BACKUP SOLUTIONS FOR SMALL COMPANIES

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Abstract: The loss of information is a major problem that each user has encountered at least once. Causes that lead to the loss of information can be multiple: hardware errors, software errors, human operating errors, voluntary destructive actions. No matter the cause, backup copy is imperative in order to recover the lost data. Creating a backup has become one of the basic operations that any computer user needs to know. Although, the most of the small companies' managers didn't pay attention to the backup solutions considering that time to time backups of important data on CDs (DVDs) is sufficient enough for data security.

1. INTRODUCTION

The information stored represents the most important resource of a computer. That is why they have to be protected against accidental loss and also against voluntary damage.

The loss of information is a major problem that each user has encountered at least once. We can enumerate many situations that lead to partial or total loss of information: a system error can deteriorate a file, a damaged hard drive, accidental or voluntary cancellation of files, formatting the hard drive, an improper partition, a virus, a hacker or a cracker. Any of these unpleasant events can have serious consequences regarding important information and regarding the user.

The user saves the information on a single hard drive, seldom thinking about making another copy on another storage media. Yet if this thing happened, it wouldn't have a recurrently character.

In general, stored information needs a huge amount of work. In absence of a backup copy, the user will have to renew the files starting from practically nothing.

2. CAUSES THAT LEAD TO THE LOSS OF INFORMATION

Causes that lead to the loss of information can be multiple:
a. Hardware errors. Buying computers from established brands that offer high quality, involves high costs that many of the small companies cannot afford. Frequently blockage of unreliable equipment, while functioning, will have negative effects considering data safety. The faulty functioning of hardware components could lead to unredeemable data loss.
b. Damaging the hard drive as a result of voltage variation or because of other reasons.
c. Software errors. Many companies still use pirated operating systems and applications or programs made by unskilled people, that don't have security elements included and also, in some cases, work defectively, altering data. Installing unsafe operating systems and improvised applications have repercussion regarding the normal performance of computers and the data safety.
d. Human operating errors due to negligence, insufficient professional qualification, insufficient reading of documentations. For example, a user could overwrite the data in a database or could erase the data that he

considers useless because he doesn't understand the use of it. Employees with a certain low level of computer knowledge, like the ones found at the companies' selling points, distribution points, are the ones that usually make mistakes. Their task is to input data. If exceptional situations occur it might be possible that they won't know how to deal with them. So, because of the misunderstanding considering a program option and the lack of protection (of data access) data could accidently be erased. That is the case of initialization options within the framework of a program package that have as an effect the data initialization, thus bringing them to 0. The small companies don't make efforts or make insignificant efforts regarding personnel training.

e. Voluntary destructive actions, like hard drive formatting or files/folders erasing.

No matter the cause, backup copy is imperative in order to recover the lost data.

3. BACKUP SOLUTIONS

Creating a backup has become one of the basic operations that any computer user needs to know. It represents the only way out in the unwanted case of data loss. What needs to be emphasized is the fact that for creating a backup you need minimum knowledge in the filed.

An efficient backup for the computer or for a small size network can be made in different manners:

a. By using two RAID hard drives. This technology offers the surety that data is stored simultaneously on two hard drives and in case one breaks down, no information will be lost.

b. By using:
- CDs or DVDs, in accordance with the quantity of information that needs to be stored. The price for writable units, CDs and empty DVDs has dropped a lot, now they can be bought by anyone.
- External hard drives – are mobile, can be used with different computers, in various locations.
- Memory-sticks – have a large memory and accessible prices.

c. For databases, that are generally often modified, we need a periodical (recurrently) backup. Varying with the quantity of data that can be lost, the backup interval is established (it can be as often as every other hour). In these situations a specialized program will be used.

4. DATA ANALYZE AND INTERPRETATION

150 questionnaires were sent through e-mail and 250 by ordinary mail to collect data to arbitrary chosen small companies (up to 50 employees). Among them 217 were returned and use for data analysis thus resulting a response rate of 54,25%.

The questions were grouped as follows:
1. Questions related to the company's field of activity.
   The companies were structured in three fields of activity as follows:
   - manufacturing
   - services
   - other activities

2. Questions related to the employees' training level, regarding informatics (if they graduate some computer operator courses or an informatics profile during high school, or an IT faculty or an IT master degree).
3. Questions regarding the way in which employees consider the possibility of data loss.
4. Questions regarding the causes that lead to the suffered data losses.
5. Questions regarding the backup solutions used by the employees.

Among the companies that have returned the questionnaires 71 have manufacturing as the field of activity, 122 are service-oriented companies (without IT domains) and 24 activate in other fields.

Collected data showed that:
- The majority of the questioned companies, no matter their field of activity, have confronted with data loss situations. This shows that every company has to pay careful consideration to backup solutions.
- The possibility of data lose is not treated with enough responsibility by a large amount of small business companies' employees.

Results are synthesized in the tables below:

Data loss causer / Company's field of activity	N	A	B	C	D	E
manufacturing	%	69 97,18	7 10,14	16 23,19	20 28,99	32 46,38
services	%	119 97,54	12 10,08	27 22,69	34 28,57	51 41,80
other activities	%	22 91,67	3 13,64	5 22,73	6 27,27	14 58,33

A - Have confronted with data loss situations

B - Have lost data because of the hard disk collapse

C - Have lost data because of some hardware errors

D - Have lost data because of software errors

E - Have lost data because of human errors

As it can be seen in the previous table:
- Data lost was caused in the majority of the cases because of human errors. This concludes that the companies pay insufficient attention to the employees professional skills rise or to their responsibility regarding data loss.
- Data losses caused by hard and soft errors follow immediately after. This concludes that a lot of small companies does not afford or are not willing to invest in high quality computers or licensed software.

Backup solutions / Company's field of activity	N	X	Y	Z	T
manufacturing		3	59	7	12
	%	4,23	83,10	9,86	16,90
services		2	88	22	20
	%	1,65	72,13	18,03	16,39
other activities		-	20	3	2
	%		83,33	12,5	8,33

X - Two RAID hard disks systems

Y - CDs or DVDs use

Z - External hard disks use

T - Memory sticks use

As it can be seen in the previous table:
- The majority of the companies regardless of their field of activity, use for backup purposes the CDs or DVDs. RAID systems is very rare. This proves that small companies make minimum investments in backup solutions.

5. CONCLUSIONS

Because of the lack of money or because the lack of specialized people in the IT field to sensitize the company stuff regarding the risks implied by the use of non operating performance computers or pirated software and software realized by non specialists, small companies don't invest in hard and soft solutions.

Small companies' managers does not pay necessary importance to employees skills' rise in the IT field, thus allowing them to reduce the human errors which conduct to important information loose. Also they didn't pay attention to the backup solutions considering that time to time backups of important data on CDs and DVDs is sufficient enough for data security.

BIBLIOGRAPHY

[1]   Preston Curtis W., Backup&Recovery, Published by O' Reilly Media, Inc., 2007
[2]   http://review.zdnet.com www.runtime.org
[3]   www.data-recovery-information.com
[4]   www.runtime.org
[5]   www.scvo.org.uk/itnetwork/ITEssentials/BackUp.aspx