



## Computer Security Analysis of Internet Cafés in Lingayen, Pangasinan

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**Abstract** – This paper entitled “Computer Security Analysis of Internet Cafés” was designed to analyse the effectiveness of computer security of Internet Cafés in Lingayen, Pangasinan. The descriptive research was used in this study. A total of 25 selected Internet Cafés in Lingayen, Pangasinan served as the respondents of the study. The data gathered were analysed using the frequency counts and percentage analysis. The study employed the survey questionnaire as the main instrument in gathering the necessary data and information. This is supported by an informal interview to validate the data gathered.

**Keywords** – Computer security, internet cafes, Security solutions, Anti-Virus, Operating Systems, Internet Service Provider (ISP)

### INTRODUCTION

A person walking around any city in the world would be sure to find an internet café somewhere. And Lingayen, Pangasinan is no exemption. The internet café is one of the establishments made indispensable in an increasingly interconnected world.

Internet café is not really about computers only; it is about people, communication and sharing information and knowledge as well as overcoming physical boundaries. While the internet cafés offer access to tremendous education, leisure, and social opportunities through internet, on the negative side, as more and more computers are connected to the internet, the networks are becoming more vulnerable, making it easy for an intruder to attack systems in many ways. These will give way to affect the security of Internet cafés in Lingayen, Pangasinan particularly from the malicious codes or malicious softwares.

### OBJECTIVES OF THE STUDY

**General:** The study aimed to achieve a better way of understanding the effectiveness of computer security of Internet Café in Lingayen, Pangasinan.

**Specific:** To have capability in administering computer security in the Internet Cafés in Lingayen, Pangasinan.

To provide an alternative method on how to protect the computer from malwares when antivirus/antimalware failed to delete it.

To save money and time for the user.

To facilitate more comprehensive help information to Internet Café owners and administrator regarding computer security.

### Significance of the study

The research findings of this study would deliver valuable information to the computer users and internet café administrators alike as they would anticipate having computer security for their Internet cafés.

There are several reasons why this study can be considered as necessary and important.

1. This study will be helpful for the internet café owners and administrators in protecting their computer from malwares that degrade the computer security.
2. The present study would provide the internet café owners and administrators awareness with the multiplicity of computer malwares.
3. This study would greatly help in degrading the reformatting process of the computer.

Eventually, the final output of this paper is meant to be inspirational as well as instructional materials for computer users, internet café administrators and students as well.

### MATERIALS AND METHODS

**a. Research Design.** The researchers employed the descriptive method of research which comprises the method or research used, source of data & the data gathering procedures such as observations, surveys, & tests. The three parameters of research will help understand how descriptive research in general is similar to and its differences from others types of research. Unlike qualitative research, descriptive research may be more analytic. It often focuses on a particular variable or factor. Descriptive research may also operate on the basis of hypothesis often generated through previous, qualitative continuum. Finally, like qualitative research, descriptive research aims to gather data w/out any manipulation of the research context. In other words, descriptive research is also low on the control or manipulation of research context scale.

**b. Research Population.** The research used questionnaire method in soliciting the needed information relative to the completion of the study. The questionnaire used 4 (four) parts. Part 1 is some socio demographic information of the respondents. Part 2, involves the description of the Internet Cafés which includes the specifications of each computers, services offered and the activities done by the users. Part 3,

includes the networking devices used by internet cafés. Part 4, impart some security measures done by the Internet administrators to protect their computers.

The researchers gathered some information with the use of internet, and read published books and magazines that are related to the study. The researcher used the internet and library method as a source of finding materials needed in the proposed research study.

**c. Tools for Data Analysis.** Tabulation of the gathered responses will be recorded and analyzed with the aid of STATA (Statistics/Data Analysis).

After recording all the gathered responses and making meaningful categories to which the recorded responses would fit into the following summary statistics and data analysis tools were employed.

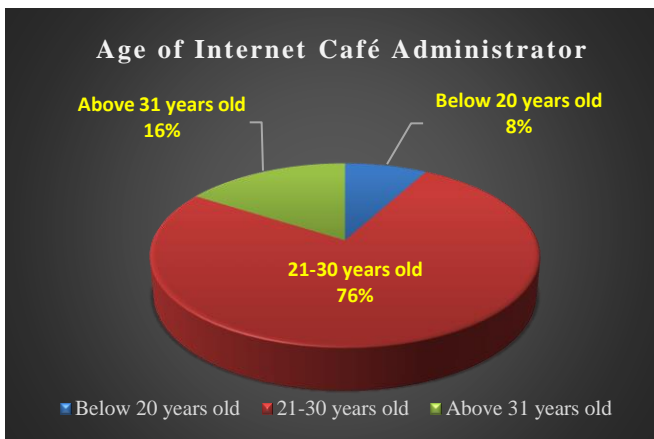
1. (Percentage)  $P = n/N * 100$   
 Where n = sample  
 N = population

2. Frequency Distribution. This was used to tabulate the responses of the respondents on the survey questionnaire.

**RESULTS AND DISCUSSION**

After the interview, survey and observation with the respondents, their current profile as internet café administrators were identified. The frequency counts and distribution of typical characteristics of the respondents according to different criteria are highlighted in Tables 1.

**Figure 1.** It shows that according to the findings of the study, majority of Internet Administrators are between ages 21- 30 years old.



**Figure 1.** Age of Internet Café Administrator

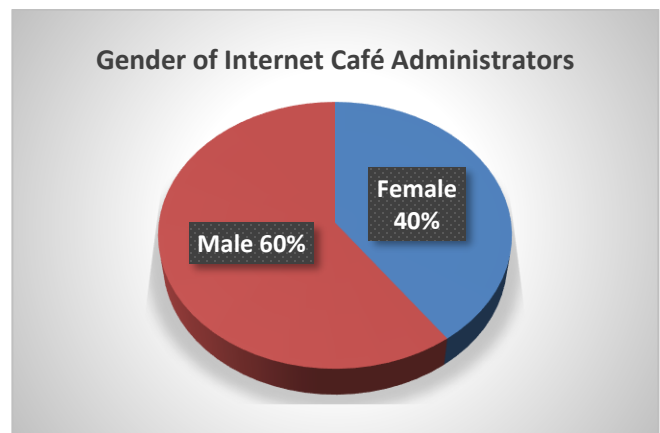
Table 1 presents the respondent’s profile with regards to their age, gender, educational attainment, Course, have a

license and years of experience as being internet café administrator.

**Table 1.** Profile of the Respondents or the Internet Café Administrators

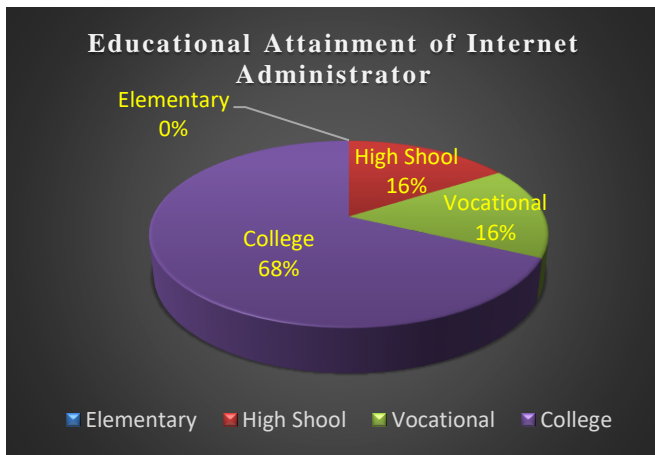
Criteria	Freq.	%
<b>Age</b>		
Below 20 years old	2	8 %
21- 30 years old	19	76%
Above 31 years old	4	16%
<b>Total</b>	<b>25</b>	<b>100%</b>
<b>Gender</b>		
Male	15	60%
Female	10	40%
<b>Total</b>	<b>25</b>	<b>100%</b>
<b>Educational Attainment</b>		
Elementary Graduate	0	0
High School Graduate	4	16%
College Graduate	17	68%
Vocational Graduate	4	16%
<b>Total</b>	<b>25</b>	<b>100%</b>
<b>Course:</b>		
Computer Related Course	12	48%
Non – Computer Related Course	13	52%
<b>Total</b>	<b>25</b>	<b>100%</b>
<b>Have a License</b>		
Yes	6	24%
No	19	76%
<b>Total</b>	<b>25</b>	<b>100%</b>
<b>Years of Being Internet Café Administrator</b>		
Less than 1 year	6	24%
1 to 3 years	8	32%
More than 3 years	11	44%
<b>Total</b>	<b>25</b>	<b>100%</b>

**Figure 2.** Presents that out of 25 respondents, 15 or 60% of the respondents are male while 10 or 40% are female. This implies that majority of internet administrators of internet cafés in Lingayen, Pangasinan are males.



**Figure 2.** Gender of Internet Café Administrator

**Figure 3** depicts that majority of the respondent are college graduates with 17 or 68% respondents. Some of the respondents are high school graduates with 4 or 16% respondents. And some are vocational graduate with 4 or 16% respondents.

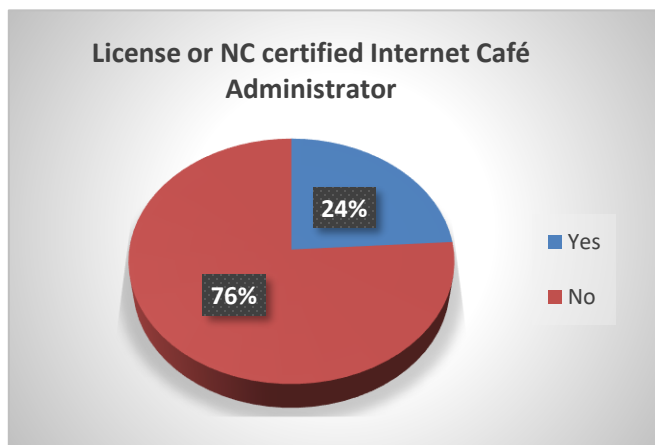


**Figure 3.** Educational Attainment of Café Administrator

According to the survey, most of the internet administrators are not graduate of Information Technology course or any related course for their job. Some of them are graduate of 2 years vocational course of basic computer and some are graduates of 4 year course but their course are not fit into their jobs.

Most of the internet administrator’s courses are not related to computer with 13 or 52% respondents. They are courses related to managing a business like Commerce and Accountancy. Some are graduates of Nursing, Architecture and Education. There are 12 or 48% respondents who are graduates of computer related course. These are graduates of ComSci, IT, and Computer Engineering.

In **Figure 4** most of the respondent’s don’t have a license or certificate of IT or Information Technology with 19 or 76% respondents and only 6 or 24% respondents have a license or certificate of IT.



**Figure 4.** License or NC certified Internet Café Administrator

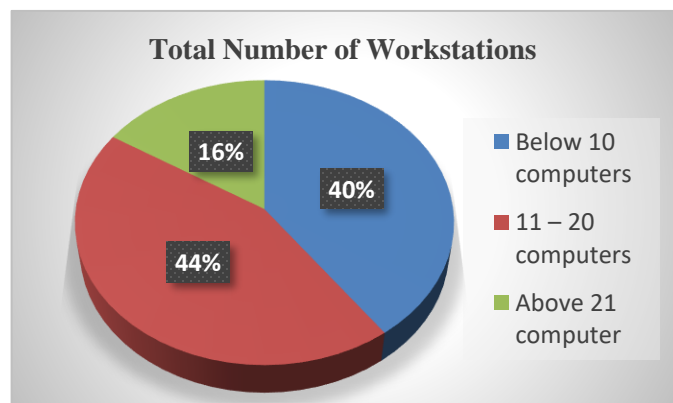
Out of 6 internet administrator who has an IT license, 4 Internet administrators are Microsoft Certified. One of the

respondents has a license of NC II Computer Hardware Servicing or TESDA certified. And the other one says he has a confidential license.

Majority of the respondents are more than three (3) years of being Internet Administrator with 11 or 44% respondents and 8 or 32% respondents are in the interval of 1 to 3 years of being Internet Administrator. 6 or 24% respondents are less than 1 year of being internet administrator.

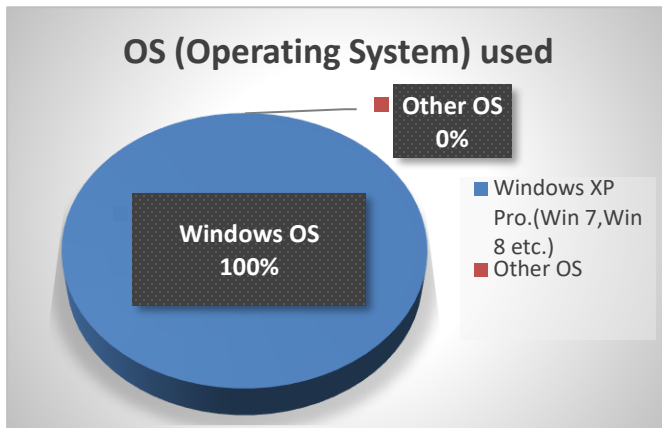
**Figure 5** shows that majority of the internet cafés have total number of workstations with the interval of 11- 20 computers with 11 or 44% respondents. Followed by below 10 computers with 10 or 40% respondents. The interval of above 20 computers got 4 or 16% respondents. This implies that internet cafés in Lingayen, Pangasinan have total workstations that are between 11- 20 computers.

**Figure 5.** Total Number of Workstations



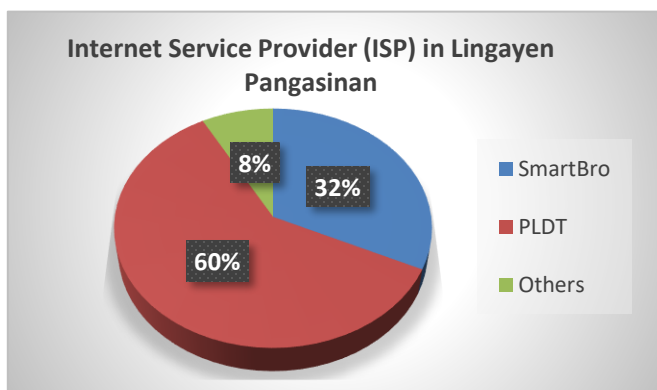
At **Figure 6** all the internet cafés in Lingayen, Pangasinan used Windows XP Professional (Win7, win8, Etc.) as their operating system. According to Internet Café administrators, Windows X Professional are most popular OS around, and mostly people don’t even have a clue of the other systems like Linux. Microsoft Windows is indeed like a tattoo permanently drawn on people’s minds. Windows was marketed perfectly and so most programs all run on Windows. Plus windows is not so complicated to learn and very user friendly.

**Figure 6.** Most OS (Operating Systems) Used



And according also to internet administrators, their customers are more used to usual Windows programs, so the most installed applications is Microsoft Office, like Word, Excel, PowerPoint, etc. to their internet cafés. Most are using Microsoft Office 2003 with 23 out of 25 respondents. Other applications that are commonly installed are Nero, which according to some internet administrators are used for cd-burning which got 2 out of 25 respondents. And some other applications that are commonly installed to internet cafés.

According to some Internet café administrators, in determining the best Internet Service Provider (ISP), the main criterion that should be addressed is the speed. According to them, this speed is usually measured by customers as how fast download and upload time is. It includes internet browsing speed and online gaming performance. There are several ISP's in the Philippines nowadays, like Globe Telecom Broadband, SmartBro, PLDT myDSL, Sky Cable and USATV. Among them PLDT myDSL is more popular in Lingayen, Pangasinan with 15 or 60% respondents as shown in **Figure 6**. According to Internet Administrators, they choose PLDT because it's cheaper and faster than other who got 10 or 40% respondents. PLDT gives several pricing options that aim to suit the needs of their customers.

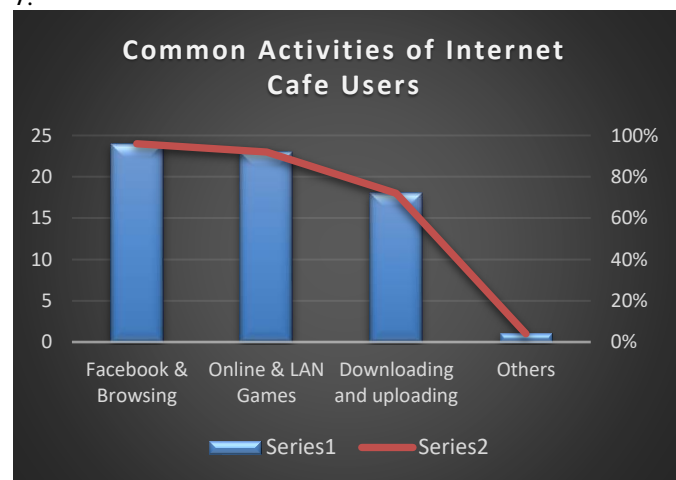


**Figure 6. Most ISP or Internet Service Providers Used**

Majority of the internet cafes has more than twenty customers with 18 or 72% respondents. Followed by 4 or 16% respondents who have 10 – 20 customers. And 3 or 12% respondents who have less than 10 customers per day.

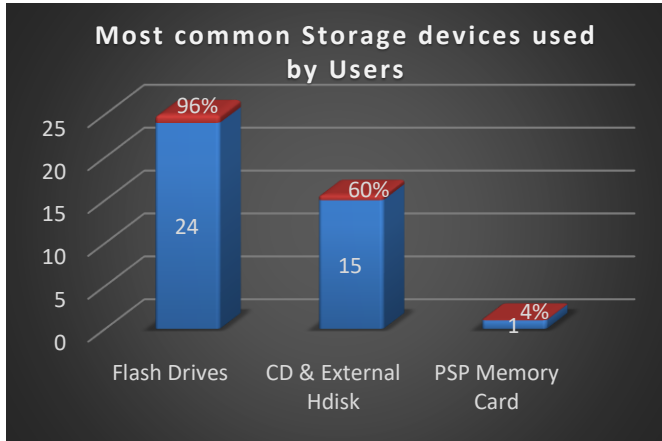
The Internet Cafes in Lingayen, Pangasinan offered many available services to their customers. Based on the survey, there were about 25 of total numbers of the Internet administrators were using the Internet and encoding as the primary services that could offer by the management of the shop. These services usually appeal to customers who are having fun browsing the Internet and people who are encoding their assigned task by their teachers, or who have little no access to a computer. These services also appeals to busy people who don't have time to type and edit their material. These customers would simply leave their work to be typed and pick it up after it is completed. Printing pictures, research materials and so on were also availed by the Internet cafes which have an average of 23 total number of the administrators or about 97%. There was about 80% of the total numbers of the administrators were said that scanning was offered as well. Also, other services such as computer repairing, tutorials, Xerox, selling snacks, CD burning, downloading audios and videos to different devices with an average of 12 total number of the administrators or have a percentage of 48%.

According to the Internet cafes administrators in Lingayen, most of their customers liked social media Facebook and browsing the Internet for their personal doings with 24 administrators agreed equivalent to 96%. 23 of them or 92% said that customers mostly students enjoyed playing online games and LAN gaming. Downloading and uploading files such as audios, videos and so on garnered 3rd place with 18 of the administrators or equivalent to 72%. Lastly, others or aside from the above activities with 4% as indicated in **Figure 7**.



**Figure 7. Common Activities of Internet Café Users in Lingayen, Pangasinan**

According to the internet café administrators, the most common devices that an Internet café avails to use by their customers was the flash drive as depicted at **Figure 8**. About 24 total numbers of the administrators or have a percentage of 96% of them noticed that their customers were using flash drives for their day-to-day data retrieval. Next were the CD and External Hdisk with 15 total numbers of the Internet café administrators or have a percentage of 60%. Other device such as PSP memory card was also allowed to use in their shops.



**Figure 8.** Most common Storage devices Used by Users

**Table 2.** Shows that the frequency counts and its percentage equivalent of internet cafes using anti –virus with yes or no variables.

**Table 2.** Usage of anti – virus by Internet Cafés

Using Anti-Virus	Frequency	Percentage (%)
Yes	24	96%
No	1	4%
Total	25	100%

Majority of the internet cafés in Lingayen, Pangasinan are using anti – virus to protect their computers against malwares with 24 or 96% respondents. While only 1 or 4% respondent do not use anti-virus. This implies that majority of internet cafes in Lingayen, Pangasinan are using anti – virus to protect their computers from malicious attacks.

Mostly internet administrators choose AVG 8.0 as the best anti – virus software with 11 out of 24 respondents. Followed by Avast with 7 respondents. And other common anti-virus software like AVIRA, McAfee, NORTON, PCCILLIN, NOD 32 and KASPERSKY.

According to a certain internet administrator, the reason why he is not using anti – virus to protect his computers is it is just useless to use anti- virus if it cannot delete or detect the other powerful kinds of malwares that can attack without the knowledge of the administrator. He also points out that even though you are using anti – virus that are updated you are not sure that it will protect your computers. Furthermore, anti –virus only make your system slows down because according to the internet administrator anti – virus software consume too much memory of the computer that decelerates performance of computers.

**Table 3** Shows that aside from using Anti-virus softwares, Café Administrators are also using other computer security softwares. Below is the number of internet cafés that utilizes other means of securing their computers with regards to yes or no survey.

**Table 3.** Use of other Computer Security Aside from Anti-virus

Other Computer Security	Frequency	Percentage (%)
Yes	13	52%
No	12	48%
Total	25	100%

Café administrators as respondents answered that they are using other computer security softwares with 13 or 52%, followed by 12 from the respondents or 48% who said that they are satisfied with just using anti – virus softwares. This implies that more than half of respondents are very conscious with it comes to virus protection and computer security.

According to some internet administrators who are using other computer security aside from anti – virus softwares, most of them prefer DEEP FREEZE to protect their computers. It helps a lot in protecting their computers since it disable all changes made by users to the operating system. It automatically delete download files when the computer restarts as it back to its original configurations and files. The software does not consumes much system resources and does not slow down the computers too. **Deep Freeze** is easy and simple to use.

**Table 4** shows how often Internet Café Administrators do maintenance on their computers with regards to maintenance schedules.

**Table 4.** How often Internet Administrators Do Maintenance

Maintenance	Frequency	Percentage (%)
Once A Week	13	52%
Once A Month	8	33%
Others	4	16%
Total	25	100%

Most of the respondents do maintenance on their computers every week with 13 or 52% followed by 8 or 33% says that they do maintenance only once a month and 4 or 16% as they preferred by the administrator to do maintenance or as really needed to undergo reconfiguring, reinstallations or defragging and cleaning the PCs entirely.

**Table 5** presents how often Internet Café Administrators format their computers when it's not working, hard disk files are corrupted, Full of viruses that infects user's files or at any reasons that needs the computers to be reformatted to be operational again.

**Table 5.** How often Internet Administrators Do Formatting

Formatting	Frequency	Percentage (%)
Less than a Year	4	16%
Quarterly (Every 4 Months)	9	36%
As Needed	12	48%
Total	25	100%

Based on the table, administrators reformat their computers as needed with 12 or 48%. Some says they do it quarterly or every 4 months with 9 responded or 36%. Others done it in less than a year that according to them, their computers really needed to be formatted to install new softwares or upgrade the operating systems to catch up with new game softwares and applications as needed and requested by most users otherwise, they would be left behind with other internet café competitors nearby.

## CONCLUSION AND RECOMMENDATION

Internet Cafés in Lingayen, Pangasinan are flourishing business that most students from nearby universities like Pangasinan State University, Lingayen campus are being served by these internet cafes. The services provided by Internet cafes help to augment the scarcity of computer usage in most computer laboratories and libraries in colleges and universities like PSU. It is important to understand the setup and systems of operations of these

internet café being the extension of learning and knowledge of our students as to how they experience and gain extra skills from their external environment aside from the school. Based on the list given by the licensing and permit section of the Office of the Mayor, there are 11 Internet cafés in Lingayen, Pangasinan who have permit to operate while the other 14 internet cafés don't have business permit. The data gathered were analysed using the frequency counts and percentage analysis. The study employed the survey questionnaire as the main instrument in gathering the necessary data and information. This is supported by an informal interview to validate the data gathered.

Researchers concluded that the effectiveness of anti-virus depends on how often it is updated. According to the respondent from Tabhaus, "anti-virus software is useless because it does not help in preventing the harmful effects of malware". Some of them only detect but cannot remove the malware while some of the Internet Cafés who used other computer security software like DEEP FREEZE are more satisfied than using Anti-Viruses. Most of our respondents offered internet and encoding services and at the same time chatting and playing LAN/ONLINE games which mainly the activities of the users which are prone in acquiring malware in their computer units. Most Internet Cafes provide flash drives as main devices for saving and acquiring data. This shows that flash disk is one way of spreading malwares.

In general, any network cannot be exempted from security risk since, it's the pathway of data thru internet or LAN connected that virus or malware could inject itself on it. However some possible measures can be taken to minimize Virus and others type of malicious attacks. In the case of cyber cafe for instance, the security solutions must consists of measures to determine, prevent, detect and correct security validations as a result of incoming or outgoing threats from both internet and external attacks. So, the researchers recommend some security steps.

1. Install and use an anti-virus program. The effectiveness of an anti-virus program depends on how often it is updated. . Therefore, it is recommended that anti -virus signature is updated regularly.
2. Install/activate a third party firewall program to keep outside access and limits inside access to outside resources.
3. Be careful when downloading and installing programs.
4. Install a security analyzer for updates and fixes. Ensure that all software versions are up to date with the most current patches and fixes.
5. Implement standard security policies. For instance, users cannot install or run any executable program, download any exe file, or store any personal information on the machines. However, regular customers may be given special dispensation



to have their data stored on the server, this data can then be copied back to the particular workstation that these users working on at the time, when done, it can be saved and copied back to the server again.

6. There should at least 2 internet administrators in the internet café. So that all customers are well accommodated and all users' necessity and activities are monitored at the same time.

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