Vulnerability Cost of Breach Calculator

Final Report

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Introduction

This is the document for the Final Report for my project in part of the completion for my final year Bachelor of Science in Cybercrime and IT Security. The Final Report will contain a description of how the Vulnerability Cost of Breach Calculator was implemented while also containing my thoughts and an overall review of the project.

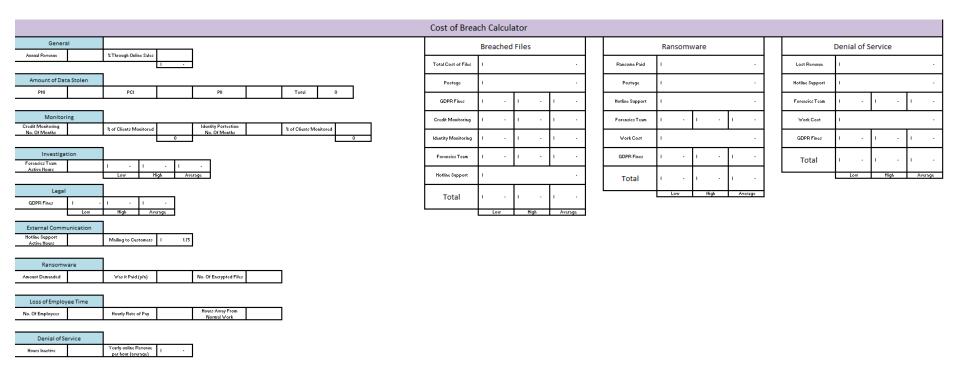# Description of Submitted Project
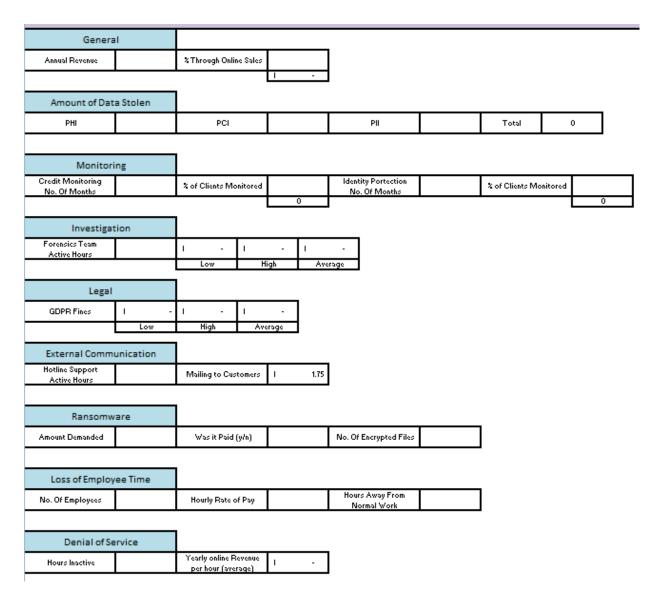

Figure 1.1: The entire database

General			
Annual Revenue		% Through Online Sales	
			-

Amount of Data Stolen							
PHI		PCI		PII		Total	0

Monitoring					
Credit Monitoring No. Of Months		% of Clients Monitored		Identity Portection No. Of Months		% of Clients Monitored	
			0				0

Investigation				
Forensics Team Active Hours		| -	| -	| -
		Low	High	Average

Legal				
GDPR Fines	| -	| -	| -
	Low	High	Average

External Communication			
Hotline Support Active Hours		Mailing to Customers	| 1.75

Ransomware					
Amount Demanded		Was it Paid (y/n)		No. Of Encrypted Files	

Loss of Employee Time					
No. Of Employees		Hourly Rate of Pay		Hours Away From Normal Work	

Denial of Service			
Hours Inactive		Yearly online Revenue per hour (average)	| -

Figure 1.2: The parameters provided for the clients to fill in

Breached Files

Breached Files					
Total Cost of Files	I				-
Postage	I				-
GDPR Fines	I	-	I	-	I -
Credit Monitoring	I	-	I	-	I -
Identity Monitoring	I	-	I	-	I -
Forensics Team	I	-	I	-	I -
Hotline Support	I				-
Total	I	-	I	-	I -
	Low		High		Average

Ransomware

Ransomware					
Ransome Paid	I				-
Postage	I				-
Hotline Support	I				-
Forensics Team	I	-	I	-	I -
Work Cost	I				-
GDPR Fines	I	-	I	-	I -
Total	I	-	I	-	I -
	Low		High		Average

Denial of Service

Denial of Service					
Lost Revenue	I				-
Hotline Support	I				-
Forensics Team	I	-	I	-	I -
Work Cost	I				-
GDPR Fines	I	-	I	-	I -
Total	I	-	I	-	I -
	Low		High		Average

Figure 1.3:

Scenario: Healthcare Data breach

Cost of Breach Calculator

General			
Annual Revenue	€ 6,500,000.00	% Through Online Sales	
		€ -	

Amount of Data Stolen							
PHI	15000	PCI		PII		Total	15000

Monitoring						
Credit Monitoring No. Of Months	4	% of Clients Monitored	57%	Identity Portection No. Of Months		% of Clients Monitored	
			8550				0

Investigation			
Forensics Team Active Hours	24	€ 3,984.00 € 39,888.00 € 21,936.00	
		Low	High	Average

Legal			
GDPR Fines	€ 130,000.00 € 260,000.00 € 195,000.00		
	Low	High	Average

External Communication			
Hotline Support Active Hours	100	Mailing to Customers	€ 1.75

Breached Files

	Low	High	Average
Total Cost of Files	€ 2,715,000.00		
Postage	€ 26,250.00		
GDPR Fines	€ 130,000.00	€ 260,000.00	€ 195,000.00
Credit Monitoring	€ 239,400.00	€ 342,000.00	€ 273,600.00
Identity Monitoring	€ -	€ -	€ -
Forensics Team	€ 3,984.00	€ 39,888.00	€ 21,936.00
Hotline Support	€ 5,000.00		
Total	€ 3,114,634.00	€ 3,388,138.00	€ 3,236,786.00
	Low	High	Average

Figure 1.4: An example of a data breach occurring in a healthcare organization

Figure 1.1 shows the full and final layout of the calculating tool using Microsoft Excel. The parameters are provided by the user on the left hand side (Figure 1.2) and while they are been entered, on the right hand side (Figure 1.3) the total is been calculated for the data breach type. The three data breach events that where chose for this project were stolen files, Ransomware and a Denial of Service attack.

Figure 1.4 shows a scenario of a Healthcare Data Breach with the relevant parameters provided on the left and a breakup of the total on the right hand side

Description of Conformance to Specification and Design

Specification

The initial plan for the project was to produce a calculating tool that would be used to calculate the cost of a potential data breach that an organisation could fall victim to. This calculating tool would have a wide target market since it wouldn't just be specific companies and organisations using this tool. Insurance companies would be able to see a more detailed visual which would aid in determining the type of insurance needed and claims made while Cybersecurity Consultants would be able to use this tool to aid in pitching their company to potential clients. The consultants could use the calculating tool to determine the direction they should go in regards to a pitch.

Design

The method I planned to use to make this possible was to using C# code to pit together instructions to ask the user a couple questions to be able to provide an answer. It became clear that I needed to go further in depth with the questions to I made the decision to use an Excel spreadsheet as a starting point and to also go more in depth with the questions that I was asking the user about the organization. Once the spreadsheet was put in place the next step would have been to go back to the C# code and turn the data from the spreadsheet into code to form some type of web application that the organisation would be able to use either online or as a downloadable calculating tool.

Conformance

In my opinion, there a very high conformance to the specification originally set in place. In the end, I have ended up producing a product that was fairly close to what I had set out to do at the start of this project. I had decided to build this calculating too which has been achieved. I made the decision to continue solely using the Excel spreadsheet. At the time this was the most practical, easier to manoeuvre and the simplest when dealing with error or miscalculations within the formulas.

One main thing that was added was calculating the cost of more than one type of data breach. Instead of only calculating the cost of stolen files, I also decided to accommodate the event of a Denial of Service attack as well as a Ransomware attack. Another adjustment I made was to give more than one final figure and to include a section for fines due to the breach. This was to try a get as close to an accurate result while also giving a range to the answer. This was due to the fact the many of the parameters would have a range of values, e.g. fines resulting from not following proper GDPR practices range from 2-4% of the annual revenue. The calculating tool would provide a minimum, maximum and average cost of a data breach which, in my opinion, was an important addition.

Description of Learning

Technical

The technical aspect of what I learned consisted of brushing up on using spreadsheets and performing in depth research to be able to carry out the project. It had been a while since I had last used Excel in depth and had to go over a few aspects such how to use the correct formulas. I was also learning how to do in depth research as there were many different aspects of this project that need to be considered from the history of breaches to the methods of calculating a breach to a company.

Personal

This project was a great opportunity to learn how to manage my time appropriately since there were multiple different deadlines so a plan had to be put in place to be able to meet those deadlines within the time given. I also had to make myself available for project meetings when requested. Other soft skills, like presenting a project in front of an audience, was also improved on.

Review of Project

In my opinion, I am very pleased with how this project went. Data breaches are a growing problem so I found it incredibly interesting to do in depth research surrounding them. Learning how damages to companies in the wake of a data breach are calculated was very beneficial as this aided in gaining further in depth knowledge about data breaches was very important. If I had the opportunity to start the project over I would have used the spreadsheet as a starting point at the very beginning. This would have saved some time instead of starting with the coding and not ending up continuing with it.

If someone were to attempt this project, the advice I would give would be to have a clear and concise plan. This would consists of only fully starting once you have a clear idea of what the finish product will be and the steps that will be needed to accomplish it. Don't be in a rush to make a start if you aren't sure where you should be starting.

I agree with the choice to use a spreadsheet when it comes to the technology perspective of the project. Using the spreadsheet made it possible to gain progress with the project at a faster pace.

The finish product may not be the exact same as the one I had originally planned but regardless of changes made during the process I do this that the project was a success. I have learned a great deal about data breaches, the affect they have on a company/organisation and the cost that they bring. I think that the in depth research I did on data breaches is very important when going down the route of working in IT security.

Acknowledgements

I cannot express enough thanks to my project supervisor, Paul Barry, for the continued support and advice during the duration of this project.

I would also like to thank my parents for their continued support and patience during the project