

Chapter 7.1

The Sense of Security and Trust

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ABSTRACT

The sense of security, identified with the Japanese term, Anshin, is identified as an important contributor to emotional trust. This viewpoint suggests that designers should consider the subjective sense of security as well as objective security measures in designing systems and their user interfaces. A survey of users reveals both the personal and the environmental factors contributing to the users' sense of security when using the Internet. A more encompassing view of Anshin as including safety, reliability, and other non-functional properties of systems may provide additional insights for system design.

INTRODUCTION

Security of systems and services is an enormous concern in the modern world. The word *security* in the context of these concerns almost always has a meaning related to the technical aspects of security, either referring to means for being secure (*The Oxford English Dictionary*, security definitions 5-7) or “the condition of being protected from or not exposed to danger; safety” (definition 1).

Definition 2 from *The Oxford English Dictionary* provides a different, rather more subjective, sense for the word security: “Freedom from doubt; confidence, assurance. Now chiefly, well-founded confidence, certainty.” It is this less commonly addressed (at least in the technical literature) sense of the word that underlies the common phrase “a false sense of security.” Yet, as Dillon (1996, p. 125) observes, the Latin antecedent *securitas*, deriving from *sine+cura* meaning literally “without care,” conveys this meaning, not the others. In

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Japanese, the word *Anshin*, combining *An*—to ease—and *Shin*—mind or worry—conveys much the same idea.

One might well ask how (and whether) this emotional or subjective sense of security—*Anshin*—relates to achievement of objective security in the sense of Definition 1. Studies such as the AOL/NCSA Online Safety Study (2005) are indicative of the issue: a large fraction (79%) of surveyed users felt their personal computers were either very safe or somewhat safe from viruses but when examined by independent experts 56% of those users' machines were found to lack current virus protection software. People feel like their computers are safer than they really are. This feeling is itself a barrier to achieving better security. In the realm of people's physical security, De Becker (1997) argues that wariness or even fear, that is absence of *Anshin*, is often an essential contributor to achieving safety and he provides many examples..

The concept of *trust* is intimately related to the idea of *sense of security* as well. People using a computer system or service are usually incurring some financial or privacy risk. What factors contribute to willingness to engage in these transactions or in other words to trust the system or service provider? We present here our current understanding of the relationship between *trust* and the *sense of security* in the hope that it will be found useful in the design of computer systems.

We begin with background concerning research on the structure of trust and *Anshin*, followed by discussion of our understanding of the implications of this research and the questions it raises for design. We very briefly present the results of analysis of a survey that we conducted to discover more about how people regard providers of computer systems and surveys. We conclude with a summary of our current understanding of these issues and a number of questions that require further investigation.

BACKGROUND

In Japanese, the term *Anshin* is commonly used to mean what we have called the sense of security. The word can refer to not only security against a threat but also to express confidence in an outcome, such as in the context of having *Anshin* that I will be on time for my flight because I am on a train scheduled to reach the airport with time to spare.

The use of the term *Anshin* in technological contexts has been investigated primarily in the field of *risk communication*—the process by which nuclear power plant providers, experts, and residents of a plant area interact in order so that residents can get *Anshin* regarding their safety (Kikkawa et al., 2003, pp.1-8). In the field of risk communication, Kikkawa identified two *Anshin* states that might be reached, one *with* knowledge and the other *without* knowledge. When one has knowledge of technology and feels secure, one is in the state of *Anshin with knowledge*. On the other hand, when one does not have such knowledge and yet feels secure, one is in the state of *Anshin without knowledge*. *Anshin with knowledge* is achieved by active learning and seeking information by users, as well as when technology experts provide information to users.

Indeed, if we broaden our view of the sense of security to include trust issues we find more related work. An extensive literature is developing on trust in various disciplines such as sociology, psychology and economics. Understanding the factors that contribute to and inhibit trust in human-machine and machine-machine interactions is important for system and service providers. Ways are needed to quantify trust in making decisions about whether and how to interact. Furthermore, system designers will want to incorporate design elements that facilitate rather than inhibit trust.

Different researchers have attempted to define trust from different points of view and consequently there are several definitions of trust.

Working from a psychological viewpoint, Deutsch (1960, 1962) defined trust in an inter-

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