



بسم الله الرحمن الرحيم

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تم رفع هذه الرسالة بواسطة / مني مغربي أحمد

بقسم التوثيق الإلكتروني بمركز الشبكات وتكنولوجيا المعلومات دون أدنى

مسئولية عن محتوى هذه الرسالة.

ملاحظات: لا يوجد





Cairo University

System dynamics approach to simulate the impacts of COVID-19 on cost overruns and time delay of construction projects

By

Ahmed Gamal Mohamed Mohamed

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
STRUCTURAL ENGINEERING

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
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Under the Supervision of

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Title of Thesis:

SYSTEM DYNAMICS APPROACH TO SIMULATE THE IMPACTS OF COVID-19 ON
COST OVERRUNS AND TIME DELAY OF CONSTRUCTION PROJECTS

Key Words:

Construction . System dynamics. Survey. Cost overruns. Time delay

Summary:

The Covid-19 outbreak caused a significant impact on all industries in the world. Especially, the industries -related to construction. It has continued operating albeit with some degree of disruption. This research objective is to develop a simulation model to understand how the COVID-19 outbreak and different policies employed by countries that impact the performance of construction projects. A System Dynamics model using Anylogic software was developed to simulate the impacts official number of reported infected cases nationally, and enforcement of health and safety measures by construction companies on key project performance indicators (time and cost). The model was validated using data from a survey was conducted among 57 projects covering six countries in the Middle East and North Africa (MENA) region. The system dynamics model produced an identical result to the conducted survey as indicated in the validation section. The developed model can be used by construction companies and governments.

Disclaimer

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

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

Name: Ahmed Gamal Mohamed Date: / /2022

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Acknowledgments

I would like to express my sincere appreciation to my major advisor Professor Dr. Hesham Osman for his professional guidance, motivation, and generous support throughout this research.

My heartfelt gratitude to father and mother for their continuous encouragement and support throughout the years of work. Special thanks and love to my sisters and friends for being a great source of motivation and inspiration.

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