

## USING SIMULATION FOR REDUCING RISK OF A MINING OPTIMIZATION PROJECT

Chinbat, U.

Graduate School of Economics and Business Administration, Furo-cho, Nagoya University,  
Chikusa-ku, Nagoya, Aichi 464-8601, Japan  
E-Mail: chinbat.undram@b.mbox.nagoya-u.ac.jp

### Abstract

The use of simulation in a project management can illustrate visual display of the project objective and the process virtually but realistically. This paper investigates the valid benefits of using simulation technique for a Mining and Iron Production Factory (MIPF) project. It is believed by the author that mining activity is particularly subject to more risks than other business activities because of its uncertainty, complexity and high cost. One of the first things to consider before starting mining projects is the risk factor. Some project risks can be reduced by visualizing and understanding the process before the actual initiation process. The paper illustrated the advantages of using computer aided simulation for an optimization project of a MIPF in a real life case study.

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**Key Words:** Project Risk Management, Mining Optimization, Simulation Analysis

### 1. INTRODUCTION

In a project context, risk is the chance of something happening that will have an impact upon objectives, including possibility of loss or gain, or variation from a desired or planned outcome, as a consequence of the uncertainty associated with following a particular course of action. The purpose of risk management is to minimize risks of project failure and to identify and take advantage of opportunities. In particular, risk management assists project managers in setting priorities, allocating resource and implementing actions and processes that reduce the risk of project failure [1].

A systematic identification, analysis and assessment of risk and dealing with the results contribute significantly to the success of projects. Risk should be considered at the earliest stages of project planning, and risk management activities should be continued throughout a project. Simulation analysis was introduced to a mining and iron production factory project to estimate performance and assess possible risks in a real life case.

Simulation is a process of designing a model of a real system and conducting experiments with this model for the purpose of understanding the behaviour of the system and/or evaluating various strategies for the operation of the system [2]. Computer designed simulation can help project management practitioners understand the behaviour of the system and optimize the system through various strategies in a virtual reality.

The use of simulation has shown great benefits in risk mitigation of an optimization project of a MIPF providing accurately calculated numeric data of the process. The numeric deliverables of the simulation analysis provided a discovery of the elements to be improved and an extent of the optimization project.

4. The use of simulation analysis tool has given the team a certainty of elements required an optimization and indication on how to optimize those elements. Furthermore, one of the risks of the management feared was a process interruption for this optimization project, which may have resulted in idle time costs. As a result of the simulation analysis tool, the project team had a satisfactory virtual model of the system, provided an opportunity to create various scenarios with optimization points and alter the model as they wish without any fear from negative risk factors.
5. The management has pointed out that, risks from machinery break down, delays from repair work can be considered in the future optimization projects. Furthermore, the team can investigate the possibility of calculating delays may occur from irresponsibility of the workers, poor management, accidents and other risks from human/organizational resistance.

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