

A Novel Multi-Objective and Multi-Criteria Decision Support System for Logistic Management during Flood Disaster

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Abstract

One of the main challenges during a disaster is an effective search and rescue efforts that include mobilizing a large number of rescuers with the objective of getting the right persons to the right place at the right time. This imposes a formidable challenge to logistic management especially in flood disaster due to the wide-ranging areas and a large number of people affected. The urgency of getting supports in terms of rescue personnel and volunteers, food, transportation for evacuation and flood relief effort is a race against time where quick and correct decisions are needed while considering all the constraints emerge due to the flood. Consequently, the pressure to the decision maker to make the right decision is often cloud with emotions and thus, no longer objective. This research proposes a decision-making framework to aid in allocating logistic and dynamic management to optimize the available resources during flood crisis that include transport ranking and schedule developed by using excel visual basic application. The applicability of framework is illustrated through a case study.

Keywords

Decision support system, Logistic Management, Multi-Criteria, Multi-Objective

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Biography

Masdi Muhammad is a Senior Lecturer in Mechanical Engineering Department and research cluster leader for Facility and Plant Engineering, UTP. He is CEng (UK), CMRP, ASQ-Certified Reliability Engineer. He obtained his first and Master degrees, BSc in Mechanical Engineering and MSc in Manufacturing System Engineering, from Lehigh University, USA. His Ph.D. in Mechanical Engineering was obtained from UTP with research on "Reliability Model for Repairable Systems with Multi-State Degradation". He is actively involved in research collaboration and consultancy with PETRONAS OPU and currently supervising PhDs and MSc students in the area of Reliability and Maintenance. He has twelve years of experience working in various positions in one of the leading semiconductor companies, involving process and equipment engineering, product development, and material quality prior to joining UTP. He is a chartered engineer and member of BEM, IEM, American Society of Quality and Co-Chair of ASME-Malaysia Section.

Nurul Rawaida Ain Burhani is currently a Ph.D. candidate in Mechanical Engineering specialized in Reliability and Corrosion with research on "Probabilistic Life Prediction Model for Corrosion under Insulation". Her MSc in Asset Management and Maintenance under Mechanical Engineering Department was obtained from UTP by coursework and with research on "Life Cycle Cost of Gas District Cooling Plant". She gained her first degrees, BSc in Mechanical Engineering from Universiti Teknologi PETRONAS. Actively involve as speaker and writer for charity work in developing youth and society.

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