FUZZY RISK ASSESSMENT MODEL FOR SAAS

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Many modern companies and corporations tend to move their computing and data to the cloud. Advantages of cloud computing are cost-effective online storage solutions, maximized accessibility, advanced security, scalability, accessbility, recoverability, ease of collaboration etc. However, a cloud also has a number of disadvantages: attacks on cloud resources and services, equipment failures, and natural disasters. They act on the vulnerability of cloud resources and create risks of harmful effects on the assets of cloud providers and users. Providers and users need tools to identify and assess potential risks.

The general goal of our study was to create a fuzzy risk assessment model for SaaS. To achieve this goal, we set the following tasks: to understand threats, vulnerabilities and risks of cloud computing, how to assess the risks and their impact on the asset of the corporation and the provider. The subject of this study was the possibility of using fuzzy logic to perform the set tasks.

For the qualitative assessment of SaaS risks, the authors proposed a fuzzy logic and a fuzzy logic inference system. The modelling was based on the materials of the ENISA expert group. From the full registries of 52 vulnerabilities, 35 risks, 23 types of assets, we have selected elements related to SaaS. We created 62 fuzzy rules with causal relationships between 15 SaaS vulnerabilities and 8 risks, between risks and their impact on 9 assets, and total impact on assets. In the built model, we applied a qualitative assessment of 5 levels of risks: Very_Low, Low, Medium, Large, Very_Large with a projection on the scale [0 .. 8]. The created rule base can be queried: what are the risks/vulnerabilities and how do they affect the specified assets in the SaaS field; what are vulnerabilities and how they affect the specified risks, what assets and how are affected by specified risks etc. The proposed knowledge base, even in its current form, can be used by both providers and cloud users for qualitative assessment of existing or potential risks of SaaS.