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# Building Career in Information Security Management

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## ABSTRACT

The issue of information security and the need to protect the company's information systems, networks, and infrastructures could be more prevalent. Information systems security managers are responsible for ensuring that information systems assets are secure. The information security manager becomes a new administrative position within a company. In this paper, the need of information security management and the role and qualification of information security manager will be discussed. In general, the main goal of this paper is to stress the importance of information security management and how to get into this professional area through the education and discipline.

## INTRODUCTION

Nowadays, there are many different threats that cause much concern to information technology users, from viruses to unauthorized access of a database, and many more. Because of these threats, information security is an important field of study that offers skilled professionals an opportunity to make a more than adequate salary. In the paragraphs to come, we will discuss in a little more detail, the different information crimes that can take place, along with the importance of data integrity. Afterwards, we will discuss information security management as an occupation. In this section of the paper, we will begin by discussing the educational requirements of obtaining a degree in an information security field as well as the different certifications that are available and mandatory to work at certain companies. Afterwards, we will delve into the industry of Information Security, dealing with the growth of the industry, the value of information security as a whole, and the demand of information security managers and personnel. The last part of this section details information security management as an occupation; more specifically what types of jobs are available in this particular field of study, what requirements those jobs place on their information security managers and few of the benefits that come with having experience. In conclusion, we will summarize the main points and provide an overview of how the information security industry will fair in the near to distant future.

## EDUCATION AND CERTIFICATION

There are a wide variety of computer disciplines that one can study in order to work in the information security industry. This industry takes people from all backgrounds in the computer field. Whether your degree is in computer programming, web development, or networking, jobs look at more than just the degree you are holding. However, your degree must be in Computer Science or some related field.

One of the main things that jobs look at has to do with the knowledge you have obtained in school and on the job. Knowledge of security issues are mandatory to work in this industry. Internet/Web security, networking and network security, and security audit techniques are some of the classes that one can take in college to further his or her understanding of the industry of information security.

Other computer classes that one can take that do not necessarily have to do with security deal with the developmental aspect of information systems. These the topics of these classes include C++, JAVA, database programming and administration, web-server management, and systems analysis and design methods. Keep in mind, that these are not the only courses one can take. There are a plethora of courses that can prepare you for the industry of information security.

Along with the computer courses that are necessary for this occupation, one must be well able to manage a group of people in general and know how business works from a management point of view. A course in e-commerce is very helpful in this regard, along with other management courses.

While companies view degrees as an important qualification to be considered for an opening, they also look at certain certifications. There are number of certifications that one can receive that make him or her even more marketable to organizations. Some of these certifications include the Global Information Assurance Certification (GIAC), Certified Information Security Professional (CISSP), and Casting Industry Suppliers Association (CISA). As you will see later on, while they are not always required, companies look for these certifications.

## INFORMATION SECURITY AS AN OCCUPATION

Companies require an assortment of different skills from their information security managers. In general, the skills that one must obtain to have such a title include, but are definitely not limited to, a variety of programming languages and a certain amount of professional knowledge dealing with information security, such as the knowledge of certain perimeter security applications and security audit tools and methodologies. In addition to the technological background, information security managers must also display practical management capabilities, such as strong analytical skills, excellent oral and written communication skills, and the ability to interact with personnel at all levels within the organization. In the few paragraphs that follow, three different job opportunities will be analyzed and compare to show some of the requirements and preferences that different companies have of their information security managers.

Here is an analysis of another job opening in the information security management field from Lending Tree, which is an online loan marketplace. The title of this position is Information Security Engineer. Educationally this position also requires a Bachelor's degree in Computer Science or related degree along with at least six years of experience. These six are broken down into three two-year segments with experience in each of the following: 1) perimeter security in large scale/high bandwidth networks with a preference on the financial services industry, 3) experience in system administration in a heterogeneous networked environment, and 3) development experience with an emphasis on creating interfaces to back end databases. Regardless of the degree, the

Table 1. Professional Knowledge Table for Lending Tree

<b>Networking</b>	<ul style="list-style-type: none"> <li>• Knowledge of TCP/IP, CIDR, switched networking, sniffing, protocol analysis</li> <li>• Experience in a high volume production environment</li> <li>• Experience in large scale Internet and WAN connected networks</li> </ul>
<b>Development</b>	<ul style="list-style-type: none"> <li>• Web Development</li> <li>• User Interface Design</li> <li>• Programming languages: C, C++, Java</li> <li>• Scripting languages: PERL, Java, Bash, sed, awk</li> <li>• Web: HTML, XML, PHP, ASP</li> <li>• Debugging: gdb, lint</li> </ul>
<b>System Administration</b>	<ul style="list-style-type: none"> <li>• GNU/ Linux (Gentoo)</li> <li>• Solaris</li> <li>• Microsoft (Windows/NT/2000/XP)</li> <li>• PC / Server / Networking / RAID hardware maintenance</li> <li>• RAID array configuration and management</li> </ul>
<b>Internet Applications</b>	<ul style="list-style-type: none"> <li>• Web servers: Apache, IIS</li> <li>• Proxies: Squid, Netscape</li> <li>• DNS (multiple domain experience including split DNS experience)</li> <li>• Miscellaneous: SSH, Mail, NTP</li> </ul>
<b>Database</b>	<ul style="list-style-type: none"> <li>• Application / Database interface</li> <li>• SQL, ODBC</li> <li>• Data normalization</li> </ul>
<b>General</b>	<ul style="list-style-type: none"> <li>• Expert at root cause analysis</li> <li>• Proficient in multiple medium report generation (real-time, ad-hoc, batch)</li> </ul>

professional knowledge that this position requires is broken down into different subcategories that are stated and defined in the table 1.

Along with the responsibilities of this job are the specific requirements that its applicants must have to even be considered to fill this position. First, as with any management position, the applicant must have great analytical and communication skills and he or she must be able to work well with other members of the IT department. Concerning the technical requirements, this person must have at least ten years of experience in computing and security, including experience with Internet technologies. The applicant must be proficient in “firewall, router, intrusion detection, compliance monitoring and switching technologies” (monster.com). The applicant must also have knowledge of the following: Firewall systems (Checkpoint FW1), remote access / virtual private networks, strong authentication software and procedures, security architectures, security audit procedures, web access control systems, mainframe architectures, Internet / Web services and communications security. Also, this position requires knowledge of mainframe architectures, database management systems (Oracle, DB2, etc.), client/server platforms (Sun Solaris, Intel / Windows, etc.), distributed message-based architectures (J2EE), storage architectures including SANs, word processing software and spreadsheets, project planning and management tools, and Internet security services (Iplanet, Websphere).

The education required for this position includes a Bachelors degree in Computer Science or some related field of study. Various certifications are mentioned, however, this job does not necessarily require one to have them to be considered. These certifications include GIAC, CISSP, CISA, MCSE, and CCNP.

In order to be considered for a position as an information security manager, much is required of the applicant. To summarize the jobs, a minimum of a Bachelors degree in some computer related field is a must. On top of that, the better, higher paying jobs require you to have at least eight to ten years of experience along with a very in-depth knowledge of quite a few topics regarding security. Not only is security an issue with these jobs, but also different platforms, development environments, and various kinds of architectures are just as important and necessary.

## CONCLUSION

Security as a whole is by far one of the most important topics when you talk about information and the passing of data from one place to another. Whether it is computerized or otherwise, safeguarding the information is one very important key to effective communication and business transactions. You have just read about some of the various actions and crimes that can threaten any type of information system. A few examples of these would be virus and worms, hackers and crackers, and back doors and Trojan horses. Each threat presents a somewhat unique way of viewing information security. Along with the different crimes that are present to an information system, there are also certain natural occurrences that can have a detrimental effect on an information system’s ability to safeguard data. An example of this would be echoes, or noise, on a communication line if one decides to pass information along a network. This is an innocent occurrence that can either cause your data to be received with things added onto the messages or cause your messages to not be received at all. Either way, businesses suffer when unadulterated information is not relayed in a timely fashion, thus creating information security as an occupation.

Since we have currently entered the Information Age, the exchanging of different types of information is vital for most businesses to stay alive. Also, since these businesses rely on sending and receiving unadulterated information in a timely fashion, there will always be a need for an information security specialist. So, to wrap up my analysis concerning the future of information security as an occupation, it looks very bright. Much is required of this field, but with dedication and hard work, one can easily have a very rewarding and lucrative career as an information security manager.

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