

# ANALIZA UGROŽENOSTI BEZBEDNOSTI INFORMACIONO-KOMUNIKACIONOG SISTEMA PRIMENOM PROGRAMA EXPERT CHOICE

## SECURITY VULNERABILITY ANALYSIS OF INFORMATION AND COMMUNICATION SYSTEM USING THE PROGRAM EXPERT CHOICE

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### Rezime

U radu je opisan model za višekriterijumsko odlučivanje (VKO) pri proceni bezbednosne ugroženosti informaciono-komunikacionog (IKT) sistema. Višekriterijumska analiza (VKA) realizovana je Analytic Hierarchy Process (AHP) metodom, izradom matematičkog modela za rešavanje same procene i isti je implementiran u program Expert Choice. U istraživanom modelu za VKO na osnovu analiza same procene bezbednosne ugroženosti definisani su osnovni kriterijumi prema alternativama, odnosno potencijalnim pretnjama po informaciono-komunikacioni sistem U početnoj fazi razvoja sistema za podršku odlučivanja (engl. Decision Support Systems) procena ugroženosti sistema vrši se po osnovnim alternativama ljudskih resursa u daljoj fazi razvoja sistema planirano je proširivanje kako alternativa, tako i samih kriterijuma prema kojima će se vršiti procena bezbednosne ugroženosti IKT sistema. U početnoj fazi dati su kriterijumi u dva kriterijumska nivoa sa tri alternative. Prvi kriterijumski nivo zasniva se na opšte zahtevanih sedam kriterijuma. U drugom kriterijumskom nivou – podkriterijumi, uzeli smo da kriterijum „neželjeno stanje sistema“ raščlanimo na dodatna četiri podkriterijuma. Sam model za VKO je dizajniran da se može primeniti za procenu bezbednosne ugroženosti bilo kojeg IKT sistema, kao i mogućnost zahtevanog proširivanja u realnom vremenu i u konkretnoj situaciji. Prikazani model za VKO predstavlja početni element sistema za podršku odlučivanju sa ciljem pružanja pomoći menadžmentu-donosiocima odluke u donošenju odluke. Model VKO implementiran je u program Expert Choice koji nam omogućava analizu mogućih alternativa u različitim situacijama od promene težinskih koeficijenata samih kriterijuma i podkriterijuma. Program nam ujedno daje analizu stanja u slučaju promene nivoa konzistentnosti prema određenim alternativama u odnosu na zahtevani kriterijum i direktan prikaz upoređivanja alternativa prema zadatom kriterijumu, a u cilju analize mogućih stanja bezbednosne ugroženosti IKT sistema. Izradom sistema za podršku u donošenju odluke menadžeru bezbednosti IKT sistema, analiziramo kriterijume po kojima će se vršiti procena bezbednosne ugroženosti IKT sistema. Univerzalnost modela i sistema omogućiće primenu na IKT sisteme neovisno od veličine, tipa i funkcije samog sistema.

**Ključne reči:** Višekriterijumsko odlučivanje, informaciono-komunikacioni sistem (IKT), AHP, Expert Choice, DSS

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## Summary

This paper describes a model for multi-criteria decision-making (MCDO) to assess the security threat information and communication (ICT) systems. Multi-criteria analysis (MCA) realized the Analytic Hierarchy Process (AHP) method, the development of mathematical models for solving the assessment and it is implementing the program Expert Choice. In the studied model for MCS based on the analysis of the assessment of the security threat are defined basic criteria to alternatives, and potential threats to information and communication system in the initial stage of development of decision support systems vulnerability assessment system by the primary alternatives to human resources in the further stages of system development. It is planned to expand to an alternative, and the very criteria by which to carry out assessment of the security vulnerability of ICT systems. The initial phase contains two criteria levels with three alternatives. The first criterion level is based on the general seven criteria. On the second criterion level - sub-criteria, we assume that the criterion of "undesired state of the system" deconstructed into four additional sub-criteria. I model for MCS is designed to be applied for the assessment of the security threat of any ICT system, and the possibility of expanding the required real-time and in a specific situation. The present model for MCS is the initial element of decision support systems in order to assist management decision-makers in making decisions. The model is implemented in the MCS program Expert Choice, which allows us to analyze possible alternatives in different situations by changing weights of criteria and sub-criteria themselves. The program also gives us the analysis of the situation in the case of level changes consistently against certain alternatives to the required criteria and a direct view of comparing alternative search criteria, in order to analyze the potential of the security vulnerability of ICT systems. Making system to support decision-making manager ICT security system, the criteria by which to carry out assessment of the security vulnerability of ICT systems. The universality of the model and the system will allow the application of the ICT systems, regardless of the size, type and function of the system itself.

**Keywords:** Multiple criteria decision making, information and communication systems (ICT), AHP, Expert Choice, DSS

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