Chapter 4.6

A Holistic Perspective of Security in Health Related Virtual Communities

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ABSTRACT

A significant issue in health related applications is protecting a patient's profile data from unauthorized access. In the case of telemedicine systems a patient's medical profile and other medical information is transferred over the network from the examination lab to the doctor's office in order for the doctor to be able to perform a diagnosis. The medical information transferred across the network should be encrypted, secured and protected until it reaches its final destination. Patients' medical profiles should be accessible by their doctors in order to support diagnosis and care, but must also be protected from other patients, medical companies and others who are not certified by the patient to access his medical data. A very important element of virtual communities is trust. Trust should be built upon the same specifications for secure data transfer and leveled access with medical information. Furthermore, trust requires a strict policy based mechanism, which defines roles, access rights and limitation among community members, as well as a flexible identification mechanism, which allows anonymity of patients, while in the same time guarantees the truthfulness of doctors' identity and expertise.

INTRODUCTION

The Web offers access to many databases that contain medical information, and has significantly changed the way patients seek medical help.

According to recent surveys, 50% of patients access medical information via the internet before visiting their doctor and this information affects their choice of treatment (Ferguson, 2002). The assistant role of virtual communities for patients who search for medical help and advice is undeniable. Researchers, practitioners, medical industry and patients jointly contribute their findings, products and experiences, to the community's knowledge base. The information transferred inside a health related virtual community and the stockpiled knowledge must be carefully protected from unauthorized use and validated in order to be qualitative and useful.

The issues of security, which traditionally applies to telecommunication applications, and confidentiality, which applies to healthcare applications, smoothly converge towards trust, which is the basis and apex of communities (Mezgar, 2005). This chapter examines various aspects of a health related virtual community always under the prism of information security and user protection. We provide several paradigms where patient information may be at risk and others where the integrity of the exchanged information can be questionable due to security faults.

The following section provides an introduction to the main community concepts and defines the structure of a typical health related virtual community. The critical features of communities (aim, limits, roles, services) are examined in the scope of a health related community. The third section deals with health information in general and with the security issues, which might arise when using medical services from distance. In the third section, we argue for the need to protect medical data on access, in transit and in storage, we summarize the possible security risks and state the need for an integrated security management system. The last section, uses an fictitious example in order to demonstrate the use of security policies, which can be help virtual communities to protect knowledge and information sharing and guarantee integrity.

Our objective in writing this chapter is:

- To enlighten the public in the security and integrity issues inside community,
- To raise the level of security awareness: a) of IT professionals, who develop, maintain or contribute to health related communities, b) of patients that reveal their privacy to a "virtual doctor" and make use of medical advices shared by other community members,
- To propose a set of technologies, which can under circumstances ensure that patients and doctors benefit from using community services without the fear of being a pray for phishers, spammers, hackers and crackers,
- To define the steps for building a trustful health related virtual community.

HEALTH RELATED VIRTUAL COMMUNITIES

This section provides a short introduction to the role of virtual communities in healthcare giving emphasis to the community structure and presenting the critical features of a healthcare community (aim, limits, roles, services). The section concludes with issues such as confidentiality and integrity of the community services and content.

In the process of psychological and medical support of patients with special needs three different types of participants can be distinguished: care providers, care givers and patients (Varlamis & Apostolakis 2007): *Care providers* are healthcare professionals, doctors and nurses, who treat and support patients as part of their work. The group is extended with researchers and scientists that convey their expertise on diseases and potential medical treatments. *Care givers* are those people who help a patient as friends or family of the patient. The group is extended with people who help voluntarily or otherwise deal with a specific

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