An Assessment of Prime Software Repositories

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ABSTRACT: This paper is to identify the collections and the downloading patterns in software repositories. Data was collected from three major software repositories (i.e., softonic.com, wareseeker.com, and download.com) from 1st April 2011 to 30 April 2011. The findings reveal that softonic.com (2,242) leads the Microsoft Windows-based educational software, followed by wareseeker.com (1,506), and download.com (991). However, Softonic.com provides the highest number of Mac-based software programs (278) while Linux-based software programs are only present in wareseeker.com (97). Accordingly, most security software programs are Windows-compatible. wareseeker.com provides 14,493 software programs for free trial. wareseeker.com provides 39,638 gaming software programs and 22,836 Internet-related free software programs. 4,683 Windows-based communication software programs are available in wareseeker.com while 2,388 are provided by download.com.

I. Introduction

Information communication technology (ICT) has revolutionised every facet of our life, be it medicine, communication, technology, agriculture, primitive arts or crafts. But ICT itself relies on software. The software industry has evolved into a giant proprietary software empire, which offers solutions for money. The inner workings of proprietary software are secretive, which makes it difficult for other software to interoperate with it. Proprietary software, even when available for free, restricts users' capability of making any modifications. Part of the issue is related to the

unavailability of the *source code* — the human readable files used to create the software.

As an alternative, free and open-source software (FOSS) has been developed since 1980s. FOSS gives everyone the right to use and distribute software as they see fit (Pfaffman, 2008).

II. Literature Review

Perry (1994) pointed out that the use of a software system depended not only on its size and age but also on factors such as the nature of the system itself (i.e., its application domain), previous experience with the system, and the processes, technologies, and organizational frameworks employed.

Kemerer and Slaughter (1999) conducted an excellent survey on software development. They noted that there had been relatively little research on empirical studies of software progression.

Johnson (2006) opined that the development of open-source software might be superior to that of the proprietary software because the open source organizational form naturally minimized transaction costs associated with the privately distributed information. The free software movement is a social movement, promoting a new method for the development, maintenance, and release mechanism of software with the goal of creating and converting all software to "free" software (Elliott & Scacchi, 2008).

Pfaffman (2008) believed that free and open-source software in many cases obviated the commonly used proprietary standards. He also mentioned that the Linux operating system had been adopted by big computer manufacturers as a competitor to the Microsoft proprietary Windows operating system in the server market (Pearson, 2000).

Giri and Sengar (2011) investigated the operating system competition on the marketplace and found Microsoft Windows to be still in the lead but competing especially on desktop markets with the new Apple OS X, based on an open source UNIX compatible kernel. They also concluded that if one used searches made on Google as an indicator, a steady 1% of all searches during the period of June 2001 through October 2003 came from computers using Linux as the operating system. The market share of Mac OS has been around 3-4% while other non-Windows operating systems gain another 4%. The rest of Google queries, that is over 90%, were made from computers running on Microsoft Windows.

III. Statement of the Issue

The growth of the software industry is phenomenal. In order to make informed decisions in software development and marketing, it is imperative to understand the preference of use by people around the world. The study is an endeavor to measure the trend of software availability in the three top downloading sites among the 5 listed in the Association of Software Professionals' (ASP) website.

IV. Scope

The scope of the study is confined to an analysis of the categories of software deposited in three popular download sites, viz., download.com, softonic.com, and wareseeker.com.

V. Objectives of the Study

The main objectives of the study are as follows:

- To measure the software deposits in three software repositories in selected categories
- To estimate the magnitude of "free", "paid' and 'trial/demo" software download
- To analyse the software download trends
- To highlight the top downloaded software programs in the selected repositories

VI. Research Methodology

In order to accomplish the set objectives, data was collected from the three selected software repositories from 1st April 2011 to 30 April 2011. The collected data was compressed to make it manageable and meaningful with the help of graphical representation.

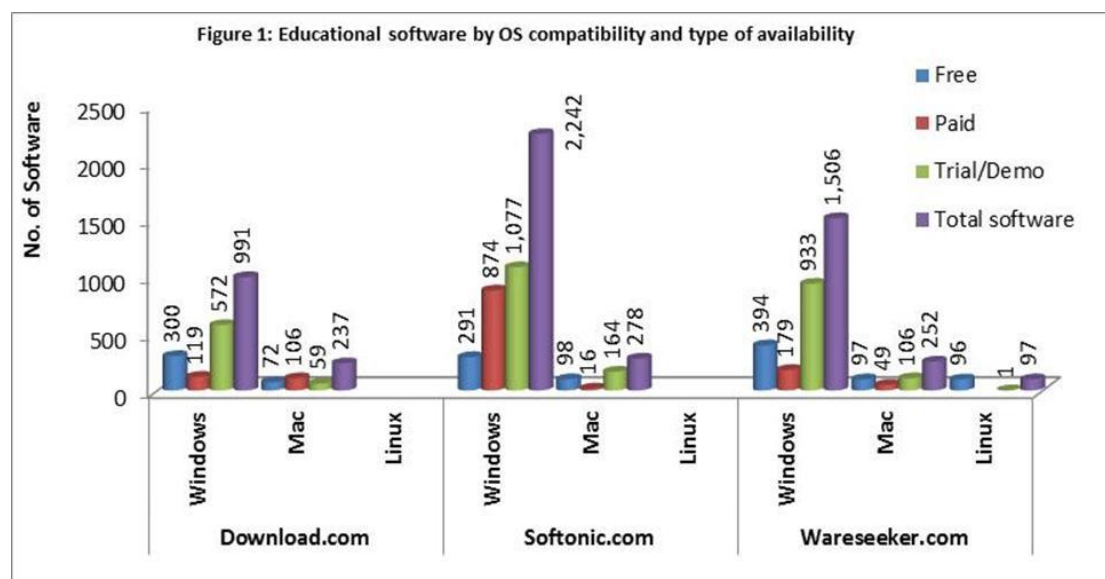## VII. Findings and Discussion

1. Educational Software

It is observed that a good chunk of free educational software programs are available in the three evaluated web repositories.

The largest number of Windows-based free educational software programs are available in wareseeker.com (394), followed by download.com (300). Mac-based free educational software programs are available most in softonic.com (98), followed by wareseeker.com (97). Only wareseeker.com hosts Linux-based educational software programs (97).

Windows-based commercial educational software programs are available most in softonic.com (874), followed by wareseeker.com (179). As far as the free trial version of educational software programs are concerned, softonic.com offers the most (1,077), followed by wareseeker.com (933).
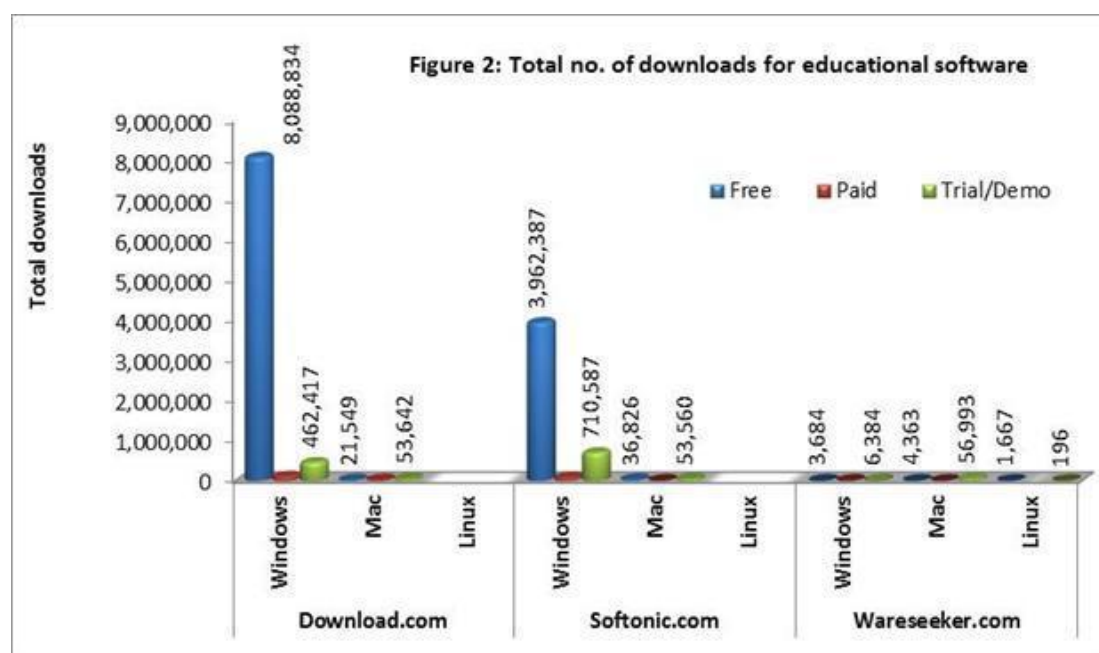
Windows-based educational software programs are available most in softonic.com (2,242), followed by wareseeker.com (1,506) and download.com (991) respectively. Softonic.com provides the largest number of Mac-based software programs (278). Linux based software programs are only available in wareseeker.com (97). See Figure 1 for more details.

Figure 1: Educational software by OS compatibility and type of availability

The largest number in the category of Windows-based software programs for free trial is provided by softonic.com (1,077), followed by wareseeker.com (933). softonic.com also offers more software programs in the paid Windows-based category (874).
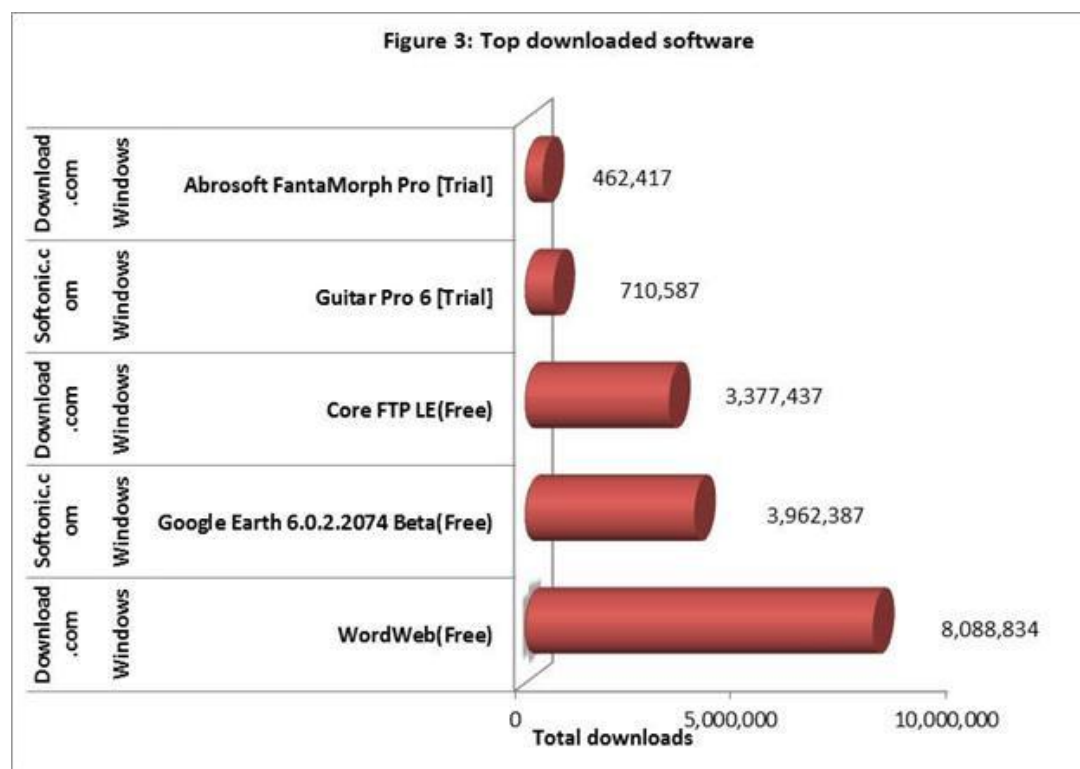
1.1. Download Measurement for Educational Software

As of April 30, 2011, Windows-based free educational software programs have been downloaded 8,088,834 times from download.com and 3,962,387 times from softonic.com. Mac-based free educational software programs have been downloaded 36,826 times in softonic.com and 21,549 times from download.com. Linux-based free educational software programs are available only in wareseeker.com and have been downloaded 1,667 times.

Figure 2: Total no. of downloads for educational software

However, Windows-based paid educational software programs have been downloaded 111,888 times from download.com, followed by softonic.com (83,785). Mac-based paid educational software programs have been downloaded 20,498 times from download.com and 3,781 times from softonic.com.

Windows-based educational software programs for free trial have been downloaded 710,587 times from softonic.com and 462,417 times from download.com. Mac-based educational software programs for free trial have been downloaded 56,993 times from wareseeker.com, 53,642 times from download.com, and 53,560 times from softonic.com.

The 5 educational software programs downloaded most are all Windows-based. WordWeb (free) has been downloaded 8,088,834 times from download.com, Google Earth (free), 3,962,387 times from softonic.com, Core FTP LE (free), 3,377,437 times from download.com, Guitar Pro (trial), 710,587 times from softonic.com, and Abrosoft FantaMorph Pro (trial), 462,417 times from download.com. See Figure 3 for more details.
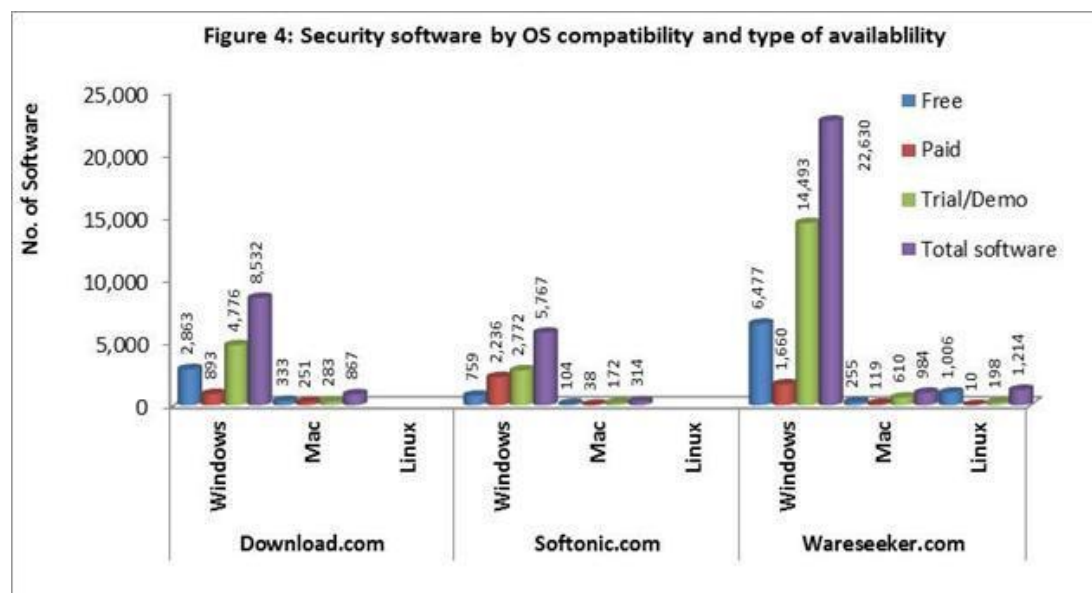

Figure 3: Top downloaded software

2. Security Software

There are more Windows-based free security software available in wareseeker.com (6,477), followed by download.com (2,863) and then softonic.com (759). There are more Mac-based free security software in download.com (333) and Linux-based free security software is only available in wareseeker.com (1,006).
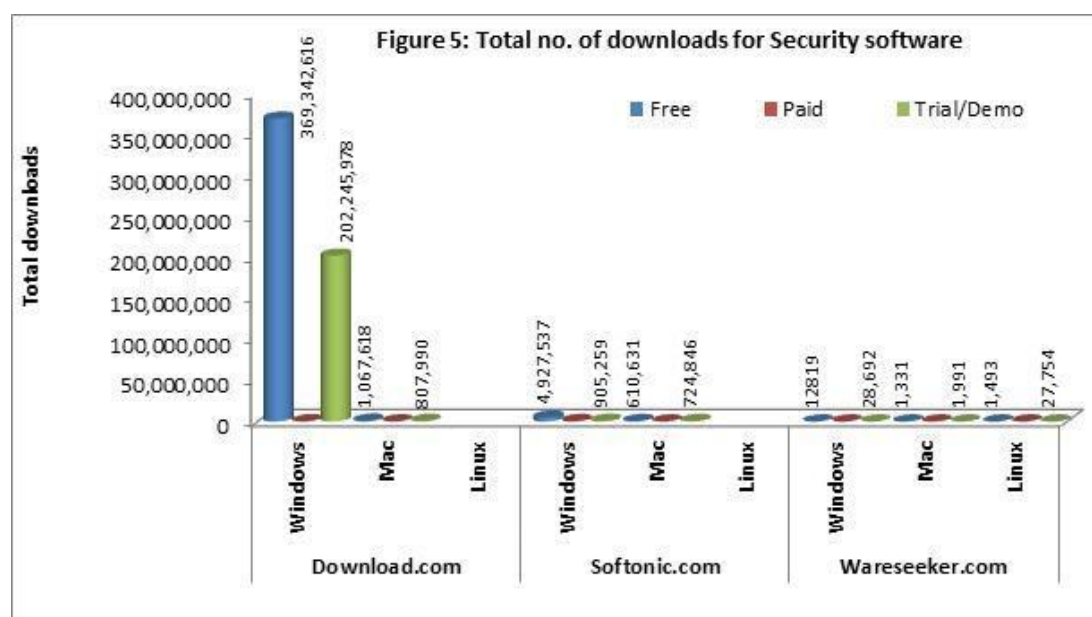
There are more Windows fee-based security software available in softonic.com (2,236), followed by wareseeker.com (1,660). And there are more Mac-based paid security software in download.com (251).

There are more Windows-based security software programs for trial in wareseeker.com (14,493), followed by download.com (4,776). wareseeker.com also has more Mac-based security software programs for trial (610). Combining the three categories (i.e., free, paid, and trial/demo) of Windows-based security software programs, wareseeker.com provides the most (22,630), followed by download.com (8,532), and softonic.com (5,767). See Figure 4 for more details.

Figure 4: Security software by OS compatibility and type of availablility
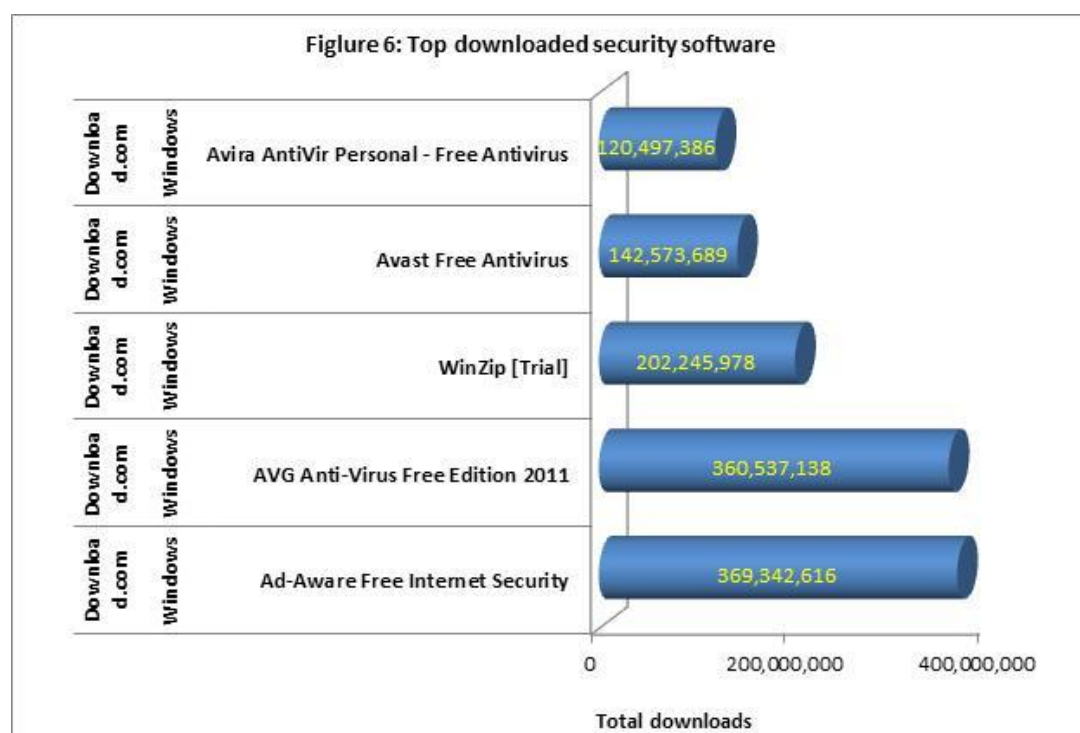
2.1. Download Measurement for Security Software

Windows-based free security software programs have been downloaded most from download.com (369,342,616 times), followed by softonic.com (4,927,537 times). Mac-based top free security software programs have been downloaded most from download.com (1,067,618 times), followed by softonic.com (610,631 times). Linux-based free security software programs have been downloaded 1,493 times only from wareseeker.com.

Figure 5: Total no. of downloads for Security software

Windows-based paid security software programs have been downloaded most from softonic.com (610,169 times), followed by download.com (375,455 times). Mac-based paid security software programs have been downloaded most from download.com (160,822 times), followed by softonic.com (20,709 times).

Windows-based trial/demo security software programs have been downloaded most from download.com (202,245,978 times), followed by softonic.com (905,259 times), and wareseeker.com (28,692 times). Mac-based trial/demo security software programs have been downloaded most from download.com (807,990 times), followed by softonic.com (724,846 times), and wareseeker.com (1,991 times). Linux-based trial/demo security software programs have been downloaded 27,754 times only from wareseeker.com.
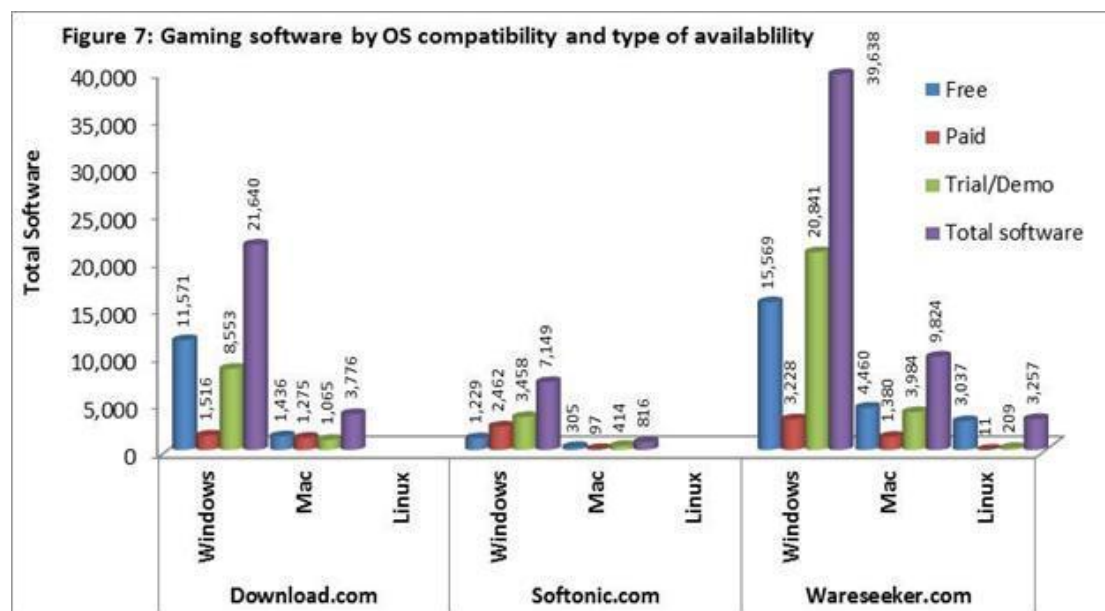
Of all the security software programs, it is observed that "Ad-Aware Free Internet Security" is downloaded most (369,342,616 times), followed by "AVG Anti-Virus Free Edition 2011" (360,537,138). Both are free to use. Of the top 5 downloaded software programs, 4 are free from download.com and compatible with Windows operating system.

Figlure 6: Top downloaded security software

3. Gaming Software

There are more gaming software programs for Windows-based operating system available in the market. wareseeker.com has most (39,638), followed by download.com (21,640) and softonic.com (7,149). Wareseeker.com has more Macintosh-based gaming software programs (9,824), followed by download.com (3,776). Linux-based gaming software programs are present only in wareseeker.com (3,257).
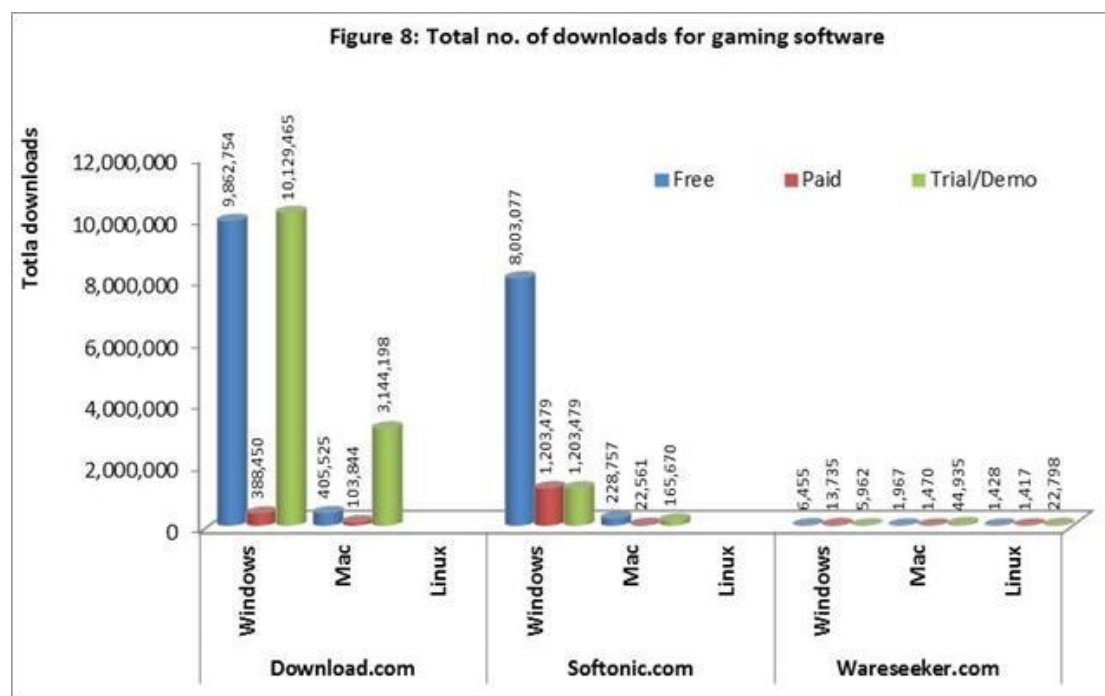
As far as Windows-based free gaming software programs are concerned, wareseeker.com has 15,569, followed by download.com (11,571). Also, wareseeker.com has 3,228 Windows fee-based gaming software programs, followed by softonic.com (2,462). Again, wareseeker.com has more Windows-based trial/demo gaming software programs (20,841), followed by download.com (21,640) and softonic.com (7,149) respectively. See Figure 7 for more details.

Figure 7: Gaming software by OS compatibility and type of availablility

A comparative study of the top 5 gaming software programs reveals that wareseeker.com holds the top two spots relating to Windows OS, one being trial (20,841) and the other being free (15,569). download.com takes the 3rd and 4th places.

3.1. Download Measurement for Gaming Software

Windows-based free gaming software programs have been downloaded most from download.com (9,862,754 times), followed by softonic.com (8,003,077 times). Mac-based gaming software programs hves been downloaded most from download.com (405,525 times) and softonic.com (228,757 times) respectively. Linux-based free gaming software programs have been downloaded 1,428 times from wareseeker.com.

Figure 8: Total no. of downloads for gaming software

Windows-based paid gaming software programs have been downloaded most from softonic.com (1,203,479 times), followed by download.com (388,450 times). Mac-based paid gaming software programs have been downloaded most from download.com (103,844 times), followed by softonic.com (22,561 times).

Windows-based trial/demo gaming software programs have been downloaded most from download.com (10,129,465 times), followed by softonic.com (1,203,479 downloads). Mac-based trial/demo gaming software programs have been downloaded most from download.com (3,144,198 times), followed by softonic.com (165,670 downloads).

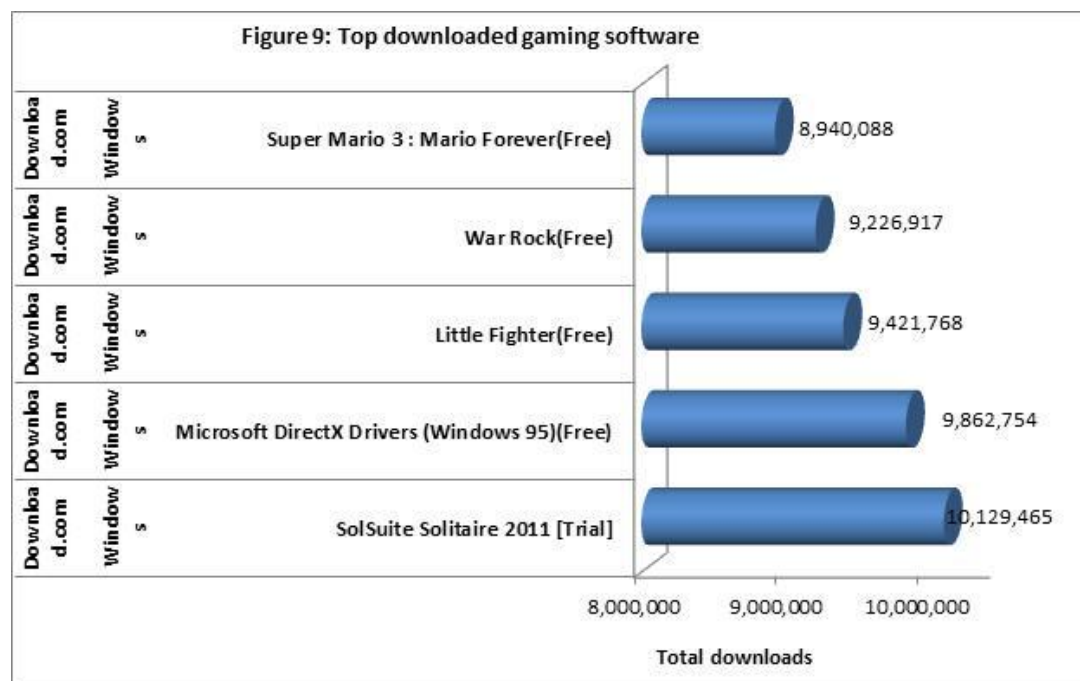Figure 9: Top downloaded gaming software

Figure 9 shows that all the top 5 downloaded gaming software programs are held by download.com, 4 being free and all supporting Windows operating system. The top slot has been taken by "SolSuite Solitaire 2011", which is provided for trial and has been downloaded 10,129,465 times.
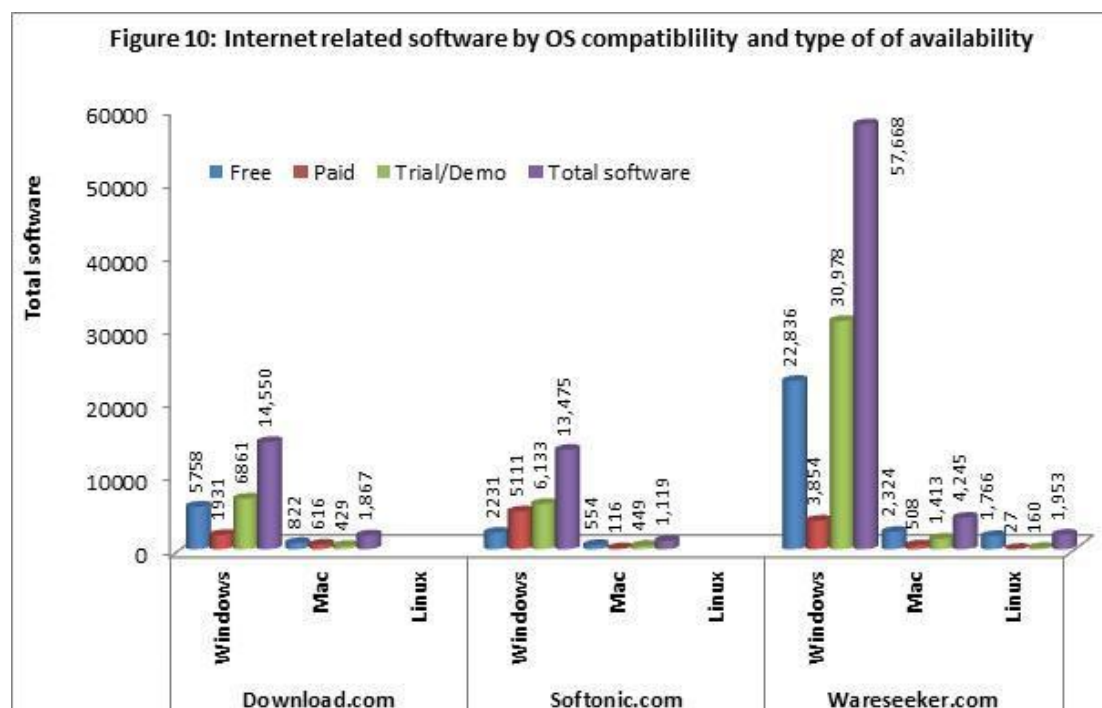
4. Internet-Related Software

Wareseeker.com has a strong pool of 22,836 Internet-related free software programs running on Windows OS, followed by download.com and softonic.com. The same site also provides access to 2,324 Mac-based Internet-related free software programs.

As far as paid Internet-related software programs are concerned, softonic.com possesses the largest number (5,111) in the Windows category. However, trial-based Internet-related software programs running on Windows OS are mostly found in the repository of wareseeker.com (30,978), followed by download.com (6,861) and softonic.com (6,133) respectively. Internet-related software programs running on Macintosh are provided in good numbers by wareseeker.com.

Most Windows-based Internet-related software programs (57,668) and most Mac-based Internet-related software programs (4,245) are provided by wareseeker.com, followed by download.com. As far as Linux-based Internet-related software programs are concerned, they are available only in wareseeker.com.
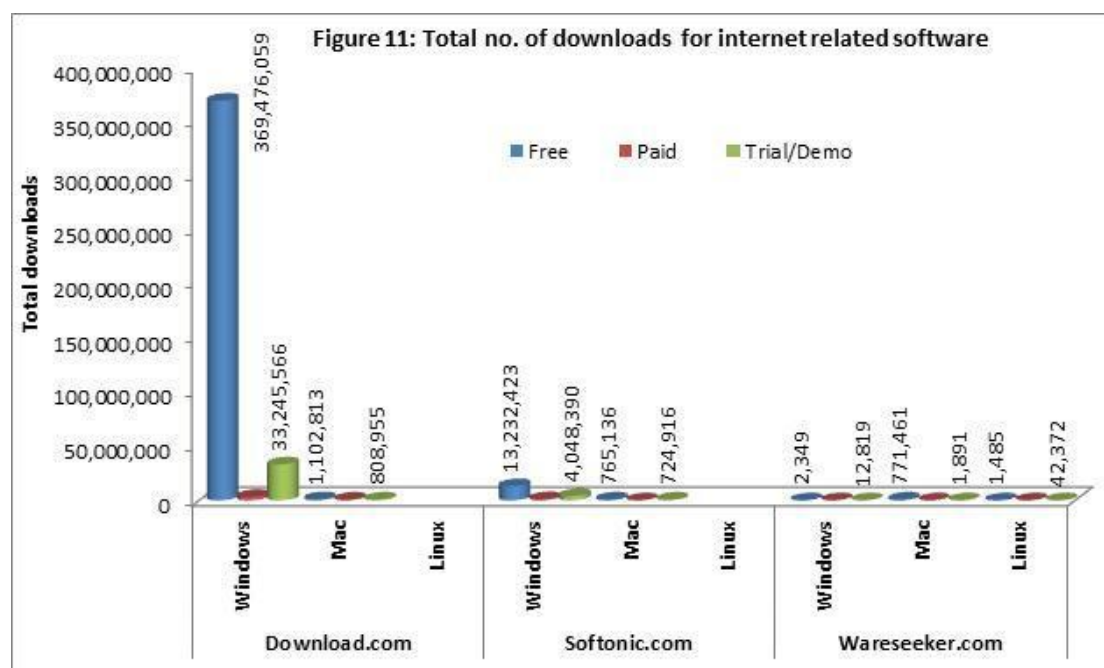
The site that provides the largest number of free Internet-related software programs is wareseeker.com (22,836). See Figure 10 for more details.

Figure 10: Internet related software by OS compatiblility and type of of availability

4.1 Download Measurement for Internet-related Software

Windows-based free Internet-related software programs have been downloaded 369,476,059 times from download.com, followed by softonic.com. Mac-based free
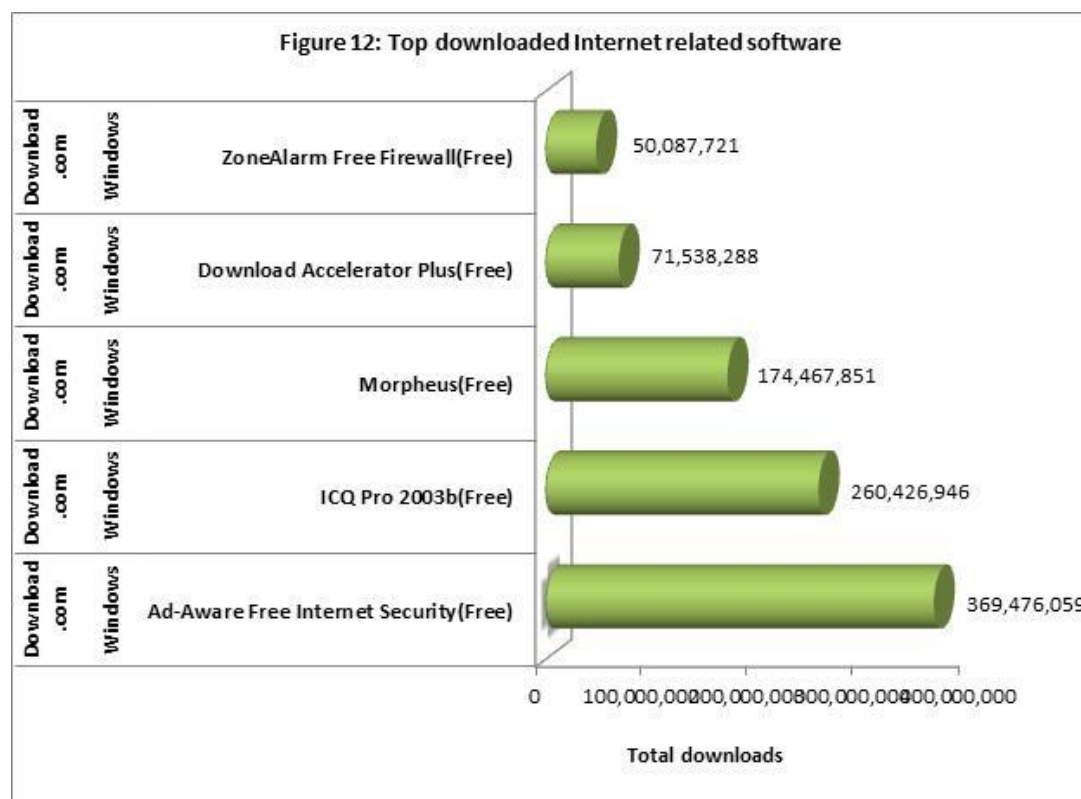
Internet-related software programs have been downloaded 1,102,813 times from download.com. Linux-based Internet-related software programs are present only in wareseeker.com and have been downloaded 1,485 times.

Figure 11: Total no. of downloads for internet related software

Paid Windows compatible Internet-related software programs have been downloaded 3,238,679 times from download.com, followed by softonic.com.

Windows-based Internet-related software programs in the trial/demo category have been downloaded 33,245,566 times from download.com, followed by softonic.com (4,048,390). Mac compatible Internet-related software programs in the trial/demo category have been downloaded 808,955 times from download.com, followed by softonic.com.

Comparing the 3 sites, it is found that all the top five downloaded Windows-based free Internet-related software programs are from download.com. "Ad-Aware Free Internet Security" has been downloaded 369,476,059 times, followed by "ICQ Pro 2003b" 260,426,946 times, etc. See Figure 12 for more details.

Figure 12: Top downloaded Internet related software

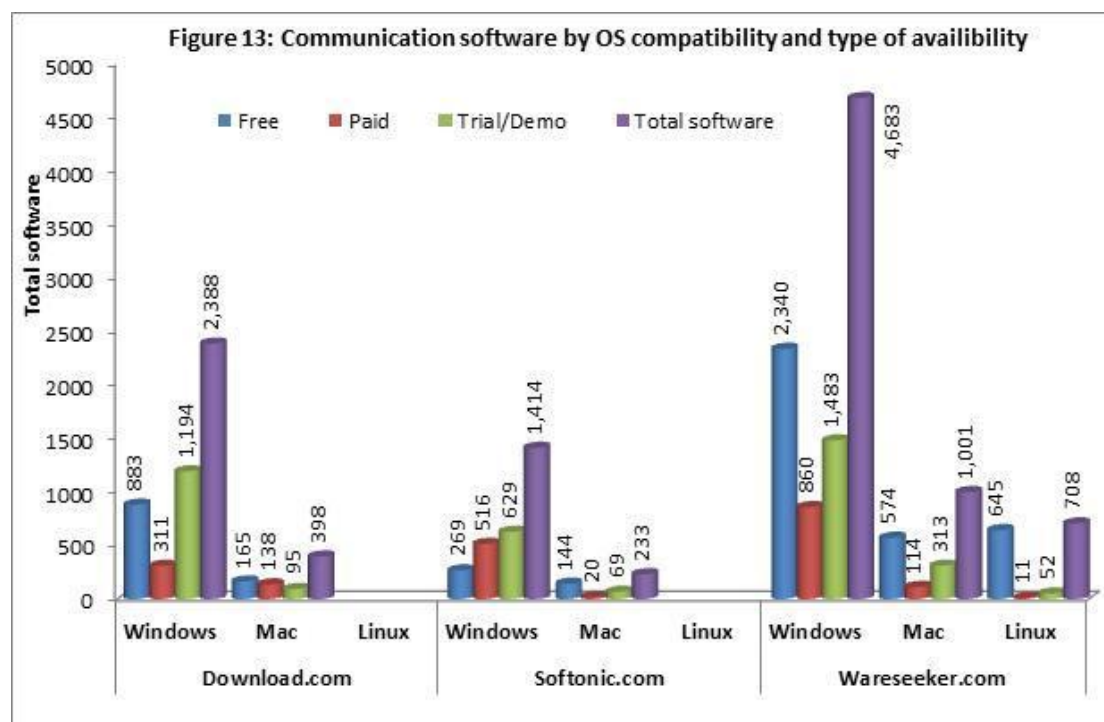|		
Download .com	Windows	ZoneAlarm Free Firewall(Free) — 50,087,721
Download .com	Windows	Download Accelerator Plus(Free) — 71,538,288
Download .com	Windows	Morpheus(Free) — 174,467,851
Download .com	Windows	ICQ Pro 2003b(Free) — 260,426,946
Download .com	Windows	Ad-Aware Free Internet Security(Free) — 369,476,059

Total downloads

5. Communication Software

Free Windows-based communication software programs are available most in wareseeker.com (2,340), followed by download.com (883). Free Mac-based communication software programs are available most in wareseeker.com. And Linux-based communication software programs are available only in wareseeker.com.

Paid Windows-based communication software programs are available most in wareseeker.com (860), followed by softonic.com (516) and download.com (311). Paid Mac-based communication software programs are available most in download.com (138), followed by wareseeker.com (114) and softonic.com (20).
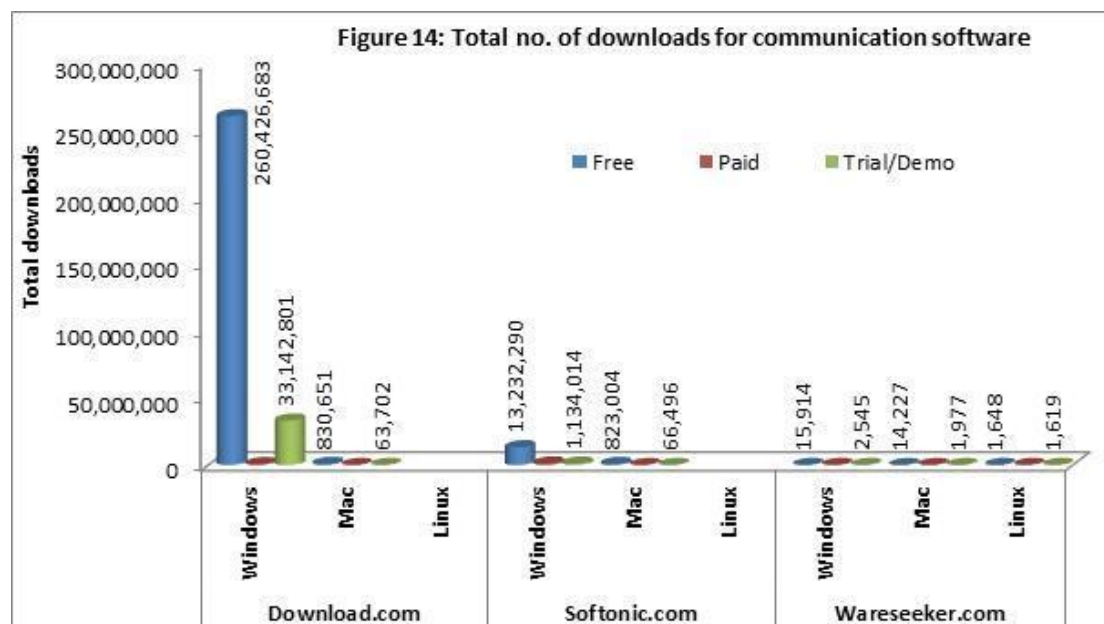
Windows-based trial/demo communication software programs are available most in wareseeker.com (1,483). Mac-based trial/demo communication software programs are also available most in wareseeker.com (318).

Altogether, there are 4,683 Windows-based communication software programs available in wareseeker.com, 2,388 in download.com, and 1,414 in softonic.com. Mac- and Linux-based communication software programs are again available most in wareseeker.com. See Figure 13 for more details.

Figure 13: Communication software by OS compatibility and type of availibility

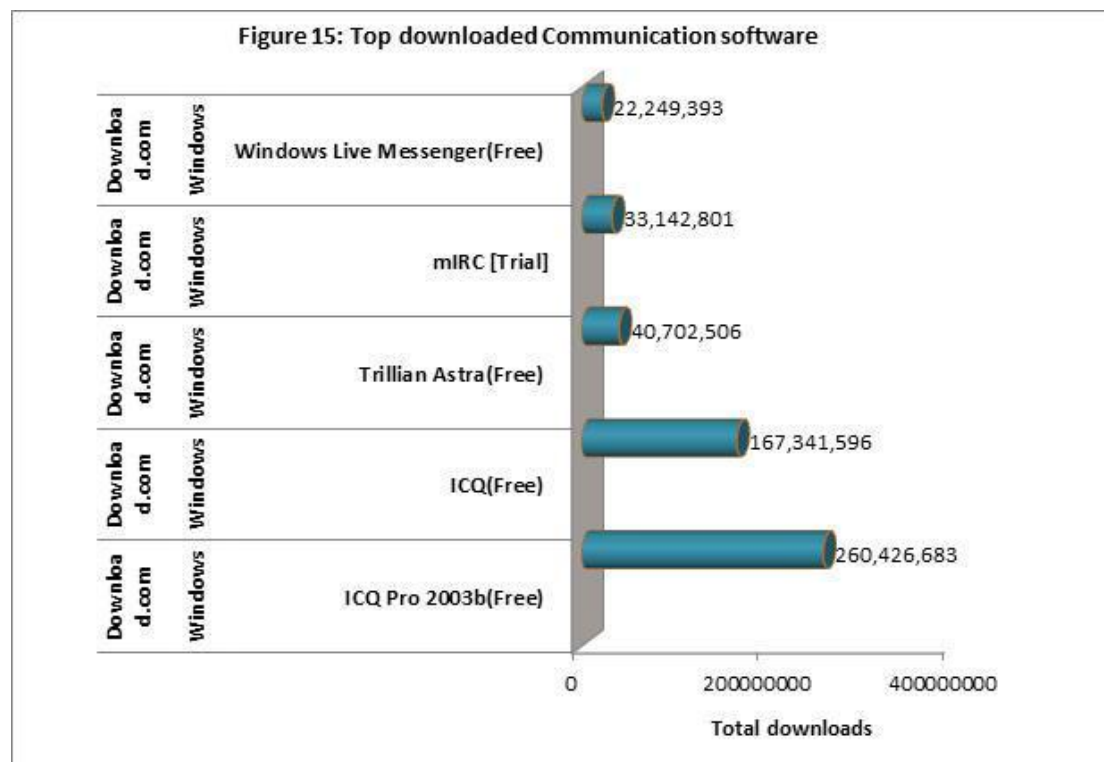## 5.1. Download Measurement for Communication Software

Windows-based free communication software programs have been downloaded 260,426,683 times has from download.com. Mac-based free communication software programs have been downloaded 830,651 times from download.com and 823,004 times from softonic.com respectively. Linux-based communication software programs have been downloaded 1,648 times from wareseeker.com.

Figure 14: Total no. of downloads for communication software

Windows-based paid communication software programs have been downloaded 1,134,011 times from softonic.com, followed by 670,837 times from download.com, and 2,264 times from wareseeker.com.

Windows-based trial/demo communication software programs have been downloaded 33,142,801 times from download.com Mac-based trial/demo communication software programs have been downloaded 66,496 from softonic.com and 63,702 times from download.com.

As far as Windows-based communication software programs are concerned, the top 5 downloaded are all from download.com. "ICQ Pro 2003b" has been downloaded 260,426,683 times, followed by "ICQ" (167,341,596). It is worth to mention that of the top five Windows-based downloaded communication software programs, four are provided for free and only one is on a trial basis.

Figure 15: Top downloaded Communication software

VIII. Conclusion

The software collections available in the three repositories contain more "free" and "trial/demo" programs. which are preferred by people when it comes to downloading. This fact that more "free" and "trial/demo" software programs have been downloaded indicates people's preference, which in turn, is a very good indicator for FOSS to succeed as a movement.

Another revelation from the comparison and analysis of the availability of software programs and their download trends in these 3 top repositories is that people prefer Windows-based software programs more than any other operation systems. This finding could be useful for the FOSS developers.

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