



INTRODUCING KNOWLEDGE MANAGEMENT, TRIZ and JUGAAD CONCEPTS TO RISK MANAGEMENT: “APPLICATION TO A CONSTRUCTION CASE STUDY”

By: Ahmed Ibrahim EL-Gendy

A thesis submitted to the faculty of engineering at Cairo university in
partial fulfillment of the requirements for the degree of

**MASTER OF SCIENCE
IN RISK ENGINEERING**

**FACULTY OF ENGINEERING, CAIRO UNIVERSITY
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UNDER SUPERVISION OF

PROF. DR. FOUAD K. MOHAMED

.....

**DR., EMERITUS PROF.
CUFE, PETROLEUM ENGINEERING
RISK MASTER COORDINATOR, REM**

Dr. Tariq M. Ali Saleh

.....

**Consultant engineer, instructor
Expert for insurance companies**

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Approved by the

Examining committee:

.....
PROF. DR. FOUAD K. MOHAMED **Thesis Main Advisor**
Dr., Emeritus Prof., Cufe, Petroleum Engineering Risk Master Coordinator, Rem

.....
DR. TARIQ M. ALI SALEH **Advisor**
Consultant engineer, instructor and expert for insurance companies

.....
PROF. DR. AHMED HASSAN GABER **Internal Examiner**
Professor of Chemical Engineering, Cairo University, and Chairman, Chemonics Egypt

.....
DR. MAHA M. NASSAR **External Examiner**
**Business Consultant and Professor of Project Management and Information system
petroleum general authority; CEO for Jupiter 2000, SAP program Manager, PMP,
PBA, RMP.**

FACULTY OF ENGINEERING, CAIRO UNIVERSITY

GIZA, EGYPT

2018

Name: Ahmed Ibrahim Mohamed El-Gendy
Date of birth: 1/11/1976
Nationality: Egyptian.
Email : seif6000@hotmail.com
Mobile : +2-01002688515
Address: GIZA, EGYPT
Registration date: 1/10/2013
Awarding date: 2018
Degree: Master of Science
Department: Risk engineering



Supervisors:

PROF. DR. FOUAD K. MOHAMED

**DR., EMERITUS PROF. CUFE, PETROLEUM ENGINEERING
RISK MASTER COORDINATOR, REM**

Dr. Tariq M. Ali Saleh

Consultant engineer, instructor and expert for insurance companies

Examiners:

PROF. DR. FOUAD K. MOHAMED

**DR., EMERITUS PROF., CUFE, PETROLEUM ENGINEERING
RISK MASTER COORDINATOR, REM**

DR. TARIQ M. ALI SALEH

Consultant engineer, instructor and expert for insurance companies

PROF. DR. AHMED HASSAN GABER

Professor of Chemical Engineering, Cairo University, and Chairman, Chemonics Egypt

DR. MAHA M. NASSAR

Business Consultant and Professor of Project Management and Information system petroleum general authority; CEO for Jupiter 2000, SAP program Manager, PMP, PBA, RMP.

Key Words:

Risk Management, Black Swan, TRIZ, JUGAAD, Creative Problem Solving

Summary

This research integrates four concepts creating a new comprehensive risk management approach called "RKTS approach" where R refers to risk, K refers to knowledge management, T refers to TRIZ (innovation theory) and S refers to theory of sustainable innovation (JUGAAD). Although Risk Management is considered a new revolutionary science, the last three concepts included in the approach (RKTS) are considered newer and revolutionary too.

Disclaimer

I hereby declare that this thesis is my own original work and that no part of it has been submitted for a degree qualification at any other university or institute.

I further declare that I have appropriately acknowledged all sources used and have cited them in the references section.

Name:

date:

Signature:

DEDICATION

I Would Like to Dedicate This Work to My Family Who Supported Me in Various
Ways

ACKNOWLEDGEMENT

First, I would like to Express My Sincere Thanks and Grateful to GOD, THE ALLMIGHTY, for giving me the power, vision and willing to complete this work.

After All, I would like to thank my Professor and Mentor Prof. Dr. Fouad Kalaf Mohamed for his invaluable insights and direction, wise supervision and support in developing this work from its early stages.

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Nomenclature

AFD: Anticipatory failure determination
AFI: Anticipatory failure identification
ALARP: As low as reasonably possible
ANT: Actor network theory
ARIZ: Algorithm Rezhnija Izobretatelskih Zadach means in English algorithm for inventive Problem solving
ASIT: Advanced systematic inventive thinking
BSC: Balanced score card
CA: Competent authority
COSO: Committee of sponsoring organization of the tread way commission
DE: Directed Evolution
DOC: Degree of creativity
DTC: Dimension, Time, Cost
ENV: Element Name Value
ERM: Enterprise Risk Management
ES: End State
FCA: Functional Cost Analysis
FMEA: Failure Mode Effects Analysis
FTA: Fault Tree Analysis
GRC: Governance, Risk and Compliance framework
HAZID: Hazard identification
HAZOP: Hazard and Operability Study
HC: Human capital
HRI: Hazard risk index
HRO: High reliability organization
IC: Intellectual capital
IE Initiating event
IFR Ideal Final Result
IPFS Innovation Project Failure Source
IPS Inventive Problem Solving
ISQ Innovation situation questionnaire
I-TRIZ Ideation Teoriya Resheniya Izobretatelskikh Zadach means in English theory of the resolution of invention-related tasks.
KPI Key performance index
KRI Key Risk Index
KRM Knowledge Risk Management
MS Mid-State

NQL Necessary Qualification Level
OTSM Russian abbreviation to “the general theory of powerful thinking”
PF Problem Formulation
PMI Project Management Institute
RC Relational Capital
RCA+ Root conflict analysis
RDS Return driven strategy framework
RDT Resource dependence theory
RMC Risk management capability
RMI Risk management index
RMM Risk management motivation
RPN Risk priority number
RTA Receiver transfer access
SC Structural capital
SIT Systematic inventive thinking
SLPM Small little people modeling
SRM Strategic risk management
SU-FIELD substance - field
TRIZ Teoriya Resheniya Izobretatelskikh Zadach means in English theory of the resolution of invention-related tasks
TRTL Russian abbreviation for the “theory of creative personality development”
TS Technical systems
TTL Time to learn
USIT Unified structured inventive thinking
USSR Union of Soviet Socialist Republics