 2009

November 2009

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- ✓ 100% Unique Visitors
- ✓ Geographic Targeting
- ✓ 20 Target Categories

Web Browsers			Operating Systems		
1	Internet Explorer 8.0	21.21%	1	Windows XP	57.57%
2	Firefox 3.5	20.49%	2	Windows Vista	21.73%
3	Internet Explorer 7.0	17.36%	3	Mac OS X	7.46%
4	Internet Explorer 6.0	12.57%	4	Windows 7	4.54%
5	Firefox 3.0	10.30%	5	Linux	1.80%
6	Safari 4.0	4.58%	6	Windows 2003	1.21%
7	Chrome 3.0	4.14%	7	Windows 2000	0.54%
8	Firefox 2.0	1.06%	8	iPhone OS X	0.54%
9	Other Mozilla	0.52%	9	Windows 98	0.10%
10	Chrome 4.0	0.44%	10	WAP	0.07%

Countries

Screen Resolutions

Internet 100%

Global usage share data from: Net Applications							
Period	IE	Firefox	Safari	Chrome	Opera	Netscape	Mozilla
2009 Q4	63.94%	24.44%	4.40%	3.87%	2.26%	0.31%	0.11%
2009 Q3	66.80%	23.06%	4.13%	2.86%	2.07%	0.50%	0.09%
2009 Q2	68.06%	23.00%	3.67%	2.13%	2.05%	0.68%	0.06%
2009 Q1	69.13%	22.67%	3.58%	1.56%	2.18%	0.51%	0.06%
2008 Q4	71.99%	20.78%	3.11%	1.16%	2.15%	0.41%	0.07%
2008 Q3	74.93%	19.07%	2.73%	0.37%	2.06%	0.43%	0.07%
2008 Q2	76.24%	18.16%	2.73%		1.97%	0.48%	0.08%
2008 Q1	77.83%	16.86%	2.65%		1.84%	0.41%	0.13%
2007 Q4	79.16%	15.84%	2.39%		1.78%	0.50%	0.09%
2007 Q3	78.85%	14.69%	4.80%		0.51%	0.76%	0.11%
2007 Q2	78.76%	14.92%	4.66%		0.46%	0.83%	0.15%
2007 Q1	79.38%	14.35%	4.70%		0.50%	0.77%	0.19%
2006 Q4	80.69%	13.50%	4.06%		0.56%	0.86%	0.23%
2006 Q3	82.88%	11.89%	3.30%		0.62%	0.88%	0.26%
2006 Q2	84.03%	10.67%	3.25%		0.57%	0.98%	0.32%
2006 Q1	85.01%	9.77%	3.10%		0.53%	1.09%	0.36%
2005 Q4	85.88%	9.00%	2.80%		0.54%	1.25%	0.43%
2005 Q3	86.74%	7.97%	2.24%		0.55%	1.92%	0.48%
2005 Q2	87.24%	8.08%	1.89%		0.52%	1.62%	0.59%
2005 Q1	89.02%	6.17%	1.70%		0.49%	1.89%	0.67%
2004 Q4	91.35%	3.66%	1.50%		0.51%	2.09%	0.80%

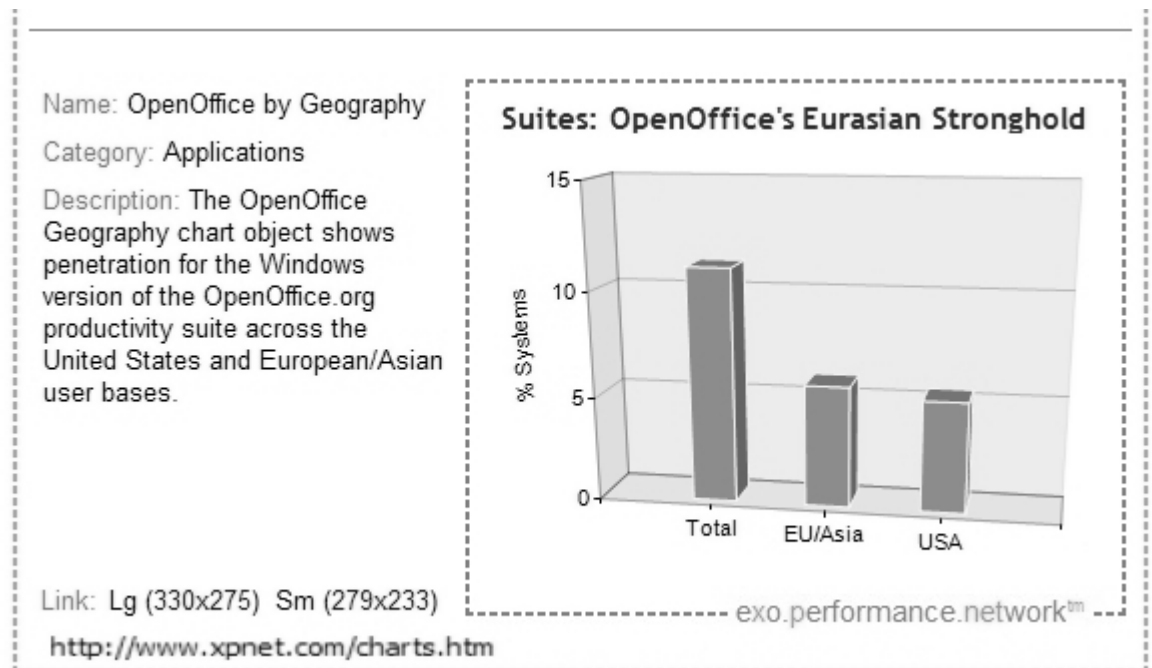
3. MySQL

- ✓ It is the world's most popular open source database software.
- ✓ Claimed by its official website (www.mysql.com), throughout its history, over 100 million copies have been downloaded or distributed.
- ✓ An Evans Data survey released in January 2004, MySQL's market share is growing faster than Windows'.
- ✓ Over the year, MySQL grew 30% while MS SQL Server and Access had 6% growth only (according to a survey of 550 developers).

4. OpenOffice.org

- ✓ To a certain extent, it is difficult to estimate the market share of OpenOffice.org because it can be freely distributed via download sites including mirrors, peer-to-peer networks, CDs, Linux distributions.

- ✓ exo.performance.network shows that the market share of OpenOffice.org is around 12% in 2009.
- ✓ Computer Sciences Corp. found that it has secured 14% of the large enterprise office systems market in 2004.
- ✓ OpenOffice.org itself claims there are 100 million downloads since version 3.0 of the software was announced just over one year ago. (Precisely, 100 millionth person clicked the download button.)



III. OSS Trend and Its Future

The future of OSS is rosy and bright. From the historical data has proved its upward trend. The following projections and forecasts outline the roadmap of OSS:

1. Gartner predicts that OSS **components** will be included in 80% of all commercial software applications by 2012. It can reduce development time and cost. By this trend, more OSS development tools will be produced by major software companies, including Microsoft.
2. One of the accelerators is “Cloud Computing”, because the Cloud Computing has been an open platform for OSS for a while. The forward movement of Cloud Computing accelerates OSS growth.
3. However, few blockages or contradictories may affect the progress of OSS movement. They are political and legal concerns, hardware proprietary (e.g. iPhone).

4. Seven Predications in 2020 (<http://2020flossroadmap.org>):
- ✓ Global digital divide reduced thanks to FLOSS.
 - ✓ FLOSS is mainstream
 - ✓ FLOSS communities are enablers of business ecosystems
 - ✓ Cloud Computing is ubiquitous
 - ✓ The IT industry is the champion of eco-responsibility
 - ✓ FLOSS is a strategic tool for Enterprise IT 3.0, i.e. Open IT
 - ✓ 40% of jobs in IT are FLOSS related

C. Benefits of OSS to SME

I. Analyze benefits and advantages of using OSS

1. According to the information above, we can see some benefits both to end users as well as developers.

- ✓ To end users
 - obviously, cost of software itself will reduce sometimes; free software can be chargeable. Actually, free software means a user is free to run the program, change the program and redistribute the program with or without changes. The program is free regardless of the price, because users have freedom in using it.
 - no more dependent on sole vendor, specially, on maintenance and support; but rather by FOSS communities and all techies.
 - avoid monopoly
 - end users can enjoy more innovation
- ✓ To developers
 - more innovation and interaction in the industry, as a result, industry grows faster technologically.
 - developers learn more from other developers, exchange and share more ideas among developers and communities.
 - intangibly, developers will gain recognition, even being famous, through this model easier

D. OSS Deployment in SME

- I. Special concerns for I.T. deployment in SME
- II. Methodology of OSS solution deployment in SME
- III. Case study of deployment plan
- IV. Hands-on session:
 1. OpenOffice.org
 2. FireFox

Reference:

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