

Design of an Integrated Risk Management System

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Abstract

Risks are a reality every organization faces on a daily basis. This study proposes a cloud based Integrated Risk Management System following the steps dictated by IRM which include, Problem Identification, Risk Estimation, Risk Evaluation, Risk Mitigation and Control and finally Risk Monitoring. A field study was performed on a recreational facility located in Lebanon. An extensive review is applied, including interviews and surveys. This integrated system aligns the organization's goals and values with its risk management strategies as well as international standards. It fosters a holistic approach and systematic thinking to determine risks and mitigate them. Adding on to the IRM, Fuzzy Failure Modes and Effects Analysis (FMEA) and Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS) are utilized as supplementary methods to properly identify and prioritize failure modes and to yield the requested results. The significance of this study can be summarized as providing a tool for them to instantly respond to both tactical and strategic risk factors encountered while increasing situational awareness within the company especially with the development of the proposed holistic cloud-based IRM approach. The organization stated that with the proposed cloud-based communication tool that utilizes the Fuzzy FMEA and TOPSIS methods, it can implement the recommended solutions to risk items more quickly and effectively, therefore ensuring security and safety to the employees of the facility and its guests.

Keywords

Risk Assessment and Management, Integrated Risk Management System, Fuzzy Failure Modes and Effects Analysis (FMEA), Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS), Cloud-Based Communication Tool.

Biographies

Volkan Cakir obtained his B.Sc. in electronics engineering from Turkish Air Force Academy, Istanbul in 1992. He obtained his M.Sc. in industrial engineering from Middle East Technical University, Ankara in 2001. He received his Ph.D. in engineering management from the Old Dominion University, Norfolk, Virginia in 2011. He worked as logistics officer for four years in 5th Airbase, Merzifon. He has been lecturing in military, private, and public institutions in both English and Turkish for more than twenty years. His research interest areas are simulation, MCDA, risk analysis and management, resilience analysis, supply chain management, system dynamics, and statistical quality control. He worked as an assistant professor and the head of the Industrial Engineering Department at Istanbul Arel University between 2012 and 2018. He is currently assistant professor at Lebanese American University. cakirvolkanphd@gmail.com.

Sasha Nasser is an Industrial Engineering senior undergraduate student at the Lebanese American University (LAU), Lebanon with a minor in Business Studies. Her internships focused on quality control and statistical data analysis where she conducted studies and in depth analysis of quality control processes to reduce wastes and time and optimize overall process in production and maintenance. She also underwent risk management and auditing training according to the ISO 31000:2018 and the ISO 45001:2018. Her main research interests are risk assessment and management, logistics planning, supply chain management, and crisis management. sasha.nasser@gmail.com

Jana Hilal is a senior Industrial Engineering student at the Lebanese American University (LAU) and an incoming Master's in Management student at HEC Paris. She is interested in the research areas of sustainable development and circular economy. Her interest in sustainability also drives her involvement in the Millennium Fellowship Program organized by the United Nations Academic Impact and MCN. Jana is also the Lead Consultant at LAU Case Competition and an Emergency Medical Technician volunteer at the Lebanese Red Cross. jana.hilal01@lau.edu

Sym Bou Zeid is an Industrial Engineering senior student at the Lebanese American University and the recipient of the MEPI Tomorrow's Leaders Gender Scholars Program Scholarship. Her internship focused on the area of supply chain management and logistics where she assisted in the tracking shipments in the last-mile-delivery compartment. She also trained in the areas of demand forecasting and freight operations. Her main research interests encompass supply chain management, logistics planning and demand forecasting. sym.bouzeid@lau.edu

Grace Berdkan is an Industrial Engineering senior undergraduate student at the Lebanese American University. She is one of the contributors of the paper written. To add, her internship focused on process improvement in a healthcare institution. Currently, she is a junior analyst intern and is focusing on her interests in consulting. grace.berdkan@lau.edu