

# Development and Assessment of User Interface for Security-Critical Systems

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November 5, 2015

For users of high-security software it is critical for them to be able to configure their product properly and with as few errors as possible. Poorly designed interfaces can cause potential disasters. An example would be if top secret information is leaked or the *wrong* information is sent.

There have been numerous hacking incidents in recent years on high prolific companies, such as the Sony Entertainment incident in 2014. As these incidents keep getting reported in the media, more and more companies start to understand the importance of cyber-security. But what do we do when the very tools we use to enforce information security do not work the way the user wants? What happens when the user makes the error?

A cyber-security company in Sweden that provide advanced cyber-security solutions to organizations around the world are looking to improve on their current products. I examined an application that is used to set up VPN systems and its current user interface. I managed to find usability problems that directly affected information security and could have lead to important information falling into the wrong hands. From the issues I found in the current user interface I created a new prototype with improvements. To be able to accomplish all this, I looked at usability design principles and tools (e.g., usability testing and heuristic evaluation) and how they worked for the design of security-critical systems. There were also certain challenges I encountered when having to work with a cyber-security company and such a domain-specific product. I did not have access to the end-user of the application and had to learn how the complex application worked and how the end-user would use it.

When designing applications that are supposed to help users uphold information security or any type of security we need to *enable* the user. To accomplish this, we need to make security usable. It might not always be possible to make *all* security usable but if we do not even consider usability as a factor we are by default disabling the user. This thesis highlights how important this is and some examples of what we can do to fix it.