# Topological Analysis of Project Risks Network: A Case of Rabat Tramway Project

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## Abstract

Topological analysis based on graph theory, has the merit of revealing the relevant properties of the structure of a network system. In this working paper, the topological analysis is used to analyse the structural properties of the project risk network. The main idea here is that the risks faced by a large infrastructure project are not independent but are often interrelated and can evolve by propagation, whence their structuration in network. Therefore, the appeal to the network theory is not trivial but is a significant development in the field of research on the analysis and management of project risks. The aim of this study is to identify critical risks and interactions among risks with regard to their roles in the network. This will provide valuable information that complements the traditional analysis based on the evaluation of the likelihood and impact of risks. The originality of this work manifests itself, particularly, through the application of topological analysis in the field of project risks management, and the adaptation of indicators of network theory, in particular, the indicators of connectivity, interface and betweenness centrality. The application on a real complex engineering project allows us to validate the usefulness and feasibility of the proposed approach.

**Keywords:** Project risks management, graph theory, topological analysis, modeling project risks, safety.

## Biography

**Younes Bourass** is a PhD researcher at Mohammadia Engineering School of Rabat (Mohammed V University, Morocco). He earned Engineering degree in Science and Technologies form the University of Lille 1, France, and Master in Management and Business from the University of Moulay Ismail, Meknes, Morocco. He has published papers in international scientific journals and conferences. Younes Bourass has completed research projects with Tramway Company of Rabat and many of national public administrations in Morocco. His research interests include modeling, manufacturing, risk management, project economics and optimization. He is member of the Quality, Safety and Maintenance Laboratory.

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