Expert System for Early Detection of Cyber Attack Types on Computers Based on a Website Using the Certainty Factor Method

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ABSTRACT

Cyberattacks pose a significant threat to information security in Indonesia, with incidents increasing every year. This issue is compounded by the lack of public awareness regarding cybersecurity threats. An early detection system for analyzing cyberattacks is essential to address this challenge. This study develops a web-based expert system using the Certainty Factor (CF) method, which is used to express the degree of confidence or belief in a fact or rule within an expert system. CF is applied to determine whether a cyberattack has occurred based on the symptoms or signs present. The system successfully detected cyberattacks with 100% accuracy across 29 Black Box Testing scenarios, confirming its functionality. Additionally, comparison testing between the system's results and manual calculations showed a 100% match, proving that the expert system has high accuracy and reliability in detecting cyberattacks. The expert system using the Certainty Factor method is effective in early detection of cyberattacks and providing appropriate solutions. The system is open-source and aims to raise public awareness about cybersecurity threats.

Keywords*: Cyberattacks, Expert System, Certainty Factor, Early Detection, Cybersecurity, State Polytechnic of Jember, National Cyber and Crypto Agency.*