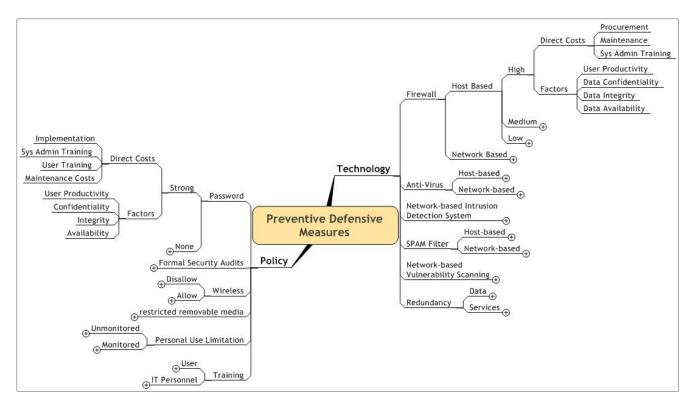
### To Be Secure or Not to Be?

You probably know about computer hackers and computer viruses. Unless your computer has been targeted by one, you may not know how they could affect an individual or an organization. If a computer is attacked by a hacker or virus, it could lose important personal information and software.

The creation of a new university campus is being considered. Your requirement is to model the risk assessment of information technology (IT) security for this proposed university. The narrative below provides some background to help develop a framework to examine IT security. Specific tasks are provided at the end of this narrative.

Computer systems are protected from malicious activity through multiple layers of defenses. These defenses, including both **policies** and **technologies** (Figure 1), have varying effects on the organization's risk categories (Figure 2).



### Figure 1 – Preventative Defensive Measures

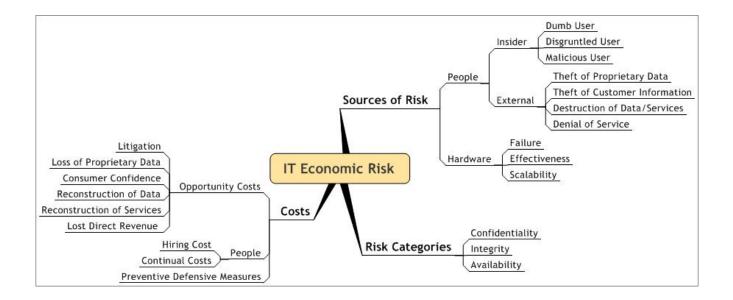
Management and usage policies address how users interact with the organization's computers and networks and how people (system administrators) maintain the network. Policies may include password requirements, formal security audits, usage tracking, wireless device usage, removable media concerns, personal use limitations, and user training. An example password policy would include requirements for the length and characters used in the password, how frequently they must be changed, and the number of failed login attempts allowed. Each policy solution has direct costs associated with its implementation and factors that impact productivity and security. In Figure 1, only the topmost branch is fully detailed. The structure is replicated for each branch.

The second aspect of a security posture is the set of technological solutions employed to detect, mitigate, and defeat unauthorized activity from both internal and external users. Technology solutions cover both software

and hardware and include intrusion detection systems (IDS), firewalls, anti-virus systems, vulnerability scanners, and redundancy. As an example, IDS monitors and records significant events on a specific computer or from the network examining data and providing an "after the fact" forensic ability to identify suspect activity. SNORT (www.snort.org) is a popular IDS solution. Figure 1 provides a sample of key defensive measures (management/usage policies and technology solutions). As with a policy, a technology solution also has direct costs, as well as factors that impact productivity and security.

Sources of risk to information security include, but are not limited to, people or hardware within or outside the organization (Figure 2). Different preventive defensive measures (Figure 1) may be more effective against an insider threat than a threat from a computer hacker. Additionally, an external threat may vary in motivation, which could also indicate different security measures. For example, an intruder who is trying to retrieve proprietary data or customer databases probably should be combated much differently from an intruder who is trying to shut down a network.

Potential costs due to information security that an organization may face (Figure 2) include opportunity cost, people, and the cost of preventative defensive measures. Significant opportunity costs include: litigation damages, loss of proprietary data, consumer confidence, loss of direct revenue, reconstruction of data, and reconstruction of services. Each cost varies based on the profile of the organization. For example, a health care component of the university might have a greater potential for loss due to litigation or availability of patient medical records than with reconstruction of services.



### Figure 2 - Economic Risk schematic for IT systems

An organization can evaluate potential opportunity costs through a risk analysis. Risks can be broken down into three risk categories; *confidentiality, integrity*, and *availability*. Combined, these categories define the organization's security posture. Each of the categories has different impacts on cost depending on the mission and requirements of the organization. *Confidentiality* refers to the protection of data from release to sources that are not authorized with access. A health care organization could face significant litigation if health care records were inadvertently released or stolen. The *integrity* of the data refers to the unaltered state of the data. If an intruder modifies pricing information for certain products or deletes entire data sets, an organization would face costs associated with correcting transactions affected by the erroneous data, the costs associated with reconstructing the correct values, and possible loss of consumer confidence and revenue. Finally, *availability* 

refers to resources being available to an authorized user, including both data and services. This risk can manifest itself financially in a similar manner as confidentiality and integrity

Each measure implemented to increase the security posture of an organization will impact each of the three risk categories (either positively or negatively). As each new defensive security measure is implemented, it will change the current security posture and subsequently the potential opportunity costs. A complicated problem faced by organizations is how to balance their potential opportunity costs against the expense of securing their IT infrastructure (preventative defensive measures).

**Task 1:** You have been tasked by the Rite-On Consulting Firm to develop a model that can be used to determine an appropriate policy and the technology enhancements for the proper level of IT security within a new university campus. The immediate need is to **determine an optimal mix of preventive defensive measures that minimizes the potential opportunity costs along with the procurement, maintenance, and system administrator training costs as they apply to the opening of a new private university. Rite-On contracted technicians to collect technical specifications on current technologies used to support IT security programs. Detailed technical data sheets that catalog** *some* **possible defensive measures are contained in Enclosures A and B. The technician who prepared the data sheets noted that as you combine defensive measures, the cumulative effects within and between the categories confidentiality, integrity, and availability cannot just be added.** 

The proposed university system has 10 academic departments, a department of intercollegiate athletics, an admissions office, a bookstore, a registrar's office (grade and academic status management), and a dormitory complex capable of housing 15,000 students. The university expects to have 600 staff and faculty (non IT support) supporting the daily mission. The academic departments will maintain 21 computer labs with 30 computers per lab, and 600 staff and faculty computers (one per employee). Each dorm room is equipped with two (2) high speed connections to the university network. It is anticipated that each student will have a computer. The total computer requirements for the remaining department/agencies cannot be anticipated at this time. It is known that the bookstore will have a Web site and the ability to sell books online. The Registrar's office will maintain a Web site where students can check the status of payments and grades. The admissions office, student health center, and the athletic department will maintain Web sites.

The average administrative employee earns \$38,000 per year and the average faculty employee earns \$77,000 per year. Current industry practice employs three to four system administrators (sys admin) per sub-network and there is typically one (1) sys admin (help desk support) employee per 300 computers. Additionally, each separate system of computers (for web hosting or data management) is typically managed by one (1) sys admin person.

The current opportunity cost projection (due to IT) with no defensive measures is shown in Table 1. The contribution of various risk categories (<u>C</u>onfidentiality Integrity, and <u>A</u>vailability) to a given cost is also shown in Table 1.

Opportunity Cost (due to IT)	Amount	Risk Category Contribution
Litigation	\$3,800,000	C (55%), I (45%)
Proprietary Data loss	\$1,500,000	C (70%), I (30%)
Consumer confidence	\$2,900,000	C (40%), I (30%), A (30%)
Data Reconstruction	\$400,000	l (100%)
Service Reconstruction	\$80,000	l (100%)
Direct Revenue Loss	\$250,000	I (30%), A (70%)

Table 1: Current Opportunity costs and Risk Category contributions

**Task 2:** We know that technical specifications will change rapidly over time. However, the relations and interplay among costs, risk categories, and sources of risk will tend to change more slowly. **Create a model for the problem in Task 1 that is flexible enough to adapt to changing technological capabilities and can be applied to different organizations.** 

Carefully describe the assumptions that you make in designing the model. In addition, provide an example of how the university will be able to use your model to initially determine and then periodically update their IT security system.

**Task 3:** Prepare a three page position paper to the university President that describes the strengths, weakness, and flexibility of your model in Task 2. In addition, explain what can be inferred and what should not be inferred from your model.

**Task 4: Explain the differences that may exist** in the initial Risk Category Contributions (Table 1) if you model IT security for a commercial company that provides a search engine for the World Wide Web (such as Google, Yahoo, AltaVista, ...). **Will your model work** for this type of organization?

**Task 5:** Honeynets are designed to gather extensive information on IT security threats. Write a **two-page memo** to your supervisor advising whether a university or a search engine company should consider using a honeynet.

**Task 6**: To become a leader in IT security consulting, Rite-On Consulting must also take an active role in anticipating the future direction of information technology and advising companies on how to respond to future security risks. After performing your analysis, write a **two-page memo** to the President of Rite-On to inform him of the future of IT security. In addition, describe how your model can be used to anticipate and respond to the uncertain future.

# **Enclosure A**

**How to read this table:** The Qualitative Values are a judgment based on the assessment from industry experts on the tools' effectiveness. Each defensive measure has several instances that vary in costs and effectiveness. The Low, Mean, and High values represent a characterization of reviews found in different consumer review periodicals as they relate to user productivity, confidentiality, integrity, and availability. The variability indicates the concentration of the data about the mean. The Low and High are the minimum and maximum possible values, respectively. Costs are in U.S. dollars. A factor value of 5.00% indicates an improvement of 5%. A value of -5.00% indicates that the factor is degraded by 5%. These values are modifiers to the existing levels. For example from a base Confidentiality level of .8 a factor value of -25% would result in a new Confidentiality factor of 0.8 - (0.8\*0.25) = 0.6. A positive value results in a positive change in the factor.

lost-based								
lost-based				Low		Mean	High	Variabilit
rewall								
rewall		<b>D</b> : 10						
	Intelli-Scan	Direct Co		,	•	15.00	,	
			Procurement/computer	n/a	\$	45.00	n/a	
			Maintenance/year/computer	n/a	\$	-	n/a	
			Training/year/sys admin	n/a	\$	1,000.00	n/a	
		Factors						
			User Productivity	-2.00%		-1.00%	0.00%	Low
			Confidentiality	9.00%		28.00%	38.00%	High
			Integrity	9.00%		28.00%	38.00%	High
L			Availability	9.00%		18.00%	28.00%	Med
Γ	Shield	Direct Co	osts					
			Procurement/computer	n/a	\$	50.00	n/a	
			Maintenance/year/computer	n/a	\$	-	n/a	
			Training/year/sys admin	n/a	\$	1,000.00	n/a	
		Factors						
			User Productivity	-5.00%		-2.00%	0.00%	Low
			Confidentiality	10.00%		20.00%	25.00%	Low
			Integrity	8.00%		15.00%	18.00%	Low
			Availability	7.00%		10.00%	20.00%	Low
F	Lava	Direct Co		1.0070		10.0070	20.0070	Lon
	Lava	Direction	Procurement/computer	n/a	\$	35.00	n/a	
				n/a	\$	33.00	n/a	
			Maintenance/year/computer		э \$	- 1,000.00		
		<b>F</b>	Training/year/sys admin	n/a	φ	1,000.00	n/a	
		Factors	Lie en Dreiden (1919)	0.000/		0.000/	0.00%	Law
			User Productivity	-3.00%		-2.00%	0.00%	Low
			Confidentiality	3.00%		28.00%	35.00%	High
			Integrity	4.00%		28.00%	40.00%	High
L			Availability	2.00%		18.00%	30.00%	High
	ProtectIT	Direct Co	osts					
			Procurement/computer	n/a	\$	40.00	n/a	
			Maintenance/year/computer	n/a	\$	-	n/a	
			Training/year/sys admin	n/a	\$	1,000.00	n/a	
		Factors						
			User Productivity	-6.00%		-3.00%	0.00%	Low
			Confidentiality	9.00%		20.00%	25.00%	Med
			Integrity	9.00%		20.00%	25.00%	Med
			Availability	9.00%		20.00%	25.00%	Med
F	Blockade	Direct Co						
			Procurement/computer	n/a	\$	30.00	n/a	
			Maintenance/year/computer	n/a	\$	-	n/a	
			Training/year/sys admin	n/a	\$	1,000.00	n/a	
		Factors	. aning your by burning	17/4	Ψ	1,000.00	n, a	
		1 001015	User Productivity	E 00%		-3.00%	0.00%	Low
			User Froductivity	-5.00%		-3.00 /0	0.00%	LOW
			Confidentiality	0.000/		20.000/	2E 000/	Mad
			Confidentiality Integrity	9.00% 9.00%		20.00% 20.00%	25.00% 25.00%	Med Med

#### **Quantitiative Values**

1				<del></del>				
	Blocker	Direct Cos						
			Procurement/computer	n/a	\$	15.00	n/a	
			Maintenance/year/computer	n/a	\$	-	n/a	
		_	Training/year/sys admin	n/a	\$	1,000.00	n/a	
		Factors						
			User Productivity	-10.00%		-5.00%	0.00%	Low
			Confidentiality	2.00%		10.00%	30.00%	High
			Integrity	1.00%		10.00%	25.00%	Med
			Availability	1.00%		5.00%	17.00%	Med
	Watertight	Direct Cos	sts					
			Procurement/computer	n/a	\$	10.00	n/a	
			Maintenance/year/computer	n/a	\$	-	n/a	
1			Training/year/sys admin	n/a	\$	1,000.00	n/a	
		Factors						
			User Productivity	-5.00%		-3.00%	0.00%	Low
			Confidentiality	9.00%		20.00%	25.00%	Med
			Integrity	9.00%		20.00%	25.00%	Med
			Availability	9.00%		20.00%	25.00%	Med
	Barrior	Direct Co:		0.0070		20.0070	2010070	
	Danio	2.1001 000	Procurement/computer	n/a	\$	10.00	n/a	
			Maintenance/year/computer	n/a	Ψ \$	-	n/a	
						1 000 00		
		Factors	Training/year/sys admin	n/a	\$	1,000.00	n/a	
		Factors	Harris Devident (1711)	4.000/		0.000/	0.000/	1
			User Productivity	-4.00%		-3.00%	-2.00%	Low
			Confidentiality	9.00%		21.00%	20.00%	Low
			Integrity	10.00%		19.00%	23.00%	Low
			Availability	7.00%		20.00%	27.00%	Med
Network-based								
Firewall				<u> </u>				
	Enterprise Solution	Direct Cos						
			Procurement	n/a	\$	15,000.00	n/a	
			Maintenance/year/computer	n/a	\$	2,000.00	n/a	
			Training/year/sys admin	n/a	\$	4,000.00	n/a	
		Factors						
			User Productivity	-15.00%		-5.00%	0.00%	Med
			Confidentiality	10.00%		30.00%	40.00%	High
			Integrity	10.00%		30.00%	40.00%	High
			Availability	10.00%		20.00%	30.00%	Med
	Network defense	Direct Cos	sts					
			Procurement	n/a	\$	17,500.00	n/a	
			Maintenance/year/computer	n/a	\$	1,500.00	n/a	
			Training/year/sys admin	n/a	\$	4,000.00	n/a	
		Factors						
			User Productivity	-10.00%		-4.00%	0.00%	Low
			Confidentiality	15.00%		30.00%	40.00%	Med
			Integrity	19.00%		30.00%	50.00%	High
			Availability	9.00%		20.00%	30.00%	Med
	System Inoc	Direct Co:		5.0070		_0.0070	00.0070	
	System moc		Procurement	n/a	\$	10,000.00	n/a	
			Maintenance/year/computer	n/a	\$ \$	1,000.00	n/a	
		<b>F</b>	Training/year/sys admin	n/a	Ф	4,000.00	n/a	
		Factors	Liene Dredveticity	45 000/		F 00%	0.000/	M1
			User Productivity	-15.00%		-5.00%	0.00%	Med
			Confidentiality	5.00%		20.00%	40.00%	High
			Integrity	2.00%		15.00%	40.00%	High
			Availability	18.00%		20.00%	30.00%	High
	Protection	Direct Cos						
			Procurement	n/a	\$	10,000.00	n/a	
			Maintenance/year/computer	n/a	\$	1,500.00	n/a	
			Training/year/sys admin	n/a	\$	2,000.00	n/a	
		Factors						
			User Productivity	-0.11		-0.05	0	Low
	1		Confidentiality	0.1		0.25	0.3	Low
			Integrity	0.1		0.25	0.3	Low
			Integrity Availability	0.1 0.1		0.25 0.13	0.3 0.2	Low Low

		<b>D</b> : ( 0		1				
	Acera	Direct Co						
			Procurement	n/a	\$	15,000.00	n/a	
			Maintenance/year/computer	n/a	\$	3,000.00	n/a	
			Training/year/sys admin	n/a	\$	2,500.00	n/a	
		Factors		70.000/		5 000/	0.000/	
			User Productivity	-70.00%		-5.00%	0.00%	High
			Confidentiality	10.00%		25.00%	30.00%	Med
			Integrity	10.00%		25.00%	30.00%	Med
			Availability	10.00%		13.00%	20.00%	Low
	Plunger	Direct Co						
			Procurement	n/a	\$	12,500.00	n/a	
			Maintenance/year/computer	n/a	\$	1,500.00	n/a	
			Training/year/sys admin	n/a	\$	2,000.00	n/a	
		Factors						
			User Productivity	-0.11		-0.05	0	Low
			Confidentiality	0.1		0.25	0.3	Low
			Integrity	0.1		0.25	0.3	Low
			Availability	0.1		0.13	0.2	Low
	Firebase	Direct Co						
			Procurement	n/a	\$	5,000.00	n/a	
			Maintenance/year/computer	n/a	\$	1,000.00	n/a	
		_	Training/year/sys admin	n/a	\$	2,500.00	n/a	
		Factors						
			User Productivity	-9.00%		-5.00%	0.00%	Med
			Confidentiality	5.00%		10.00%	20.00%	Med
			Integrity	5.00%		10.00%	20.00%	Med
			Availability	1.00%		5.00%	13.00%	Med
	Enterprise Lava	Direct Co						
			Procurement	n/a	\$	2,000.00	n/a	
			Maintenance/year/computer	n/a	\$	-	n/a	
		_	Training/year/sys admin	n/a	\$	3,500.00	n/a	
		Factors						
			User Productivity	-11.00%		-7.00%	0.00%	Med
			Confidentiality	2.00%		10.00%	20.00%	Med
			Integrity	3.00%		10.00%	20.00%	Med
		<b>D</b> : (0)	Availability	1.00%		5.00%	13.00%	Med
	Draco	Direct Co			•		,	
			Procurement	n/a	\$	3,000.00	n/a	
			Maintenance/year/computer	n/a	\$	500.00	n/a	
			Training/year/sys admin	n/a	\$	2,500.00	n/a	
		Factors	Lines Decision (C. St. )	44.0004		7 000/	0.000/	
			User Productivity	-11.00%		-7.00%	0.00%	Med
			Confidentiality	2.00%		18.00%	20.00%	Med
				3.00%		17.00%	20.00%	Med
leat based A	a.4:		Availability	1.00%		10.00%	13.00%	Low
Host-based Ar /irus	111-							
711.03								
	Bug Killer	Direct Co		m le	¢	00.00	/	
			Procurement/computer	n/a	\$	20.00	n/a	
			Maintenance/year/computer	n/a	\$	-	n/a	
		Factors	Training/year/sys admin	n/a	\$	1,000.00	n/a	
		Factors	User Productivity	E 000/		2.00%	0.00%	۰
			USEL FIQUUCUVIIV	-5.00%		-2.00%	0.00%	Low
			•	0.000/		20 000/	20 000/	
			Confidentiality	9.00%		28.00%	38.00%	High
			Confidentiality Integrity	9.00%		28.00%	38.00%	High
	A-4 1/	Direct	Confidentiality Integrity Availability					-
	Anti-V	Direct Co	Confidentiality Integrity Availability sts	9.00% 9.00%		28.00% 18.00%	38.00% 28.00%	High
	Anti-V	Direct Co	Confidentiality Integrity Availability sts Procurement/computer	9.00% 9.00% n/a	\$	28.00%	38.00% 28.00% n/a	High
	Anti-V	Direct Co	Confidentiality Integrity Availability sts Procurement/computer Maintenance/year/computer	9.00% 9.00% n/a n/a	\$	28.00% 18.00% 12.00 -	38.00% 28.00% n/a n/a	High
	Anti-V		Confidentiality Integrity Availability sts Procurement/computer	9.00% 9.00% n/a		28.00% 18.00%	38.00% 28.00% n/a	High
	Anti-V	Direct Co Factors	Confidentiality Integrity Availability sts Procurement/computer Maintenance/year/computer Training/year/sys admin	9.00% 9.00% n/a n/a n/a	\$	28.00% 18.00% 12.00 - 1,000.00	38.00% 28.00% n/a n/a	High Med
	Anti-V		Confidentiality Integrity Availability sts Procurement/computer Maintenance/year/computer Training/year/sys admin User Productivity	9.00% 9.00% n/a n/a -3.00%	\$	28.00% 18.00% 12.00 - 1,000.00 -1.00%	38.00% 28.00% n/a n/a 0.00%	High Med
	Anti-V		Confidentiality Integrity Availability sts Procurement/computer Maintenance/year/computer Training/year/sys admin User Productivity Confidentiality	9.00% 9.00% n/a n/a -3.00% 10.00%	\$	28.00% 18.00% 12.00 - 1,000.00 -1.00% 29.00%	38.00% 28.00% n/a n/a 0.00% 32.00%	High Med Low Med
	Anti-V		Confidentiality Integrity Availability sts Procurement/computer Maintenance/year/computer Training/year/sys admin User Productivity	9.00% 9.00% n/a n/a -3.00%	\$	28.00% 18.00% 12.00 - 1,000.00 -1.00%	38.00% 28.00% n/a n/a 0.00%	High Med

Insecticide	Direct Co						
		Procurement/computer	n/a	\$	8.00	n/a	
		Maintenance/year/computer	n/a	\$	-	n/a	
		Training/year/sys admin	n/a	\$	1,000.00	n/a	
	Factors	User Productivity	-6.00%		-3.00%	0.00%	L
		Confidentiality	9.00%		20.00%	25.00%	M
		Integrity	9.00%		20.00%	25.00%	M
		Availability	9.00%		20.00%	25.00%	M
Smasher	Direct Co		010070		2010070	20.0070	
		Procurement/computer	n/a	\$	10.00	n/a	
		Maintenance/year/computer	n/a	\$	-	n/a	
		Training/year/sys admin	n/a	\$	1,000.00	n/a	
	Factors						
		User Productivity	-8.00%		-3.00%	0.00%	Lo
		Confidentiality	5.00%		20.00%	23.00%	М
		Integrity	2.00%		10.00%	20.00%	М
		Availability	9.00%		18.00%	25.00%	Μ
Stomper	Direct Co						
		Procurement/computer	n/a	\$	5.00	n/a	
		Maintenance/year/computer	n/a	\$	-	n/a	
		Training/year/sys admin	n/a	\$	1,000.00	n/a	
	Factors				5 000/	0.0001	
		User Productivity	-9.00%		-5.00%	0.00%	M
		Confidentiality	5.00%		10.00%	20.00%	M
			5.00%		10.00%	20.00%	M
<b>T</b> 0 "	D: 10	Availability	1.00%		5.00%	13.00%	L
The Swatter	Direct Co		2/2	¢	8.00	n/a	
		Procurement/computer	n/a	\$	8.00		
		Maintenance/year/computer	n/a	\$	-	n/a	
	Factors	Training/year/sys admin	n/a	\$	1,000.00	n/a	
	Factors	Llear Braductivity	-9.00%		-5.00%	0.00%	М
		User Productivity Confidentiality	-9.00 <i>%</i> 15.00%		-5.00 % 19.00%	20.00%	M
		Integrity	15.00%		18.00%	19.00%	L
		Availability	1.00%		5.00%	13.00%	M
McKiller	Direct Co		1.0070		3.0070	13.0070	IVI
Werther	Direction	Procurement/computer	n/a	\$	8.00	n/a	
		Maintenance/year/computer	n/a	\$	-	n/a	
		Training/year/sys admin	n/a	\$	1,000.00	n/a	
	Factors			Ŧ	.,		
		User Productivity	-11.00%		-5.00%	0.00%	М
		Confidentiality	15.00%		19.00%	23.00%	M
		Integrity	15.00%		16.00%	18.00%	M
		Availability	1.00%		6.00%	10.00%	M
Fogger	Direct Co						
- 33		Procurement/computer	n/a	\$	3.00	n/a	
		Maintenance/year/computer	n/a	\$	-	n/a	
		Training/year/sys admin	n/a	\$	1,000.00	n/a	
	Factors						
		User Productivity	-11.00%		-5.00%	0.00%	М
		Confidentiality	15.00%		19.00%	23.00%	Lo
		Integrity	15.00%		16.00%	18.00%	Lo
		Availability	1.00%		6.00%	10.00%	М
Innoculator	Direct Co	osts					
		Procurement/computer	n/a	\$	5.00	n/a	
		Maintenance/year/computer	n/a	\$	-	n/a	
		Training/year/sys admin	n/a	\$	1,000.00	n/a	
	Factors						
		User Productivity	-11.00%		-5.00%	0.00%	М
		eeerrieddenny					
		Confidentiality	10.00%		16.00%	22.00%	M
			10.00% 5.00%		16.00% 10.00%	22.00% 11.00%	M

work-based								
i-Virus								
	Enterprise Stopper	Direct Co	sts					
			Procurement	n/a	\$	4,000.00	n/a	
			Maintenance/year/computer	n/a	\$	-	n/a	
			Training/year/sys admin	n/a	\$	3,000.00	n/a	
		Factors						
			User Productivity	-15.00%		-5.00%	0.00%	Med
			Confidentiality	10.00%		30.00%	40.00%	High
			Integrity	10.00%		30.00%	40.00%	High
			Availability	10.00%		20.00%	30.00%	Med
	System Splatter	Direct Co	sts					
			Procurement	n/a	\$	1,000.00	n/a	
			Maintenance/year/computer	n/a	\$	-	n/a	
			Training/year/sys admin	n/a	\$	2,500.00	n/a	
		Factors						
			User Productivity	-8.00%		-5.00%	0.00%	Low
			Confidentiality	10.00%		30.00%	35.00%	Med
			Integrity	12.00%		30.00%	41.00%	Med
			Availability	9.00%		20.00%	28.00%	Med
	Enterprise Inoculation	Direct Co	· · · · · · · · · · · · · · · · · · ·					
			Procurement	n/a	\$	600.00	n/a	
			Maintenance/year/computer	n/a	\$	-	n/a	
			Training/year/sys admin	n/a	\$	3,000.00	n/a	
		Factors	<u> </u>		Ŧ	,		
			User Productivity	-15.00%		-5.00%	0.00%	Med
			Confidentiality	10.00%		30.00%	36.00%	Med
			Integrity	12.00%		30.00%	35.00%	Med
			Availability	9.00%		20.00%	21.00%	Med
	Global Protect	Direct Co	· · · · · · · · · · · · · · · · · · ·					
			Procurement	n/a	\$	400.00	n/a	
			Maintenance/year/computer	n/a	\$	-	n/a	
			Training/year/sys admin	n/a	\$	4,000.00	n/a	
		Factors	rannig, your by barnin	n/a	Ψ	1,000.00	n/d	
			User Productivity	-11.00%		-5.00%	0.00%	Med
			Confidentiality	10.00%		25.00%	30.00%	Med
			Integrity	10.00%		25.00%	30.00%	Med
			Availability	10.00%		13.00%	20.00%	Low
	Bug Zapper	Direct Co		10.0070		10.0070	20.0070	2011
	Bug Zapper	Direction	Procurement	n/a	\$	600.00	n/a	
			Maintenance/year/computer	n/a	\$	-	n/a	
				n/a	φ \$	1,000.00	n/a	
		Factors	Training/year/sys admin	n/a	φ	1,000.00	n/a	
		1 001015	User Productivity	-11.00%		-8.00%	0.00%	Med
			•	5.00%		-8.00 % 25.00%	30.00%	Med
			Confidentiality Integrity	7.00%		25.00%	30.00%	Med
			Availability	11.00%		13.00%	20.00%	Med
	Enterprise Stomper	Direct Co	· · · · · · · · · · · · · · · · · · ·	11.00 /0		10.0070	20.00 /0	ivieu
	Enterprise Stomper	Direct Co		-	۴	200.00	-/-	
			Procurement Maintananaa/waar/computer	n/a	\$ ¢	300.00	n/a	
			Maintenance/year/computer	n/a	\$ ¢	-	n/a	
		Easter-	Training/year/sys admin	n/a	\$	1,000.00	n/a	
		Factors	Lines Dead anti-the	0.000/		4.0000	0.000/	
			User Productivity	-9.00%		-4.00%	0.00%	Med
			Confidentiality	20.00%		25.00%	30.00%	Med
			Integrity	9.00%		20.00%	28.00%	Med
		<b>D</b> : -	Availability	11.00%		13.00%	19.00%	Low
	Enterprise Fogger	Direct Co						
			Procurement	n/a	\$	400.00	n/a	
			Maintenance/year/computer	n/a	\$	-	n/a	
			Training/year/sys admin	n/a	\$	3,000.00	n/a	
		Factors						
			User Productivity	-11.00%		-8.00%	0.00%	Med
			Confidentiality	5.00%		25.00%	30.00%	Med
			Integrity	7.00%		25.00%	31.00%	Med
				11.00%				

	Oriente de Corres	Discut Or	-1-					
	System fixer	Direct Co	sts Procurement	2/2	¢	250.00	n/a	
			Maintenance/year/computer	n/a n/a	\$ \$	-	n/a	
			Training/year/sys admin	n/a	Ψ \$	750.00	n/a	
		Factors	riannig, yoar, byb aarnin	n/a	Ψ	100.00	n/a	
		, actore	User Productivity	-11.00%		-5.00%	0.00%	Med
			Confidentiality	2.00%		10.00%	20.00%	Med
			Integrity	5.00%		9.00%	21.00%	Med
			Availability	2.00%		3.00%	11.00%	Low
	System Doctor	Direct Co	-					
			Procurement	n/a	\$	300.00	n/a	
			Maintenance/year/computer	n/a	\$	-	n/a	
			Training/year/sys admin	n/a	\$	1,500.00	n/a	
		Factors						
			User Productivity	-6.00%		-2.00%	0.00%	Low
			Confidentiality	4.00%		10.00%	15.00%	Low
			Integrity	5.00%		7.00%	15.00%	Low
			Availability	1.00%		5.00%	13.00%	Low
	Blue Sky	Direct Co	sts					
	1		Procurement	n/a	\$	400.00	n/a	
	1		Maintenance/year/computer	n/a	\$	-	n/a	
	1		Training/year/sys admin	n/a	\$	2,000.00	n/a	
	1	Factors						
	1		User Productivity	-5.00%		-2.00%	-1.00%	Low
	1		Confidentiality	3.00%		10.00%	14.00%	Low
	1		Integrity	1.00%		2.00%	9.00%	Low
			Availability	1.00%		12.00%	13.00%	Low
	Acer Security	Direct Co	sts					
			Procurement	n/a	\$	300.00	n/a	
			Maintenance/year/computer	n/a	\$	-	n/a	
			Training/year/sys admin	n/a	\$	1,000.00	n/a	
		Factors						
			User Productivity	-9.00%		-5.00%	0.00%	Med
			Confidentiality	5.00%		10.00%	20.00%	Med
			Integrity	5.00%		10.00%	20.00%	Med
			Availability	1.00%		5.00%	13.00%	Low
	Protection	Direct Co						
			Procurement	n/a	\$	250.00	n/a	
			Maintenance/year/computer	n/a	\$	-	n/a	
			Training/year/sys admin	n/a	\$	1,000.00	n/a	
		Factors						
			User Productivity	-11.00%		-9.00%	0.00%	Med
,								
			Confidentiality	4.00%		10.00%	20.00%	Med
			Integrity	2.00%		10.00%	19.00%	Med
trusion etection			Integrity	2.00%		10.00%	19.00%	Med
trusion etection	Data Watcher	Direct Co	Integrity Availability	2.00%		10.00%	19.00%	Med
trusion etection	Data Watcher	Direct Co	Integrity Availability	2.00%	\$	10.00%	19.00%	Med
trusion etection	Data Watcher	Direct Co	Integrity Availability sts	2.00% 0.00%	\$	10.00% 5.00%	19.00% 15.00%	Med
trusion etection	Data Watcher	Direct Co	Integrity Availability sts Procurement	2.00% 0.00%		10.00% 5.00% 19,000.00	19.00% 15.00% n/a	Med
trusion etection	Data Watcher	Direct Co Factors	Integrity Availability sts Procurement Maintenance/year/computer/as	2.00% 0.00% n/a n/a	\$	10.00% 5.00% 19,000.00 50.00	19.00% 15.00% n/a n/a	Med
trusion etection	Data Watcher		Integrity Availability sts Procurement Maintenance/year/computer/as	2.00% 0.00% n/a n/a	\$	10.00% 5.00% 19,000.00 50.00	19.00% 15.00% n/a n/a	Med
rusion etection	Data Watcher		Integrity Availability sts Procurement Maintenance/year/computer/as Training/year/sys admin	2.00% 0.00% n/a n/a n/a	\$	10.00% 5.00% 19,000.00 50.00 5,000.00	19.00% 15.00% n/a n/a n/a	Med Med
rusion etection	Data Watcher		Integrity Availability sts Procurement Maintenance/year/computer/as Training/year/sys admin User Productivity	2.00% 0.00% n/a n/a n/a -10.00%	\$	10.00% 5.00% 19,000.00 50.00 5,000.00	19.00% 15.00% n/a n/a 0.00%	Med Med
trusion etection	Data Watcher		Integrity Availability sts Procurement Maintenance/year/computer/as Training/year/sys admin User Productivity Confidentiality	2.00% 0.00% n/a n/a n/a -10.00% 10.00%	\$	10.00% 5.00% 19,000.00 50.00 5,000.00 -5.00% 20.00%	19.00% 15.00% n/a n/a 0.00% 30.00%	Med Med Low
trusion etection	Data Watcher		Integrity Availability sts Procurement Maintenance/year/computer/as Training/year/sys admin User Productivity Confidentiality Integrity Availability	2.00% 0.00% n/a n/a n/a -10.00% 10.00% 18.00%	\$	10.00% 5.00% 19,000.00 50.00 5,000.00 -5.00% 20.00% 20.00%	19.00% 15.00% n/a n/a 0.00% 30.00% 30.00%	Med Med Low Med Low
trusion etection		Factors	Integrity Availability sts Procurement Maintenance/year/computer/as Training/year/sys admin User Productivity Confidentiality Integrity Availability	2.00% 0.00% n/a n/a n/a -10.00% 10.00% 18.00%	\$	10.00% 5.00% 19,000.00 50.00 5,000.00 -5.00% 20.00% 20.00%	19.00% 15.00% n/a n/a 0.00% 30.00% 30.00%	Med Med Low Med Low
trusion etection		Factors	Integrity Availability sts Procurement Maintenance/year/computer/as Training/year/sys admin User Productivity Confidentiality Integrity Availability sts	2.00% 0.00% n/a n/a -10.00% 10.00% 18.00% 10.00%	\$	10.00% 5.00% 19,000.00 50.00 5,000.00 -5.00% 20.00% 20.00% 20.00%	19.00% 15.00% n/a n/a 0.00% 30.00% 30.00% 30.00%	Med Med Low Med Low
trusion etection		Factors	Integrity Availability sts Procurement Maintenance/year/computer/as Training/year/sys admin User Productivity Confidentiality Integrity Availability sts Procurement Maintenance/year/computer/as	2.00% 0.00% n/a n/a -10.00% 10.00% 18.00% 10.00% n/a n/a	\$ \$ \$	10.00% 5.00% 19,000.00 50.00 5,000.00 -5.00% 20.00% 20.00% 20.00% 20.00%	19.00% 15.00% n/a n/a 0.00% 30.00% 30.00% 30.00% 30.00%	Med Med Low Med Low
trusion etection		Factors Direct Co	Integrity Availability sts Procurement Maintenance/year/computer/as Training/year/sys admin User Productivity Confidentiality Integrity Availability sts Procurement	2.00% 0.00% n/a n/a n/a -10.00% 10.00% 18.00% 10.00%	\$ \$ \$ \$	10.00% 5.00% 19,000.00 50.00 5,000.00 -5.00% 20.00% 20.00% 20,000.00	19.00% 15.00% n/a n/a 0.00% 30.00% 30.00% 30.00% 30.00%	Med Med Low Med Low
trusion etection		Factors	Integrity Availability Availability sts Procurement Maintenance/year/computer/as Training/year/sys admin User Productivity Confidentiality Integrity Availability sts Procurement Maintenance/year/computer/as Training/year/sys admin	2.00% 0.00% n/a n/a -10.00% 10.00% 10.00% 10.00% n/a n/a n/a n/a	\$ \$ \$ \$	10.00% 5.00% 19,000.00 50.00 5,000.00 -5.00% 20.00% 20.00% 20.00% 20,000.00 100.00 7,000.00	19.00% 15.00% n/a n/a n/a 0.00% 30.00% 30.00% 30.00% 30.00% n/a n/a n/a n/a	Med Med Low Med Low
trusion etection		Factors Direct Co	Integrity Availability Availability sts Procurement Maintenance/year/computer/as Training/year/sys admin User Productivity Confidentiality Integrity Availability sts Procurement Maintenance/year/computer/as Training/year/sys admin User Productivity	2.00% 0.00% n/a n/a -10.00% 10.00% 10.00% 10.00% n/a n/a n/a n/a n/a n/a -11.00%	\$ \$ \$ \$	10.00% 5.00% 19,000.00 50.00 5,000.00 -5.00% 20.00% 20.00% 20.00% 20.00% 20.000 100.00 7,000.00 -9.00%	19.00% 15.00% 15.00% n/a n/a 0.00% 30.00% 30.00% 30.00% 30.00% n/a n/a n/a n/a n/a n/a -2.00%	Med Med Low Med Low Med
etwork-based trusion etection ystem		Factors Direct Co	Integrity Availability Availability sts Procurement Maintenance/year/computer/as Training/year/sys admin User Productivity Confidentiality Integrity Availability sts Procurement Maintenance/year/computer/as Training/year/sys admin	2.00% 0.00% n/a n/a -10.00% 10.00% 10.00% 10.00% n/a n/a n/a n/a	\$ \$ \$ \$	10.00% 5.00% 19,000.00 50.00 5,000.00 -5.00% 20.00% 20.00% 20.00% 20,000.00 100.00 7,000.00	19.00% 15.00% n/a n/a n/a 0.00% 30.00% 30.00% 30.00% 30.00% n/a n/a n/a n/a	Med Med Low Med Low Med

Correlation Inc	Direct Co						
		Procurement	n/a	\$	15,000.00	n/a	
		Maintenance/year/computer/as	n/a	\$	-	n/a	
	Feeters	Training/year/sys admin	n/a	\$	6,000.00	n/a	
	Factors	User Productivity	-10.00%		-5.00%	0.00%	Ме
		Confidentiality	3.00%		9.00%	42.00%	Hig
		Integrity	4.00%		11.00%	41.00%	Hig
		Availability	0.00%		13.00%	39.00%	Hig
Detect IT	Direct Co		0.0070		1010070	0010070	
		Procurement	n/a	\$	8,000.00	n/a	
		Maintenance/year/computer/as	n/a	\$	50.00	n/a	
		Training/year/sys admin	n/a	\$	5,000.00	n/a	
	Factors						
		User Productivity	-15.00%		-10.00%	0.00%	Me
		Confidentiality	5.00%		15.00%	25.00%	Me
		Integrity	5.00%		15.00%	25.00%	Me
		Availability	5.00%		15.00%	25.00%	Me
Security Associates	Direct Co						
		Procurement	n/a	\$	9,000.00	n/a	
		Maintenance/year/computer/as	n/a	\$	-	n/a	
	_	Training/year/sys admin	n/a	\$	4,000.00	n/a	
	Factors						
		User Productivity	-12.00%		-8.00%	0.00%	Me
		Confidentiality	5.00%		15.00%	20.00%	Me
		Integrity	5.00%		15.00%	18.00%	Lov
		Availability	5.00%		15.00%	17.00%	Lov
Network Traffic ID	Direct Co			•			
		Procurement	n/a	\$	9,000.00	n/a	
		Maintenance/year/computer/as	n/a	\$	75.00	n/a	
		Training/year/sys admin	n/a	\$	5,000.00	n/a	
	Factors		45 0004		10.000/	0.000/	
		User Productivity	-15.00%		-10.00%	0.00%	Me
		Confidentiality	5.00%		16.00%	30.00%	Me
		Integrity	5.00%		18.00%	28.00%	Me
Linitan	Dire et Ce	Availability	5.00%		20.00%	26.00%	Me
Unitec	Direct Co	Procurement	n/a	\$	5,000.00	n/a	
		Maintenance/year/computer/as	n/a	գ \$	20.00	n/a	
		Training/year/sys admin	n/a	ф \$	7,000.00	n/a	
	Factors	Taining/year/sys autilit	n/a	Ψ	7,000.00	n/a	
	1 001013	User Productivity	-30.00%		-20.00%	-2.00%	Me
		Confidentiality	5.00%		-20.00 % 18.00%	20.00%	Me
		Integrity	5.00% 7.00%		17.00%	20.00%	Me
		Availability	10.00%		17.00%	20.00%	Lov
Network Eye	Direct Co		10.0070		17.0070	20.0070	LU
INCLWOIN EYE	Direct CO	Procurement	n/a	\$	4,000.00	n/a	
		Maintenance/year/computer/as	n/a	ֆ \$	4,000.00	n/a	
		Training/year/sys admin	n/a	գ \$	2,000.00	n/a	
	Factors	rannig/year/sys aurini	1//a	Ψ	2,000.00	iva	
	1 001013	User Productivity	-30.00%		-10.00%	0.00%	Me
		Confidentiality	5.00%		20.00%	25.00%	Me
		Integrity	7.00%		20.00%	25.00%	Me
		Availability	10.00%		22.00%	25.00%	Me
	Direct Co	,	. 0.0070		//	_0.0070	IVIC
Watcher	51000 00	Procurement	n/a	\$	3,000.00	n/a	
Watcher			n/a	\$	-	n/a	
Watcher		Maintenance/vear/computer/as	11/a	Ψ	=		
Watcher		Maintenance/year/computer/as	n/a	¢	1 000 00	n/a	
Watcher	Factors	Maintenance/year/computer/as Training/year/sys admin	n/a	\$	1,000.00	n/a	
Watcher	Factors	Training/year/sys admin		\$			Ma
Watcher	Factors	Training/year/sys admin User Productivity	-30.00%	\$	-10.00%	0.00%	Me
Watcher	Factors	Training/year/sys admin		\$			Me Me Me

twork-based								
AM Filter								
Г	Spam Stoper	Direct Co	sts					
	• •		Procurement	n/a	\$	45,000.00	n/a	
			Maintenance/year/computer	n/a	\$	-	n/a	
			Training/year/sys admin	n/a	\$	1,000.00	n/a	
		Factors						
			User Productivity	-0.10%		-0.10%	-0.10%	Low
			Confidentiality	0.00%		0.00%	0.00%	Low
			Integrity	0.00%		0.00%	0.00%	Low
			Availability	15.00%		15.00%	15.00%	Low
F	Mail Control	Direct Co	sts					
			Procurement	n/a	\$	30,000.00	n/a	
			Maintenance/year/computer	n/a	\$	-	n/a	
			Training/year/sys admin	n/a	\$	1,500.00	n/a	
		Factors						
			User Productivity	-0.10%		-0.10%	-0.10%	Low
			Confidentiality	0.00%		0.00%	0.00%	Low
			Integrity	0.00%		0.00%	0.00%	Low
			Availability	-5.00%		2.00%	15.00%	Med
F	Postman	Direct Co	· · · · · · · · · · · · · · · · · · ·	ĺ				
			Procurement	n/a	\$	3,000.00	n/a	
			Maintenance/year/computer	n/a	\$	-	n/a	
			Training/year/sys admin	n/a	\$	2,000.00	n/a	
		Factors			*	,		
			User Productivity	-5.00%		-1.00%	-0.10%	Low
			Confidentiality	0.00%		0.00%	0.00%	Low
			Integrity	0.00%		0.00%	0.00%	Low
			Availability	-8.00%		1.00%	7.00%	Med
F	Mail Scrubber	Direct Co	· · · · · · · · · · · · · · · · · · ·					
		Direction	Procurement	n/a	\$	5,000.00	n/a	
			Maintenance/year/computer	n/a	\$	-	n/a	
			Training/year/sys admin	n/a	\$	1,000.00	n/a	
		Factors	Taining/year/sys admin	n/a	Ψ	1,000.00	11/a	
		1 001013	User Productivity	-0.30%		-0.20%	-0.10%	Low
			Confidentiality	0.00%		0.00%	0.00%	Low
			Integrity	0.00%		0.00%	0.00%	Low
			Availability	0.00%		1.00%	5.00%	Low
F	Spam Meiseter	Direct Co		0.0070		1.0070	0.0070	2011
	opannimeiseter	Direction	Procurement	n/a	\$	1,500.00	n/a	
			Maintenance/year/computer	n/a	φ \$	1,300.00	n/a	
			Training/year/sys admin	n/a	Ψ \$	800.00	n/a	
		Factors	Taining/year/sys admin	n/a	Ψ	000.00	11/a	
		1 001013	User Productivity	-5.00%		-1.00%	-0.10%	Low
			Confidentiality	-5.00%		0.00%	0.00%	Low
			Integrity	0.00%		0.00%	0.00%	Low
			Availability	-10.00%		-3.00%	10.00%	Med
F	Email Valve	Direct Co		10.0078		5.0070	10.0070	INIEU
			Procurement	n/o	¢	10 000 00	n/a	
			Procurement Maintenance/year/computer	n/a n/a	\$ \$	10,000.00	n/a n/a	
				n/a n/a		-		
		Factors	Training/year/sys admin	n/a	\$	500.00	n/a	
		Factors	Lloor Droductivity	0.000/		0.25%	0.400/	1
			User Productivity	-0.20%		-0.25%	-0.10%	Low
			Confidentiality	0.00%		0.00%	0.00%	Low
			Integrity	0.00%		0.00%	0.00%	Low
F		<b>D</b> : -	Availability	0.00%		3.00%	5.00%	Med
	Email Filter	Direct Co			-			
			Procurement	n/a	\$	5,000.00	n/a	
			Maintenance/year/computer	n/a	\$	-	n/a	
			Training/year/sys admin	n/a	\$	1,000.00	n/a	
		Factors						
			User Productivity	-0.30%		-0.25%	-0.10%	Low
			Confidentiality	0.00%		0.00%	0.00%	Low
			Integrity	0.00%		0.00%	0.00%	Low

Г	A see INC	Direct Co.	-1-					
	Acer INC	Direct Co		- (-	¢	400.00	- (-	
			Procurement Maintenance/year/computer	n/a n/a	\$ \$	100.00	n/a n/a	
						-		
		Factors	Training/year/sys admin	n/a	\$	1,000.00	n/a	
		Factors	Lloor Broductivity	0.20%		0.25%	-0.10%	Low
			User Productivity Confidentiality	-0.20% 0.00%		-0.25% 0.00%	0.00%	
								Low
				0.00%		0.00%	0.00%	Low
			Availability	-15.00%		-5.00%	5.00%	Med
Network-based Vulnerability Scanning								
	Hole Plugger	Direct Co	sts					
			Procurement	n/a	\$	75,000.00	n/a	
			Maintenance/year	n/a	\$	25,000.00	n/a	
			Training/year/sys admin	n/a	\$	10,000.00	n/a	
		Factors						
			User Productivity	-1.00%		-0.50%	0.00%	Low
			Confidentiality	0.00%		0.00%	0.00%	Low
			Integrity	-1.00%		0.00%	10.00%	Med
			Availability	-1.00%		0.00%	10.00%	Med
	Scanner	Direct Co	sts					
			Procurement	n/a	\$	60,000.00	n/a	
			Maintenance/year	n/a	\$	20,000.00	n/a	
			Training/year/sys admin	n/a	\$	5,000.00	n/a	
		Factors						
			User Productivity	-1.00%		-0.50%	0.00%	Low
			Confidentiality	0.00%		0.00%	0.00%	Low
			Integrity	-10.00%		-70.00%	15.00%	Med
			Availability	-10.00%		-70.00%	15.00%	Med
	Health Check	Direct Co	sts					
			Procurement	n/a	\$	90,000.00	n/a	
			Maintenance/year	n/a	\$	25,000.00	n/a	
			Training/year/sys admin	n/a	\$	9,000.00	n/a	
		Factors						
			User Productivity	-1.00%		-0.50%	0.00%	Low
			Confidentiality	0.00%		0.00%	0.00%	Low
			Integrity	-0.50%		0.00%	5.00%	Low
			Availability	-0.50%		0.00%	5.00%	Low
	Net Assesment	Direct Co	sts					
			Procurement	n/a	\$	50,000.00	n/a	
			Maintenance/year	n/a	\$	20,000.00	n/a	
			Training/year/sys admin	n/a	\$	7,000.00	n/a	
		Factors	-					
			User Productivity	-0.90%		-0.50%	0.00%	Low
			Confidentiality	0.00%		0.00%	0.00%	Low
			Integrity	-15.00%		-9.00%	10.00%	Med
			Availability	-19.00%		-10.00%	10.00%	Med
	SCT scanner	Direct Co						
			Procurement	n/a	\$	30,000.00	n/a	
			Maintenance/year	n/a	\$	10,000.00	n/a	
			Training/year/sys admin	n/a	\$	5,000.00	n/a	
		Factors			Ŧ	-,		
			User Productivity	-5.00%		-3.00%	0.00%	Med
			Confidentiality	0.00%		0.00%	0.00%	Low
			Integrity	-20.00%		-9.00%	15.00%	Med
			Availability	-20.00%		-10.00%	15.00%	High
	NetStat	Direct Co		20.00 /0		10.00 /0	10.00 /0	riigii
	neiotai		Procurement	n/a	\$	20,000.00	n/a	
			Maintenance/year	n/a	\$	6,000.00	n/a	
		Feature	Training/year/sys admin	n/a	\$	3,000.00	n/a	
		Factors	Lloor Droductivity	4.000/		0 500/	0.000/	1.200
			User Productivity	-1.20%		-0.50%	0.00%	Low
			Confidentiality	0.00%		0.00%	0.00%	Low
			Integrity	-20.00%		-10.00%	1.00%	Med
			Availability	-20.00%		-10.00%	1.00%	Med

	) ( . l O	Discut Ou	-1-					
	VulnerScan	Direct Co		,	^	45 000	,	
			Procurement	n/a	\$	15,000.00	n/a	
			Maintenance/year	n/a	\$	5,000.00	n/a	
			Training/year/sys admin	n/a	\$	3,000.00	n/a	
		Factors						
			User Productivity	-1.20%		-0.50%	0.00%	Low
			Confidentiality	0.00%		0.00%	0.00%	Low
			Integrity	-30.00%		-20.00%	9.00%	High
			Availability	-30.00%		-20.00%	9.00%	High
Data			•					
Redundancy								
	Sonic Data	Direct Co	sts					
	Como Data	Direction	Procurement	n/a	\$	800,000.00	n/a	
			Maintenance/year/computer	n/a	\$	8,000.00	n/a	
			Training/year/sys admin	n/a	\$ \$	1,000.00	n/a	
		Factors	Taining/year/sys admin	n/a	Ψ	1,000.00	n/a	
		Factors	Llees Dreductivity	0.000/		1.000/	40.000/	Mad
			User Productivity	0.00%		1.00%	10.00%	Med
			Confidentiality	0.00%		0.00%	0.00%	Low
			Integrity	10.00%		20.00%	40.00%	Med
			Availability	10.00%		20.00%	40.00%	Med
	Data Soutions	Direct Co						
			Procurement	n/a	\$	500,000.00	n/a	
			Maintenance/year/computer	n/a	\$	5,000.00	n/a	
			Training/year/sys admin	n/a	\$	1,000.00	n/a	
		Factors						
			User Productivity	0.00%		1.00%	20.00%	Med
			Confidentiality	0.00%		0.00%	0.00%	Low
			Integrity	0.00%		10.00%	60.00%	High
			Availability	0.00%		10.00%	60.00%	High
	Data R Us	Direct Co	· ·					
	Data IX 03	Direction	Procurement	n/a	\$	300,000.00	n/a	
					э \$			
			Maintenance/year/computer	n/a		4,000.00	n/a	
			Training/year/sys admin	n/a	\$	1,000.00	n/a	
		Factors		0.000/		4.000/	=	
			User Productivity	0.00%		1.00%	5.00%	Med
			Confidentiality	0.00%		0.00%	0.00%	Low
			Integrity	0.00%		10.00%	30.00%	Med
			Availability	0.00%		10.00%	30.00%	Med
	Bytes	Direct Co	sts					
			Procurement	n/a	\$	250,000.00	n/a	
			Maintenance/year/computer	n/a	\$	3,000.00	n/a	
			Training/year/sys admin	n/a	\$	1,000.00	n/a	
		Factors						
			User Productivity	0.00%		1.00%	5.00%	Low
			Confidentiality	0.00%		0.00%	0.00%	Low
			Integrity	0.00%		20.00%	22.00%	Med
			Availability	0.00%		20.00%	22.00%	Med
	Digital Solutions	Direct Co	5	0.0070		_0.0070		inica
	Digital Solutions	Direct CO	Procurement	n/c	¢	150 000 00	n/o	
				n/a	\$	150,000.00	n/a	
			Maintenance/year/computer	n/a	\$	3,000.00	n/a	
			Training/year/sys admin	n/a	\$	1,000.00	n/a	
		Factors						
			User Productivity	0.00%		1.00%	3.00%	Low
			Confidentiality	0.00%		0.00%	0.00%	Low
			Integrity	0.00%		10.00%	15.00%	Med
			Availability	0.00%		10.00%	15.00%	Med
	Data	Direct Co	sts					
			Procurement	n/a	\$	100,000.00	n/a	
			Maintenance/year/computer	n/a	\$	10,000.00	n/a	
			Training/year/sys admin	n/a	\$	1,000.00	n/a	
		Factors		1,0	Ψ	.,000.00	17.4	
		1 001015	User Productivity	0.00%		1.00%	3.00%	Low
			•					
	1		Confidentiality	0.00%		0.00%	0.00%	Low
								Mod
			Integrity Availability	0.00% 0.00%		15.00% 15.00%	17.00% 17.00%	Med Med

Web King edundant Servies	Direct Co Factors Direct Co Direct Co	Procurement Maintenance/year/computer Training/year/sys admin User Productivity Confidentiality Integrity Availability Procurement Maintenance/year/computer Training/year/sys admin User Productivity Confidentiality Integrity Availability	n/a n/a 0.00% 0.00% 10.00% 10.00% n/a n/a n/a 0.00% 0.00% 0.00%	\$ \$ \$ \$ \$ \$ \$	50,000.00 10,000.00 1,000.00 1.00% 20.00% 20.00% 30,000.00 10,000.00 1,000.00 1.00% 0.00%	n/a n/a 10.00% 0.00% 40.00% 40.00% n/a n/a n/a 20.00% 0.00%	Med Low High High Med Low
edundant Servies	Factors Direct Co Factors	Procurement Maintenance/year/computer Training/year/sys admin User Productivity Confidentiality Integrity Availability Procurement Maintenance/year/computer Training/year/sys admin User Productivity Confidentiality Integrity Availability	n/a n/a 0.00% 10.00% 10.00% n/a n/a n/a 0.00% 0.00% 0.00%	\$ \$ \$ \$	10,000.00 1,000.00 1.00% 20.00% 20.00% 30,000.00 10,000.00 1,000.00 1.00%	n/a n/a 10.00% 40.00% 40.00% n/a n/a n/a n/a 20.00%	Low High High Med
	Direct Co Factors	Maintenance/year/computer Training/year/sys admin User Productivity Confidentiality Integrity Availability Procurement Maintenance/year/computer Training/year/sys admin User Productivity Confidentiality Integrity Availability	n/a n/a 0.00% 10.00% 10.00% n/a n/a n/a 0.00% 0.00% 0.00%	\$ \$ \$ \$	10,000.00 1,000.00 1.00% 20.00% 20.00% 30,000.00 10,000.00 1,000.00 1.00%	n/a n/a 10.00% 40.00% 40.00% n/a n/a n/a n/a 20.00%	Low High High Med
	Direct Co Factors	Training/year/sys admin User Productivity Confidentiality Integrity Availability Sts Procurement Maintenance/year/computer Training/year/sys admin User Productivity Confidentiality Integrity Availability	n/a 0.00% 0.00% 10.00% n/a n/a n/a 0.00% 0.00% 0.00%	\$ \$ \$	1,000.00 1.00% 20.00% 20.00% 30,000.00 10,000.00 1,000.00 1.00%	n/a 10.00% 0.00% 40.00% n/a n/a n/a 20.00%	Low High High Med
	Direct Co Factors	User Productivity Confidentiality Integrity Availability sts Procurement Maintenance/year/computer Training/year/sys admin User Productivity Confidentiality Integrity Availability	0.00% 0.00% 10.00% n/a n/a n/a 0.00% 0.00%	\$	1.00% 0.00% 20.00% 20.00% 30,000.00 10,000.00 1,000.00 1.00%	10.00% 0.00% 40.00% n/a n/a n/a 20.00%	Low High High Med
	Direct Co Factors	Confidentiality Integrity Availability sts Procurement Maintenance/year/computer Training/year/sys admin User Productivity Confidentiality Integrity Availability	0.00% 10.00% n/a n/a n/a 0.00% 0.00% 0.00%	\$	0.00% 20.00% 20.00% 30,000.00 10,000.00 1,000.00 1.00%	0.00% 40.00% n/a n/a n/a 20.00%	Low High High Med
	Factors	Confidentiality Integrity Availability sts Procurement Maintenance/year/computer Training/year/sys admin User Productivity Confidentiality Integrity Availability	0.00% 10.00% n/a n/a n/a 0.00% 0.00% 0.00%	\$	0.00% 20.00% 20.00% 30,000.00 10,000.00 1,000.00 1.00%	0.00% 40.00% n/a n/a n/a 20.00%	Low High High Med
	Factors	Integrity Availability Ists Procurement Maintenance/year/computer Training/year/sys admin User Productivity Confidentiality Integrity Availability	10.00% 10.00% n/a n/a 0.00% 0.00% 0.00%	\$	20.00% 20.00% 30,000.00 10,000.00 1,000.00 1.00%	40.00% 40.00% n/a n/a n/a 20.00%	High High Med
	Factors	Availability sts Procurement Maintenance/year/computer Training/year/sys admin User Productivity Confidentiality Integrity Availability	10.00% n/a n/a 0.00% 0.00% 0.00%	\$	20.00% 30,000.00 10,000.00 1,000.00 1.00%	40.00% n/a n/a n/a 20.00%	High
	Factors	sts Procurement Maintenance/year/computer Training/year/sys admin User Productivity Confidentiality Integrity Availability	n/a n/a 0.00% 0.00% 0.00%	\$	30,000.00 10,000.00 1,000.00 1.00%	n/a n/a n/a 20.00%	Med
	Factors	Procurement Maintenance/year/computer Training/year/sys admin User Productivity Confidentiality Integrity Availability	n/a n/a 0.00% 0.00%	\$	10,000.00 1,000.00 1.00%	n/a n/a 20.00%	
ServU		Maintenance/year/computer Training/year/sys admin User Productivity Confidentiality Integrity Availability	n/a n/a 0.00% 0.00%	\$	10,000.00 1,000.00 1.00%	n/a n/a 20.00%	
ServU		Training/year/sys admin User Productivity Confidentiality Integrity Availability	n/a 0.00% 0.00% 0.00%		1,000.00 1.00%	n/a 20.00%	
ServU		User Productivity Confidentiality Integrity Availability	0.00% 0.00% 0.00%	\$	1.00%	20.00%	
ServU		Confidentiality Integrity Availability	0.00% 0.00%				
ServU	Direct Co	Confidentiality Integrity Availability	0.00% 0.00%				
ServU	Direct Co	Integrity Availability	0.00%		0.00%	0.00%	Low
ServU	Direct Co	Availability				0.00%	LOW
ServU	Direct Co		0.000/		10.00%	60.00%	High
ServU	Direct Co	sts	0.00%		10.00%	60.00%	High
		Procurement	n/a	\$	15,000.00	n/a	
		Maintenance/year/computer	n/a	\$	10,000.00	n/a	
		Training/year/sys admin	n/a	\$	1,000.00	n/a	
	Factors						
		User Productivity	0.00%		1.00%	5.00%	Med
		Confidentiality	0.00%		0.00%	0.00%	Low
		Integrity	0.00%		10.00%	30.00%	High
		Availability	0.00%		10.00%	30.00%	High
Robust Solutions	Direct Co	osts					Med
		Procurement	n/a	\$	10,000.00	n/a	
		Maintenance/year/computer	n/a	\$	10,000.00	n/a	
		Training/year/sys admin	n/a	\$	1,000.00	n/a	
	Factors						
		User Productivity	0.00%		1.00%	5.00%	Low
		Confidentiality	0.00%		0.00%	0.00%	Low
			0.00%		20.00%	22.00%	Med
		Availability	0.00%		20.00%	22.00%	Med
blicity	Direct Co	osts					
		Procurement	n/a	\$	10,000.00	n/a	
		Maintenance/year/computer	n/a	\$	10,000.00	n/a	
		Training/year/sys admin	n/a	\$	1,000.00	n/a	
	Factors						
		User Productivity	0.00%		1.00%	3.00%	Low
		,	0.00%				Low
		•	0.00%				Med
			0.00%		10.00%	15.00%	Med
)	Direct Co						
		Procurement	n/a	\$	6,000.00	n/a	
	Factors	. anning, your, byb durnin	1/4	Ψ	1,000.00	1	
	1 401010	User Productivity	0.00%		1 00%	3 00%	Low
		•					Low
							Med
							Med
	licity	Factors	Confidentiality Integrity Availability licity Direct Costs Procurement Maintenance/year/computer Training/year/sys admin Factors User Productivity Confidentiality Integrity Availability Direct Costs Procurement Maintenance/year/computer Training/year/sys admin	Confidentiality     0.00%       Integrity     0.00%       Availability     0.00%       Availability     0.00%       Icity     Direct Costs       Procurement     n/a       Maintenance/year/computer     n/a       Training/year/sys admin     n/a       Factors     User Productivity       Confidentiality     0.00%       Integrity     0.00%       Availability     0.00%       Availability     0.00%       Direct Costs     Procurement       Direct Costs     Procurement       States     Procurement       Maintenance/year/computer     n/a       Training/year/sys admin     n/a       Factors     User Productivity       O.00%     Confidentiality       Integrity     0.00%       Confidentiality     0.00%	Confidentiality     0.00%       Integrity     0.00%       Availability     0.00%       Icity     Direct Costs       Procurement     n/a       Maintenance/year/computer     n/a       Training/year/sys admin     n/a       Factors     User Productivity       O.00%     Integrity       O.00%     Integrity       O.00%     Integrity       O.00%     Procurement       Direct Costs     Procurement       Direct Costs     Procurement       Direct Costs     Naintenance/year/computer       Direct Costs     Procurement       Maintenance/year/computer     n/a       S     Training/year/sys admin       n/a     \$       Factors     User Productivity       O.00%     O.00%       Example     User Productivity       O.00%     Na       Factors     User Productivity       O.00%     Confidentiality       O.00%     Integrity       O.00%     Integrity	Confidentiality         0.00%         0.00%           Integrity         0.00%         20.00%           Availability         0.00%         20.00%           licity         Direct Costs         7           Procurement         n/a         \$ 10,000.00           Training/year/sys admin         n/a         \$ 10,000.00           Factors         User Productivity         0.00%         1.00%           Confidentiality         0.00%         1.00%         10.00%           Integrity         0.00%         1.00%         10.00%           Availability         0.00%         10.00%         10.00%           Integrity         0.00%         10.00%         10.00%           Availability         0.00%         10.00%         10.00%           Direct Costs         Frocurement         n/a         \$ 6,000.00           Maintenance/year/computer         n/a         \$ 10,000.00           Training/year/sys admin         n/a         \$ 10,000.00           Factors         User Productivity         0.00%         1.00%           Confidentiality         0.00%         1.00%         1.00%           Licer Productivity         0.00%         1.00%         1.00%           <	Confidentiality         0.00%         0.00%         0.00%         22.00%         20.00%         20.00%         20.00%         20.00%         2

Policy -Preventive Defensive Measure

## **Enclosure B**

How to read this table: The Qualitative Values are a judgment based on the assessment from industry experts on the tools' effectiveness. Each defensive measure has several instances that vary in costs and effectiveness. The Low, Mean, and High values represent a characterization of reviews found in different consumer review periodicals as they relate to user productivity, confidentiality, integrity, and availability. The variability indicates the concentration of the data about the mean. The Low and High are the minimum and maximum possible values, respectively. Costs are in U.S. dollars. A factor value of 5.00% indicates an improvement of 5%. A value of -5.00% indicates that the factor is degraded by 5%. These values are modifiers to the existing levels. For example from a base Confidentiality level of .8 a factor value of 25% would result in a new Confidentiality factor of 0.8 - (0.8\*0.25) = 0.6. A positive value results in a positive change in the factor.

Quantitiative Values High Variability Low Mean Strong Passwords Costs Policy Implementation n/a \$45,000 n/a Low \$8,000 \$12,000 \$15,000 Med Training/year per Sys Admin \$12 Med Training/year per user \$3 \$5 Maintenance Costs \$10,000 \$12,000 \$20,000 Med Factors 9.00% 28.00% 38.00% User Productivity Med Confidentiality 9.00% 28.00% 38.00% Low Integrity 9.00% 28.00% 38.00% Low Availability 9.00% 18.00% 28.00% Low No Password Policy Costs Policy Implementation n/a n/a n/a n/a Training/year per Sys Admin n/a n/a n/a n/a Training/year per user n/a n/a n/a n/a Maintenance Costs n/a n/a n/a n/a Factors User Productivity 0.00% 0.00% 0.00% Low Confidentiality -75.00% -50.00% 0.00% High Integrity -75.00% -50.00% 0.00% High Availability -75.00% -50.00% 0.00% High Formal Security Audits Costs \$45,000 Policy Implementation n/a n/a Low Training/year per Sys Admin \$10.000 \$12.000 \$20.000 Med Maintenance Costs \$10,000 \$12,000 \$20,000 Med Factors User Productivity 0.00% 0.00% -10.00% Low Confidentiality -5.00% 20.00% 40.00% High -5.00% 20.00% 40.00% High Integrity -5.00% 20.00% 40.00% Availabilitv Hiah Disallow Wireless Costs Policy Implementation n/a \$20,000 n/a Low Training/year per User \$5 \$10 \$30 Med \$10,000 \$12,000 \$20,000 Med Maintenance Costs Factors User Productivity -10.00% -5.00% 0.00% Low Confidentiality 0.00% 5.00% 10.00% Low Integrity 0.00% 5.00% 10.00% Low Availability 0.00% 5.00% 10.00% Low Allow Wireless Costs Policy Implementation n/a \$45,000 n/a Low \$20,000 \$30,000 \$40,000 Med Training/year per Sys Admin \$5 \$10 \$30 Med Training/year per User \$10,000 Maintenance Costs \$12,000 \$20,000 Med Factors User Productivity 40.00% 60.00% 70.00% Med Confidentiality -60.00% -30.00% 0.00% High Integrity -60.00% -30.00% 0.00% High -60.00% -30.00% Availability 0.00% High

Restrict						
Removable						
Media						
	Costs					
	00313	Policy Implementation	n/a	\$20,000	n/a	Low
		Training/year per Sys Admin	\$10,000	\$12,000	\$20,000	Med
		Training/year per User	\$5	\$10	\$30	Med
		87 1				
	<b>E</b>	Maintenance Costs	\$10,000	\$12,000	\$20,000	Med
	Factors	United Back of St	50.000/	40.000/	00.000/	1.
		User Productivity	-50.00%	-40.00%	-30.00%	Low
		Confidentiality	0.00%	5.00%	10.00%	Low
		Integrity	0.00%	5.00%	10.00%	Low
		Availability	0.00%	5.00%	10.00%	Low
Unmonitored						
Personal Use	_					
	Costs					
		Policy Implementation	n/a	\$20,000	n/a	Low
		Training/year per Sys Admin	\$0	\$0	\$0	Med
		Training/year per User	\$0	\$0	\$0	Med
		Maintenance Costs	\$0	\$0 \$0	\$0 \$0	Med
	Factors		ψυ	φU	ΨU	Meu
	1 401013	User Productivity	-20.00%	-10.00%	10.00%	High
			-20.00%			
		Confidentiality Integrity		-10.00%	10.00%	High
		* .	-19.00%	-10.00%	10.00%	High
Restricted		Availability	-19.00%	-10.00%	10.00%	High
Tracking	Costs					
	00515	Policy Implementation	n/a	\$45,000	n/a	Low
		Training/year per Sys Admin	\$20,000	\$30,000	\$40,000	Med
		Training/year per User	\$3	\$5	\$10	Med
		Maintenance Costs	\$10,000	\$12,000	\$20,000	Med
	Factors	Maintenance Costs	\$10,000	ψ12,000	φ20,000	Wea
	1 401013	User Productivity	-40.00%	0.00%	25.00%	High
	-	Confidentiality	-10.00%	28.00%	38.00%	High
		Integrity	9.00%	28.00%	38.00%	Med
		Availability	9.00%	18.00%	28.00%	Low
User Training		Availability	9.00 %	18.00 %	20.00 /8	LOW
Required						
	Costs					
		Policy Implementation	n/a	\$45,000	n/a	Low
		Training/year per User	\$5	\$10	\$13	Med
		Maintenance Costs	\$10,000	\$12,000	\$20,000	Med
	Factors					
		User Productivity	2.00%	15.00%	30.00%	Med
		Confidentiality	10.00%	30.00%	50.00%	High
		Integrity	10.00%	30.00%	50.00%	High
		Availability	10.00%	30.00%	50.00%	High
Sys Admin						
Training						
Required						
	Costs					
	00313	Policy Implementation	n/o	\$45,000	n/o	Low
		Training/year per Sys Admin	n/a		n/a \$40.000	
			\$20,000	\$30,000	\$40,000	Med
	Fastan	Maintenance Costs	\$10,000	\$18,000	\$20,000	Med
	Factors	l la sa Das du stinit.	00.000/	40.000/	CO. CO2/	M . 1
		User Productivity	20.00%	40.00%	60.00%	Med
		Confidentiality	10.00%	30.00%	50.00%	Med
				00 0001		
	-	Integrity Availability	10.00%	30.00% 30.00%	50.00% 50.00%	Med Med