Assessment Methodology For System Change Controls Based On Fuzzy Set Theory

Angel R. Otero
Florida Institute of Technology

ABSTRACT

Attacks on information are an ever-increasing threat to every industry. For years, organizations have been a primary target for attacks by cybercriminals largely because of the significant value of the confidential and sensitive information they host. To protect the information, organizations require general information technology controls to be well designed, implemented, and to operate effectively and in compliance with laws and regulations. General information technology controls related to change management (or system change controls), for example, are critical in ensuring the integrity, completeness, and reliability of financial information. Alarming facts within the literature evidence inadequate change management security practices and prompt for the identification of additional methods to assist organizations in protecting their sensitive and critical information. The literature shows traditional change management assessment methodologies that do not promote an effective evaluation, prioritization, and, therefore, implementation of system change controls in organizations. This research prompts for the development of a decision support methodology that can accurately prioritize system change controls in organizations. The methodology uses fuzzy set theory to allow for a more accurate assessment of imprecise parameters than traditional methodologies. It is argued that evaluating system change controls using fuzzy set theory leads to a more detailed and precise assessment and, therefore, supports an effective selection of system change controls in organizations.