

## PhD Dissertation Abstract

"Model of Process Safety Management of Information Systems in Higher Education Institutions" - doctoral dissertation written under the supervision of prof. UG, dr hab. Jerzy Auksztol.

### Summary

The main aim of this dissertation is to analyze the existing methods of information system security management (SI) and to develop a model of IS security management processes, which would guarantee an optimal level of information security. The implementation of partial objectives consisted of :

- gathering and systemizing information on the existing methods of managing IS security in business organizations
- identification of threats to information systems
- analysis of the current state of security of information systems
- identification and categorization of processes related to the security of the organization's information systems
- designing a reference model for higher education safety processes.

On the basis of the aforesaid objectives, two research hypotheses were formulated.

1. The application of the IS security management process may take place in an enterprise with a classic organizational structure without the need for restructuring the entire organization.
2. The application of the reference model of the IS security management processes in the organization will prepare it for and facilitate obtaining ISO 27001 certification confirming its high operational standards.

So as to acquire information enabling the construction of the IS security management processes, a case study was chosen as a research method. Case studies were carried out in three different higher education schools representing typical structures and profiles of higher education. Each study was treated as a paradigmatic case. A group of both public and private universities was subjected to research. In three universities selected, with the use of the case study method, an extended survey was carried out to design a reference model of security processes for information systems. In the theoretical part of the thesis, the analysis of domestic and foreign literature on issues related to both IS security and organization management is applied. In the research part, the case study method as well as the interview and observation techniques were applied.

The dissertation consists of five chapters. The first chapter presents the management style based on building and following processes. The concepts of the organization of processes and the principles of separation and creation of processes in the enterprise are discussed here. The subject of the discussion are the information resources of the organization and the manner of presenting them as multi-

threaded processes. The second chapter is concerned with the theory of security of information systems. It presents a definition of elements and processes related to information systems. Chapter two also provides a classification of IS threats categorized in accordance to specific criteria. Moreover, a presentation of data protection methods as used in IS and the currently used concepts of security management constitute an integral part of this chapter. The third chapter presents the legal conditions and structure of higher education in Poland as well as the characteristics of information systems at universities. Areas requiring increased security in information systems and the implementation of such protective measures were described following the example of dedicated virtual university support systems. The fourth chapter is a thorough analysis of information systems of selected universities. Threats to their information systems were identified on the grounds of empirical research conducted. The conclusions from the analyses carried out provided information on the current state of solutions guaranteeing IS security in higher education institutions. These conclusions were also a starting point for creating a model of the IS security management processes. The fifth chapter is concerned with the design of the reference IS management model for higher education structured on the process-based approach. This chapter presents a method of categorizing processes and activities related to the organization's IS security and possible modifications to the unit's organizational structure so as to adapt to the requirements of the new management tool. The utility of the model was verified and its strengths and weaknesses were pointed out. Additionally, this chapter also outlines the direction of further research in the development of IS management systems in educational organizations. The conclusions of this dissertation contain a concise summary of the theoretical and empirical research carried out. The conclusions also propose synthetic answers to the research hypotheses postulated by this particular research work. The attachments, including the descriptions of research tools, as well as the lists of literature, drawings, graphs, diagrams and tables are an integral part of this dissertation.