The place and role of biometrics identification in e-commerce

PhD thesis

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In the first chapter of my PhD thesis, I explain the evolution, the impact, the structure and the system design of e-commerce systems. Also I demonstrate the present and the expected future volume of the e-commerce market. I introduce the vulnerability tests according to e-commerce systems. The first step according to my criteria is the ability to detect the components of the system. Other critical items are the encryption, protection against sniffing, logs, firewalls, DMZ, wireless systems just to mention a few. It is also a critical point to select the most suitable biometric technology.

In the second chapter, I analyze the different biometric technologies. Each method has unique attribution like advantages and disadvantages. They also have different false acceptance rate and false rejection rate. I describe the unique parameters for the main biometric technologies and I present a longer explanation for each method. Such a description helps to understand the main differences in between the technologies. I examined the weak points of different biometric methods. I realized that each application has to be evaluated using the method I created. The thesis describes the usability of the templates. It also demonstrates how a biometric sample can be copied. Later it describes how can the infra-red technology used in biometrics. This chapter also introduces the parts of the system and their factors and it analyzes the communication in between the elements.

In the third chapter, I introduce some vulnerability tests performed by me in order to specify the security level of a given biometric device. I examine if the template is suitable for the identification. I also demonstrate how it is possible to make a fake template for several different devices. Using the model I determined, it can be distinguished which technology and which device is suitable for a given purpose. I demonstrate this unique model in the last chapter. The model is specific to the e-commerce solutions that are integrated with biometric devices.