CIS 481 – Intro to Information Security

IN-CLASS EXERCISE # 1

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Logistics

A. Get into your regular team

B. Discuss and complete the assignment together. Don't just assign different problems to each teammate! That defeats the purpose of team-based learning.

C. Choose a recorder to prepare the final copy to submit to instructor in Blackboard.

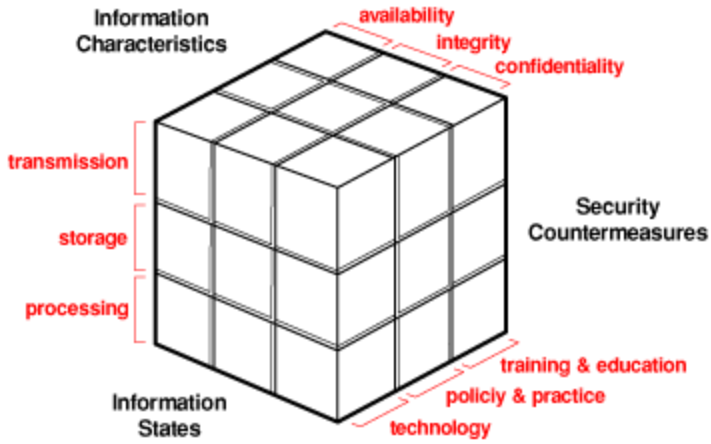
Problem 1

The CIA triad presents three essential characteristics of information that must be protected. However, most agree that these three characteristics are not the only ones that need to be protected. Other characteristics include authenticity, accuracy, possession, timeliness and utility. If you were tasked with creating an information security *rectangle*, instead presenting FOUR characteristics of information, which would you choose and why? (8 pts.)

For the security rectangle, we would add Accuracy onto the CIA triad. We chose this because if the data being protected is not accurate; then all the other characteristics will suffer more greatly than any other characteristics. For instance, you can have the most secure data in the world that is authentic, useful, and presented in a timely manner, but if the data is inaccurate; then it becomes useless. We would keep the original CIA triad characteristics because they have been proven to be beneficial to information security.

Problem 2

In 1991, John McCumber proposed a model for Information Security that uses a 3-D cube, as below. Describe the three dimensions of the McCumber cube. (9 pts.)



The three dimensions of the McCumber Cube are stated as Information Characteristics, Information States, and Security Countermeasures. Starting with Information Characteristics, it is the three sides of the CIA triad which are availability, integrity, and confidentiality. This first dimension is about making sure that information that is sensitive is made available to those who have required access when needed. Also making sure information is not intentionally, or accidentally modified to the point where someone is questioning how reliable the information is. Finally, making sure that the information is not disclosed to any unauthorized individual to protect it.
The second dimension of the McCumber Cube is Information States which can be broken down into storage, transmission, and processing. The second dimension is about making sure that any data/information that is being used is to achieve a certain goal, making sure data is being transferred between information systems correctly which is known as data in transit, and finally storing the transferred data in memory in an information system which is known as data at rest.
The third, and final dimension of the McCumber Cube is Security Countermeasures which is broken down into Technology, Policy & Practice, and Training & Education. In this final dimension, it is important to note that any information , or data needs to be protected. Examples such as firewalls, anti-virus, etc are beneficial in protecting sensitive information. Making it clear to anybody that uses information systems have proper training, and have good educational knowledge that involve the protection of sensitive information. Finally, having good management directives that implement how information is supposed to be implemented in any organization to ensure that any individuals are following good practices in any organization.

Problem 3

How can the practice of information security be described as both an art and a science? How does security as a social science influence its practice? (8 pts.)

Information security can be described as an art because there are no clear cut and dry instructions to implementing information security. There are also no widely accepted solutions as to what a specific information security should look like. This is also true in art. There is no instruction manual on how to create an art piece that everyone will like. Sure, there are classes and books on art, but none that will lead to creating the next

Mona Lisa. Copying a portrait of the Mona Lisa will not have as much value as the original art piece. For example, the information security methods that work for one organization, may not have as much value to a different organization.

Information security can be described as a science because of the way it is developed. Just about everything that can be done on a computer results from an interaction between a specific hardware and specific software. This is like a science experiment. Two or more variables having a reaction, which leads to a certain outcome. Same goes with a computer, loading several programs in order to accomplish what you want is somewhat similar to a science experiment.

Social science examines the various behavior tendencies of humans as they interact with systems. Information security has to be developed in a way that it is secure enough to block out threats, but also have a certain degree of ease of access so people are able and willing to use the system. If you make the information security a long drawn out process, people will find a way to bypass it or not use it. If you develop it to simple, it will be easy for outside threats to cause you trouble. You must find the fine line in the middle where it is secure enough, but also easy enough for the average person to operate.